

**SUPPLEMENTAL A. DATA FOR INVESTIGATION OF INTERMITTENT AIR
EXPOSURE ON FOUR-STAGE AND ONE-STAGE ANAEROBIC SEMI-CONTINUOUS**

Table A-1. Transfer data for Train 4S Fermentor 1.

Train 4S – Fermentor 1										
Day	pH	Feedstock Added	Liquid Removed	Solids Removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00					0					
2.58					253					
5.58					283					
7.58					1761					
9.58	6.3	32	284.4	0	1085	520.1	0.966	0.548	10.14	13.96
12.64	6.5	32	304.5	0	1578	541.3	0.966	0.501	14.7	22.81
14.53	6.7	32	285.7	23.1	864	576.8	0.966	0.501	15.66	24.29
16.37	6.5	32	316.1	59.7	915	643.8	0.966	0.501	15.71	24.21
19.64	6.4	32	206	30.3	2033	504.3	0.966	0.501	20.71	31.19
21.58	6.9	32	212.6	49.7	1461	530.3	0.966	0.501	18.21	27.71
23.43	6.0	32	143.1	51.4	1200	462.5	0.966	0.501	22.74	33.97
26.59	6.1	32	169.5	44.9	1129	482.4	0.966	0.501	21.72	31.95
28.52	6.2	32	136.9	91.4	883	496.3	0.966	0.501	19.29	28.15
30.66	6.4	32	147.2	58.6	415	473.8	0.966	0.501	20.07	28.89
33.59	5.7	32	88.6	117.4	562	474.1	0.966	0.501	15.04	22.06
35.56	6.4	32	159.6	61.6	757	489.2	0.966	0.501	18.44	26.64
37.75	6.4	32	167.3	61.3	727	496.6	0.966	0.501	19.38	27.95
40.66	6.6	32	146.3	69.6	638	483.9	0.966	0.501	20.25	28.93
42.59	5.9	32	121.9	92	523	481.9	0.966	0.501	20.29	29
44.79	6.4	32	146.3	77.6	483	491.9	0.966	0.501	19.75	28.04
47.67	6.7	32	151.7	91	655	510.7	0.954	0.491	20.72	29.38
49.45		32	109.2	126.2	493	503.4	0.952	0.691	20.63	29
51.63	5.9	32	99.1	74.9	453	442	0.946	0.363	22.31	31.04
54.67	5.8	32	142.7	76.4	604	487.4	0.941	0.810	13.02	18.02
56.50	6.0	32	165	76.2	506	509.2	0.948	0.689	12.52	17.28
58.68		32	96.3	88	393	452.3	0.963	0.750	16.32	22.2
61.55	6.0	32	121.2	77.4	442	436.6	0.964	0.389	15.51	21.3
63.56	5.7	32	132.6	84.9	0	485.5	0.952	0.600	14.56	19.91
65.69	6.0	32	123.3	79.7	389	471	0.962	0.495	12.21	16.58
68.53	6.0	32	164.9	81	721	513.9	0.963	0.517	17.3	23.7
70.59	6.0	32	115.2	89.2	593	472.4	0.930	0.591	16.92	22.99
72.72	6.0	32	126.7	82.1	551	476.8	0.961	0.498	19.92	27.37
75.59	6.0	32	135.6	90.1	332	493.7	0.964	0.538	16.57	22.61

Table A-1. Continued.

Train 4S – Fermentor 1										
Day	pH	Feedstock Added	Liquid Removed	Solids Removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
77.59	6.0	32	147.7	81.8	470	491.1	0.964	0.306	16.89	22.9
79.72	6.2	32	119.6	91.2	321	478.8	0.964	0.531	18.46	25.11
82.56	5.5	32	106.4	91.1	393	465.5	0.954	0.658	22.63	30.52
84.62	5.7	32	104.5	95.6	574	468.1	0.963	0.535	25.09	33.94
86.78	6.0	32	97.7	96.1	521	461.8	0.961	0.569	25.21	34.21
89.58	5.7	32	95.7	84.7	340	448.4	0.963	0.515	25.03	34.39
91.62	6.0	32	112.2	91.9	381	472.1	0.963	0.535	23.96	33.09
93.80	5.9	32	138.1	55	440	461.1	0.963	0.414	22.97	31.79
96.55	5.5	32	136.3	94.1	623	498.4	0.963	0.513	25.45	35.19
98.65	5.1	32	148.8	89.7	919	506.5	0.965	0.527	29.82	40.82
100.31	5.5	32	132.4	67.1	404	467.5	0.957	0.483	30.97	42.54
103.59	5.3	32	116.9	102	483	486.9	0.959	0.634	29.41	40.72
105.71	6.2	32	149	86.7	481	503.7	0.958	0.481	25.68	35.36
107.74	5.7	32	172.4	64	342	504.4	0.958	0.530	28.26	38.62
110.58	5.5	32	153.5	91.9	383	513.4	0.960	0.531	27.7	37.94
112.58	5.4	32	147.5	96.2	540	511.7	0.963	0.400	27	37.25
114.58	5.9	32	172.3	65.2	589	505.5	0.962	0.381	26.58	36.71
117.89	5.9	32	150.2	73.2	574	491.4	0.959	0.386	31.29	43.45
119.49	6.0	32	154.3	83.3	396	505.6	0.963	0.492	27.59	38.19
121.66	5.8	32	139.9	85.5	404	493.4	0.962	0.635	24.92	34.49
124.40	6.1	32	134.5	78.8	319	481.3	0.969	0.457	27.03	37.12
126.54	5.9	32	135.5	93.8	323	497.3	0.963	0.470	25.73	35.19
128.60	6.0	32	119.2	77.6	311	464.8	0.971	0.514	22.99	31.32
131.53	6.0	32	131.2	69	364	468.2	0.971	0.509	27.42	37.43
133.00	6.2	32	93.5	92.2	289	453.7	0.969	0.476	28.54	38.69
135.80	5.8	32	122.8	101	298	491.8	0.970	0.451	23.81	32.15
138.71	6.0	32	91.2	80.3	376	438.5	0.968	0.489	24.89	33.71
140.57	6.0	32	118.7	82.3	347	469	0.965	0.430	27.4	37.07
142.00	5.9	32	97.5	99.8	347	465.3	0.970	0.444	24.28	32.87
146.00	6.0	32	116.8	72.6	379	457.4	0.969	0.444	24.25	33.13
147.60	6.0	32	154.1	75.4	285	497.5	0.968	0.811	21.35	29.09
149.82	6.1	32	73.9	113.2	313	455.1	0.971	0.485	23.87	32.58
152.60	6.1	32	135	73.9	330	476.9	0.972	0.421	22.57	30.84
154.82	6.1	32	89.8	96.2	317	454	0.971	0.466	22.95	31.33
156.81	5.9	32	106.4	90.7	351	465.1	0.970	0.448	27.88	37.99
159.00	5.8	32	154.5	87.5	498	490	0.970	0.445	22.81	31.48
161.84	6.0	32	100.4	111.7	470	480.1	0.969	0.469	22.4	30.65

Table A-1. Continued.

Train 4S – Fermentor 1										
Day	pH	Feedstock Added	Liquid Removed	Solids Removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
163.85	5.9	32	122.4	104.5	470	494.9	0.970	0.450	22.72	31.35
166.99	5.5	32	152.9	69.9	530	490.8	0.947	0.628	21.79	30.48
168.57	5.9	32	143.2	66.2	402	477.4	0.961	0.338	24.25	33.94
170.76	5.7	32	180.6	58.1	502	506.7	0.959	0.295	18.98	26.71
173.62	5.8	32	140.3	104	334	512.3	0.965	0.143	18.77	26.72
175.53	5.7	32	123.4	89.3	519	480.7	0.969	0.703	22.61	32.2
177.49	6.0	32	129.1	85.5	647	482.6	0.964	0.421	23.47	33.65
180.66	5.7	32	130.3	72.6	766	470.9	0.964	0.380	23.54	34.52
182.50	5.7	32	115.9	77.7	581	461.6	0.964	0.388	22.86	33.51
184.63	5.7	32	123.2	80.1	476	471.3	0.964	0.582	23.78	34.46
187.53	5.6	32	131.9	84.2	521	484.1	0.964	0.495	23.7	34.34
189.52	6.0	32	167.3	65.2	462	500.5	0.967	0.453	22.06	32.13
191.57	6.0	32	152.4	83.4	353	503.8	0.963	0.460	23.12	33.58
194.62	5.8	32	143.2	70.8	491	481.9	0.965	0.476	20.01	29.16
196.68	6.5	32	124.3	111.6	438	503.9	0.958	0.493	21.24	30.54
198.62	5.8	32	121.8	82.7	374	472.5	0.966	0.475	22.13	32.08
201.51	5.8	32	123.8	81.9	510	473.7	0.966	0.471	22.47	32.47
203.66	6.4	32	93.5	93	311	454.5	0.955	0.475	20.75	30.11
205.54	5.5	32	127.3	77.7	366	473	0.962	0.478	20.45	29.48
208.92	6.0	32	105.2	92	391	465.2	0.967	0.479	22.67	32.8
210.68	6.5	32	105.2	102.3	404	475.5	0.967	0.476	21.59	31.22
212.75	6.0	32	103.1	86.4	315	457.5	0.966	0.476	21.62	31.17
214.60		32	115.8	81.7	391	349.7	0.968	0.443	23.36	33.38

Table A-2. Transfer data for Train 4S Fermentor 2.

Train 4S – Fermentor 2						
Day	pH	Solids added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	cm ³	(g)
0.00						
2.58					199.9	
5.58					595.6	
7.58					1076.3	
9.58	5.8	0.0	280.2	0.0	1046.5	492.6
12.64	5.8	0.0	313.2	0.0	525.4	483.4
14.53	6.0	23.1	349.5	0.0	244.6	508.3
16.37	6.1	59.7	211.6	0.0	336.1	414.4
19.64	6.2	30.3	235.1	0.0	478.6	446.5
21.58	6.1	49.7	162.4	0.0	504.1	416
23.43	6.3	51.4	187.7	0.0	553.0	461.1
26.59	6.0	44.9	199.3	0.0	721.1	474.1
28.52	6.1	91.4	180.3	0.0	636.0	481.1
30.66	6.8	58.6	176.4	0.0	627.5	460.7
33.59	6.0	117.4	194.1	0.0	655.1	507.1
35.56	6.0	61.6	205.9	0.0	533.9	487.9
37.75	5.9	61.3	185.6	0.0	499.8	469.1
40.66	6.0	69.6	187.5	0.0	504.1	476.6
42.59	6.0	92.0	200.0	0.0	378.6	502.4
44.79	6.0	57.0	214.2	0.0	327.6	487.9
47.67	5.8	91.0	208.2	146.9	429.7	507.5
49.45		126.2	151.3	122.3	304.2	448.9
51.63	5.7	74.9	190.6	124.2	274.4	511.3
54.67	5.8	76.4	214.1	126.4	361.6	497
56.50	5.8	76.2	157.3	150.2	316.9	440.9
58.68		88.0	172.3	121.3	210.6	476.4
61.55	6.0	77.4	189.5	125.5	295.7	484
63.56	5.6	84.9	173.7	0.0	0.0	476.2
65.69	6.0	79.7	218.7	153.2	314.8	506.7
68.53	6.0	81.0	178.0	60.5	491.3	472.5
70.59	6.0	89.2	187.9	60.4	289.3	495.6
72.72	6.0	82.1	198.9	65.6	212.7	488.8
75.59	6.0	90.1	194.9	68.1	234.0	495.7
77.59	5.6	75.4	185.5	64.4	202.1	491.9
79.72	6.0	91.2	169.4	66.6	285.0	471.3
82.56		91.1	174.8	61.8	395.6	495.5
84.62	5.7	95.6	169.4	67.7	316.9	463.2

Table A-2. Continued.

Train 4S – Fermentor 2						
Day	pH	Solids added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	cm ³	(g)
86.78	5.8	96.1	151.9	61.1	372.2	473.6
89.58	6.0	84.7	178.1	67.5	265.9	483.4
91.62	5.9	91.9	167.0	64.6	238.2	480.3
93.80	5.6	55.0	202.9	148.0	465.8	488.1
96.55	5.4	94.1	213.4	0.0	757.2	536.1
98.65	5.3	89.7	175.3	60.6	595.6	498.7
100.31	5.3	67.1	191.5	66.1	485.0	479.2
103.59	5.1	102.0	208.1	64.4	499.8	519.5
105.71	5.6	86.7	206.1	65.5	299.9	512.2
107.74	5.8	64.0	213.8	70.3	185.0	503
110.58	5.5	91.9	220.3	0.0	327.6	526.7
112.58	5.1	96.2	217.4	62.0	319.1	514.8
114.58		65.2	196.3	57.7	259.5	494.7
117.89	5.8	73.2	211.5	64.1	234.0	516.5
119.49	5.9	83.3	204.0	72.6	178.7	512.2
121.66	5.8	85.5	188.0	66.1	187.2	499.9
124.40	6.0	78.8	202.5	68.5	199.9	506.4
126.54	5.9	93.8	172.1	0.0	208.4	486.3
128.60	5.9	72.6	173.5	0.0	138.3	483.7
131.53	6.0	69.0	164.0	0.0	231.8	468.6
133.00	6.1	92.2	197.1	0.0	312.7	515.8
135.80	5.9	101.0	140.4	0.0	248.9	481.3
138.71	6.0	80.3	171.8	0.0	244.6	488.8
140.57	5.9	82.3	170.3	0.0	187.2	481.3
142.00	5.7	99.8	160.7	0.0	157.4	493.3
146.00	5.9	72.6	201.3	0.0	272.3	509.4
147.60	6.0	75.4	159.8	0.0	187.2	478.9
149.82	6.1	113.2	181.1	0.0	197.8	516.2
152.60	5.9	73.9	156.5	0.0	319.1	470.6
154.82	5.8	96.2	169.9	0.0	393.5	481.5
156.81	5.7	85.7	194.2	0.0	278.6	511.4
159.00	5.7	87.5	201.8	0.0	340.3	505.8
161.84		111.7	202.1	0.0	344.6	547.8
163.85	6.0	104.5	194.9	0.0	368.0	496.4
166.99	5.5	69.9	179.9	70.5	476.4	472.9
168.57	6.0	66.2	213.5	53.9	240.4	512.7
170.76	5.6	58.1	217.2	62.1	382.9	512

Table A-2. Continued.

Train 4S – Fermentor 2						
Day	pH	Solids added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	cm ³	(g)
173.62	5.9	104.0	188.3	39.3	455.2	494.4
175.53	5.5	89.3	190.5	66.6	270.1	518.6
177.49	5.5	85.5	175.1	106.3	363.7	492.2
180.66	5.8	72.6	165.4	0.0	546.6	483.2
182.50	5.6	77.7	179.1	67.2	351.0	492.6
184.63	5.6	80.1	189.2	69.5	295.7	506.9
187.53	5.4	84.2	205.1	67.1	331.8	519.9
189.52	6.5	65.2	211.3	131.8	295.7	506.8
191.57	6.0	83.4	185.1	63.8	219.1	511.9
194.62	5.9	70.8	206.2	63.9	489.2	519.9
196.68	6.0	111.6	180.9	66.6	397.7	509
198.62	5.7	82.7	178.4	40.6	291.4	496.8
201.51	5.8	81.9	160.0	67.6	297.8	487
203.66	6.3	93.0	180.3	70.2	242.5	505.6
205.54	5.5	77.7	168.1	0.0	278.6	486
208.92	6.0	92.0	177.1	63.5	455.2	509.9
210.68	6.5	102.3	163.6	60.1	306.3	489.3
212.75	6.0	86.4	179.6	58.5	202.1	482.6
214.60		81.7	180.3	0.0	223.3	310.5

Table A-3. Transfer data for Train 4S Fermentor 3.

Train 4S – Fermentor 3						
Day	pH	Solids added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	cm ³	(g)
0.00						
2.58					236.1	
5.58					676.4	
7.58					1822.8	
9.58	5.8	0.0	275.0	0.0	1118.8	520.9
12.64	5.9	0.0	339.5	0.0	614.7	520.1
14.53	6.3	0.0	235.3	0.0	253.1	396.2
16.37	6.4	0.0	189.4	0.0	206.3	351.1
19.64	6.2	0.0	185.7	0.0	206.3	346.4
21.58	6.5	3.3	167.7	0.0	176.5	330.9
23.43	6.5	24.8	182.9	0.0	182.9	335.2
26.59	6.6	19.7	186.3	0.0	289.3	351
28.52	6.8	92.2	165.3	0.0	304.2	347.9
30.66	6.3	42.9	211.5	0.0	470.1	451.8
33.59	6.2	130.4	194.1	87.8	663.6	451.5
35.56	6.3	43.6	177.0	31.3	470.1	464.7
37.75	6.1	44.8	181.0	33.9	684.9	470.1
40.66	6.2	58.7	205.5	39.6	612.6	486.4
42.59	6.2	94.4	204.7	65.8	412.6	476.1
44.79	6.1	57.0	214.2	30.7	521.1	487.9
47.67	5.9	90.3	153.9	88.0	695.5	451.6
49.45		123.8	219.5	78.3	202.1	474
51.63	5.4	95.6	200.6	84.6	272.3	489.6
54.67	5.6	59.3	144.6	48.4	368.0	433.7
56.50	5.7	59.8	183.9	69.1	268.0	493.5
58.68	5.5	92.1	189.7	84.7	229.7	482.3
61.55	6.0	71.9	179.7	67.9	336.1	475.7
63.56	5.8	87.4	210.2	70.1	0.0	492.9
65.69	6.0	67.7	176.8	43.3	242.5	452.4
68.53	6.0	75.5	201.0	70.7	229.7	496.2
70.59	6.0	96.9	196.5	81.3	195.7	480.9
72.72	6.0	72.0	199.9	44.5	138.3	472.4
75.59	6.0	90.9	195.6	73.4	172.3	478.1
77.59	5.9	81.8	177.6	70.3	146.8	466.1
79.72	6.1	93.1	198.7	76.8	153.1	482.4
82.56		111.8	167.3	114.5	251.0	470
84.62	5.4	89.4	181.1	80.3	268.0	472
86.78	5.8	117.8	185.4	113.4	323.3	481
89.58	6.0	90.0	186.1	58.3	329.7	454.4
91.62	6.0	105.2	194.8	98.7	278.6	488.3
93.80	5.8	40.2	241.7	0.0	372.2	491
96.55	5.5	116.8	203.3	94.6	450.9	481.1
98.65	5.5	113.1	185.2	98.2	495.6	470.3
100.31	5.5	54.8	224.5	12.1	416.9	481.8
103.59	5.2	113.4	214.5	98.3	472.2	499.4
105.71	5.8	92.8	206.7	55.0	325.4	468.9

Table A-3. Continued.

Train 4S – Fermentor 3						
Day	pH	Solids added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	cm ³	(g)
107.74	6.1	53.2	231.3	24.2	219.1	502.3
110.58		98.3	218.4	68.1	421.1	488.2
112.58	5.0	93.6	204.5	61.1	433.9	472
114.58	5.8	63.6	221.8	36.6	289.3	494.8
117.89	5.7	78.2	216.0	56.7	297.8	494.5
119.49	5.8	91.5	204.9	58.6	257.4	472
121.66	5.7	97.4	210.9	91.8	229.7	505.3
124.40	5.9	82.7	188.8	61.5	178.7	467.6
126.54	5.8	108.0	190.5	106.2	206.3	488.7
128.60	5.8	77.8	173.5	72.3	129.7	468
131.53	5.8	73.6	224.6	49.0	508.4	500
133.00	6.0	110.9	188.0	104.9	421.1	482
135.80	5.9	141.9	191.8	132.3	259.5	482.2
138.71	5.9	97.3	183.5	106.3	278.6	491.5
140.57	6.0	93.3	199.0	69.4	382.9	475.1
142.00	5.7	132.4	214.6	111.9	259.5	494.1
146.00	5.9	80.7	181.6	73.0	278.6	473.9
147.60	5.8	94.5	221.7	77.1	251.0	504.3
149.82	5.9	148.3	183.7	151.7	357.3	487.1
152.60	5.7	88.0	184.1	80.1	572.2	476.2
154.82	5.7	107.8	218.8	96.2	561.5	507.2
156.81	5.6	97.5	207.8	79.4	365.8	489.7
159.00	5.6	91.5	249.6	50.1	495.6	508.2
161.84		157.4	203.8	151.5	542.4	497.9
163.85	6.0	106.0	178.6	94.6	485.0	467.2
166.99	5.5	62.9	215.9	28.7	689.1	481.7
168.57	6.0	65.4	218.3	42.9	253.1	495.8
170.76	5.7	52.9	198.8	52.0	385.0	497.9
173.62	5.6	110.1	223.6	84.1	846.5	497.6
175.53	5.5	117.4	199.4	95.8	280.8	477.8
177.49	6.4	102.6	187.1	92.9	338.2	477.4
180.66	5.8	90.4	195.5	75.9	563.7	481
182.50	5.7	91.2	213.9	69.0	467.9	491.7
184.63	5.5	97.8	225.4	63.2	380.7	490.8
187.53	5.5	99.0	211.5	74.7	397.7	487.2
189.52	6.5	60.7	220.0	20.4	321.2	479.7
191.57	6.0	110.2	223.9	82.9	291.4	496.6
194.62	5.6	84.5	210.7	47.1	450.9	473.3
196.68	6.0	139.7	204.0	121.1	402.0	485.4
198.62	5.7	101.1	190.8	77.3	270.1	467
201.51	5.6	108.9	209.6	87.7	431.8	488.4
203.66	6.2	118.3	193.3	105.1	355.2	480.1
205.54	5.5	95.6	212.7	73.9	414.8	491
208.92	5.5	124.8	191.0	124.0	610.4	490.2
210.68	6.5	128.0	189.0	129.8	276.5	490.8
212.75	6.0	89.4	203.4	64.7	214.8	478.7
214.60		92.2	212.0	54.3	293.5	262.1

Table A-4. Transfer data for Train 4S Fermentor 4.

Train 4S – Fermentor 4											
Day	pH	Solids added	Fresh medium added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00						0					
2.58						270.1					
5.58						308.4					
7.58						1718.6					
9.58	6.1	0.0	175	277.1	0.0	1576.1	526.6	0.698	0.402		
12.64	6.3	0.0	175	218.4	0.0	1016.7	419.4	0.698	0.402		
14.53	6.7	0.0	175	191.5	0.0	238.2	370.4	0.698	0.402		
16.37	6.6	0.0	175	187.8	0.0	229.7	351.2	0.698	0.402		
19.64	6.7	0.0	175	173.8	0.0	255.2	335.3	0.698	0.402		
21.58	7.0	0.0	175	172.1	0.0	257.4	337.4	0.698	0.402		
23.43	6.7	0.0	175	177.5	0.0	202.1	333.9	0.698	0.402		
26.59	6.8	0.0	175	167.4	0.0	127.6	329.2	0.698	0.402		
28.52	7.4	0.0	175	182.2	0.0	127.6	335.0	0.698	0.402		
30.66	7.4	0.0	175	171.5	0.0	85.1	326.9	0.698	0.402		
33.59	7.2	87.8	175	173.2	0.0	63.8	330.9	0.698	0.402		
35.56	6.6	31.3	175	178.1	0.0	391.4	415.3	0.698	0.402	3.46	5.03
37.75	7.1	33.9	175	193.1	0.0	625.3	439.3	0.698	0.402	3.89	6.22
40.66	7.1	36.9	175	185.4	4.4	416.9	452.9	0.698	0.402	4.06	6.44
42.59	6.2	65.8	175	201.0	38.2	380.7	473.4	0.698	0.402	4.11	6.20
44.79	7.1	30.7	175	159.3	39.4	542.4	468.0	0.698	0.402	4.60	7.76
47.67	6.3	88.0	175	180.0	79.1	482.8	471.1	0.644	0.387	4.97	8.11
49.45	0.0	78.3	175	197.3	51.8	293.5	470.8	0.648	0.353	5.24	7.71
51.63	6.2	84.6	175	140.9	113.1	344.6	469.4	0.648	0.353	5.64	8.05
54.67	6.6	48.4	175	199.2	20.3	489.2	471.1	0.632	0.499	5.78	8.30
56.50	6.2	69.1	175	189.3	52.3	272.3	472.5	0.643	0.353	5.63	7.12
58.68	5.7	84.7	175	183.6	69.7	242.5	468.6	0.673	0.356	5.51	6.78
61.55	6.0	67.9	175	199.7	63.9	272.3	468.7	0.973	0.280	5.55	8.00
63.56	5.9	70.1	175	160.2	53.1	0.0	443.2	0.714	0.368	5.26	6.51
65.69	6.0	43.3	175	204.4	8.9	225.5	470.0	0.725	0.231	5.17	6.46
68.53	6.0	70.7	175	189.2	50.6	236.1	469.1	0.689	0.326	5.16	6.58
70.59	6.0	81.3	175	180.9	69.0	125.5	468.6	0.701	0.306	5.05	7.74
72.72	6.0	44.5	175	184.9	27.8	140.4	468.2	0.711	0.287	4.83	5.15
75.59	6.0	73.4	175	173.2	70.7	151.0	470.5	0.677	0.420	4.55	4.80
77.59	5.9	70.3	175	189.3	52.6	161.7	471.6	0.716	0.324	4.21	4.67
79.72	6.1	76.8	175	177.0	69.5	168.0	469.7	0.742	0.302	3.82	5.09
82.56	5.6	114.5	175	180.7	105.3	304.2	471.5	0.669	0.482	4.08	6.49
84.62	5.8	80.3	175	189.4	58.4	114.9	467.5	0.725	0.397	4.50	7.21
86.78	6.2	113.4	175	161.0	122.2	291.4	469.8	0.784	0.243	4.96	7.27
89.58	5.9	58.3	175	197.3	31.1	246.7	470.1	0.770	0.345	5.44	7.87
91.62	6.1	98.7	175	198.5	69.6	206.3	469.7	0.744	0.291	5.44	6.70
93.80	5.9	0.0	175	196.3	0.0	314.8	470.0	0.738	0.352	5.53	7.88
96.55	5.8	94.6	175	176.8	63.1	355.2	445.3	0.756	0.327	5.36	6.39
98.65	5.8	98.2	175	189.5	78.6	372.2	469.9	0.779	0.381	5.53	8.91
100.31	5.8	12.1	175	207.8	0.0	336.1	468.6	0.758	0.339	5.94	9.01
103.59	6.1	98.3	175	173.7	68.8	385.0	444.2	0.712	0.407	6.24	9.45
105.71	5.9	55.0	175	207.2	18.0	227.6	470.2	0.766	0.173	6.80	9.54

Table A-4. Continued.

Train 4S – Fermentor 4											
Day	pH	Solids added	Fresh medium added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
107.74	6.2	24.2	175	195.0	1.4	185.0	472.2	0.754	0.326	6.75	8.55
110.58	5.7	68.1	175	180.3	59.5	414.8	471.7	0.742	0.292	7.01	10.17
112.58	5.3	61.1	175	204.3	27.3	365.8	470.5	0.738	0.250	7.19	10.32
114.58	5.9	36.6	175	203.0	3.7	338.2	470.1	0.718	0.577	7.84	12.87
117.89	5.6	56.7	175	181.5	44.7	442.4	469.5	0.719	0.244	8.51	12.02
119.49	5.8	58.6	175	210.2	17.3	287.1	468.9	0.701	0.260	8.56	10.37
121.66	5.5	91.8	175	176.7	85.8	387.1	470.7	0.700	0.273	9.11	13.24
124.40	5.8	61.5	175	194.6	37.2	370.1	470.3	0.710	0.194	8.95	11.95
126.54	5.7	106.2	175	177.2	100.5	406.3	471.5	0.710	0.310	8.88	11.72
128.60	5.8	67.3	175	207.8	28.8	310.5	469.3	0.706	0.240	8.94	10.72
131.53	5.7	49.0	175	189.3	29.3	450.9	469.6	0.729	0.239	8.47	10.77
133.00	6.1	104.9	175	190.0	83.7	365.8	468.8	0.702	0.267	7.94	9.22
135.80	5.8	132.3	175	197.1	106.7	242.5	471.5	0.719	0.280	7.62	9.96
138.71	6.0	106.3	175	181.9	97.4	310.5	472.0	0.735	0.313	7.65	10.75
140.57	5.9	69.4	175	199.0	40.5	263.7	470.1	0.759	0.314	7.47	9.65
142.00	5.8	111.9	175	179.5	105.1	165.9	472.7	0.729	0.283	7.41	8.73
146.00	6.0	73.0	175	210.6	32.6	374.4	470.2	0.740	0.333	7.44	10.18
147.60	6.0	77.1	175	191.6	57.5	257.4	472.0	0.737	0.343	7.13	9.13
149.82	6.0	151.7	175	173.4	151.3	293.5	473.0	0.741	0.359	6.87	8.47
152.60	5.8	80.1	175	214.9	36.9	378.6	471.7	0.762	0.345	7.25	10.84
154.82	6.0	96.2	175	195.1	73.3	351.0	472.2	0.748	0.353	7.21	9.89
156.81	5.9	74.4	175	214.7	30.6	225.5	470.9	0.745	0.357	7.22	9.32
159.00	5.8	50.1	175	204.0	18.3	329.7	472.2	0.756	0.348	7.46	9.74
161.84	6.1	151.5	175	172.8	152.2	282.9	473.5	0.737	0.370	6.89	7.83
163.85	6.1	94.6	175	186.7	79.0	391.4	471.2	0.768	0.373	6.99	10.77
166.99	5.6	28.7	175	202.5	0.0	546.6	472.2	0.751	0.360	7.31	11.57
168.57	6.0	42.9	175	204.2	9.9	359.5	471.2	0.733	0.518	7.05	8.83
170.76	5.7	52.0	175	205.6	18.1	374.4	471.7	0.704	0.652	7.25	9.36
173.62	6.1	84.1	175	187.5	67.2	531.8	470.6	0.710	0.560	7.77	14.22
175.53	5.6	95.8	175	185.2	80.5	244.6	469.9	0.699	0.581	7.57	10.80
177.49	5.7	92.9	175	188.1	74.7	376.5	469.8	0.708	0.497	7.80	10.27
180.66	5.9	75.9	175	198.7	48.7	442.4	471.5	0.711	0.562	8.07	11.03
182.50	6.0	69.0	175	197.5	42.8	329.7	471.3	0.696	0.635	7.23	9.33
184.63	5.6	63.2	175	198.1	36.6	338.2	471.5	0.696	0.525	7.20	10.29
187.53	5.6	74.7	175	187.8	56.3	399.9	469.4	0.692	0.535	7.56	12.10
189.52	6.5	20.4	175	203.2	0.0	348.8	469.7	0.700	0.551	7.49	10.44
191.57	6.5	82.9	175	181.1	60.9	246.7	459.1	0.699	0.561	7.29	8.04
194.62	5.9	47.1	175	190.3	27.3	482.8	470.5	0.684	0.474	7.35	10.52
196.68	6.0	121.1	175	173.6	120.8	395.6	473.3	0.672	0.495	6.85	9.09
198.62	6.0	77.3	175	196.2	52.4	291.4	471.3	0.674	0.523	7.16	10.44
201.51	5.9	87.7	175	189.0	69.2	478.6	470.5	0.689	0.517	7.12	12.52
203.66	6.3	105.1	175	199.2	76.3	374.4	470.4	0.692	0.514	7.04	10.77
205.54	5.5	73.9	175	196.5	47.6	436.0	470.2	0.693	0.611	8.09	11.45
208.92	5.5	124.0	175	195.5	100.2	508.4	471.7	0.707	0.529	8.49	12.84
210.68	6.5	129.8	175	184.9	115.9	310.5	471.0	0.740	0.553	9.44	18.02
212.75	6.0	64.7	175	216.0	21.0	238.2	472.3	0.738	0.590	9.55	11.44
214.60		54.3	175	210.6	16.4	314.8	262.1	0.698	0.402	9.18	9.15

Table A-5. Transfer data for Train 4R Fermentor 1.

Train 4R – Fermentor 1										
Day	pH	Feedstock added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00					0					
2.58					340.3					
5.58					191.4					
7.58					455.2					
9.58	6.5	32	238.7	8.9	1180	515.6	0.956	0.501	8.30	10.04
12.64	7.0	32	267.9	0	1497	517.9	0.954	0.501	13.66	19.45
14.53	6.8	32	256.7	0	767.8	521.2	0.954	0.501	14.70	21.67
16.37	6.7	32	189.7	2.9	848.7	486.7	0.954	0.501	16.76	24.64
19.64	6.2	32	219.4	39.6	959.3	527	0.954	0.501	19.23	29.29
21.58	6.7	32	110.1	76.3	804	454.4	0.954	0.501	17.82	26.48
23.43	6.0	32	99.8	59.2	576.4	427	0.954	0.501	21.50	30.68
26.59	6.8	32	117	47.6	665.8	432.6	0.954	0.501	17.66	25.08
28.52	6.8	32	85.7	102.6	410.5	456.3	0.954	0.501	20.11	28.05
30.66	6.4	32	71.5	108.7	510.5	448.2	0.954	0.501	3.99	4.98
33.59	6.6	32	80.6	95	323.3	443.6	0.954	0.501	14.57	19.88
35.56	6.1	32	87.5	87.8	342.4	443.3	0.954	0.501	16.22	21.85
37.75	6.8	32	145.3	51.3	391.4	464.6	0.954	0.501	18.46	24.70
40.66	7.1	32	100.6	116	538.1	484.6	0.954	0.501	19.73	26.25
42.59	6.4	32	164.7	50.2	378.6	482.9	0.954	0.501	19.42	25.60
44.79	6.5	32	70.9	115.3	429.7	454.2	0.954	0.501	10.17	13.34
47.67	6.9	32	136.4	51.6	506.2	456	0.961	0.164	9.67	12.66
49.45	7.1	32	53.9	115.6	304.2	437.5	0.959	0.618	22.05	28.85
51.63	5.9	32	157.6	46.4	323.3	472	0.960	0.060	9.79	12.78
54.67	5.6	32	168.3	51.3	531.8	487.6	0.956	0.669	11.58	15.13
56.50	5.9	32	146.4	60.1	508.4	474.5	0.956	0.611	21.99	28.77
58.68	5.6	32	156.5	70.9	493.5	495.4	0.952	0.512	13.81	18.12
61.55	6.0	32	109.5	85.6	478.6	463.1	0.951	0.923	18.29	24.21
63.56	6.0	32	112.9	93.5	467.1	474.4	0.955	0.555	13.96	18.55
65.69	6.0	32	85.9	66.1	542.4	420	0.960	0.481	21.12	28.19
68.53	6.0	32	106.3	82	540.3	456.3	0.954	0.580	20.39	27.48
70.59	6.0	32	106.5	62.1	346.7	436.6	0.951	0.422	20.53	27.17
72.72	6.0	32	99	100.3	189.3	467.3	0.957	0.519	17.52	22.97
75.59	6.0	32	78.6	83	325.4	429.6	0.958	0.555	16.71	21.78
77.59	6.0	32	65.1	79.3	244.6	412.4	0.960	0.396	19.86	25.78
79.72	7.0	32	100.8	82.5	263.7	451.3	0.959	0.549	20.42	26.41
82.56	0.0	32	93.6	75.1	206.3	436.8	0.950	0.592	25.90	33.68
84.62	5.8	32	82.2	105.8	276.5	456	0.961	0.507	25.53	33.73
86.78	5.9	32	132.7	65.5	297.8	466.2	0.960	0.492	26.02	34.36
89.58	5.7	32	112.2	88.3	402	468.5	0.959	0.459	27.62	36.41
91.62	5.9	32	128.7	99.1	219.1	495.8	0.962	0.521	24.69	32.97
93.80	6.0	32	133.9	58.9	325.4	460.8	0.992	1.632	26.20	35.02
96.55	5.5	32	134.4	76.3	385	478.7	0.961	0.331	27.47	36.67
98.65	5.6	32	156.1	62.4	280.8	486.5	0.951	0.517	25.91	34.84
100.31	5.5	32	217.8	81	293.5	566.8	0.963	0.561	25.50	34.16
103.59	5.5	32	123.1	69.8	419	460.9	0.956	0.772	31.76	42.14
105.71	6.7	32	160.8	62.3	319.1	491.1	0.962	0.421	23.73	31.34

Table A-5. Continued.

Train 4R – Fermentor 1										
Day	pH	Feedstock added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
107.74	6.5	32	149.6	56.9	389.2	474.5	0.963	0.478	27.88	36.68
110.58	5.5	32	152.7	75.5	389.2	496.2	0.963	0.595	24.27	32.09
112.58	5.3	32	161.8	57.5	482.8	487.3	0.961	0.188	25.67	34.14
114.58	5.7	32	174.6	76.9	391.4	519.5	0.959	0.391	27.89	37.03
117.89	5.8	32	180	47	493.5	495	0.960	0.375	28.43	37.69
119.49	6.1	32	142.2	79	248.9	489.2	0.963	0.560	23.19	30.66
121.66	5.8	32	102	83.9	270.1	453.9	0.963	0.629	25.11	32.99
124.40	6.2	32	112.4	87	121.2	467.4	0.973	0.423	22.87	29.97
126.54	6.1	32	80.6	85.2	219.1	433.8	0.964	0.476	23.09	30.14
128.60	6.3	32	86.2	94	208.4	448.2	0.977	0.522	22.85	29.71
131.53	6.1	32	90.4	93.8	240.4	452.2	0.976	0.531	24.37	31.61
133.00	0.0	32	119.4	65.4	359.5	452.8	0.971	0.474	23.66	30.88
135.80	5.7	32	121.2	91.1	340.3	480.3	0.969	0.459	23.59	30.58
138.71	6.0	32	128.8	82.8	327.6	479.6	0.968	0.497	24.19	31.73
140.57	6.0	32	137.9	87.1	225.5	493	0.968	0.479	21.51	28.29
142.00	6.0	32	99.1	83	268	450.1	0.968	0.414	24.43	32.08
146.00	5.9	32	153.6	63.8	299.9	485.4	0.970	0.478	24.10	31.66
147.60	5.8	32	156.1	70.1	280.8	494.2	0.968	0.460	22.75	29.85
149.82	5.8	32	166.6	80.1	295.7	514.7	0.969	0.506	22.70	29.94
152.60	5.9	32	158.7	82.6	282.9	509.3	0.970	0.447	23.10	30.32
154.82	5.8	32	126.5	67.9	295.7	462.4	0.969	0.473	25.83	33.90
156.81	5.9	32	116	97.5	214.8	481.5	0.968	0.437	23.22	30.46
159.00	5.8	32	140.4	51.5	261.6	459.9	0.969	0.476	24.75	32.38
161.84	5.9	32	141.2	101.5	261.6	510.7	0.969	0.472	22.30	29.11
163.85	6.3	32	131.4	72.9	165.9	472.3	0.971	0.478	21.49	28.04
166.99	5.8	32	115.4	75.8	217	459.2	0.966	0.528	20.75	27.21
168.57	6.1	32	143.3	76.5	378.6	487.8	0.963	0.311	22.14	29.01
170.76	5.7	32	123.9	73.6	344.6	465.5	0.958	0.453	18.60	24.35
173.62	6.3	32	135.5	75.8	287.1	479.3	0.963	0.477	22.40	29.28
175.53	5.9	32	143.8	76	223.3	487.8	0.966	0.474	23.71	30.81
177.49	6.1	32	136.7	87.2	272.3	491.9	0.966	0.449	17.27	22.44
180.66	5.7	32	124.5	79.3	319.1	471.8	0.963	0.433	20.35	26.41
182.50	5.7	32	127.5	69	268	464.5	0.966	0.457	20.94	27.10
184.63	5.8	32	124.8	69	227.6	461.8	0.965	0.530	23.51	30.31
187.53	5.8	32	149.3	77.6	236.1	494.9	0.968	0.468	21.54	27.79
189.52	6.5	32	176.6	50	346.7	494.6	0.960	0.467	21.81	28.18
191.57	6.0	32	150.4	93.5	285	511.9	0.964	0.471	21.72	28.15
194.62	5.5	32	142.3	65.7	287.1	476	0.965	0.479	20.81	27.06
196.68	6.0	32	98.5	115.5	191.4	482	0.965	0.483	21.07	27.36
198.62	5.9	32	80.1	74.2	280.8	422.3	0.965	0.474	20.95	27.24
201.51	5.8	32	73.4	109	404.1	450.4	0.961	0.467	22.58	29.76
203.66	6.2	32	111.9	68.4	353.1	448.3	0.964	0.475	19.30	25.38
205.54	5.5	32	178.2	63	338.2	509.2	0.963	0.475	22.54	29.54
208.92	6.0	32	171.6	68.9	402	508.5	0.964	0.475	23.17	30.35
210.68	6.0	32	130.5	120.8	206.3	519.3	0.967	0.473	19.79	25.80
212.75	6.0	32	99.5	76.5	312.7	444	0.965	0.473	22.01	28.71
214.60		32	101.8	95.7	242.5	465.5	0.971	0.493	19.73	25.70

Table A-6. Transfer data for Train 4R Fermentor 2.

Train 4R – Fermentor 2						
Day	pH	Solids added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(cm ³)	(g)
0.00						
2.58					255.2	
5.58					253.1	
7.58					1371.9	
9.58	6.1	8.9	251.8	0.0	1123.1	502.7
12.64	6.2	0.0	277.9	0.0	782.7	464.5
14.53	6.2	0.0	244.9	0.0	231.8	418.2
16.37	6.2	29.0	252.2	0.0	161.7	418.9
19.64	6.3	39.6	168.6	0.0	212.7	354.2
21.58	6.3	76.3	144.5	4.6	163.8	372.8
23.43	6.4	59.2	145.2	19.6	289.3	405.6
26.59	6.3	47.6	170.8	8.6	297.8	431.8
28.52	6.5	102.6	157.2	95.0	274.4	449.6
30.66	6.5	108.7	158.9	97.0	234.0	447.2
33.59	6.2	95.0	157.9	76.1	359.5	439
35.56	6.3	87.8	175.0	66.7	261.6	453.9
37.75	6.2	51.3	185.0	23.9	236.1	457.6
40.66	6.4	116.0	194.3	118.0	346.7	496.3
42.59	5.5	50.2	173.0	28.2	193.6	451
44.79	6.2	115.3	163.3	102.4	259.5	450.4
47.67	6.1	51.6	148.5	40.4	329.7	437.2
49.45	6.5	115.6	185.0	111.2	191.4	480.6
51.63	6.0	46.5	196.8	16.9	174.4	467.3
54.67	5.7	51.3	184.4	38.9	361.6	472
56.50	5.7	60.1	208.2	31.2	219.1	479.3
58.68	5.7	70.9	171.8	64.0	223.3	464.9
61.55	6.0	85.6	186.5	80.6	268.0	481.5
63.56	6.0	93.5	129.7	108.3	249.3	444.5
65.69	6.0	66.1	170.5	60.1	289.3	464.5
68.53	6.0	82.0	148.7	78.1	323.3	444.8
70.59	6.0	62.1	179.2	52.5	85.1	469.6
72.72	6.0	100.3	139.6	117.3	53.2	456.6
75.59	6.0	83.0	123.6	107.3	176.5	447.9
77.59	5.8	79.3	161.3	57.1	223.3	439.1
79.72	6.1	82.5	143.4	106.2	302.0	467.1
82.56	5.4	75.1	160.4	76.8	576.4	462.1
84.62	5.6	105.8	176.5	104.5	372.2	475.2
86.78	5.9	65.5	177.3	73.0	182.9	484.8
89.58	5.5	88.3	201.6	103.2	442.4	516.5
91.62	5.8	99.1	170.7	125.9	282.9	497.5
93.80	5.7	58.9	186.0	40.5	380.7	467.6
96.55	5.4	76.3	191.1	79.6	438.2	494.4
98.65	5.7	62.4	248.6	47.8	168.0	534
100.31	5.7	81.0	167.7	66.0	148.9	452.7
103.59	5.7	69.8	196.6	79.3	191.4	506.1
105.71	6.0	62.3	178.4	48.0	163.8	464.1

Table A-6. Continued.

Train 4R – Fermentor 2						
Day	pH	Solids added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(cm ³)	(g)
107.74	5.9	56.9	203.1	49.3	361.6	495.5
110.58	5.6	75.5	193.4	56.2	389.2	474.1
112.58	5.3	57.5	229.4	19.7	353.1	491.6
114.58	5.8	76.9	200.2	77.1	140.4	500.4
117.89	5.8	47.0	194.7	28.2	182.9	475.9
119.49	5.9	79.0	161.7	83.6	93.6	466.3
121.66	5.9	83.9	172.5	98.4	78.7	487
124.40	6.1	87.0	138.5	101.2	121.2	452.7
126.54	6.0	85.2	157.3	99.1	97.8	471.2
128.60	6.0	89.0	157.4	106.5	176.5	474.9
131.53	5.8	93.8	157.1	109.0	391.4	472.3
133.00	0.0	65.4	188.8	64.7	308.4	488.1
135.80	5.6	91.8	186.3	108.6	253.1	503.1
138.71	5.9	82.8	199.7	90.4	351.0	507.3
140.57	5.9	87.1	158.8	88.2	191.4	459.9
142.00	6.0	3.0	188.7	8.9	87.2	494.6
146.00	5.9	63.8	199.4	55.4	321.2	491
147.60	5.8	70.1	222.7	60.4	231.8	513
149.82	5.8	80.1	213.8	75.4	197.8	509.1
152.60	5.7	82.6	168.2	86.1	374.4	471.7
154.82	5.7	67.9	187.6	61.7	297.8	481.4
156.81	5.7	92.5	163.3	105.2	159.5	476
159.00	5.7	51.5	215.9	28.7	291.4	493.1
161.84	5.8	101.5	180.1	101.1	253.1	479.7
163.85	6.2	72.9	164.6	78.5	108.5	470.2
166.99	5.5	75.8	191.8	67.0	385.0	483
168.57	6.2	76.5	174.2	74.3	282.9	472
170.76	5.7	73.6	183.2	77.8	170.2	487.4
173.62	6.3	75.8	193.0	76.2	214.8	493.4
175.53	5.7	76.0	198.6	61.6	182.9	484.2
177.49	6.2	87.2	175.3	97.9	170.2	486
180.66	5.7	79.3	170.0	87.6	302.0	478.3
182.50	5.7	69.0	169.1	58.9	240.4	459
184.63	5.7	69.0	198.1	60.2	110.6	489.3
187.53	5.6	77.6	199.7	79.7	253.1	501.8
189.52	6.5	50.0	221.6	26.1	261.6	497.7
191.57	6.0	93.5	180.6	109.8	195.7	496.9
194.62	5.6	65.7	185.9	60.6	253.1	480.8
196.68	6.0	115.5	130.2	156.0	191.4	470.7
198.62	5.8	74.2	154.0	79.8	142.5	459.6
201.51	5.7	109.0	153.0	217.1	240.4	471.1
203.66	6.1	68.4	216.6	58.7	212.7	506.9
205.54	5.5	63.0	212.7	54.0	136.1	503.7
208.92	6.0	68.9	224.6	64.2	312.7	519.9
210.68	6.5	120.8	153.4	159.6	112.7	492.2
212.75	6.0	76.5	166.7	72.2	157.4	462.4
214.60		95.7	183.6	102.9	63.8	490.8

Table A-7. Transfer data for Train 4R Fermentor 3.

Train 4R – Fermentor 3						
Day	pH	Solids added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(cm ³)	(g)
0.00						
2.58					0.0	
5.58					180.8	
7.58					740.2	
9.58	6.0	0.0	219.1	0.0	1048.6	510.3
12.64	6.2	0.0	256.7	0.0	521.1	504
14.53	6.3	0.0	259.3	0.0	253.1	468.5
16.37	6.4	0.0	189.1	0.0	178.7	372.3
19.64	6.7	0.0	169.1	0.0	108.5	340.1
21.58	6.5	4.6	125.4	0.0	61.7	373.9
23.43	6.9	19.6	156.1	0.0	142.5	385.7
26.59	6.8	8.6	170.4	0.0	146.8	403.8
28.52	6.8	95.0	156.3	29.4	108.5	390.7
30.66	6.7	97.0	160.9	80.0	323.3	443.9
33.59	6.4	76.1	162.6	70.8	436.0	457.3
35.56	6.4	66.7	169.6	54.1	259.5	457
37.75	6.4	23.9	207.1	0.0	225.5	483.1
40.66	6.4	118.0	159.2	112.2	297.8	453.4
42.59	6.3	28.2	164.7	2.7	244.6	439.2
44.79	6.4	102.4	146.6	90.8	199.9	435.5
47.67	6.4	40.4	188.3	19.2	251.0	467.1
49.45	6.5	111.2	180.1	96.1	163.8	465
51.63	6.1	16.9	181.7	0.0	185.0	459.3
54.67	6.1	38.9	189.6	8.5	206.3	459.2
56.50	6.4	31.2	176.0	7.4	144.6	446.2
58.68	5.9	64.0	194.2	49.2	163.8	479.4
61.55	6.0	80.6	157.3	59.6	248.9	436.3
63.56	5.8	108.3	172.2	100.0	190.9	463.9
65.69	6.0	60.1	164.1	35.4	182.9	439.4
68.53	6.0	78.1	180.1	64.5	255.2	466.5
70.59	6.0	52.5	168.2	35.9	87.2	451.6
72.72	6.0	100.3	139.6	117.3	17.0	456.6
75.59	6.0	107.3	148.2	113.5	165.9	454.4
77.59	5.9	57.1	181.8	18.9	112.7	443.6
79.72	6.1	106.2	170.7	123.2	117.0	487.7
82.56	5.7	76.8	181.5	59.3	276.5	464
84.62	5.8	104.5	191.7	93.4	168.0	480.6
86.78	6.2	73.0	221.7	26.3	161.7	475
89.58	5.6	103.2	204.9	79.5	280.8	481.2
91.62	5.9	125.4	177.7	119.4	168.0	471.2
93.80	5.9	40.5	200.8	0.0	244.6	458.7
96.55	5.5	79.6	239.0	38.8	312.7	498.2
98.65	5.7	47.8	192.1	11.8	165.9	456.1
100.31	5.7	66.0	213.1	39.4	140.4	486.5
103.59	5.8	79.3	169.6	70.6	189.3	460.9
105.71	6.3	48.0	201.3	15.4	102.1	468.7

Table A-7. Continued.

Train 4R – Fermentor 3						
Day	pH	Solids added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(cm ³)	(g)
107.74	6.6	49.3	180.6	25.9	197.8	457.2
110.58	5.9	56.2	201.3	29.2	227.6	474.3
112.58	5.7	19.7	210.9	0.0	302.0	476.5
114.58	5.9	77.1	181.9	54.3	193.6	459.1
117.89	5.8	28.2	171.8	12.6	202.1	456.2
119.49	5.9	83.6	194.5	72.9	140.4	483.8
121.66	5.7	98.4	158.0	95.3	106.4	454.9
124.40	6.0	101.2	175.5	98.5	108.5	472.8
126.54	5.9	99.1	183.6	88.4	95.7	472.9
128.60	5.9	101.5	184.1	86.6	155.3	469.2
131.53	5.8	109.0	194.4	89.4	312.7	474.8
133.00	5.8	64.7	209.4	19.1	321.2	463.8
135.80	5.7	108.6	213.8	90.1	259.5	495.3
138.71	5.9	90.4	165.9	73.2	306.3	448.7
140.57	5.9	88.2	203.6	58.2	191.4	473.6
142.00	5.8	8.9	194.6	69.0	227.6	474.7
146.00	5.8	55.4	218.6	8.9	357.3	472.1
147.60	5.7	60.4	218.3	32.8	257.4	490.7
149.82	5.8	75.4	176.7	63.4	297.8	465.1
152.60	5.6	86.1	187.3	68.1	414.8	469.3
154.82	5.6	61.7	183.8	42.1	265.9	464.2
156.81	5.7	100.2	196.4	89.0	121.2	485.2
159.00	5.6	28.7	186.0	0.0	272.3	452.5
161.84	5.8	101.1	179.4	94.4	193.6	472.7
163.85	6.1	78.5	189.0	55.9	172.3	466.4
166.99	5.4	67.0	176.5	40.8	205.0	450.3
168.57	6.2	74.3	196.1	57.6	206.3	479.4
170.76	5.7	77.8	199.5	48.6	197.8	470.3
173.62	6.2	76.2	192.9	52.7	351.0	469.4
175.53	5.8	61.6	194.3	37.9	210.6	470.6
177.49	6.3	97.9	182.9	85.8	204.2	470.8
180.66	5.8	87.6	163.7	80.1	323.3	456.2
182.50	5.8	58.9	196.9	30.8	223.3	468.8
184.63	5.7	60.2	207.2	29.5	204.2	476.5
187.53	5.5	79.7	205.1	56.1	348.8	481.5
189.52	6.5	26.1	204.9	0.0	244.6	470.1
191.57	6.0	109.8	186.0	100.0	189.3	476.2
194.62	5.6	60.6	174.8	30.6	372.2	444.8
196.68	6.0	156.0	167.7	167.4	191.4	479.1
198.62	5.8	79.8	175.8	43.9	168.0	439.9
201.51	5.7	127.1	212.1	106.3	370.1	491.3
203.66	6.2	58.7	213.2	23.8	221.2	478.3
205.54	5.5	54.0	223.5	21.6	176.5	491.1
208.92	6.0	64.2	198.0	43.1	389.2	476.9
210.68	6.0	159.6	170.1	156.5	114.9	467
212.75	6.0	72.2	192.3	55.7	165.9	475.8
214.60		102.9	190.6	86.4	578.5	474.1

Table A-8. Transfer data for Train 4R Fermentor 4.

Train 4R – Fermentor 4											
Day	pH	Solids added	Fresh medium added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
2.58											
5.58											
7.58											
9.58	6.2	0.0	175	221.9	0.0	251.8	512.8	0.699	0.521		
12.64	6.3	0.0	175	218.4	0.0	1016.7	419.4	0.698	0.402		
14.53	6.7	0.0	175	191.5	0.0	238.2	370.4	0.698	0.402		
16.37	6.6	0.0	175	187.8	0.0	229.7	351.2	0.698	0.402		
19.64	6.7	0.0	175	173.8	0.0	255.2	335.3	0.698	0.402		
21.58	7.0	0.0	175	172.1	0.0	257.4	337.4	0.698	0.402		
23.43	6.7	0.0	175	177.5	0.0	202.1	333.9	0.698	0.402		
26.59	6.8	0.0	175	167.4	0.0	127.6	329.2	0.698	0.402		
28.52	7.4	0.0	175	182.2	0.0	127.6	335.0	0.698	0.402		
30.66	7.4	0.0	175	171.5	0.0	85.1	326.9	0.698	0.402		
33.59	7.2	87.8	175	173.2	0.0	63.8	330.9	0.698	0.402		
35.56	6.6	31.3	175	178.1	0.0	391.4	415.3	0.698	0.402	3.65	4.86
37.75	7.1	33.9	175	193.1	0.0	625.3	439.3	0.698	0.402	4.08	5.27
40.66	7.1	36.9	175	185.4	4.4	416.9	452.9	0.698	0.402	4.04	5.09
42.59	6.2	65.8	175	201.0	38.2	380.7	473.4	0.698	0.402	4.51	5.85
44.79	7.1	30.7	175	159.3	39.4	542.4	468.0	0.698	0.402	3.19	3.99
47.67	6.3	88.0	175	180.0	79.1	482.8	471.1	0.644	0.387	4.51	5.66
49.45	0.0	78.3	175	197.3	51.8	293.5	470.8	0.648	0.353	3.27	4.09
51.63	6.2	84.6	175	140.9	113.1	344.6	469.4	0.648	0.353	3.90	4.93
54.67	6.6	48.4	175	199.2	20.3	489.2	471.1	0.632	0.499	3.26	4.09
56.50	6.2	69.1	175	189.3	52.3	272.3	472.5	0.643	0.353	2.33	2.88
58.68	5.7	84.7	175	183.6	69.7	242.5	468.6	0.673	0.356	1.57	1.96
61.55	6.0	67.9	175	199.7	63.9	272.3	468.7	0.973	0.280	2.73	3.49
63.56	5.9	70.1	175	160.2	53.1	0.0	443.2	0.714	0.368	3.28	4.16
65.69	6.0	43.3	175	204.4	8.9	225.5	470.0	0.725	0.231	4.12	5.36
68.53	6.0	70.7	175	189.2	50.6	236.1	469.1	0.689	0.326	4.55	5.80
70.59	6.0	81.3	175	180.9	69.0	125.5	468.6	0.701	0.306	4.23	5.34
72.72	6.0	44.5	175	184.9	27.8	140.4	468.2	0.711	0.287	3.13	3.90
75.59	6.0	73.4	175	173.2	70.7	151.0	470.5	0.677	0.420	4.49	5.73
77.59	5.9	70.3	175	189.3	52.6	161.7	471.6	0.716	0.324	4.42	5.68
79.72	6.1	76.8	175	177.0	69.5	168.0	469.7	0.742	0.302	3.46	4.50
82.56	5.6	114.5	175	180.7	105.3	304.2	471.5	0.669	0.482	4.17	5.40
84.62	5.8	80.3	175	189.4	58.4	114.9	467.5	0.725	0.397	4.85	6.47
86.78	6.2	113.4	175	161.0	122.2	291.4	469.8	0.784	0.243	5.10	6.87
89.58	5.9	58.3	175	197.3	31.1	246.7	470.1	0.770	0.345	5.43	7.30
91.62	6.1	98.7	175	198.5	69.6	206.3	469.7	0.744	0.291	5.30	7.07
93.80	5.9	0.0	175	196.3	0.0	314.8	470.0	0.738	0.352	5.64	7.50
96.55	5.8	94.6	175	176.8	63.1	355.2	445.3	0.756	0.327	4.58	6.00
98.65	5.8	98.2	175	189.5	78.6	372.2	469.9	0.779	0.381	4.12	5.43
100.31	5.8	12.1	175	207.8	0.0	336.1	468.6	0.758	0.339	3.25	4.10
103.59	6.1	98.3	175	173.7	68.8	385.0	444.2	0.712	0.407	3.46	4.41
105.71	5.9	55.0	175	207.2	18.0	227.6	470.2	0.766	0.173	3.26	4.16

Table A-8. Continued.

Train 4R – Fermentor 4											
Day	pH	Solids added	Fresh medium added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
107.74	6.2	24.2	175	195.0	1.4	185.0	472.2	0.754	0.326	2.56	3.29
110.58	5.7	68.1	175	180.3	59.5	414.8	471.7	0.742	0.292	3.04	3.89
112.58	5.3	61.1	175	204.3	27.3	365.8	470.5	0.738	0.250	4.19	5.40
114.58	5.9	36.6	175	203.0	3.7	338.2	470.1	0.718	0.577	4.56	5.80
117.89	5.6	56.7	175	181.5	44.7	442.4	469.5	0.719	0.244	6.19	8.01
119.49	5.8	58.6	175	210.2	17.3	287.1	468.9	0.701	0.260	4.85	6.29
121.66	5.5	91.8	175	176.7	85.8	387.1	470.7	0.700	0.273	4.40	5.71
124.40	5.8	61.5	175	194.6	37.2	370.1	470.3	0.710	0.194	5.77	7.47
126.54	5.7	106.2	175	177.2	100.5	406.3	471.5	0.710	0.310	6.50	8.37
128.60	5.8	67.3	175	207.8	28.8	310.5	469.3	0.706	0.240	5.56	7.16
131.53	5.7	49.0	175	189.3	29.3	450.9	469.6	0.729	0.239	8.33	10.66
133.00	6.1	104.9	175	190.0	83.7	365.8	468.8	0.702	0.267	7.35	9.36
135.80	5.8	132.3	175	197.1	106.7	242.5	471.5	0.719	0.280	7.50	9.60
138.71	6.0	106.3	175	181.9	97.4	310.5	472.0	0.735	0.313	7.32	9.58
140.57	5.9	69.4	175	199.0	40.5	263.7	470.1	0.759	0.314	5.95	7.75
142.00	5.8	111.9	175	179.5	105.1	165.9	472.7	0.729	0.283	6.01	7.77
146.00	6.0	73.0	175	210.6	32.6	374.4	470.2	0.740	0.333	6.20	8.06
147.60	6.0	77.1	175	191.6	57.5	257.4	472.0	0.737	0.343	4.19	5.33
149.82	6.0	151.7	175	173.4	151.3	293.5	473.0	0.741	0.359	4.71	5.98
152.60	5.8	80.1	175	214.9	36.9	378.6	471.7	0.762	0.345	5.80	7.50
154.82	6.0	96.2	175	195.1	73.3	351.0	472.2	0.748	0.353	5.93	7.67
156.81	5.9	74.4	175	214.7	30.6	225.5	470.9	0.745	0.357	4.16	5.28
159.00	5.8	50.1	175	204.0	18.3	329.7	472.2	0.756	0.348	5.22	6.68
161.84	6.1	151.5	175	172.8	152.2	282.9	473.5	0.737	0.370	4.24	5.30
163.85	6.1	94.6	175	186.7	79.0	391.4	471.2	0.768	0.373	4.80	6.12
166.99	5.6	28.7	175	202.5	0.0	546.6	472.2	0.751	0.360	5.08	6.51
168.57	6.0	42.9	175	204.2	9.9	359.5	471.2	0.733	0.518	3.81	4.82
170.76	5.7	52.0	175	205.6	18.1	374.4	471.7	0.704	0.652	4.16	5.21
173.62	6.1	84.1	175	187.5	67.2	531.8	470.6	0.710	0.560	4.37	5.60
175.53	5.6	95.8	175	185.2	80.5	244.6	469.9	0.699	0.581	3.80	4.87
177.49	5.7	92.9	175	188.1	74.7	376.5	469.8	0.708	0.497	3.53	4.51
180.66	5.9	75.9	175	198.7	48.7	442.4	471.5	0.711	0.562	4.15	5.35
182.50	6.0	69.0	175	197.5	42.8	329.7	471.3	0.696	0.635	4.28	5.41
184.63	5.6	63.2	175	198.1	36.6	338.2	471.5	0.696	0.525	4.78	5.99
187.53	5.6	74.7	175	187.8	56.3	399.9	469.4	0.692	0.535	6.34	8.18
189.52	6.5	20.4	175	203.2	0.0	348.8	469.7	0.700	0.551	4.58	5.85
191.57	6.5	82.9	175	181.1	60.9	246.7	459.1	0.699	0.561	3.35	4.26
194.62	5.9	47.1	175	190.3	27.3	482.8	470.5	0.684	0.474	5.25	6.81
196.68	6.0	121.1	175	173.6	120.8	395.6	473.3	0.672	0.495	4.18	5.37
198.62	6.0	77.3	175	196.2	52.4	291.4	471.3	0.674	0.523	6.35	8.08
201.51	5.9	87.7	175	189.0	69.2	478.6	470.5	0.689	0.517	6.61	8.54
203.66	6.3	105.1	175	199.2	76.3	374.4	470.4	0.692	0.514	6.52	8.43
205.54	5.5	73.9	175	196.5	47.6	436.0	470.2	0.693	0.611	4.96	6.42
208.92	5.5	124.0	175	195.5	100.2	508.4	471.7	0.707	0.529	6.23	8.15
210.68	6.5	129.8	175	184.9	115.9	310.5	471.0	0.740	0.553	4.58	5.92
212.75	6.0	64.7	175	216.0	21.0	238.2	472.3	0.738	0.590	6.86	8.79
214.60		54.3	175	210.6	16.4	314.8	262.1	0.698	0.402	4.55	5.87

Table A-9. Transfer data for Train 1S Fermentor 1.

Train 1S – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00						0					
2.00						461.6					
5.00						491.3					
7.00						1935.6					
9.65	6.1	7.7	44.0	9.0	0.0	1133.7	258.0	0.985	0.443	8.91	11.95
12.70	6.1	7.7	44.0	9.0	0.0	1027.3	196.5	0.985	0.443	10.97	16.35
14.58	6.0	7.7	44.0	234.0	0.0	467.9	462.9	0.985	0.443	11.34	17.26
16.91	6.1	7.7	44.0	134.0	0.0	425.4	372.3	0.985	0.443	8.44	13.05
19.69	6.1	7.7	44.0	54.0	0.0	529.6	295.1	0.985	0.443	12.95	19.77
21.60	6.8	7.7	44.0	0.0	0.0	489.2	251.7	0.985	0.443	11.23	16.74
23.47	6.7	7.7	44.0	0.0	0.0	557.3	215.7	0.985	0.443	14.14	20.83
26.65	6.9	7.7	44.0	0.0	0.0	512.6	212.9	0.985	0.443	17.04	25.26
28.51	6.4	7.7	44.0	0.0	0.0	368.0	228.9	0.985	0.443	15.97	23.45
30.69	6.4	7.7	149.0	8.0	0.0	136.1	275.0	0.985	0.443	8.67	12.66
33.61	6.2	7.7	44.0	19.0	0.0	378.6	310.9	0.985	0.443	9.82	13.99
35.58	6.1	7.7	44.0	39.0	0.0	625.3	336.3	0.985	0.443	11.01	15.43
37.78	6.0	7.7	44.0	49.0	0.0	687.0	336.1	0.985	0.443	12.76	18.04
40.69	6.1	7.7	44.0	30.0	11.3	663.6	333.6	0.985	0.443	14.35	21.23
42.61	6.1	7.7	44.0	34.0	14.0	429.7	340.3	0.985	0.443	15.00	22.10
44.81	6.0	7.7	44.0	41.0	7.5	470.1	340.8	0.985	0.443	9.58	13.96
47.72	5.9	7.7	44.0	39.0	12.1	608.3	343.4	0.969	0.084	15.31	21.91
49.48	0.0	7.7	44.0	25.0	21.2	399.9	338.5	0.965	0.841	15.44	21.95
51.63	5.4	7.7	44.0	29.0	15.5	263.7	336.8	0.963	0.451	15.45	21.71
54.69	5.6	7.7	44.0	43.0	10.1	453.1	345.4	0.973	0.992	16.64	23.30
56.53	5.3	7.7	44.0	23.0	24.1	419.0	339.4	0.954	0.860	16.49	23.01
58.67	5.7	7.7	44.0	45.0	1.8	274.4	339.0	0.975	0.508	15.87	22.38
61.53	6.5	7.7	44.0	39.0	4.2	448.8	335.5	0.973	0.280	17.01	23.38
63.59	5.5	7.7	44.0	25.0	19.4	0.0	336.7	0.968	0.618	16.98	23.20
65.71	6.0	7.7	44.0	45.0	1.9	293.5	339.2	0.972	0.586	16.97	23.08
68.56	6.0	7.7	44.0	31.0	13.6	429.7	336.9	0.973	0.595	18.93	25.66
70.63	6.0	7.7	44.0	15.0	27.4	280.8	334.7	0.972	0.517	18.23	24.49
72.75	6.0	7.7	44.0	19.0	26.9	134.0	338.2	0.966	0.466	17.65	23.67
75.61	6.0	7.7	44.0	3.0	39.9	151.0	335.2	0.970	0.556	17.14	22.90
77.57	6.0	7.7	44.0	25.0	19.9	140.4	337.2	0.974	0.231	16.12	21.47
79.74	5.9	7.7	44.0	19.0	30.9	34.0	342.2	0.959	0.743	16.07	21.24
82.62	5.4	7.7	44.0	3.0	40.8	304.2	336.1	0.968	0.503	19.28	25.57
84.65	5.2	7.7	44.0	49.0	1.0	438.2	342.3	0.968	0.724	20.23	27.48
86.80	5.5	7.7	44.0	29.0	24.2	333.9	345.5	0.965	0.491	20.07	27.21
89.63	5.5	7.7	44.0	31.0	12.8	278.6	336.1	0.969	0.421	19.79	26.75
91.61	5.8	7.7	44.0	19.0	23.5	195.7	334.8	0.970	0.602	18.40	24.83
93.82	5.6	7.7	44.0	49.0	0.0	231.8	340.1	0.968	0.548	18.50	25.00
96.59	5.6	7.7	44.0	21.0	23.8	336.1	337.1	0.937	0.648	18.20	24.55
98.64	5.5	7.7	44.0	29.0	18.5	410.5	339.8	0.925	0.355	19.22	25.97
100.33	5.5	7.7	44.0	39.0	9.1	376.5	340.4	0.970	0.562	20.21	27.33
103.68	5.3	7.7	44.0	15.0	31.4	385.0	338.7	0.955	1.129	19.81	26.66
105.73	5.7	7.7	44.0	9.0	2.5	312.7	303.8	0.951	0.648	23.81	31.97

Table A-9. Continued.

Train 1S – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
107.76	6.0	7.7	44.0	49.0	1.7	191.4	343.0	0.968	0.531	21.54	28.79
110.57	5.5	7.7	44.0	35.0	10.0	359.5	337.3	0.969	0.558	21.09	28.16
112.63	5.3	7.7	44.0	39.0	7.1	363.7	338.4	0.965	0.643	22.11	29.36
114.71	5.7	7.7	44.0	25.0	13.8	329.7	331.1	0.962	1.011	22.01	29.27
117.93	5.8	7.7	44.0	33.0	9.4	391.4	334.7	0.964	0.293	22.69	30.33
119.47	5.8	7.7	44.0	38.0	9.5	242.5	339.8	0.967	0.533	21.69	28.94
121.69	5.8	7.7	44.0	3.0	42.1	253.1	337.4	0.965	0.607	21.24	28.35
124.39	5.9	7.7	44.0	29.0	16.6	163.8	337.9	0.974	0.417	19.63	26.19
126.57	6.1	7.7	44.0	9.0	40.1	206.3	341.4	0.966	0.572	18.96	25.53
128.59	6.0	7.7	44.0	24.0	22.2	148.9	338.5	0.979	0.532	15.91	21.39
131.51	5.9	7.7	44.0	16.0	29.3	389.2	337.6	0.974	0.462	17.44	23.45
133.00	5.8	7.7	44.0	7.0	38.2	446.7	337.5	0.972	0.518	17.05	22.99
135.71	5.6	7.7	44.0	44.0	2.6	268.0	338.9	0.978	0.491	18.20	24.41
138.74	5.9	7.7	44.0	31.0	17.2	308.4	339.5	0.977	0.474	15.47	20.79
140.55	5.9	7.7	44.0	35.0	8.5	253.1	335.8	0.977	0.439	17.58	23.60
142.80	5.7	7.7	44.0	9.0	39.0	83.0	340.3	0.975	0.477	17.12	23.10
145.97	5.9	7.7	44.0	51.0	0.0	227.6	340.1	0.977	0.429	17.33	23.38
147.56	5.9	7.7	44.0	29.0	16.2	185.0	337.5	0.977	0.346	17.28	23.31
149.81	6.1	7.7	44.0	11.0	36.1	178.7	339.4	0.981	0.500	15.01	20.37
152.59	5.8	7.7	44.0	25.0	18.7	502.0	336.0	0.977	0.440	17.99	24.30
154.81	5.6	7.7	44.0	35.0	12.3	457.3	339.6	0.977	0.435	18.79	25.63
156.80	5.8	7.7	44.0	26.0	21.3	285.0	339.6	0.976	0.320	18.00	24.82
159.00	5.7	7.7	44.0	56.0	0.0	378.6	343.4	0.977	0.444	17.86	24.82
161.86	0.0	7.7	44.0	11.0	30.4	193.6	333.7	0.978	0.428	17.89	24.96
163.77	5.9	7.7	44.0	25.0	24.3	331.8	338.3	0.976	0.420	17.09	23.94
166.98	5.5	7.7	44.0	41.0	0.0	414.8	332.9	0.971	0.406	16.54	23.27
168.56	6.0	7.7	44.0	54.0	0.0	223.3	341.3	0.962	0.613	17.40	24.34
170.00	5.6	7.7	44.0	26.0	16.9	363.7	335.2	0.968	0.771	17.12	24.00
173.58	5.6	7.7	44.0	30.0	16.4	431.8	338.7	0.971	0.773	18.71	26.27
175.49	5.6	7.7	44.0	32.0	15.6	168.0	339.9	0.971	0.455	19.60	27.61
177.48	6.1	7.7	44.0	19.0	26.6	361.6	337.9	0.970	0.604	16.37	23.28
180.65	5.6	7.7	44.0	17.0	29.8	374.4	339.1	0.969	0.643	16.75	23.84
182.49	5.7	7.7	44.0	39.0	8.7	380.7	340.0	0.973	0.649	16.73	23.73
184.51	5.5	7.7	44.0	45.0	1.0	472.2	338.3	0.971	0.739	18.13	25.66
187.47	5.3	7.7	44.0	41.0	5.3	212.7	338.6	0.971	0.618	18.84	26.73
189.50	6.5	7.7	44.0	24.0	23.9	325.4	340.2	0.967	0.651	18.23	25.96
191.49	5.9	7.7	44.0	15.0	31.0	174.4	338.3	0.968	0.660	16.74	23.85
194.60	5.7	7.7	44.0	20.0	25.7	278.6	338.0	0.973	0.664	14.84	21.20
196.71	6.0	7.7	44.0	0.0	53.7	402.0	345.6	0.970	0.666	16.51	23.42
198.60	5.8	7.7	44.0	53.0	0.0	446.7	338.2	0.974	0.652	14.49	20.67
201.47	5.6	7.7	44.0	49.0	0.0	480.7	334.5	0.972	0.716	17.78	21.76
203.65	6.3	7.7	44.0	36.0	3.2	399.9	331.5	0.976	0.672	17.98	21.95
205.49	5.5	7.7	44.0	42.0	6.0	389.2	340.3	0.972	0.674	16.57	23.91
208.92	6.0	7.7	44.0	27.0	19.5	619.0	338.8	0.971	0.676	19.25	28.02
210.65	6.0	7.7	44.0	23.0	27.0	278.6	342.3	0.971	0.678	17.66	25.80
212.78	6.0	7.7	44.0	21.0	28.9	223.3	342.2	0.974	0.683	16.11	23.51
214.00		7.7	44.0	43.0	8.6	234.0	766.4	0.985	0.443	16.75	24.30

Table A-10. Transfer data for Train 1R Fermentor 1.

Train 1R – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
2.00						329.7					
5.00						170.2					
7.00						1474.0					
9.65	6.1	7.7	44.0	9.0	0.0	1140.1	503.7	0.977	0.535	10.27	13.61
12.70	6.1	7.7	44.0	9.0	0.0	1027.3	196.5	0.985	0.443	12.35	18.23
14.58	6.0	7.7	44.0	234.0	0.0	467.9	462.9	0.985	0.443		
16.91	6.1	7.7	44.0	134.0	0.0	425.4	372.3	0.985	0.443	13.12	19.07
19.69	6.1	7.7	44.0	54.0	0.0	529.6	295.1	0.985	0.443	14.43	20.12
21.60	6.8	7.7	44.0	0.0	0.0	489.2	251.7	0.985	0.443	6.63	8.96
23.47	6.7	7.7	44.0	0.0	0.0	557.3	215.7	0.985	0.443	8.43	11.01
26.65	6.9	7.7	44.0	0.0	0.0	512.6	212.9	0.985	0.443	5.58	7.24
28.51	6.4	7.7	44.0	0.0	0.0	368.0	228.9	0.985	0.443	7.40	9.42
30.69	6.4	7.7	149.0	8.0	0.0	136.1	275.0	0.985	0.443	19.45	26.73
33.61	6.2	7.7	44.0	19.0	0.0	378.6	310.9	0.985	0.443	7.47	9.78
35.58	6.1	7.7	44.0	39.0	0.0	625.3	336.3	0.985	0.443	8.54	11.26
37.78	6.0	7.7	44.0	49.0	0.0	687.0	336.1	0.985	0.443	8.77	11.68
40.69	6.1	7.7	44.0	30.0	11.3	663.6	333.6	0.985	0.443	10.59	14.34
42.61	6.1	7.7	44.0	34.0	14.0	429.7	340.3	0.985	0.443	9.97	13.51
44.81	6.0	7.7	44.0	41.0	7.5	470.1	340.8	0.985	0.443	11.47	15.63
47.72	5.9	7.7	44.0	39.0	12.1	608.3	343.4	0.969	0.084	13.53	18.88
49.48	0.0	7.7	44.0	25.0	21.2	399.9	338.5	0.965	0.841	15.63	21.65
51.63	5.4	7.7	44.0	29.0	15.5	263.7	336.8	0.963	0.451	15.76	21.76
54.69	5.6	7.7	44.0	43.0	10.1	453.1	345.4	0.973	0.992	16.33	22.39
56.53	5.3	7.7	44.0	23.0	24.1	419.0	339.4	0.954	0.860	17.93	24.48
58.67	5.7	7.7	44.0	45.0	1.8	274.4	339.0	0.975	0.508	16.03	21.81
61.53	6.5	7.7	44.0	39.0	4.2	448.8	335.5	0.973	0.280	16.24	22.03
63.59	5.5	7.7	44.0	25.0	19.4	0.0	336.7	0.968	0.618	19.51	26.34
65.71	6.0	7.7	44.0	45.0	1.9	293.5	339.2	0.972	0.586	13.36	17.99
68.56	6.0	7.7	44.0	31.0	13.6	429.7	336.9	0.973	0.595	16.35	21.97
70.63	6.0	7.7	44.0	15.0	27.4	280.8	334.7	0.972	0.517	18.67	24.81
72.75	6.0	7.7	44.0	19.0	26.9	134.0	338.2	0.966	0.466	18.38	24.28
75.61	6.0	7.7	44.0	3.0	39.9	151.0	335.2	0.970	0.556	17.40	22.98
77.57	6.0	7.7	44.0	25.0	19.9	140.4	337.2	0.974	0.231	0.00	0.00
79.74	5.9	7.7	44.0	19.0	30.9	34.0	342.2	0.959	0.743	16.20	21.26
82.62	5.4	7.7	44.0	3.0	40.8	304.2	336.1	0.968	0.503	19.14	25.09
84.65	5.2	7.7	44.0	49.0	1.0	438.2	342.3	0.968	0.724	20.32	26.69
86.80	5.5	7.7	44.0	29.0	24.2	333.9	345.5	0.965	0.491	21.19	27.73
89.63	5.5	7.7	44.0	31.0	12.8	278.6	336.1	0.969	0.421	21.70	28.87
91.61	5.8	7.7	44.0	19.0	23.5	195.7	334.8	0.970	0.602	21.04	28.07
93.82	5.6	7.7	44.0	49.0	0.0	231.8	340.1	0.968	0.548	20.03	26.67
96.59	5.6	7.7	44.0	21.0	23.8	336.1	337.1	0.937	0.648	19.88	26.49
98.64	5.5	7.7	44.0	29.0	18.5	410.5	339.8	0.925	0.355	19.66	26.15
100.33	5.5	7.7	44.0	39.0	9.1	376.5	340.4	0.970	0.562	18.56	24.60
103.68	5.3	7.7	44.0	15.0	31.4	385.0	338.7	0.955	1.129	18.73	24.73
105.73	5.7	7.7	44.0	9.0	2.5	312.7	303.8	0.951	0.648	19.45	25.67

Table A-10. Continued.

Train 1R – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
107.76	6.0	7.7	44.0	49.0	1.7	191.4	343.0	0.968	0.531	18.87	24.98
110.57	5.5	7.7	44.0	35.0	10.0	359.5	337.3	0.969	0.558	19.71	26.27
112.63	5.3	7.7	44.0	39.0	7.1	363.7	338.4	0.965	0.643	21.84	28.95
114.71	5.7	7.7	44.0	25.0	13.8	329.7	331.1	0.962	1.011	20.95	27.80
117.93	5.8	7.7	44.0	33.0	9.4	391.4	334.7	0.964	0.293	20.84	27.76
119.47	5.8	7.7	44.0	38.0	9.5	242.5	339.8	0.967	0.533	19.84	26.34
121.69	5.8	7.7	44.0	3.0	42.1	253.1	337.4	0.965	0.607	19.09	25.23
124.39	5.9	7.7	44.0	29.0	16.6	163.8	337.9	0.974	0.417	17.24	22.75
126.57	6.1	7.7	44.0	9.0	40.1	206.3	341.4	0.966	0.572	18.31	24.03
128.59	6.0	7.7	44.0	24.0	22.2	148.9	338.5	0.979	0.532	18.42	24.14
131.51	5.9	7.7	44.0	16.0	29.3	389.2	337.6	0.974	0.462	20.64	26.99
133.00	5.8	7.7	44.0	7.0	38.2	446.7	337.5	0.972	0.518	18.60	24.20
135.71	5.6	7.7	44.0	44.0	2.6	268.0	338.9	0.978	0.491	18.79	24.42
138.74	5.9	7.7	44.0	31.0	17.2	308.4	339.5	0.977	0.474	18.24	23.66
140.55	5.9	7.7	44.0	35.0	8.5	253.1	335.8	0.977	0.439	20.48	26.54
142.80	5.7	7.7	44.0	9.0	39.0	83.0	340.3	0.975	0.477	20.02	25.94
145.97	5.9	7.7	44.0	51.0	0.0	227.6	340.1	0.977	0.429	20.10	26.02
147.56	5.9	7.7	44.0	29.0	16.2	185.0	337.5	0.977	0.346	17.69	22.78
149.81	6.1	7.7	44.0	11.0	36.1	178.7	339.4	0.981	0.500	16.55	21.35
152.59	5.8	7.7	44.0	25.0	18.7	502.0	336.0	0.977	0.440	18.84	24.24
154.81	5.6	7.7	44.0	35.0	12.3	457.3	339.6	0.977	0.435	19.63	25.35
156.80	5.8	7.7	44.0	26.0	21.3	285.0	339.6	0.976	0.320	17.65	22.88
159.00	5.7	7.7	44.0	56.0	0.0	378.6	343.4	0.977	0.444	17.41	22.52
161.86	0.0	7.7	44.0	11.0	30.4	193.6	333.7	0.978	0.428	17.16	22.17
163.77	5.9	7.7	44.0	25.0	24.3	331.8	338.3	0.976	0.420	17.42	22.56
166.98	5.5	7.7	44.0	41.0	0.0	414.8	332.9	0.971	0.406	17.88	23.23
168.56	6.0	7.7	44.0	54.0	0.0	223.3	341.3	0.962	0.613	17.88	23.17
170.00	5.6	7.7	44.0	26.0	16.9	363.7	335.2	0.968	0.771	17.07	22.14
173.58	5.6	7.7	44.0	30.0	16.4	431.8	338.7	0.971	0.773	18.15	23.57
175.49	5.6	7.7	44.0	32.0	15.6	168.0	339.9	0.971	0.455	18.56	24.04
177.48	6.1	7.7	44.0	19.0	26.6	361.6	337.9	0.970	0.604	17.10	22.16
180.65	5.6	7.7	44.0	17.0	29.8	374.4	339.1	0.969	0.643	18.91	24.75
182.49	5.7	7.7	44.0	39.0	8.7	380.7	340.0	0.973	0.649	17.08	22.34
184.51	5.5	7.7	44.0	45.0	1.0	472.2	338.3	0.971	0.739	18.47	24.08
187.47	5.3	7.7	44.0	41.0	5.3	212.7	338.6	0.971	0.618	18.23	23.90
189.50	6.5	7.7	44.0	24.0	23.9	325.4	340.2	0.967	0.651	19.21	25.28
191.49	5.9	7.7	44.0	15.0	31.0	174.4	338.3	0.968	0.660	18.60	24.60
194.60	5.7	7.7	44.0	20.0	25.7	278.6	338.0	0.973	0.664	19.78	26.47
196.71	6.0	7.7	44.0	0.0	53.7	402.0	345.6	0.970	0.666	18.56	24.80
198.60	5.8	7.7	44.0	53.0	0.0	446.7	338.2	0.974	0.652	14.50	19.31
201.47	5.6	7.7	44.0	49.0	0.0	480.7	334.5	0.972	0.716	18.24	24.33
203.65	6.3	7.7	44.0	36.0	3.2	399.9	331.5	0.976	0.672	17.59	23.47
205.49	5.5	7.7	44.0	42.0	6.0	389.2	340.3	0.972	0.674	18.03	24.06
208.92	6.0	7.7	44.0	27.0	19.5	619.0	338.8	0.971	0.676	20.38	27.54
210.65	6.0	7.7	44.0	23.0	27.0	278.6	342.3	0.971	0.678	18.68	25.14
212.78	6.0	7.7	44.0	21.0	28.9	223.3	342.2	0.974	0.683	17.81	23.95
214.00		7.7	44.0	43.0	8.6	234.0	766.4	0.985	0.443	17.47	23.30

**SUPPLEMENTAL B. DATA FOR PROPAGATED FIXED-BED MIXED-ACID
FERMENTATION: EFFECT OF VOLATILE SOLIDS LOADING RATE AND
AGITATION AT HIGH PH**

Table B-1. Transfer data for Train 1 Fermentor 4.

Train 1 – Fermentor 4											
Day	pH	Feedstock + nutrient added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
2.00											
5.00											
7.61	5.64	40	400	216.1	299.7	765.7	515.8	0.989	0.493	9.78	11.79
9.56	6.09			261.6		506.2	514.1	0.989	0.487	5.04	6.30
12.64	5.28			120.4		1333.6	433.2	0.989	0.490	11.88	16.39
14.65	5.14			371.4		593.4	645	0.969	0.380	13.38	20.01
16.68	5.41			365.6		423.3	587.9	0.968	0.391	16.48	26.27
19.56	5.14			284		397.7	466.6	0.981	0.448	9.84	16.59
21.64	5.31	40	400	207.4	193.7	295.7	401.1	0.980	0.444	13.30	22.96
23.61	5.14			207.8		1001.8	517.7	0.977	0.431	4.63	7.11
26.82	5.08			263.9		723.2	527	0.975	0.419	11.94	19.76
28.57	5.19			244.7		274.4	549.3	0.980	0.498	11.52	19.38
30.65	5.1			227.7		374.4	480.3	0.979	0.448	11.15	18.95
33.85	6.62			215.8		450.9	450.8	0.978	0.448	10.26	17.22
35.58	9.23	40	400	255.9	220.1	80.8	476	0.995	0.115	5.46	8.64
37.66	7.45			174.5		234.0	517.9	0.981	0.386	1.99	2.56
40.82	8.79			152.9		146.8	500.3	0.983	0.379	5.66	7.18
42.70	9.19			227.8		172.3	582.9	0.995	0.440	3.91	4.92
44.60	9.33			191		108.5	527.8	0.995	0.531	3.17	3.93
47.94	9.32			169		87.2	530.1	0.990	0.370	2.72	3.31
49.65	9.34	40	400	201.1	350.7	46.8	551.8	0.995	0.429	1.84	2.14
51.65	7.84			229.3		245.7	517.9	0.993	0.392	2.55	2.64
54.88	9.13			197.7		121.2	506.9	0.996	0.265	3.37	3.55
56.68	9.01			118.7		104.2	470	0.995	0.308	2.73	3.12
58.57	9.16			210.2		125.5	570.1	0.994	0.353	1.04	1.04
61.63	9.17			177.7		100.0	541.3	0.999	0.349	2.63	2.63
63.50	9.25	40	400	152.4	370	93.6	522.4	0.997	0.489	3.35	3.35
65.71	8			178.9		210.6	517.7	0.994	0.350	2.70	2.74
68.59	9.01			169.7		117.0	554.1	0.996	0.432	3.84	3.96
70.66	9.14			189.6		108.5	564.9	0.996	0.511	3.32	3.39

Table B-1. Continued.

Train 1 – Fermentor 4											
Day	pH	Feedstock + nutrient added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
72.64	9.21			192.6		112.7	553.9	0.996	0.500	2.94	2.97
75.90	9.25			197.9		91.5	574	0.995	0.660	2.78	2.78
77.67	9.23	40	400	227.8	356	74.4	583.8	0.997	0.480	2.50	2.50
79.56	8.38			235.3		127.6	518.7	0.994	0.371	3.07	3.07
82.50	9.13			180.6		97.8	485.3	0.996	0.504	2.73	2.73
84.63	9.21			146.4		114.9	484.6	0.997	0.496	2.33	2.33
86.61	9.35			221.1		74.4	537.4	0.997	0.286	3.48	3.52
89.92	9.31			172.7		2.1	508.9	0.998	0.362	3.38	3.41
91.68	9.44	40	400	195.2	342.8	76.6	538	0.997	0.313	3.23	3.23
93.63	8.5			225.6		151.0	527.2	0.993	0.396	3.08	3.08
96.56	9.01			129		151.0	495.6	0.996	0.371	4.14	4.18
98.65	9.08			140.6		91.5	495.9	0.996	0.345	4.12	4.15
100.61	9.28			177.6		129.7	527.3	0.995	0.373	3.49	3.52
103.51	9.34			167.9		127.6	528.8	0.996	0.496	3.31	3.31
105.65	9.27	40	400	199.9	353.9	95.7	553.8	0.997	0.364	2.78	2.89
107.61	7.53			187		272.3	515.3	0.993	0.437	3.57	3.61
110.55	8.57			183.5		142.5	554.3	0.996	0.357	1.46	1.52
112.61	8.8			216.8		106.4	553.5	0.996	0.416	3.78	3.88
114.90	8.96			192		53.2	547.3	0.997	0.304	3.89	3.96
117.49	8.91			184.6		121.2	527.8	0.996	0.376	3.68	3.74
119.80	8.98	40	400	188.5	360.8	91.5	549.3	0.983	0.931	2.70	2.73
121.63	6.78			165		313.1	515.1	0.994	0.337	2.17	2.47
124.98	7.6			185.3		231.8	558.3	0.998	0.607	3.62	3.87
126.83	8.25			214.6		142.5	594.9	0.997	0.415	3.42	3.61
128.57	8.45			217.5		229.1	555.9	0.997	0.406	3.61	3.92
131.77	8.42			188.9		107.4	539.6	0.998	0.539	3.72	4.02

Table B-2. Transfer data for Train 1 Fermentor 3.

Train 1 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
0.00							
2.00							
5.00							
7.61	5.54	299.7	201	153.1	324.6	1008.2	477.7
9.56	5.38		276	183.7		1291.1	446.1
12.64	4.95		321	335.2		869.9	531.1
14.65	5.11		238	319.6		461.6	511.2
16.68	5.31		190	246.8		436.0	427.6
19.56	4.93		222	217.1		389.2	368.6
21.64	4.96	193.7	225	241.7	128.8	251.0	370.5
23.61	5.17		225	220.7		370.1	430.8
26.82	5.19		206	218.6		442.4	420.45
28.57	5.15		218	205.4		274.4	399
30.65	6.73		226	199.7		397.7	411.9
33.85	9.61		193	241.6		106.4	424.5
35.58	9.21	220.1	199	174	201.8	51.0	375.8
37.66	9.3		224	159		85.1	389
40.82	9.32		200	236.3		91.5	448
42.70	9.42		182	175.6		91.5	408.7
44.60	9.37		220	194.4		117.0	411.9
47.94	9.32		202	190.4		93.6	427.2
49.65	9.38	350.7	171	213.4	224	176.5	437.4
51.65	9.36		190	218.5		80.8	557.8
54.88	9.27		216	163.2		95.7	518.9
56.68	9.12		177	223.3		119.1	565.5
58.57	9.16		184	182		87.2	515
61.63	9.22		214	160		80.8	523.9
63.50	9.19	370	189	219	347.7	78.7	566.7
65.71	9.25		197	215		112.7	583.6
68.59	9.25		184	181.5		72.3	564.2
70.66	9.25		196	181.7		102.1	563.4
72.64	9.27		234	213.5		97.8	573.4
75.90	9.29		182	207.7		93.6	584.9
77.67	9.22	356	185	196.9	362.5	89.3	559.4
79.56	9.23		214	203.6		134.0	549.4
82.50	9.25		172	179.9		87.2	556.4
84.63	9.24		186	201.1		87.2	548.6

Table B-2. Continued.

Train 1 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
86.61	9.35		230	194		83.0	530.2
89.92	9.32		205	208.3		123.4	561
91.68	9.43	342.8	143	206.1	345.4	72.3	551.5
93.63	9.3		148	194.9		119.1	543.6
96.56	9.25		164	135.9		129.7	495.1
98.65	9.2		181	174.4		95.7	516
100.61	9.36		214	181.2		129.7	522.3
103.51	9.36		216	193.9		85.1	547.3
105.65	9.2	353.9	179	226.1	340.6	83.0	566.7
107.61	9.13		206	227.4		119.1	576.2
110.55	9.14		190	185.8		102.1	551.1
112.61	9.13		180	211.4		89.3	552
114.90	9.18		210	173.9		36.2	519.8
117.49	9.08		200	212.7		104.2	552.5
119.80	9.04	360.8	210	190.4	344.8	72.3	535.2
121.63	8.89		220	210.5		91.5	549.7
124.98	8.91		208	223.6		101.0	556
126.83	8.94		180	177.4		127.6	537.2
128.57	8.98		180	205		136.1	536.3
131.77	8.91		218	175.8		95.7	505.8

Table B-3. Transfer data for Train 1 Fermentor 2.

Train 1 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
0.00							
2.00							
5.00							
7.61	5.42	324.6	147	203.7	310.1	2431.2	513.8
9.56	5.23		258	272		995.4	518
12.64	5.11		260	318		623.2	489.3
14.65	5.33		166	236.9		427.5	424.8
16.68	5.55		235	191.2		368.0	349.8
19.56	5.05		210	223		110.6	380.8
21.64	5.31	128.8	215	231	133.2	414.8	364.2
23.61	5.19		228	212.4		406.3	351.7
26.82	5.21		206	206.5		478.6	316.3
28.57	5.77		228	221.7		180.8	316.7
30.65	9.48		233	216.1		108.5	328.8
33.85	9.73		201	192.9		65.9	315.5
35.58	9.18	201.8	197	201.3	120.7	87.2	322
37.66	9.34		202	218.9		78.7	399.2
40.82	9.37		196	198.7		121.2	375
42.70	9.33		204	181.8		93.6	370.8
44.60	9.38		210	211.1		102.1	390.1
47.94	9.31		192	201.4		127.6	380.8
49.65	9.34	224	205	171.9	198.1	51.0	370
51.65	9.44		225	181.8		119.1	389.8
54.88	9.35		190	211.8		95.7	423.4
56.68	9.11		181	176.9		106.4	396.2
58.57	9.26		218	184.7		114.9	396.6
61.63	9.28		195	214.6		100.0	424.3
63.50	9.2	347.7	195	187.1	216.9	78.7	404
65.71	9.22		190	197.1		124.4	529.2
68.59	9.26		198	182.1		85.1	520.8
70.66	9.22		200	193.7		72.3	531.1
72.64	9.27		218	228.4		76.6	532.7
75.90	9.22		184	182.4		95.7	514
77.67	9.15	362.5	191	187.3	326.6	78.7	513.9
79.56	9.23		208	211.9		106.4	543.9
82.50	9.26		176	172.9		93.6	535.7
84.63	9.24		204	184		83.0	539.3

Table B-3. Continued.

Train 1 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
86.61	9.41		224	226.1		87.2	554
89.92	9.24		150	205.2		19.1	543.6
91.68	9.39	345.4	183	145.8	331.8	61.7	477.6
93.63	9.35		172	146.9		104.2	487.1
96.56	9.28		182	164.6		159.5	510.9
98.65	9.17		199	183.2		3613.8	522.4
100.61	9.28		230	210.2		106.4	536.7
103.51	9.18		180	215.9		100.0	550.1
105.65	9.19	340.6	201	181.2	330.7	89.3	511.9
107.61	9.18		220	203.5		72.3	516.9
110.55	9.16		176	189.9		89.3	529.8
112.61	9.2		204	180.4		76.6	513.6
114.90	9.21		195.8	209.5		23.4	536.3
117.49	9.01		216	197.4		87.2	520.1
119.80	9.07	344.8	197	211.6	323.6	131.9	535.2
121.63	9		203	218.7		57.0	550.4
124.98	9.15		324	207.9		121.2	531.9
126.83	9.13		183	178.4		115.9	521.8
128.57	9.14		204	181.2		272.3	524.4
131.77	9.19		207	212.8		54.2	545.4

Table B-4. Transfer data for Train 1 Fermentor 1.

Train 1 – Fermentor 4											
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
2.00											
5.00											
7.61	5.78	310.1	0	150.4	288.4	944.4	512.9	0.684	0.493	6.04	7.71
9.56	5.2		200	245.0		1433.6	452.6	0.684	0.493	0.00	0.00
12.64	5.19		200	256.4		1038.0	404.8	0.684	0.493	0.00	0.00
14.65	6.01		200	164.0		1138.7	322.4	0.684	0.493	0.00	0.00
16.68	5.73		200	225.9		570.0	356.1	0.684	0.493	0.00	0.00
19.56	5.7		200	208.3		176.5	326	0.684	0.493	0.00	0.00
21.64	6.07	133.2	0	216.7	24.3	153.1	315.1	0.587	0.446	1.30	1.96
23.61	5.7		200	215.3		399.9	347.5	0.665	0.483	0.00	0.00
26.82	5.81		200	209.2		344.6	329.7	0.661	0.482	0.00	0.00
28.57	6.6		200	230.0		97.8	319.4	0.656	0.479	0.00	0.00
30.65	8.14		200	203.2		117.0	288.5	0.650	0.477	0.00	0.00
33.85	8.17		200	201.0		59.6	282.5	0.644	0.473	0.00	0.00
35.58	7.97	120.7	0	200.8	4.9	72.3	279.8	0.674	0.479	0.00	0.00
37.66	9.35		200	196.2		59.6	317.7	0.657	0.478	0.00	0.00
40.82	9.21		200	195.8		76.6	320.6	0.656	0.477	0.00	0.00
42.70	9.02		200	202.9		72.3	325.6	0.656	0.477	0.00	0.00
44.60	9.28		200	202.5		97.8	320.9	0.657	0.477	0.00	0.00
47.94	9.23		200	192.0		114.9	317.3	0.660	0.478	0.00	0.00
49.65	9.15	198.1	0	204.0	45.4	53.2	323.5	0.761	0.500	0.00	0.00
51.65	9.43		200	217.9		104.2	397.1	0.800	0.420	0.00	0.00
54.88	9.31		200	187.0		63.8	377.3	0.800	0.420	0.00	0.00
56.68	9.01		200	178.9		102.1	380.6	0.800	0.420	1.29	1.29
58.57	9.21		200	215.3		104.2	401.5	0.800	0.420	0.00	0.00
61.63	9.19		200	194.9		78.7	383.2	0.820	0.420	0.00	0.00
63.50	9.03	216.9	0	194.1	120.1	80.8	388.5	0.744	0.409	0.61	0.61
65.71	9.15		200	190.5		114.9	405.4	0.793	0.418	0.00	0.00
68.59	9.18		200	195.8		129.7	503.3	0.791	0.417	0.00	0.00
70.66	9.12		200	199.7		110.6	420.7	0.790	0.417	0.61	0.61
72.64	9.11		200	211.2		112.7	417.6	0.788	0.416	0.00	0.00
75.90	9.15		200	185.2		112.7	404.5	0.781	0.416	0.00	0.00
77.67	8.98	326.6	0	194.0	150.7	83.0	418.3	0.786	0.417	0.13	0.13
79.56	9.17		200	206.0		104.2	516.7	0.786	0.417	0.00	0.00
82.50	9.14		200	176.6		70.2	507.1	0.786	0.416	0.00	0.00
84.63	9.09		200	202.0		89.3	527.9	0.786	0.416	0.24	0.24

Table B-4. Continued.

Train 1 – Fermentor 4											
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
86.61	9.19		200	217.5		80.8	523	0.786	0.416	0.00	0.00
89.92	9.04		200	151.1		104.2	440.1	0.786	0.416	0.00	0.00
91.68	9.13	331.8	0	184.6	244.1	97.8	502.8	0.853	0.413	0.24	0.24
93.63	9.25		200	170.8		104.2	517.9	0.799	0.416	0.00	0.00
96.56	9.16		200	182.2		93.6	546.5	0.802	0.416	0.00	0.00
98.65	9.01		200	201.8		76.6	556.9	0.805	0.415	0.24	0.24
100.61	9.02		200	223.6		100.0	549	0.809	0.415	0.00	0.00
103.51	9.14		200	180.9		85.1	525.4	0.814	0.415	0.00	0.00
105.65	9.13	330.7	0	204.0	266.7	80.8	544.8	0.860	0.355	0.24	0.24
107.61	9.29		200	218.0		102.1	532.9	0.818	0.403	0.00	0.00
110.55	9.24		200	176.1		85.1	513.7	0.821	0.401	0.00	0.00
112.61	9.21		200	204.3		100.0	536.2	0.825	0.398	0.24	0.24
114.90	0		200	195.8		23.4	528.8	0.828	0.395	0.00	0.00
117.49	9.08		200	213.5		140.4	536.2	0.830	0.390	0.00	0.00
119.80	9.23	323.6	0	196.8	249.2	57.4	520.1	0.860	0.394	0.19	0.19
121.63	9.19		200	202.5		85.1	518.4	0.833	0.396	0.00	0.00
124.98	9.29		200	201.8		106.4	514.8	0.835	0.395	0.00	0.00
126.83	9.27		200	183.1		110.6	511.5	0.837	0.394	0.19	0.19
128.57	9.26		200	204.7		246.7	527.3	0.839	0.394	0.00	0.00
131.77	9.23		200	205.5		63.8	519.4	0.841	0.394	0.00	0.00

Table B-5. Transfer data for Train 2 Fermentor 4.

Train 2 – Fermentor 4											
Day	pH	Feedstock + nutrient added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
2.00											
5.00											
7.58	5.57	40	400	226.6	290.6	1599.5	517.2	0.983	0.454	8.97	10.92
9.54	5.6			254.5		995.4	513.4	0.987	0.428	5.83	7.36
12.63	5.08			297.9		1280.5	508.3	0.985	0.441	12.91	18.47
14.63	5.34	40	400	325.4	220.8	974.2	546.2	0.985	0.441	13.28	20.20
16.66	5.5			258.8		504.1	519.1	0.984	0.432	5.40	7.78
19.62	4.8			280.5		689.1	567.7	0.985	0.439	13.32	20.92
21.62	5.1	40	400	280.7	294.7	416.9	575.4	0.961	0.408	17.85	29.42
23.60	5.41			201.46		712.5	516.74	0.980	0.432	9.65	15.08
26.81	5.06			355.7		763.6	609.9	0.979	0.430	14.56	24.34
28.54	5.14	40	400	219.9	274	463.7	493.9	0.954	0.449	14.20	24.45
30.60	5.1			225.4		969.9	517.2	0.972	0.432	4.73	7.24
33.84	5.54			204.8		161.7	522.8	0.969	0.430	13.00	21.82
35.55	5.92	40	400	246	292.1	338.2	538.1	0.971	0.435	7.46	12.49
37.65	7.34			241.2		323.3	517.3	0.969	0.435	5.26	7.97
40.82	8.16			140.4		187.2	475.3	0.967	0.436	7.54	10.96
42.68	9	40	400	155.6	351.5	114.9	507.1	0.994	0.316	7.01	10.18
44.61	7.79			248.1		231.8	515.4	0.996	0.268	5.02	6.27
47.91	8.94			153.3		155.3	435.2	0.979	0.378	6.92	8.98
49.63	9.23	40	400	163.1	287	91.5	450.1	0.994	0.362	6.62	8.82
51.64	7.43			229.9		257.4	516.7	0.994	0.432	1.56	1.60
54.85	9.1			149.4		185.0	475.5	0.994	0.348	5.31	6.24
56.67	9.01	40	400	117.4	350.9	157.4	468.3	0.994	0.193	5.98	7.24
58.56	8.18			242.2		180.8	518.3	0.991	0.343	1.70	1.82
61.61	8.95			147.6		148.9	448.2	0.999	0.158	6.77	7.70
63.49	9.18	40	400	131.8	352.4	68.1	484.2	0.994	0.378	9.18	10.53
65.77	8			220.2		155.3	517.8	0.993	0.369	3.87	4.18
68.58	8.9			152.7		138.3	468.2	0.994	0.342	6.92	7.72
70.65	9.01	40	400	175	369.8	140.4	544.8	0.994	0.400	6.46	7.34
72.64	8.06			194.3		191.4	515.9	0.994	0.153	4.37	4.65
75.88	8.94			164.8		140.4	530.1	0.994	0.322	7.55	8.29
77.61	9.04	40	400	164.4	361.1	104.2	525.5	0.994	0.399	7.28	8.04
79.55	8.28			239		168.0	518.7	0.993	0.352	3.77	3.93
82.48	8.9			141.3		76.6	483.3	0.994	0.325	7.18	7.75
84.62	9.1	40	400	152.9	353.1	129.7	506	0.994	0.301	7.58	8.26

Table B-5. Continued.

Train 2 – Fermentor 4											
Day	pH	Feedstock + nutrient added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
86.60	8.35			247.6		134.0	519.1	0.992	0.336	4.04	4.18
89.90	8.91			144.8		65.9	477.3	0.993	0.318	8.44	9.03
91.67	9.31	40	400	198	324.9	106.4	522.9	0.994	0.281	7.60	8.15
93.62	8.33			171.7		163.8	517.8	0.991	0.370	4.23	4.37
96.56	8.93			133.7		138.3	507.4	0.993	0.321	6.79	7.13
98.64	9	40	400	162.8	365.3	112.7	528.1	0.993	0.325	6.97	7.36
100.60	8.61			238.2		170.2	515.6	0.993	0.336	3.86	3.97
103.50	9.04			189.3		144.6	486.1	0.992	0.243	6.76	7.01
105.64	9.1	40	400	138.8	339.9	129.7	478.7	0.994	0.394	7.36	7.95
107.61	7.41			251.3		342.4	517.9	0.992	0.384	3.16	3.29
110.54	8.73			139.4		165.9	481.8	0.994	0.408	7.11	7.43
112.60	9	40	400	180.8	334.3	144.6	515.1	0.994	0.414	6.58	6.90

Table B-6. Transfer data for Train 2 Fermentor 3.

Train 2 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
0.00							
2.00							
5.00							
7.58	5.5	290.6	183	186.6	327.2	2088.7	513.8
9.54	5.08		296	254.3		1725.0	467.4
12.63	5.13		307	337.5		816.8	502.5
14.63	5.2	220.8	263	285.2	187.1	378.6	472.3
16.66	5.46		295	312.3		389.2	498.9
19.62	5.33		238	291.5		408.4	479.4
21.62	5.57	294.7	215	248.8	177	255.2	425.8
23.60	5.33		335	296.14		393.5	533.01
26.81	5.47		210	243.8		516.9	460.6
28.54	5.52	274	197	178.4	245.4	302.0	423.8
30.60	5.18		230	235.5		404.1	443.5
33.84	9.41		218	222.4		148.9	426.4
35.55	9.22	292.1	177	196.1	226	89.3	422.1
37.65	8.76		178	200.9		144.6	482.7
40.82	9.07		187	173.3		125.5	455.2
42.68	9.27	351.5	183	180.3	288.5	119.1	468.8
44.61	9.16		205	169.7		29.8	525.4
47.91	9.16		176	169		131.9	555.6
49.63	9.25	287	209	199.2	364.2	100.0	563.4
51.64	9.39		225	190.4		127.6	480.3
54.85	9.31		154	144.4		140.4	506.4
56.67	9.08	350.9	193	163.1	351.7	136.1	514.8
58.56	9.21		208	173.6		112.7	510.5
61.61	9.16		205	185.7		151.0	538.9
63.49	9.21	352.4	183	199.9	362.6	102.1	562.5
65.77	9.05		222	171.5		102.1	545.1
68.58	9.13		188	231.1		112.7	594.7
70.65	9.15	369.8	175	181.2	367.5	123.4	548.7
72.64	9.21		200	210.9		114.9	544.2
75.88	9.19		176	160.5		127.6	528.8
77.61	9.14	361.1	185	187.2	357	102.1	544.2
79.55	9.16		194	207.7		138.3	545.2
82.48	9.24		200	162.9		108.5	528.4
84.62	9.24	353.1	183	204.1	360.6	110.6	564.7

Table B-6. Continued.

Train 2 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
86.60	9.24		210	217		123.4	551.8
89.90	9.28		200	194.1		19.1	541.9
91.67	9.48	324.9	207	199.6	343.2	78.7	542.8
93.62	9.32		186	166.1		138.3	519.5
96.56	9.24		173	159.6		191.4	538.1
98.64	9.16	365.3	203	199.5	345.5	104.2	545
100.60	9.25		206	210.4		146.8	558.3
103.50	9.3		190	183.3		78.7	548.8
105.64	9.16	339.9	183	198.6	357.3	108.5	555.9
107.61	9.07		204	216.3		146.8	534.4
110.54	9.11		207	175.5		136.1	520.4
112.60	9.19	334.3	205	214.4	335.6	193.6	550

Table B-7. Transfer data for Train 2 Fermentor 2.

Train 2 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
0.00							
2.00							
5.00							
7.58	5.48	327.2	185	184	330.6	1605.9	514.6
9.54	5.04		266	292.5		1580.4	503.4
12.63	5.14		300	309.7		672.1	470.9
14.63	5.24	187.1	201	269.8	183.6	397.7	453.4
16.66	5.42		235	294.7		346.7	453.6
19.62	5.2		215	237.1		397.7	382.6
21.62	5.38	177	205	220.7	138.7	357.3	359.4
23.60	5.45		315	224.83		263.7	392.05
26.81	5.62		194	210.7		344.6	372
28.54	8.93	245.4	219	204.3	148.8	159.5	353.1
30.60	9.06		221	219.8		146.8	449.7
33.84	9.51		190	217.6		106.4	436.9
35.55	9.18	226	193	179.8	228.5	125.5	408.3
37.65	9.25		190	175.6		108.5	400.7
40.82	9.18		193	186.8		131.9	413.3
42.68	9.31	288.5	206	186.2	237	148.9	423.2
44.61	9.4		205	199.5		117.0	468.8
47.91	9.32		196	177		146.8	466.8
49.63	9.25	364.2	185	208.6	275.7	91.5	484.3
51.64	9.35		175	217.1		129.7	567.7
54.85	9.26		184	154.5		148.9	517.9
56.67	9.12	351.7	217	191.6	351.9	129.7	543.5
58.56	9.26		220	206.7		102.1	539
61.61	9.24		192	207.6		127.6	549.5
63.49	9.21	362.6	209	181.9	348.9	117.0	530.8
65.77	9.18		234	222.2		110.6	541.5
68.58	9.21		171	186.3		106.4	551.5
70.65	9.23	367.5	195	176.7	359	121.2	535.7
72.64	9.22		204	196.8		10.6	536.3
75.88	9.25		190	176.8		131.9	541.7
77.61	9.18	357	297	184.1	369.4	87.2	553.5
79.55	9.22		222	192.5		125.5	538
82.48	9.24		179	199.7		104.2	565.1
84.62	9.25	360.6	201	185.7	357.6	114.9	543.3

Table B-7. Continued.

Train 2 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
86.60	9.33		222	206.8		97.8	542
89.90	9.31		199	201.1		8.5	549.7
91.67	9.43	343.2	191	210.1	331.7	97.8	541.8
93.62	9.41		170	185.8		151.0	548
96.56	9.25		196	173.1		93.6	531.3
98.64	9.14	345.5	199	206.5	341.3	110.6	547.8
100.60	9.36		206	202.8		138.3	546.7
103.50	9.34		183	190.5		131.9	544.9
105.64	9.16	357.3	205	185.2	350.6	72.3	535.8
107.61	9.14		230	203.4		134.0	537.9
110.54	9.15		188	207.2		127.6	560.4
112.60	9.22	335.6	203	206.7	334.3	123.4	541

Table B-8. Transfer data for Train 2 Fermentor 1.

Train 2 – Fermentor 4											
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
2.00											
5.00											
7.58	5.61	330.6	0	187.7	255.3	1127.3	516.6	0.860	0.218	9.49	11.42
9.54	5.16		200	262.3		1733.5	509	0.860	0.218		
12.63	5.17		200	293.9		1484.6	443.5	0.860	0.218		
14.63	5.28	183.6	0	206.1	64.8	1276.2	344.5	0.733	0.537	5.32	8.52
16.66	5.42		200	225.3		493.5	385.1	0.828	0.298		
19.62	5.37		200	213.8		650.9	357.3	0.828	0.298		
21.62	5.55	138.7	0	209.0	57.7	542.4	341.4	0.789	0.460	2.63	4.03
23.60	5.64		200	205.7		287.1	341.91	0.808	0.362		
26.81	8.74		200	193.8		138.3	335.6	0.797	0.391		
28.54	9.18	148.8	0	226.8	37.8	136.1	339.3	0.810	0.362	0.85	1.14
30.60	9.4		200	209.0		131.9	371.8	0.806	0.375		
33.84	9.51		200	189.8		695.5	360.6	0.802	0.390		
35.55	9.24	228.5	0	195.8	99	129.7	369.5	0.743	0.416	0.29	0.29
37.65	9.26		200	188.6		72.3	419.7	0.792	0.387		
40.82	9.18		200	193.2		123.4	428.7	0.791	0.386		
42.68	9.23	237	0	204.4	128.4	129.7	407.5	0.760	0.425	0.32	0.32
44.61	9.41		200	196.7		117.0	431	0.778	0.401		
47.91	9.21		200	195.5		119.1	417.4	0.773	0.403		
49.63	9.18	275.7	0	186.2	165.7	93.6	426.6	0.807	0.542	3.42	4.52
51.64	9.35		200	168.7		119.1	456	0.852	0.431		
54.85	9.25		200	180.4		117.0	483.8	0.852	0.440		
56.67	8.92	351.9	0	214.6	212.3	110.6	501.6	0.831	0.368	1.40	1.55
58.56	9.3		200	220.4		108.5	563.1	0.852	0.437		
61.61	9.24		200	190.3		100.0	538.3	0.847	0.444		
63.49	9.12	348.9	0	209.1	266.1	108.5	549.9	0.850	0.371	1.01	1.01
65.77	9.15		200	233.2		106.4	553.6	0.845	0.412		
68.58	9.09		200	171.1		63.8	520.2	0.849	0.406		
70.65	9.03	359	0	197.0	276.3	102.1	547.4	0.863	0.444	1.01	1.01
72.64	9.26		200	199.8		112.7	549.9	0.852	0.415		
75.88	9.17		200	189.3		119.1	544.4	0.852	0.409		
77.61	9.04	369.4	0	197.7	286.2	91.5	558	0.863	0.444	1.25	1.25
79.55	9.23		200	220.7		102.1	562.8	0.856	0.424		
82.48	9.19		200	178.6		95.7	539.4	0.857	0.427		
84.62	9.13	357.6	0	202.0	283.7	123.4	559.8	0.855	0.421	1.15	1.15

Table B-8. Continued.

Train 2 – Fermentor 4											
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
86.60	9.31		200	216.0		95.7	555.5	0.857	0.425		
89.90	9.2		200	199.0		0.0	538.2	0.857	0.428		
91.67	9.29	331.7	0	191.8	263.9	78.7	529.8	0.856	0.421	1.04	1.04
93.62	9.34		200	170.4		119.1	518.6	0.856	0.424		
96.56	9.17		200	196.8		104.2	547.2	0.856	0.424		
98.64	9.02	341.3	0	201.7	267.6	104.2	543.4	0.857	0.421	1.17	1.17
100.60	9.31		200	202.7		136.1	536.8	0.857	0.423		
103.50	9.26		200	183.7		136.1	533	0.857	0.423		
105.64	9.07	350.6	0	208.8	265.2	129.7	548.1	0.848	0.369	2.82	3.21
107.61	9.19		200	227.7		114.9	557.3	0.855	0.412		
110.54	9.08		200	188.8		106.4	527	0.854	0.409		
112.60	9.25	334.3	0	205.7	258.2	129.7	538	0.849	0.346	2.43	2.82

Table B-9. Transfer data for Train 3 Fermentor 4.

Train 3 – Fermentor 4											
Day	pH	Feedstock + nutrient added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
2.00											
5.00											
7.62	5.92	40	400	260.3	257.6	421.1	517.9	0.988	0.415	7.31	8.39
9.57	5.73			272.7		280.8	515.4	0.999	0.415	5.93	7.09
12.65	5.78			243.9		510.5	504.3	0.993	0.415	6.07	8.06
14.66	5.54	40	400	250.2	266	550.9	516.2	0.977	0.379	11.09	16.55
16.73	6.08			269.4		346.7	517.2	0.987	0.416	5.56	7.81
19.74	5.45			183.6		127.6	479.4	0.989	0.408	11.70	17.82
21.66	5.49	40	400	220.1	342	272.3	562.1	0.965	0.422	16.30	26.16
23.63	5.56			256.5		542.4	519	0.982	0.408	7.21	10.88
26.83	5.36			158.2		465.8	505.7	0.980	0.407	15.13	24.68
28.58	5.37	40	400	226.1	301.2	276.5	527.3	0.960	0.484	15.37	25.80
30.66	5.47			243.8		655.1	521.8	0.975	0.426	6.21	9.62
33.86	5.48			250.3		833.8	557.4	0.972	0.429	15.62	26.02
35.59	5.78	40	400	354.6	293.5	191.4	648.1	0.974	0.213	14.12	24.07
37.59	6.16			255.8		263.7	529.4	0.972	0.392	4.19	5.90
40.84	5.74			251.2		351.0	552.6	0.971	0.389	11.13	18.37
42.71	6.26	40	400	206.5	306.9	138.3	513.4	0.978	0.223	12.37	20.69
44.63	6.14			262.5		329.7	515.9	0.985	0.341	4.19	6.23
47.95	9.02			152.9		95.7	437.8	0.976	0.311	9.80	15.48
49.66	9.18	40	400	215.3	279.8	78.7	495.1	0.996	0.264	9.06	14.50
51.67	7.91			251.3		253.1	526.5	0.995	0.406	4.61	6.14
54.90	9.31			158.9		144.6	475.5	0.994	0.356	7.08	10.47
56.69	8.8	40	400	217.5	287.7	100.0	505.2	0.997	0.226	3.80	5.44
58.64	7.49			235.8		195.7	517.3	0.992	0.313	1.27	1.52
61.68	8.92			146.6		102.1	426.3	0.997	0.313	4.45	5.87
63.51	9.06	40	400	142.5	300.8	55.3	443.3	0.995	0.400	5.06	6.90
65.74	7.84			227.2		172.3	518.5	0.994	0.370	3.84	4.44
68.60	8.98			145.1		125.5	451.9	0.996	0.534	5.45	6.77
70.67	9.09	40	400	139.9	308.1	110.6	448	0.993	0.583	5.48	6.94
72.66	8.18			233		136.1	517.7	0.994	0.354	3.97	4.42
75.91	9.01			157.6		129.7	450.7	0.994	0.351	6.18	7.27
77.63	9.14	40	400	163.8	304.5	85.1	468.3	0.995	0.457	6.18	7.44
79.58	8.43			238.1		83.0	520.8	0.994	0.311	3.36	3.68
82.54	9.11			151.3		106.4	455.8	0.994	0.411	5.61	6.44
84.66	9.24	40	400	124.6	341.2	97.8	465.8	0.995	0.372	5.83	6.78

Table B-9. Continued.

Train 3 – Fermentor 4											
Day	pH	Feedstock + nutrient added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
86.65	8.47			253.5		119.1	520.1	0.993	0.260	3.60	3.87
89.94	9.09			149.9		119.1	444.5	0.995	0.443	5.53	6.16
91.69	9.36	40	400	135.2	315.1	65.9	450.3	0.993	0.360	5.47	6.12
93.64	8.43			250.3		121.2	518.1	0.994	0.389	2.28	2.35
96.58	9.06			89.5		85.1	392.1	0.994	0.365	5.14	5.49
98.66	9.11	40	400	100.9	326.5	65.9	427.4	0.994	0.363	5.60	6.84
100.63	8.61			241.7		123.4	516.8	0.994	0.321	3.41	3.75

Table B-10. Transfer data for Train 3 Fermentor 3.

Train 3 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
0.00							
2.00							
5.00							
7.62	5.99	257.6	243	260.3	257.4	553.0	517.7
9.57	5.43		244	263.2		646.6	511.4
12.65	5.36		265	257.4		1027.3	484.4
14.66	5.35	266	207	252.1	231.5	797.6	483.6
16.73	5.71		245	235		448.8	512.8
19.74	5.02		249	269.1		146.8	505.7
21.66	5.26	342	261	215	259	225.5	474
23.63	5.38		339	245.6		342.4	562.9
26.83	5.45		204	182.9		459.4	409.2
28.58	5.36	301.2	229	296.7	353.6	268.0	650.3
30.66	5.38		320	293.4		291.4	592.5
33.86	5.51		286	338.4		619.0	603.8
35.59	5.97	293.5	189	275.3	275.4	204.2	550.7
37.59	5.98		216	280.3		210.6	563.4
40.84	6.03		213	212.3		287.1	494.5
42.71	9.06	306.9	205	205.4	289.5	68.1	494.9
44.63	9.3		230	184.4		121.2	504.4
47.95	9.23		204	209.6		89.3	541.3
49.66	9.38	279.8	203	215.2	317.2	68.1	532.4
51.67	9.36		215	201		134.0	492.6
54.90	9.33		174	190.9		97.8	499.5
56.69	9.14	287.7	189	167.5	311.8	104.2	479.3
58.64	9.23		176	145.3		108.5	270.7
61.68	9.27		202	165.5		110.6	481.4
63.51	9.17	300.8	187	206.6	311.6	97.8	518.2
65.74	9.13		158	161.8		110.6	502.7
68.60	9.21		178	141.6		95.7	497
70.67	9.2	308.1	187	177.1	355.1	91.5	532.2
72.66	9.21		210	167.8		102.1	479.7
75.91	9.22		182	175.7		95.7	515.9
77.63	9.25	304.5	183	188	333.3	78.7	521.3
79.58	9.21		184	174.5		117.0	488.9
82.54	9.27		196	161.9		97.8	497.7
84.66	9.31	341.2	167	181.1	350.1	104.2	531.2

Table B-10. Continued.

Train 3 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
86.65	9.4		170	177.7		80.8	515.9
89.94	9.29		207	162.2		106.4	505.7
91.69	9.44	315.1	185	191	355	65.9	546
93.64	9.3		136	125.5		102.1	457.3
96.58	9.29		158	130.8		72.3	466.3
98.66	9.22	326.5	203	154.2	334	74.4	488.2
100.63	9.32		184	149.7		104.2	475

Table B-11. Transfer data for Train 3 Fermentor 2.

Train 3 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
0.00							
2.00							
5.00							
7.62	5.98	257.4	249	245.1	272.6	331.8	517.7
9.57	6.28		262	239.7		665.8	496.6
12.65	5.61		212	260.1		1169.9	509.7
14.66	5.42	231.5	193	210.3	244.9	808.3	455.2
16.73	5.48		225	232.7		789.1	434.6
19.74	4.98		255	249		895.5	413.5
21.66	5.09	259	225	266.9	149.9	453.1	416.8
23.63	5.24		253	323.7		217.0	520.2
26.83	5.28		230	204.4		482.8	435
28.58	5.17	353.6	209	237.1	219.4	346.7	456.5
30.66	5.31		252	307.4		355.2	582.4
33.86	5.8		217	286.3		616.8	512.5
35.59	6.16	275.4	199	191.5	251.4	265.9	442.9
37.59	6.13		214	213.3		178.7	463.1
40.84	8.08		202	213.3		127.6	458.3
42.71	9.12	289.5	203	207.2	238.5	46.8	445.7
44.63	9.24		215	221.9		100.0	491.5
47.95	9.22		192	202		74.4	473.7
49.66	9.27	317.2	209	200.2	258.2	63.8	458.4
51.67	9.4		209	210.7		110.6	511.9
54.90	9.33		180	172.7		80.8	500.7
56.69	9.13	311.8	205	187.4	319.3	89.3	506.7
58.64	9.3		210	175.1		106.4	496
61.68	9.25		190	201.4		85.1	526.6
63.51	9.18	311.6	207	184.4	327.5	85.1	511.9
65.74	9.18		187	156.2		100.0	491.3
68.60	9.22		190	177.9		85.1	528.8
70.67	9.19	355.1	205	191.9	348.9	100.0	540.8
72.66	9.27		214	204.9		102.1	541.3
75.91	9.25		170	182.2		110.6	543.2
77.63	9.22	333.3	219	184.9	344.7	70.2	529.6
79.58	9.23		224	184.5		97.8	514.4
82.54	9.31		178	196.2		95.7	552
84.66	9.27	350.1	195	169.7	363.2	89.3	532.9

Table B-11. Continued.

Train 3 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
86.65	9.44		216	167.3		93.6	514.5
89.94	9.31		189	208.9		117.0	558.5
91.69	9.4	355	197	187.3	345.2	102.1	532.5
93.64	9.34		166	136.5		117.0	504.3
96.58	9.3		186	158.4		87.2	532
98.66	9.22	334	211	204.6	349.7	61.7	554.3
100.63	9.92		204	180.9		93.6	532.5

Table B-12. Transfer data for Train 3 Fermentor 1.

Train 3 – Fermentor 4											
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
2.00											
5.00											
7.62	6.52	272.6	0	252.2	191.8	302.0	518.5	0.804	0.217	3.95	4.88
9.57	5.79		200	256.8		574.3	518.8	0.804	0.217		
12.65	5.5		200	208.3		1063.5	455.3	0.804	0.217		
14.66	5.28	244.9	0	195.5	179.4	440.3	449.4	0.844	0.328	6.28	9.68
16.73	5.53		200	214.7		840.2	432.3	0.814	0.245		
19.74	5.05		200	254.1		1306.0	414.8	0.814	0.245		
21.66	5.23	149.9	0	231.6	53.2	748.7	359.2	0.789	0.494	5.06	8.37
23.63	5.21		200	239.0		482.8	376.9	0.813	0.306		
26.83	5.38		200	230.3		642.4	330.5	0.815	0.324		
28.58	6	219.4	0	214.3	10.9	97.8	299.6	0.750	0.466	1.33	2.10
30.66	5.42		200	240.7		397.7	431	0.796	0.367		
33.86	6.29		200	217.2		538.1	387.9	0.793	0.392		
35.59	6.44	251.4	0	201.5	94.3	225.5	370.2	0.740	0.443	1.87	2.87
37.59	7.04		200	211.2		210.6	449	0.779	0.398		
40.84	8.84		200	201.9		102.1	436.9	0.772	0.413		
42.71	8.87	238.5	0	205.6	153.5	78.7	433.5	0.719	0.412	1.18	1.77
44.63	9.19		200	204.9		129.7	439.5	0.761	0.412		
47.95	9.13		200	187.6		72.3	433.9	0.754	0.416		
49.66	9.17	258.2	0	207.8	163.3	100.0	445.5	0.778	0.410	1.14	1.70
51.67	9.36		200	200.1		100.0	459.6	0.757	0.412		
54.90	9.27		200	179.5		76.6	456.6	0.754	0.412		
56.69	8.94	319.3	0	203.5	198.2	72.3	476.1	0.806	0.401	0.98	1.31
58.64	9.29		200	208.1		70.2	519.2	0.843	0.410		
61.68	9.19		200	188.1		85.1	510.4	0.843	0.409		
63.51	8.99	327.5	0	204.6	243.7	59.6	522.7	0.856	0.382	1.03	1.21
65.74	9.13		200	186.4		97.8	518.6	0.843	0.403		
68.60	9.09		200	190.4		85.1	531.2	0.838	0.401		
70.67	9.05	348.9	0	206.4	260.2	83.0	540.7	0.866	0.362	1.13	1.31
72.66	9.21		200	208.8		87.2	549.7	0.849	0.392		
75.91	9.13		200	170.9		93.6	510.9	0.850	0.388		
77.63	9.01	344.7	0	222.6	272.6	76.6	569.3	0.849	0.389	1.18	1.32
79.58	9.19		200	224.2		91.5	563.6	0.851	0.386		
82.54	9.18		200	178.7		74.4	534.8	0.853	0.384		
84.66	9.15	363.2	0	197.6	286.3	91.5	558	0.858	0.360	1.03	1.03

Table B-12. Continued.

Train 3 – Fermentor 4											
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
86.65	9.37		200	211.9		80.8	555.4	0.852	0.381		
89.94	9.17		200	189.2		100.0	541.8	0.853	0.380		
91.69	9.21	345.2	0	198.5	274.3	72.3	546.9	0.851	0.343	0.85	0.85
93.64	9.27		200	165.2		100.0	516.9	0.854	0.370		
96.58	9.21		200	186.7		4.3	550.8	0.854	0.367		
98.66	9.08	349.7	0	214.1	270.2	80.8	557.3	0.853	0.368	1.04	1.04
100.63	9.34		200	201.6		91.5	556.7	0.853	0.366		

Table B-13. Transfer data for Train 4 Fermentor 4.

Train 4 – Fermentor 4											
Day	pH	Feedstock + nutrient added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
2.00											
5.00											
7.62	6.6	80	400	182	376.2	461.6	558.2	0.989	0.446	6.03	8.39
9.57	6.7			126.7		812.5	556	0.982	0.400	6.25	8.38
12.65	7.04			134.2		425.4	564.4	0.985	0.423	13.64	17.67
14.66	7.64	80	400	162.1	428.9	351.0	591	0.984	0.498	9.23	11.99
16.73	6.36			167.5		935.9	555.6	0.983	0.353	6.83	9.30
19.74	8.06			140.2		570.7	552.8	0.985	0.323	12.63	16.17
21.66	8.33	80	400	144.6	426	136.1	570.6	0.983	0.234	14.86	18.62
23.63	7.61			130.2		348.8	546.5	0.984	0.366	6.97	8.23
26.83	8.37			159.5		187.2	571.1	0.993	0.355	13.34	15.99
28.58	8.93	80	400	203.4	415.7	104.2	619.1	0.998	0.413	15.95	19.37
30.66	7.18			161.7		480.7	561.1	0.989	0.384	4.60	4.93
33.86	8.26			191.1		182.9	613.3	0.990	0.328	13.40	15.63
35.59	8.66	80	400	162.2	443.3	97.8	605.5	0.989	0.350	6.92	7.87
37.59	7.74			150.5		289.3	575.5	0.987	0.370	13.76	15.99
40.84	8.49			88.4		142.5	556.4	0.982	0.313	13.77	16.03
42.71	8.81	80	400	200.1	452.7	104.2	652.8	0.989	0.317	17.28	20.50
44.63	7.84			201.8		248.9	553.9	0.988	0.322	7.11	8.08
47.95	8.76			105.9		114.9	546.5	0.987	0.334	14.38	16.85
49.66	8.97	80	400	193.3	442.7	110.6	636	0.986	0.331	16.31	19.38
51.67	7.85			144		282.9	565.3	0.987	0.346	8.63	9.62
54.90	8.8			197.2		102.1	636.4	0.985	0.191	14.17	16.37
56.69	9.16	80	400	202.3	429.2	87.2	631.5	0.988	0.390	16.11	18.89
58.64	8.14			161.6		91.5	563.6	0.985	0.352	7.20	7.94
61.68	8.81			126.8		114.9	561.8	0.986	0.322	13.00	14.71
63.51	8.94	80	400	178.3	462	83.0	640.3	0.986	0.320	13.90	16.00
65.74	8.22			112.4		195.7	562.9	0.985	0.570	7.48	8.09
68.60	8.66			129.5		112.7	609.5	0.986	0.272	12.31	13.64
70.67	8.97	80	400	190.9	436.7	112.7	627.6	0.982	0.367	1.62	1.64
72.66	6.94			168.2		627.5	564.7	0.984	0.340	6.11	6.72
75.91	8.63			210.9		117.0	635.3	0.990	0.303	12.40	13.89
77.63	8.82	80	400	175.4	459.9	0.0	635.3	0.986	0.187	12.93	14.53
79.58	7.14			153.6		543.4	570.7	0.989	0.328	4.99	5.63
82.54	8.28			175.3		142.5	598.5	0.989	0.346	11.17	12.51
84.66	8.65	80	400	153.2	485.8	91.5	639	0.985	0.222	14.15	15.76

Table B-14. Transfer data for Train 4 Fermentor 3.

Train 4 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
0.00							
2.00							
5.00							
7.62	6.52	376.2	181	175.8	378.5	419.0	554.3
9.57	7.7		185	134.7		278.6	545.8
12.65	7.78		95	160.3		138.3	587.8
14.66	8.12	428.9	121	102.4	419.3	161.7	521.7
16.73	7.67		150	165.6		516.9	526.4
19.74	7.4		110	160.8		272.3	496.8
21.66	7.91	426	177	128.5	312.3	612.6	440.8
23.63	8.51		212	157.6		261.6	552.5
26.83	8.73		229	192.4		93.6	606.3
28.58	8.64	415.7	181	200.5	441.3	100.0	641.8
30.66	8.65		194	216.7		147.8	649.6
33.86	8.82		152	183.6		106.4	628.8
35.59	8.88	443.3	181	133.7	461.8	100.0	595.5
37.59	8.88		208	151.7		119.1	571.2
40.84	8.95		208	185.3		106.4	626.3
42.71	9.02	452.7	193	215	431.1	78.7	646.1
44.63	8.79		204	200.8		110.6	664.2
47.95	9.08		160	191.4		68.1	668.6
49.66	9.12	442.7	187	173.2	464.8	89.3	638
51.67	9.16		210	218.3		112.7	610.3
54.90	9.12		207	196.2		123.4	595
56.69	9.28	429.2	195	200.5	403.3	91.5	603.8
58.64	9.01		198	162.6		97.8	625.8
61.68	9.11		193	208.5		85.1	656
63.51	9	462	169	168.1	468.7	93.6	636.8
65.74	9.19		190	161		102.1	623.6
68.60	9.04		192	149.1		61.7	644.5
70.67	9.13	436.7	243	244	446.1	97.8	690.1
72.66	8.91		242	241.3		153.1	675.8
75.91	9.09		211	208.3		102.1	677.2
77.63	9.12	459.9	193	216.6	460.1	102.1	676.7
79.58	9		203	183.7		83.0	666.8
82.54	8.99		178	214.8		95.7	681.5
84.66	9.05	485.8	165	137.7	503.2	77.6	640.9

Table B-15. Transfer data for Train 4 Fermentor 2.

Train 4 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
0.00							
2.00							
5.00							
7.62	6.5	378.5	135	184	383.3	578.5	567.3
9.57	8.05		140	177.3		174.4	557.7
12.65	8.44		164	94.5		42.5	514.8
14.66	7.75	419.3	160	122.8	410	346.7	532.8
16.73	8.59		145	140.9		83.0	538.1
19.74	8.76		182	109.6		157.4	533.4
21.66	8.66	312.3	209	176.5	424.3	217.0	600.8
23.63	8.55		226	212.5		312.7	484
26.83	8.7		184	229.1		191.4	495.4
28.58	8.63	441.3	151	178.3	271.7	138.3	450
30.66	8.71		159	195.6		127.6	614.1
33.86	8.85		200	151		102.1	576.8
35.59	8.9	461.8	200	182.5	440.3	97.8	622.8
37.59	8.98		230	205.8		95.7	638.5
40.84	9.04		202	208.3		51.0	637.4
42.71	9.06	431.1	185	196.7	437.5	70.2	634.2
44.63	9.06		190	204.3		102.1	626.3
47.95	9.18		182	160.6		68.1	610.9
49.66	9.16	464.8	205	191	440.2	70.2	631.2
51.67	9.31		218	206.6		83.0	652.2
54.90	9.22		203	208		0.0	660.3
56.69	9.36	403.3	189	197.2	452.7	87.2	649.9
58.64	9.2		168	196		110.6	597.1
61.68	9.17		190	193.6		80.8	583.6
63.51	9.03	468.7	195	172.3	407	76.6	579.3
65.74	9.23		206	186.7		76.6	633.4
68.60	9.1		194	192.6		102.1	648
70.67	9.18	446.1	239	245.4	403.7	76.6	649.1
72.66	9.03		214	244		129.7	687.1
75.91	9.19		209	211.1		63.8	655.6
77.63	9.15	460.1	175	195.3	456.9	63.8	652.2
79.58	9.25		186	204.3		193.6	652.6
82.54	9.15		190	176.8		97.8	633.6
84.66	9.2	503.2	192	166.5	479.4	63.8	645.9

Table B-16. Transfer data for Train 4 Fermentor 1.

Train 4 – Fermentor 4											
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
2.00											
5.00											
7.62	6.63	383.3	0	137.5	321.2	278.6	532.8	0.776	0.324	6.46	8.71
9.57	7.47		200	133.8		363.7	516.3	0.776	0.324		
12.65	5.61		200	163.7		512.6	538.7	0.776	0.324		
14.66	6.06	410	0	6.7	238.3	159.5	319.1	0.743	0.345	12.36	17.05
16.73	7.88		200	136.0		199.9	531.8	0.768	0.330		
19.74	7.8		200	181.5		302.9	414.6	0.768	0.330		
21.66	8.43	424.3	0	207.2	330.6	155.3	611.9	0.839	0.306	4.93	6.16
23.63	8.86		200	225.8		244.6	628.8	0.779	0.327		
26.83	8.93		200	183.5		51.0	600.4	0.779	0.328		
28.58	8.59	271.7	0	149.7	380.5	59.6	604.3	0.828	0.251	3.83	4.70
30.66	8.81		200	159.5		113.8	415.1	0.799	0.308		
33.86	8.9		200	199.0		121.2	454.8	0.805	0.304		
35.59	0	440.3	0	0.0	180.7	0.0	254.8	0.798	0.333	3.83	4.70
37.59	8.99		200	224.7		100.0	644	0.802	0.305		
40.84	9.07		200	202.9		80.8	618.6	0.806	0.300		
42.71	9.06	437.5	0	187.2	352.4	61.7	613.7	0.802	0.244	3.28	3.98
44.63	9.11		200	188.7		95.7	619.6	0.802	0.297		
47.95	9.18		200	183.1		55.3	630.2	0.802	0.296		
49.66	9.12	440.2	0	204.8	367.5	74.4	646.4	0.813	0.265	3.59	4.28
51.67	9.32		200	215.0		76.6	640.1	0.805	0.280		
54.90	9.22		200	203.8		57.4	625.6	0.805	0.277		
56.69	9.3	452.7	0	191.3	351.1	74.4	616.5	0.794	0.283	3.06	3.61
58.64	9.27		200	185.4		112.7	639.7	0.804	0.280		
61.68	9.15		200	192.2		117.0	653.9	0.804	0.277		
63.51	8.93	407	0	196.4	384.7	46.8	655.2	0.802	0.279	3.05	3.55
65.74	9.27		200	201.9		68.1	596.4	0.802	0.279		
68.60	9.16		200	194.3		36.2	593.3	0.801	0.280		
70.67	9.25	403.7	0	243.9	279.7	68.1	597.7	0.773	0.390	3.23	3.81
72.66	9.09		200	213.3		91.5	644.4	0.796	0.301		
75.91	9.11		200	209.3		72.3	630.5	0.795	0.306		
77.63	9.03	456.9	0	178.1	369.1	0.0	621.3	0.784	0.363	2.61	2.87
79.58	9.26		200	185.5		51.0	630.8	0.790	0.328		
82.54	9.2		200	191.2		70.2	643.3	0.788	0.338		
84.66	9.24	479.4	0	193.7	382.8	59.6	650.6	0.852	0.283	2.58	2.85

Table B-17. Transfer data for Train 5 Fermentor 4.

Train 5 – Fermentor 4											
Day	pH	Feedstock + nutrient added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
2.00											
5.00											
7.62	6.56	120	400	110.4	485.1	336.1	595.5	0.970	0.000	6.66	9.59
9.57	6.63			86.6		1116.7	594.8	0.973	0.448	6.10	8.22
12.65	7.26			89.5		397.7	629.9	0.971	0.448	11.47	15.52
14.66	8.15	120	400	62.8	557.3	161.7	620.1	0.971	0.448	10.30	13.85
16.73	6.68			120.1		991.2	594.9	0.980	0.387	5.91	8.81
19.74	7.78			77.3		516.9	580.7	0.990	0.420	12.41	16.62
21.66	8.42	120	400	124.2	494.5	146.8	618.7	0.977	0.430	13.51	17.88
23.63	6.87			50.9		869.9	603.7	0.978	0.427	7.73	10.78
26.83	8.28			150.1		85.1	729.5	0.987	0.142	12.44	16.36
28.58	8.44	120	400	202.5	618	78.7	820.5	0.982	0.361	15.51	20.37
30.66	6.83			75.8		651.9	604.4	0.980	0.382	7.24	9.74
33.86	7.42			163.6		329.7	723.6	0.981	0.315	14.18	18.18
35.59	8.39	120	400	188.9	555.2	104.2	744.1	0.983	0.345	10.71	13.96
37.59	6.96			105.3		787.0	615.4	0.982	0.396	8.45	11.19
40.84	8.24			181.1		117.0	743.5	0.987	0.350	16.44	21.01
42.71	8.68	120	400	256.5	563.1	106.4	819.6	0.982	0.278	18.52	23.74
44.63	7.06			110		642.4	605.7	0.981	0.333	8.47	11.03
47.95	8.47			141.1		148.9	698.2	0.983	0.340	16.57	21.07
49.66	8.75	120	400	175.4	568.3	93.6	743.7	0.985	0.379	19.27	24.76
51.67	6.87			66.6		570.0	605.2	0.978	0.371	8.56	10.61
54.90	8.47			227.5		63.8	807.2	0.982	0.311	16.76	21.03
56.69	8.83	120	400	218.4	515.5	102.1	733.9	0.985	0.323	19.62	24.98
58.64	7.22			109.9		587.1	606	0.976	0.332	8.96	10.95
61.68	8.44			137		114.9	704.4	0.981	0.343	15.50	19.42
63.51	8.67	120	400	185.9	552.8	112.7	738.7	0.981	0.336	18.59	23.61
65.74	7.05			73.4		865.7	606.3	0.979	0.330	8.84	11.00
68.60	8.24			159.4		127.6	723.6	0.979	0.259	15.27	19.14
70.67	8.58	120	400	203.4	532.1	36.2	735.5	0.977	0.209	8.62	9.01
72.66	7.47			88.3		343.2	601.8	0.981	0.353	7.97	10.36
75.91	7.7			165.1		227.6	737.5	0.985	0.353	16.63	21.48
77.63	8.22	120	400	255.1	532.5	140.4	787.6	0.985	0.311	18.09	23.42
79.58	6.99			26.9		80.8	561.7	0.982	0.392	8.40	11.44
82.54	7.33			191.7		340.3	748.6	0.986	0.390	14.47	18.75
84.66	7.79	120	400	134.9	565.2	282.9	700.1	0.794	0.386	15.29	19.91

Table B-18. Transfer data for Train 5 Fermentor 3.

Train 5 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
0.00							
2.00							
5.00							
7.62	6.48	485.1	101	126.7	468.3	110.6	595
9.57	7.91		105	120.3		155.3	607.3
12.65	8.27		81	80.2		34.0	574.4
14.66	8.58	557.3	135	74.1	499.5	104.2	573.6
16.73	8.64		140	109.6		155.3	628.2
19.74	8.64		224	113.7		97.8	651.7
21.66	8.56	494.5	207	210.4	568.7	129.7	779.1
23.63	8.61		260	180.5		189.3	700.7
26.83	8.6		194	237.9		136.1	770.9
28.58	8.61	618	179	175.4	552.6	89.3	728
30.66	8.63		200	200.3		93.6	788.3
33.86	8.73		232	180.8		91.5	788.5
35.59	8.77	555.2	187	212.6	625.9	53.2	838.5
37.59	8.53		262	236		144.6	762.6
40.84	8.64		174	259.7		102.1	780.4
42.71	8.79	563.1	173	188.4	505.2	74.4	693.6
44.63	8.8		200	202.3		91.5	750.9
47.95	8.88		184	188.1		89.3	755.2
49.66	8.94	568.3	161	219.7	526.5	65.9	746.2
51.67	8.93		190	270.8		100.0	786.2
54.90	8.9		222	160.5		100.0	703.4
56.69	9.05	515.5	197	261	499.3	63.8	760.3
58.64	8.89		160	210.8		87.2	772.6
61.68	8.91		190	177.3		91.5	720.6
63.51	8.89	552.8	211	199.9	528.1	93.6	728
65.74	8.92		216	191.6		110.6	745
68.60	8.76		180	173.8		63.8	762.8
70.67	8.93	532.1	189	243.3	528.1	70.2	771.4
72.66	8.54		224	228.7		121.2	771
75.91	8.72		205	216		95.7	766.3
77.63	8.75	532.5	133	214.4	539.2	8.5	753.6
79.58	8.4		169	216.4		174.4	741.2
82.54	8.5		184	146.4		117.0	692.1
84.66	8.55	565.2	169	198.8	530.8	126.6	729.6

Table B-19. Transfer data for Train 5 Fermentor 2.

Train 5 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
0.00							
2.00							
5.00							
7.62	6.56	468.3	97	102.4	494.3	0.0	596.7
9.57	7.34		130	99.6		282.9	565.8
12.65	7.15		155	79.5		908.2	584.3
14.66	6.94	499.5	162	136.3	520.1	691.3	656.4
16.73	8.8		252	134.8		112.7	629.9
19.74	8.39		240	224.2		570.7	719.8
21.66	8.06	568.7	193	206	525.1	142.5	731.1
23.63	8.54		212	255.7		197.8	773.3
26.83	8.53		192	193.8		97.8	725.5
28.58	8.52	552.6	193	178.4	546.5	93.6	724.9
30.66	8.67		208	202.1		107.4	728
33.86	8.81		226	232.9		14.9	733.3
35.59	8.82	625.9	169	188.4	538.7	72.3	727.1
37.59	8.9		188	259.1		91.5	808
40.84	8.93		180	174.4		63.8	733
42.71	8.89	505.2	199	175.5	562.4	68.1	737.9
44.63	8.88		230	207.5		106.4	678.4
47.95	8.98		156	184.3		31.9	700.9
49.66	8.96	526.5	193	163.9	508.6	80.8	672.5
51.67	9.1		236	188.1		112.7	685.2
54.90	8.94		206	223.6		153.1	729.5
56.69	9.1	499.3	187	199.6	508	0.0	707.6
58.64	9		158	159.6		172.3	696.2
61.68	9.03		239	190.7		80.8	693.1
63.51	8.89	528.1	141	212.3	523.3	95.7	735.6
65.74	9.1		164	215.8		95.7	733.5
68.60	8.96		209	180		85.1	677.7
70.67	8.98	528.1	197	193.4	511.9	85.1	705.3
72.66	8.82		226	225.7		106.4	716
75.91	9.01		183	205.5		80.8	715.1
77.63	8.96	539.2	149	136.2	555.4	83.0	691.6
79.58	8.81		194	169.6		97.8	670.7
82.54	8.8		192	186.3		106.4	694.9
84.66	8.85	530.8	175	171.4	527	61.7	698.4

Table B-20. Transfer data for Train 5 Fermentor 1.

Train 5 – Fermentor 4											
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
2.00											
5.00											
7.62	6.71	494.3	0	98.5	433.3	102.1	605.1	0.722	0.269	8.60	12.72
9.57	7.83		200	118.7		38.3	566.8	0.722	0.269		
12.65	7.6		200	154.5		121.2	656.3	0.722	0.269		
14.66	6.33	520.1	0	162.5	462.8	316.9	698.6	0.806	0.348	6.83	9.49
16.73	6.45		200	247.3		1412.3	675.2	0.743	0.289		
19.74	6.17		200	238.8		398.2	619.6	0.743	0.289		
21.66	6.2	525.1	0	189.9	314.9	1263.4	578.9	0.732	0.346	11.79	18.99
23.63	8.34		200	210.4		163.8	712.4	0.749	0.308		
26.83	7.88		200	192.8		108.5	701.6	0.755	0.316		
28.58	8.43	546.5	0	193.2	439.3	236.1	706.6	0.762	0.360	10.28	13.20
30.66	8.57		200	208.6		104.2	733.8	0.748	0.324		
33.86	8.71		200	227.4		10.6	724.9	0.749	0.331		
35.59	8.8	538.7	0	171.4	451.6	80.8	697.1	0.826	0.220	7.85	9.94
37.59	8.92		200	185.2		104.2	705.2	0.768	0.310		
40.84	8.95		200	181.8		53.2	712.5	0.771	0.309		
42.71	8.98	562.4	0	201.8	453.5	53.2	729.4	0.772	0.333	5.88	7.67
44.63	9		200	230.4		87.2	762.7	0.777	0.300		
47.95	9.04		200	156.2		59.6	732.2	0.783	0.294		
49.66	8.97	508.6	0	194.4	508.0	63.8	776.5	0.858	0.304	6.15	7.94
51.67	9.1		200	233.6		114.9	698.4	0.792	0.308		
54.90	8.9		200	206.5		59.6	659.7	0.796	0.308		
56.69	9.1	508	0	178.3	396.0	40.4	648.4	0.752	0.337	5.89	7.36
58.64	9.03		200	157.0		85.1	681.9	0.796	0.310		
61.68	8.91		200	238.9		46.8	723.9	0.799	0.313		
63.51	8.84	523.3	0	143.7	461.1	68.1	678.9	0.789	0.315	5.62	6.97
65.74	9.12		200	161.9		87.2	661.4	0.787	0.317		
68.60	8.99		200	209.3		61.7	691.7	0.785	0.318		
70.67	8.93	511.9	0	189.0	423.3	12.8	686.4	0.746	0.354	1.22	1.27
72.66	8.89		200	225.5		89.3	698.8	0.781	0.323		
75.91	9.13		200	183.3		83.0	672.8	0.778	0.326		
77.63	9.07	555.4	0	154.4	458.9	78.7	687.1	0.766	0.345	4.72	5.94
79.58	9.07		200	194.2		36.2	703.3	0.771	0.333		
82.54	8.98		200	191.7		63.8	709.3	0.769	0.336		
84.66	9.09	527	0	176.1	465.8	43.6	716.3	0.822	0.336	5.22	6.53

**SUPPLEMENTAL C. DATA FOR PROPAGATED FIXED-BED MIXED-ACID
FERMENTATION: EFFECT OF VOLATILE SOLIDS LOADING RATE AND
AGITATION AT NEAR-NEUTRAL PH**

Table C-1. Transfer data for Train 1 Fermentor 4.

Train 1 – Fermentor 4											
Day	pH	Feedstock + nutrient added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
2.00						336.1	0				
5.00						304.2	0				
7.80	6.04	40	400	210.5	317.5	95.7	528	0.986	0.489		
9.59	5.82			227		510.5	543.8	0.983	0.509	10.72	13.72
12.65	5.59			316.4		425.4	605.4	0.977	0.516	14.07	17.83
14.63	5.95			292.1		246.7	552.3	0.974	0.488	15.31	19.46
16.54	5.96			202.8		259.5	510.2	0.983	0.487	10.72	13.72
19.45	5.72			270.1		257.4	605.4	0.976	0.502	13.33	16.79
21.56	5.72	40	400	269.1	326.7	223.3	595.8	0.970	0.478	11.10	14.32
23.48	5.74			244.2		119.1	549	0.971	0.493	14.69	18.21
26.50	5.77			251.7		204.2	516.2	0.975	0.310	13.40	16.49
28.49	5.97			224.3		208.4	449.6	0.980	0.310	12.66	15.82
30.19	6			222.9		251.0	511.7	0.985	0.353	5.63	6.90
33.43	5.86			173.2		355.2	495.3	0.986	0.339	13.60	17.04
35.44	5.97	40	400	213.8	306.7	214.8	520.5	0.989	0.406	13.03	16.53
37.41	5.89			241.6		308.4	511.8	0.989	0.386	5.33	6.67
40.44	5.86			156.1		297.8	471.7	0.989	0.314	7.03	8.90
42.47	6.02			242.1		197.8	547.2	0.989	0.419	9.28	12.00
44.46	6.02			222.2		193.6	527.8	0.991	0.325	8.55	10.59
47.55	6.17			187.6		276.5	490.7	0.992	0.399	9.48	12.55
49.43	6.3	40	400	215.6	284.8	31.9	500.4	0.992	0.392	9.03	11.84
51.41	6.11			238		306.3	511	0.989	0.447	4.40	5.55
54.40	6.19			142		225.5	452.7	0.988	0.233	8.15	10.46
56.32	5.87			247.4		248.9	561.4	0.992	0.355	8.44	10.65
58.60	5.94			192.9		282.9	502.1	0.993	0.303	9.51	12.67
61.34	6.19			201.9		465.8	488.1	0.996	0.275	7.34	9.37
63.34	6.34	40	400	203.5	267.8	365.8	471.3	0.993	0.404	6.77	8.23
65.59	6.25			211.7		259.5	507.3	0.988	0.757	3.71	4.44
68.33	6.05			176.1		365.8	480.4	0.986	0.374	6.79	8.31
70.33	5.96			238.5		244.6	541.8	0.993	0.378	7.33	9.51
72.68	5.66			196.9		825.3	486.6	0.989	0.400	8.53	10.86
75.34	5.53			226.7		735.9	482.8	0.990	0.477	9.47	11.99

Table C-1. Continued.

Train 1 – Fermentor 4											
Day	pH	Feedstock + nutrient added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
77.33	5.51	40	400	204.9	202.8	246.7	407.7	0.986	0.322	11.22	14.20
79.34	5.99			185.1		385.0	498.4	0.987	0.360	2.76	3.52
82.34	5.56			174.1		195.7	483.3	0.990	0.340	8.67	11.39
84.34	5.88			199.6		344.6	511.1	0.992	0.359	7.80	10.83
86.36	5.96			193.8		878.5	479	0.988	0.408	8.80	12.44
89.34	5.79			198.1		976.3	437.2	0.997	0.246	8.31	10.56
91.33	6.39	40	400	185.2	217.1	472.2	402.3	0.990	0.206	7.42	10.97
93.34	6.11			223.1		319.1	525.9	0.989	0.305	3.25	4.34
96.35	6.04			227.1		474.3	552.8	0.986	0.400	10.39	14.23
98.34	6.15			223.8		306.3	547.7	0.987	0.340	10.32	14.74
100.32	6.29			201.4		344.6	488.9	0.990	0.401	8.46	11.93
103.33	5.83			234.4		1165.6	473.2	0.988	0.238	11.75	18.48
105.32	5.82	40	400	260	183.3	1316.6	443.3	0.990	0.337	10.80	17.11
107.32	5.93			220.1		478.6	509.2	0.987	0.394	5.91	8.37
110.41	5.62			151.2		574.3	457	0.986	0.419	8.73	12.61
112.37	5.85			190.9		582.8	505.6	0.988	0.347	8.69	11.66
114.45	5.94			232.1		1261.3	477.5	0.986	0.311	11.16	17.20
117.34	5.57			271		1191.1	430.8	0.987	0.196	8.62	13.37
119.34	6.67	40	400	185	179.8	363.7	364.8	0.994	0.203	5.90	9.75
121.39	5.8			235.2		253.1	514.8	0.989	0.384	3.62	5.01
124.34	5.92			151.9		314.8	465	0.991	0.305	7.37	10.09
126.33	6.09			205.7		567.9	506.1	0.993	0.423	6.99	9.87
128.35	5.42			224.1		123.4	475.5	0.986	0.359	9.30	12.30
131.78	5.57	40	400	190.1	190.4	165.9	380.5	0.971	0.340	11.11	16.61
133.76	6.58			191.8		285.0	357.1	0.993	0.127	6.40	9.68
135.33	5.97			236.7		221.2	521.1	0.989	0.406	5.58	7.17
138.34	6.03			146.6		353.1	441.5	0.989	0.279	4.00	5.21
140.36	6.01	40	400	154.7	290	757.2	444.7	0.989	0.283	7.21	10.83

Table C-2. Transfer data for Train 1 Fermentor 3.

Train 1 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
0.00							
2.00						274.4	0
5.00						325.4	0
7.80	5.7	317.5	263	231.4	311.1	355.2	542.5
9.59	5.71		240	291.5		497.7	569.5
12.65	5.66		280	265.9		374.4	513.3
14.63	5.94		235	294.4		191.4	523.4
16.54	5.9		246	300.8		193.6	549
19.45	5.93		230	263		178.7	491.2
21.56	5.72	326.7	229	269.1	326.7	391.4	595.8
23.48	6.11		182	213.5		163.8	443.1
26.50	6.54		206	187.1		268.0	406.4
28.49	6.95		197	222.3		151.0	418.3
30.19	6.16		214	209.8		206.3	442.9
33.43	6.13		202	200.5		257.4	440.2
35.44	6.92	306.7	197	211.3	223.9	199.9	435.2
37.41	6.05		218	202.5		214.8	513.2
40.44	6.1		214	234.3		385.0	519.3
42.47	6.37		189	228.2		363.7	490.7
44.46	6.8		198	187.2		251.0	442.6
47.55	7.34		186	199.9		221.2	444.5
49.43	7.67	284.8	201	181.8	239.6	95.7	421.4
51.41	6.26		236	186.3		299.9	458.2
54.40	6.21		206	249.5		463.7	497.2
56.32	6.73		181	193.6		225.5	444.1
58.60	7.27		196	182.2		185.0	423.8
61.34	7.96		200	190		146.8	429.3
63.34	8.13	267.8	209	196.7	233.9	119.1	430.6
65.59	6.52		220	186.2		304.2	458.6
68.33	6.76		196	239		299.9	484.9
70.33	7.1		209	187.5		104.2	431.7
72.68	5.52		192	202		108.5	442.2
75.34	7.95		178	178.1		153.1	417.3
77.33	8.16	202.8	191	185	228.8	121.2	413.8
79.34	6.63		212	172.3		259.5	382.9
82.34	6.99		180	203.2		51.0	413
84.34	8.04		209	174.2		93.6	382.2

Table C-2. Continued.

Train 1 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
86.36	8.73		202	201.7		74.4	411.3
89.34	8.61		172	244.3		108.5	451.1
91.33	6.04	217.1	203	258	192.2	257.4	450.2
93.34	5.95		220	253.1		321.2	470
96.35	6.3		176	223.9		299.9	428.9
98.34	7.75		193	170.8		136.1	371.1
100.32	8.48		210	188.8		104.2	380
103.33	8.47		205	203.8		93.6	392
105.32	8.43	183.3	197	197.5	190.8	38.3	388.3
107.32	6.34		210	170.9		489.2	375.9
110.41	7.25		174	200.8		168.0	405.6
112.37	8.19		189	170.5		106.4	372.5
114.45	8.78		209	187.7		95.7	382.6
117.34	8.62		206	206.4		123.4	397.4
119.34	8.66	179.8	197	195.6	194.1	127.6	389.7
121.39	7.55		208	193.7		146.8	371.1
124.34	8.18		188	196		95.7	369.7
126.33	8.45		197	182.1		110.6	353.6
128.35	8.45		198	202.4		1203.9	362.7
131.78	8.49	190.4	184	168.7	180.1	102.1	348.8
133.76	8.72		191	189.1		80.8	350.8
135.33	7.84		190	159.5		140.4	349.4
138.34	8.12		220	193.5		127.6	372.3
140.36	7.42	290	190	209.6	175.8	253.1	385.4

Table C-3. Transfer data for Train 1 Fermentor 2.

Train 1 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
0.00							
2.00						255.2	0
5.00						338.2	0
7.80	5.69	311.1	237	265.2	260.8	899.7	526
9.59	5.72		251	238.9		427.5	495.2
12.65	5.65		235	279.2		327.6	503.7
14.63	5.93		201	238.9		225.5	451
16.54	5.93		201	245.4		193.6	463.2
19.45	6.05		229	225.4		157.4	415.1
21.56	6.45	326.7	201	226.5	187.5	193.6	414
23.48	7.48		203	180.6		134.0	369.4
26.50	7.74		201	201.1		89.3	387.5
28.49	8.01		199	195.2		76.6	381.5
30.19	7.39		209	208.5		108.5	386.8
33.43	8.07		189	197.2		72.3	382.7
35.44	8.08	223.9	215	194.3	174.5	59.6	368.8
37.41	7.38		205	211.5		117.0	412.9
40.44	8.7		199	209.3		51.0	399.6
42.47	8.33		203	186.1		68.1	382.2
44.46	8.49		197	192.4		40.4	391.5
47.55	8.46		195	179.1		34.0	490.5
49.43	8.53	239.6	207	197.9	201.5	282.9	399.4
51.41	7.85		209	227.4		114.9	431.9
54.40	8.5		197	199.5		108.5	404.8
56.32	8.58		201	178.6		114.9	393.8
58.60	8.49		197	190.5		78.7	407.8
61.34	8.77		207	194.7		63.8	406.3
63.34	8.8	233.9	203	207.8	201.5	51.0	409.3
65.59	8.39		179	214.7		121.2	436.8
68.33	8.38		207	189.5		119.1	393.7
70.33	8.67		205	203.8		25.5	402.8
72.68	8.64		199	186		140.4	394.8
75.34	8.73		187	175.7		46.8	392.7
77.33	8.68	228.8	209	187.6	210.4	80.8	398
79.34	8.62		201	204.7		87.2	410.7
82.34	8.8		193	174.2		72.3	398.6
84.34	8.9		187	211		68.1	423.2

Table C-3. Continued.

Train 1 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
86.36	8.93		201	196.8		57.4	401.7
89.34	8.95		199	165.3		102.1	395.4
91.33	9.07	192.2	201	201.2	220.2	85.1	421.4
93.34	7.44		199	214.1		119.1	389.4
96.35	8.86		193	168.9		78.7	366.9
98.34	8.91		205	189		72.3	382.9
100.32	8.92		207	203.2		87.2	390.8
103.33	8.85		209	200.9		63.8	384.1
105.32	8.95	190.8	197	193.1	189.7	104.2	382.8
107.32	8.52		189	203.5		185.0	379.3
110.41	8.9		194	169.1		61.7	355.8
112.37	8.96		203	186.3		76.6	375.7
114.45	9.14		203	203.2		134.0	383.5
117.34	8.86		209	200.7		102.1	376.2
119.34	8.96	194.1	201	193.7	185.4	59.6	379.1
121.39	8.45		199	200.6		80.8	383.3
124.34	8.94		197	181.5		231.8	369.9
126.33	8.9		207	194.9		97.8	378.7
128.35	8.54		199	191.2		102.1	382.6
131.78	8.79	180.1	185	181.8	197.6	76.6	379.4
133.76	9.01		235	186.9		102.1	378.2
135.33	8.79		231	183.9		70.2	344
138.34	8.98		203	214.5		163.8	371
140.36	8.46	175.8	198	182.3	159.9	59.6	342.2

Table C-4. Transfer data for Train 1 Fermentor 1.

Train 1 – Fermentor 4											
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
2.00						287.1	0				
5.00						287.1	0				
7.80	5.64	209.3	0	239.2	209.3	718.9	525.1	0.810			
9.59	5.63		200	251.7		625.3	481.7				
12.65	5.62		200	233.2		333.9	426.2				
14.63	6.59		200	204.7		104.2	393	0.801	0.401	3.58	4.36
16.54	6.65		200	202.1		223.3	412.1	0.803	0.403	6.75	8.31
19.45	7.94		200	228.9		106.4	409.3	0.801	0.403	3.18	3.77
21.56	8.43	106.5	0	197.0	106.5	87.2	380.1	0.801	0.403	1.43	1.64
23.48	8.44		200	203.2		40.4	393.9	0.801	0.403	0.76	0.82
26.50	8.65		200	200.3		59.6	390	0.802	0.403	0.85	0.89
28.49	8.84		200	198.5		31.9	388.8	0.755	0.419	5.39	6.89
30.19	8.79		200	208.9		55.3	380.6	0.792	0.406	1.06	1.10
33.43	8.74		200	187.6		44.7	370.8	0.790	0.407	0.84	0.84
35.44	8.78	93.39	0	211.4	93.4	151.0	381.4	0.762	0.332	1.19	1.23
37.41	8.77		200	203.0		78.7	381.5	0.780	0.393	0.44	0.44
40.44	8.93		200	197.3		21.3	378.5	0.776	0.392	0.45	0.45
42.47	8.95		200	201.4		38.3	379.7	0.780	0.386	0.32	0.32
44.46	9.02		200	195.6		53.2	377.4	0.778	0.382	0.26	0.26
47.55	9.08		200	192.1		38.3	381.1	0.775	0.377	0.22	0.22
49.43	9.21	110.5	0	204.8	110.5	48.9	388.2	0.736	0.384	0.00	0.00
51.41	8.99		200	205.7		89.3	401.7	0.761	0.382	0.70	0.76
54.40	9.01		200	194.9		87.2	394.4	0.757	0.382	0.44	0.47
56.32	9.04		200	198.6		87.2	398.4	0.753	0.382	0.16	0.17
58.60	8.83		200	193.8		44.7	397.3	0.749	0.382	0.15	0.15
61.34	9.16		200	203.0		78.7	402.4	0.751	0.382	0.29	0.64
63.34	9.06	122.9	0	200.3	122.9	34.0	397.5	0.774	0.319	0.30	0.31
65.59	9.19		200	177.3		89.3	396.6	0.761	0.364	0.24	0.24
68.33	9.04		200	204.1		80.8	417.9	0.763	0.361	0.25	0.25
70.33	9.13		200	200.8		112.7	512.1	0.765	0.359	0.15	0.15
72.68	8.96		200	195.4		155.3	409.3	0.768	0.355	0.15	0.15
75.34	8.94		200	185.9		97.8	407.8	0.766	0.352	0.15	0.15
77.33	8.9	141.3	0	205.1	141.3	61.7	419.9	0.808	0.306	0.00	0.00
79.34	8.97		200	198.7		89.3	411	0.784	0.346	0.33	0.33
82.34	8.97		200	189.7		108.5	411.1	0.787	0.338	0.20	0.20
84.34	8.7		200	186.7		89.3	408.7	0.791	0.334	0.61	0.61

Table C-4. Continued.

Train 1 – Fermentor 4											
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
86.36	9.2		200	196.9		78.7	411	0.796	0.331	0.15	0.15
89.34	9.29		200	196.1		89.3	417.9	0.794	0.327	0.15	0.15
91.33	9.27	143.3	0	198.6	143.3	95.7	416.5	0.805	0.345	0.52	0.56
93.34	8.98		200	195.8		89.3	413.7	0.796	0.335	0.33	0.33
96.35	9.25		200	189.4		85.1	416.6	0.798	0.340	0.40	0.44
98.34	9.09		200	201.3		97.8	425.5	0.798	0.340	0.17	0.17
100.32	9		200	201.9		125.5	422.8	0.799	0.342	0.17	0.17
103.33	9.06		200	205.1		87.2	419.8	0.797	0.344	0.14	0.14
105.32	9.12	144.4	0	194.0	144.4	93.6	413.1	0.820	0.331	0.00	0.00
107.32	9.06		200	185.4		78.7	379.2	0.805	0.340	0.31	0.31
110.41	9.1		200	192.5		93.6	392	0.807	0.340	0.26	0.26
112.37	9.12		200	200.3		112.7	400	0.808	0.340	0.14	0.14
114.45	9.21		200	200.4		110.6	398.1	0.810	0.340	0.19	0.19
117.34	9.01		200	205.8		85.1	397	0.808	0.339	0.17	0.17
119.34	9.09	118.5	0	198.3	118.5	117.0	391.1	0.753	0.354	0.10	0.10
121.39	8.96		200	197.3		102.1	380.2	0.786	0.343	0.29	0.29
124.34	9.08		200	194.9		51.0	376.7	0.782	0.345	0.21	0.21
126.33	9.05		200	203.5		59.6	380.9	0.776	0.346	0.13	0.13
128.35	8.82		200	194.8		36.2	376.1	0.769	0.347	0.00	0.00
131.78	9.03	110.4	0	185.5	110.4	65.9	380.3	0.773	0.349	0.16	0.16
133.76	9.25		200	230.0		100.0	394.2	0.784	0.360	0.00	0.00
135.33	9.24		200	228.2		93.6	417.2	0.776	0.349	0.15	0.15
138.34	9.09		200	198.4		89.3	388.2	0.778	0.356	0.14	0.14
140.36	9.04	117	0	191.4	117.0	102.1	382.6	0.842	0.334	0.13	0.13

Table C-5. Transfer data for Train 2 Fermentor 4.

Train 2 – Fermentor 4											
Day	pH	Feedstock + nutrient added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
2.00											
4.00											
7.00						257.4	0				
9.67	5.51	40	400	201.3	314.2	712.5	515.5	0.990	0.400	6.73	8.54
11.68	6.13			244.6		255.2	518.6	0.987	0.473	3.06	3.73
14.69	5.55			262.5		421.1	551.7	0.973	0.437	7.34	9.13
16.63	5.58	40	400	325.9	253.4	251.0	579.3	0.972	0.502	8.70	11.02
18.60	5.88			209.4		316.9	515.9	0.984	0.480	3.26	4.01
21.00	5.54			342		289.3	661.8	0.975	0.314	8.55	10.69
23.32	5.72	40	400	289.6	280.9	223.3	570.5	0.972	0.501	8.99	11.28
25.74	6.81			192.2		529.6	517.7	0.982	0.485	3.80	5.09
28.66	6.26			223.4		553.0	509.2	0.975	0.474	13.87	18.33
30.78	5.88	40	400	297.1	277.1	348.8	574.2	0.976	0.477	15.06	19.74
32.58	5.77			199.1		195.7	511	0.984	0.463	6.45	8.30
35.64	5.76			176.7		378.6	497.6	0.978	0.419	9.92	12.72
37.60	5.99	40	400	238.2	319.5	191.4	557.7	0.982	0.483	13.90	18.38
39.52	5.88			170.3		282.9	510.9	0.986	0.393	5.39	6.78
42.43	5.94			199.8		310.5	506.5	0.982	0.416	10.91	14.00
44.55	6.03	40	400	211.5	319.2	229.7	530.7	0.984	0.318	12.65	16.47
46.43	6.1			188		238.2	506.5	0.988	0.438	5.92	7.49
49.49	6.01			215.5		355.2	535.6	0.987	0.401	10.75	14.15
51.48	6.22	40	400	186.3	289.9	287.1	476.2	0.988	0.285	10.92	14.21
53.18	6.19			209.1		331.8	507.8	0.989	0.359	5.45	6.92
56.41	5.8			184.3		414.8	492.6	0.985	0.409	10.68	13.63
58.43	5.83	40	400	298.6	294.5	255.2	593.1	0.986	0.312	12.67	16.17
60.41	5.74			199		361.6	510.7	0.987	0.327	5.94	7.57
63.43	5.95			240.9		402.0	542.1	0.986	0.411	11.27	14.51
65.47	5.93	40	400	220.5	314.2	219.1	534.7	0.985	0.390	12.40	16.05
67.45	5.83			193.1		676.4	516.2	0.987	0.320	5.77	7.33
70.54	5.8			226		395.6	540.7	0.983	0.417	13.13	17.13
72.42	5.92	40	400	211.8	311.7	204.2	523.5	0.983	0.447	15.13	19.87
74.40	6.12			219.9		453.1	510.6	0.987	0.366	6.47	8.37
77.39	5.9			281.1		408.4	599.7	0.983	0.355	15.22	19.94
79.32	5.74	40	400	225.6	304.4	310.5	530	0.982	0.335	11.53	15.09
81.58	5.6			200.8		516.9	507.7	0.985	0.354	6.06	7.76
84.33	5.67			263.9		361.6	559.9	0.991	0.346	12.62	16.41

Table C-5. Continued.

Train 2 – Fermentor 4											
Day	pH	Feedstock + nutrient added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
86.33	5.82	40	400	194.9	277.8	255.2	472.7	0.985	0.393	13.84	17.97
88.58	5.97			184.8		214.8	508.6	0.985	0.828	7.12	8.89
91.32	5.84			202.3		442.4	502	0.984	0.383	11.13	14.53
93.33	5.82	40	400	221.8	288.1	195.7	509.9	0.987	0.358	11.71	15.79
95.67	5.61			200.6		436.0	516.2	0.986	0.317	5.33	6.84
98.33	5.68			164.4		355.2	482	0.985	0.391	10.95	14.44
100.32	5.78	40	400	225.6	308.3	244.6	533.9	0.988	0.418	11.75	15.53
102.34	6.87			203.4		348.8	511.2	0.990	0.397	5.83	7.44
105.33	5.47			218.4		759.3	543.8	0.985	0.325	11.87	15.34
107.34	5.33	40	400	261.6	284.9	657.2	546.5	0.981	0.314	15.26	19.63
109.35	6			202.9		380.7	509.9	0.986	0.483	6.88	8.62
112.33	5.91			257.2		410.5	579.6	0.977	0.251	14.44	18.47
114.33	5.97	40	400	250.2	288.1	325.4	538.3	0.982	0.375	15.77	20.26
116.34	5.96			200.5		414.8	512	0.987	0.401	7.11	8.95
119.35	6.03			229.3		410.5	529.5	0.983	0.345	11.79	15.27
121.33	6.01	40	400	217.3	299.9	268.0	517.2	0.981	0.370	14.65	19.64
123.31	6.08			258.6		268.0	511.4	0.989	0.441	6.05	7.78
126.32	5.84			218.9		380.7	489.8	0.983	0.359	11.84	15.65
128.31	5.85	40	400	243.4	258.3	293.5	501.7	0.982	0.249	15.23	19.84
130.31	5.88			215.2		285.0	513.9	0.987	0.441	5.73	7.33
133.40	5.82			148.6		370.1	471.1	0.985	0.418	11.02	14.54
135.36	5.79	40	400	219.9	322	323.3	541.9	0.982	0.240	14.11	18.72
137.44	6.43			227.7		287.1	511.7	0.988	0.348	6.30	8.02
140.33	5.92			167.1		423.3	451.5	0.984	0.306	10.32	13.53
142.33	5.72	40	400	246.4	301.5	374.4	547.9	0.982	0.317	12.47	16.53
144.39	5.92			218.8		365.8	522.1	0.988	0.367	6.96	8.90
147.33	5.71			203.3		438.2	523.4	0.983	0.303	12.86	16.79
149.33	5.78	40	400	224.3	315	323.3	539.3	0.982	0.284	12.77	16.77
151.33	5.86			244.3		314.8	514.5	0.989	0.430	6.24	7.97
154.76	5.61			206.5		525.4	499.7	0.976	0.381	14.52	18.97
156.75	5.73	40	400	271.4	245.2	310.5	516.6	0.980	0.376	15.57	20.53
158.32	5.83			203.4		282.9	513.3	0.982	0.355	4.37	5.57
161.34	5.79			213		397.7	505.3	0.982	0.279	8.47	11.12
163.35	5.74	40	400	192.6	299.4	340.3	492	0.985	0.402	10.90	14.28

Table C-6. Transfer data for Train 2 Fermentor 3.

Train 2 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
0.00							
2.00							
4.00							
7.00						240.4	0
9.67	5.44	314.2	207	236	294.9	755.1	530.9
11.68	5.72		256	280.6		410.5	545.2
14.69	5.66		310	352.4		489.2	573.7
16.63	5.75	253.4	247	338.1	193.1	308.4	531.2
18.60	5.68		264	358.4		180.8	587.5
21.00	5.65		148	252.9		212.7	486.5
23.32	5.86	280.9	249	165.2	212.2	206.3	377.4
25.74	5.78		258	187		214.8	442.8
28.66	5.88		176	290.3		244.6	509.6
30.78	6.14	277.1	221	169.6	223.5	246.7	393.1
32.58	5.97		232	189.2		304.2	441.6
35.64	5.96		170	239.8		338.2	482.6
37.60	6.3	319.5	183	162.8	241	270.1	403.8
39.52	6.02		200	169.1		312.7	477.5
42.43	6.02		218	226.9		229.7	502.3
44.55	6.22	319.2	209	209.8	273.9	163.8	483.7
46.43	6.11		186	216.3		117.0	525.2
49.49	6.81		192	163		238.2	490.2
51.48	6.12	289.9	233	211	297.9	561.5	508.9
53.18	5.98		280	196.3		336.1	494.8
56.41	5.87		214	287.4		406.3	572.7
58.43	5.92	294.5	215	243.3	249.7	259.5	493
60.41	5.86		222	232.5		272.3	531.2
63.43	5.93		212	235.3		329.7	511.8
65.47	5.92	314.2	199	233.9	247	306.3	480.9
67.45	5.81		204	221.6		287.1	541.6
70.54	5.95		244	211.7		253.1	514.8
72.42	5.89	311.7	175	274.2	263.2	231.8	537.4
74.40	5.84		210	311.7		227.6	580.1
77.39	5.7		240	215.7		285.0	469.1
79.32	5.67	304.4	187	248.9	234.7	255.2	483.6
81.58	5.58		198	256.7		263.7	547.5
84.33	5.95		194	179.6		212.7	479.6

Table C-6. Continued.

Train 2 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
86.33	6.52	277.8	199	185.7	299.1	287.1	484.8
88.58	5.92		200	181.1		327.6	457.3
91.32	5.92		196	212		323.3	464.6
93.33	5.87	288.1	233	194.2	244	225.5	438.2
95.67	5.67		238	174.2		236.1	477.9
98.33	5.74		196	218.6		272.3	527.9
100.32	5.62	308.3	219	226.6	271.9	446.7	498.5
102.34	5.97		238	241		374.4	529
105.33	5.31		222	224.5		506.2	517
107.34	5.45	284.9	233	250.8	254.5	314.8	505.3
109.35	5.68		224	276.7		414.8	530.2
112.33	5.83		196	218		374.4	467.9
114.33	6.02	288.1	201	208.4	229.6	282.9	438
116.34	5.91		209	221.2		274.4	490.1
119.35	6.06		198	219.1		404.1	471.6
121.33	6.23	299.9	205	210.9	230	342.4	440.9
123.31	6.04		222	239.2		276.5	505.7
126.32	5.91		200	232.9		574.3	479.4
128.31	5.95	258.3	195	206.1	230.7	576.4	436.8
130.31	5.94		210	193.2		240.4	459.6
133.40	5.75		177	220.5		406.3	466.5
135.36	5.85	322	195	182.2	234.1	348.8	416.3
137.44	6.09		210	170.1		272.3	498.2
140.33	5.72		214	266.1		478.6	528.4
142.33	5.93	301.5	187	201.2	265.9	508.4	467.1
144.39	5.88		230	226.5		453.1	496.6
147.33	5.78		182	221.7		633.8	485.9
149.33	5.85	315	201	206.8	231.4	419.0	438.2
151.33	5.57		212	235.2		376.5	516.1
154.76	5.71		198	226.3		550.9	483
156.75	6.06	245.2	205	217.9	230.4	323.3	448.3
158.32	5.87		200	199.9		306.3	456.1
161.34	5.9		196	207.9		376.5	446
163.35	6.68	299.4		181.4	236.8	280.8	418.2

Table C-7. Transfer data for Train 2 Fermentor 2.

Train 2 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
0.00							
2.00							
4.00							
7.00						234.0	
9.67	5.51	294.9	247	207.7	298.6	548.8	506.3
11.68	5.72		272	254.6		404.1	496
14.69	5.7		260	307.7		376.5	504
16.63	6.05	193.1	189	248.3	203.7	268.0	452
18.60	5.78		178	260.8		195.7	436.7
21.00	5.98		222	147.2		346.7	349.7
23.32	6.8	212.2	197	250.2	170.4	185.0	420.6
25.74	6.17		176	255.6		127.6	456
28.66	7.09		227	175.7		223.3	372.4
30.78	7.71	223.5	179	223.3	198.6	89.3	421.9
32.58	6.9		173	230.9		197.8	442.1
35.64	6.56		189	165		368.0	379.8
37.60	7.34	241	201	185.2	213.7	163.8	398.9
39.52	6.52		257	196.4		193.6	421.4
42.43	6.9		213	212		185.0	419.4
44.55	7.85	273.9	193	206.6	208.9	223.3	415.5
46.43	8.33		213	184.5		217.0	397.7
49.49	6.37		209	191.4		461.6	459.1
51.48	6.44	297.9	203	229	234	329.7	463
53.18	6.02		207	277.7		329.7	520.9
56.41	6.15		197	211.4		359.5	445.3
58.43	6.88	249.7	203	212.8	214.5	185.0	427.3
60.41	6.05		185	216.7		327.6	456.6
63.43	6.13		209	206.7		665.8	417.9
65.47	6.32	247	195	196.4	216.7	429.7	413.1
67.45	5.94		193	197.5		282.9	438.5
70.54	6.15		209	237.5		361.6	425.4
72.42	6.33	263.2	205	170.3	218.2	221.2	388.5
74.40	5.86		217	202.9		244.6	428.1
77.39	6.79		205	233.3		297.8	433.9
79.32	7.02	234.7	201	182.2	213	159.5	395.2
81.58	5.84		199	191.1		261.6	411.7
84.33	7.49		201	187.8		191.4	410.7

Table C-7. Continued.

Train 2 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
86.33	7.97	299.1	197	196.3	218.6	140.4	414.9
88.58	6.87		185	191.1		257.4	490.7
91.32	6.78		205	188.9		355.2	474.6
93.33	6.13	244	205	228.2	252.4	412.6	480.6
95.67	5.76		207	230.7		217.0	466.7
98.33	6.08		197	193.4		372.2	426.6
100.32	6.16	271.9	213	214.1	212.2	306.3	426.3
102.34	5.98		209	231.3		391.4	479.4
105.33	5.8		201	215.3		408.4	448.4
107.34	6.78	254.5	199	230.4	214.7	270.1	445.1
109.35	5.94		183	217.6		229.7	459.5
112.33	6.77		207	189.9		389.2	417.9
114.33	7.37	229.6	199	198.1	229.9	117.0	428
116.34	6.36		207	205.4		217.0	423
119.35	7.54		201	191.3		189.3	416.2
121.33	8	230	209	200.5	216	153.1	416.5
123.31	6.49		209	215.6		325.4	424.7
126.32	7.39		205	193.1		242.5	407.5
128.31	7.88	230.7	193	191.6	218.1	87.2	409.7
130.31	6.12		191	203.7		419.0	415.8
133.40	6.96		196	171.9		321.2	391.8
135.36	7.64	234.1	209	191.5	216.2	202.1	407.7
137.44	6.5		207	202.5		244.6	419.1
140.33	7.38		205	207		189.3	416.1
142.33	8.09	265.9	203	184	220.1	148.9	404.1
144.39	6.07		201	223.3		470.1	444
147.33	7.15		197	176.9		253.1	409.7
149.33	7.84	231.4	203	196.5	224	148.9	420.5
151.33	6.15		201	206.4		365.8	422.7
154.76	7.48		201	193.5		180.8	407.9
156.75	8.58	230.4	205	200.6	208.1	129.7	408.7
158.32	7.18		191	192		155.3	427.9
161.34	8.03		209	187.9		172.3	418.5
163.35	8.51	236.8		190.6	235.1	146.8	425.7

Table C-8. Transfer data for Train 2 Fermentor 1.

Train 2 – Fermentor 4											
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
2.00											
4.00											
7.00			0			246.7	0				
9.67	5.46	298.6	0	247.0	198.8	529.6	519.9	0.819	0.364	7.97	10.22
11.68	5.89		200	268.9		376.5	539.1	0.819	0.364	0.00	0.00
14.69	6.42		200	257.4		365.8	468.6	0.819	0.364	0.00	0.00
16.63	7.27	203.7	0	190.6	144.3	278.6	409.1	0.780	0.377	2.63	3.45
18.60	6.57		200	176.3		210.6	389	0.803	0.366	0.00	0.00
21.00	7.76		200	219.8		110.6	411.7	0.800	0.366	0.00	0.00
23.32	8.12	170.4	0	199.5	119.2	134.0	392.9	0.735	0.366	0.95	1.22
25.74	7.23		200	173.4		153.1	365.2	0.764	0.374	0.00	0.00
28.66	8.23		200	227.5		172.3	392.1	0.756	0.375	2.73	3.48
30.78	7.49	198.6	0	181.6	108.2	65.9	363.4	0.730	0.392	0.82	0.88
32.58	8.74		200	174.2		170.2	375.4	0.752	0.378	3.11	3.93
35.64	8.15		200	188.7		210.6	401	0.746	0.379	1.99	2.16
37.60	7.49	213.7	0	204.3	134.4	182.9	411.5	0.792	0.314	2.19	2.43
39.52	8.47		200	259.2		174.4	474.4	0.759	0.366	2.87	3.29
42.43	8.78		200	213.4		87.2	414.1	0.765	0.361	1.85	2.01
44.55	8.85	208.9	0	192.4	132.6	129.7	399.5	0.790	0.308	0.94	0.98
46.43	8.44		200	203.2		46.8	393.9	0.776	0.339	7.34	9.75
49.49	7.34		200	207.0		168.0	422.3	0.776	0.332	6.31	8.11
51.48	8.61	234	0	202.0	132.3	106.4	407.9	0.765	0.373	2.89	3.60
53.18	8.01		200	207.4		151.0	430.4	0.780	0.328	4.81	6.00
56.41	8.29		200	198.2		74.4	421	0.778	0.332	2.84	3.39
58.43	8.57	214.5	0	201.1	145.2	78.7	420.5	0.798	0.324	1.26	1.41
60.41	8.24		200	184.2		119.1	411.4	0.779	0.338	3.65	4.43
63.43	8.62		200	207.2		121.2	426.1	0.780	0.339	1.99	2.35
65.47	8.74	216.7	0	193.0	148.9	97.8	416.6	0.784	0.360	1.17	1.31
67.45	6.91		200	189.0		344.6	403.1	0.784	0.339	4.90	7.07
70.54	7.04		200	205.6		189.3	412.2	0.785	0.340	2.64	3.31
72.42	8.7	218.2	0	200.7	129.8	106.4	405	0.777	0.404	1.39	3.69
74.40	8.29		200	213.7		93.6	414.6	0.783	0.364	4.81	3.55
77.39	8.74		200	199.5		125.5	399.9	0.783	0.364	1.88	3.79
79.32	8.72	213	0	197.9	127.6	76.6	399.2	0.763	0.357	4.79	4.28
81.58	5.77		200	195.5		138.3	404.6	0.777	0.358	2.93	3.72
84.33	8.81		200	197.6		114.9	407.4	0.776	0.355	1.60	3.81

Table C-8. Continued.

Train 2 – Fermentor 4											
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
86.33	8.74	218.6	0	193.5	140.0	53.2	408	0.792	0.329	1.15	3.83
88.58	8.7		200	180.7		123.4	407	0.777	0.349	3.13	3.89
91.32	8.76		200	200.9		119.1	425	0.776	0.348	1.93	3.91
93.33	8.87	252.4	0	200.5	147.8	112.7	422.4	0.795	0.302	0.79	3.83
95.67	7.36		200	202.1		257.4	446.9	0.781	0.341	4.36	3.85
98.33	7.43		200	198.5		199.9	436.3	0.783	0.335	2.77	3.86
100.32	7.53	212.2	0	208.3	153.9	178.7	436.5	0.805	0.319	1.67	3.87
102.34	7.09		200	205.7		242.5	415.6	0.787	0.328	3.79	3.86
105.33	7.93		200	196.9		253.1	408.6	0.789	0.330	2.17	3.85
107.34	8.53	214.7	0	197.0	138.5	146.8	410.3	0.786	0.321	1.23	3.86
109.35	8.72		200	181.3		110.6	408.3	0.789	0.332	3.24	3.86
112.33	8.51		200	204.2		170.2	424.6	0.790	0.333	2.12	3.86
114.33	8.89	229.9	0	196.7	148.7	119.1	419.9	0.786	0.440	1.25	3.86
116.34	8.43		200	203.4		134.0	422.1	0.787	0.349	3.62	3.86
119.35	8.72		200	196.9		136.1	417.2	0.789	0.346	1.84	3.86
121.33	8.79	216	0	204.5	140.3	136.1	418.5	0.792	0.321	1.07	3.86
123.31	8.82		200	203.5		140.4	416.1	0.791	0.350	2.79	3.86
126.32	8.85		200	200.3		95.7	410.5	0.789	0.351	1.23	3.86
128.31	8.79	218.1	0	190.1	144.7	80.8	408.9	0.789	0.330	0.66	3.86
130.31	8.63		200	186.8		108.5	403.1	0.789	0.339	2.13	3.86
133.40	8.76		200	192.3		148.9	414.7	0.788	0.339	1.18	3.86
135.36	8.84	216.2	0	204.3	143.2	129.7	421.8	0.787	0.356	2.59	3.86
137.44	8.94		200	203.9		129.7	415.9	0.788	0.343	1.36	3.86
140.33	8.8		200	199.9		110.6	411.5	0.788	0.344	1.30	3.86
142.33	8.87	220.1	0	198.9	138.1	144.6	410.4	0.779	0.359	0.70	3.86
144.39	8.62		200	198.2		119.1	414.5	0.786	0.350	2.20	3.86
147.33	8.78		200	192.5		72.3	408.7	0.785	0.355	1.23	3.86
149.33	8.69	224	0	198.1	141.9	80.8	414.6	0.798	0.329	0.70	3.86
151.33	8.36		200	197.9		129.7	418.6	0.786	0.351	2.44	3.86
154.76	8.76		200	198.5		70.2	418.4	0.786	0.351	1.76	3.86
156.75	8.98	208.1	0	200.2	142.6	125.5	417.4	0.809	0.318	0.57	3.86
158.32	9.04		200	187.3		119.1	404.3	0.793	0.341	1.91	3.86
161.34	8.97		200	204.4		100.0	416.4	0.795	0.337	0.92	3.86
163.35	9.03	235.1	0	190.8	130.6	102.1	404.8	0.827	0.317	0.41	3.86

Table C-9. Transfer data for Train 3 Fermentor 4.

Train 3 – Fermentor 4											
Day	pH	Feedstock + nutrient added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
2.00											
4.00											
7.00						155.3	0				
9.67	5.62	40	400	210.2	316.8	1391.1	527	0.978	0.464	5.86	7.88
11.68	6.12			250.1		421.1	517.6	0.987	0.438	2.25	2.86
14.69	5.57			172.6		589.2	482.6	0.976	0.475	5.71	7.43
16.63	5.53	40	400	232.5	303.9	291.4	536.4	0.973	0.490	7.44	9.87
18.60	5.84			253.9		251.0	524.6	0.985	0.462	3.19	3.98
21.00	5.48			223.4		270.1	534.4	0.975	0.309	7.88	10.23
23.32	5.33	40	400	310.2	307.7	178.7	617.9	0.972	0.298	9.26	12.15
25.74	6.08			228.4		123.4	513.9	0.986	0.464	2.67	3.30
28.66	5.6			220.5		553.0	493.6	0.962	0.487	14.99	19.20
30.78	5.52	40	400	334.3	247.7	172.3	582	0.956	0.488	13.45	17.21
32.58	5.72			237.1		234.0	514.9	0.980	0.486	4.98	6.16
35.64	5.69			238.5		444.5	538.4	0.980	0.562	11.88	15.66
37.60	5.83	40	400	175.8	331.2	431.8	507	0.968	0.526	10.05	13.08
39.52	6.33			267.1		263.7	551.1	0.980	0.037	7.69	9.71
42.43	6.2			133.9		280.8	438.1	0.978	0.415	11.58	15.03
44.55	6.18	40	400	225.3	310.2	238.2	535.5	0.980	0.400	14.69	20.10
46.43	6.06			239.1		219.1	510.6	0.986	0.375	5.69	7.37
49.49	6.48			177.3		246.7	472.9	0.984	0.428	11.86	16.47
51.48	6.11	40	400	160.1	311.5	234.0	471.6	0.984	0.251	13.21	18.83
53.18	6.3			242.4		276.5	607.6	0.987	0.377	5.19	6.90
56.41	5.97			156.6		325.4	459.2	0.985	0.339	11.53	16.04
58.43	5.9	40	400	214.4	300.5	314.8	514.9	0.986	0.298	11.43	16.49
60.41	5.9			211.9		442.4	511.7	0.986	0.354	11.31	16.76
63.43	5.95			180.2		368.0	463.2	0.988	0.264	11.66	15.85
65.47	5.97	40	400	217.2	299.7	217.0	516.9	0.988	0.298	10.70	15.29
67.45	6.15			237		282.9	512.1	0.988	0.374	5.34	7.04
70.54	6.17			205.1		280.8	500.1	0.986	0.309	10.36	14.44
72.42	6.11	40	400	187.1	296.9	187.2	484	0.986	0.371	9.64	13.64
74.40	6.04			246.8		265.9	512.5	0.987	0.371	5.84	7.61
77.39	5.91			193.9		240.4	480.9	0.985	0.392	11.63	16.05
79.32	5.78	40	400	214.8	290.5	214.8	505.3	0.986	0.419	11.53	16.19
81.58	6.04			243.2		342.4	508.3	0.987	0.393	11.08	15.32
84.33	6.09			176.9		251.0	454.6	0.987	0.389	14.16	19.63

Table C-9. Continued.

Train 3 – Fermentor 4											
Day	pH	Feedstock + nutrient added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
86.33	6.05	40	400	198	287.7	210.6	485.7	0.983	0.346	6.24	8.55
88.58	6.31			241.9		316.9	508.7	0.987	0.771	11.54	15.67
91.32	6.08			200.7		285.0	470.6	0.984	0.270	10.41	14.06
93.33	5.86	40	400	194.2	285.2	219.1	479.4	0.987	0.343	12.73	17.34
95.67	5.75			249.7		389.2	509.8	0.988	0.337	6.42	8.30
98.33	5.61			168.7		327.6	453.2	0.984	0.384	11.69	15.60
100.32	5.76	40	400	182.8	291.7	202.1	474.5	0.985	0.393	13.03	17.57
102.34	6.13			188.9		227.6	467.8	0.986	0.242	12.66	17.17
105.33	5.7			207.1		642.4	516.3	0.987	0.362	7.66	9.83
107.34	5.51	40	400	172.3	303	444.5	475.3	0.982	0.287	12.78	17.00
109.35	6.27			253		316.9	512.5	0.988	0.488	5.86	7.46
112.33	6.11			182.4		423.3	463.9	0.978	0.246	13.09	17.41
114.33	6.16	40	400	226.3	276	263.7	502.3	0.983	0.301	12.33	16.54
116.34	6.33			251.9		223.3	513.8	0.995	0.337	5.80	7.46
119.35	6.23			169.2		297.8	462.9	0.982	0.296	12.99	17.33
121.33	6.15	40	400	215.3	288.8	263.7	504.1	0.980	0.384	14.56	19.63
123.31	6.23			236.1		248.9	512.7	0.987	0.454	6.07	7.77
126.32	6.01			164		274.4	451.6	0.983	0.323	12.33	16.46
128.31	6.07	40	400	218.8	292.3	168.0	511.1	0.983	0.421	10.59	14.31
130.31	6.22			252.5		338.2	513.1	0.988	0.419	5.08	6.62
133.40	6.02			152.7		323.3	449.8	0.985	0.438	9.91	13.42
135.36	5.88	40	400	199.4	302.3	212.7	501.7	0.985	0.309	6.07	7.93
137.44	6.42			224.9		257.4	509.5	0.988	0.355	11.03	15.21
140.33	6.02			183.8		214.8	466	0.986	0.281	12.37	18.18
142.33	5.93	40	400	164.9	297.6	450.9	462.5	0.985	0.425	13.05	18.53
144.39	5.89			247.2		276.5	515.8	0.988	0.292	5.94	7.99
147.33	5.66			226.1		248.9	521.8	0.983	0.362	13.99	20.22
149.33	5.69	40	400	206.8	280.3	51.0	487.1	0.985	0.343	9.90	13.59
151.33	5.71			250.4		293.5	513.2	0.988	0.375	5.98	7.93
154.76	5.82			130.8		287.1	417.2	0.981	0.428	11.84	16.22
156.75	5.84	40	400	195.1	285	212.7	480.1	0.982	0.280	9.67	13.35
158.32	5.92			250.9		206.3	514.4	0.988	0.327	2.43	3.21
163.35	6.14			166.3		180.8	452.8	0.983	0.311	10.66	14.80

Table C-10. Transfer data for Train 3 Fermentor 3.

Train 3 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
0.00							
2.00							
4.00							
7.00						151.0	0
9.67	5.68	316.8	223	219.7	302.3	1220.9	522
11.68	5.74		247	250.7		561.5	531
14.69	5.47		254	228		546.6	499
16.63	5.54	303.9	279	270.6	249.5	261.6	520.1
18.60	5.83		284	267		151.0	568.9
21.00	5.45		220	310.2		231.8	583.5
23.32	5.6	307.7	241	234.7	256.3	193.6	491
25.74	5.57		240	211.9		138.3	534
28.66	5.96		270	309.6		319.1	555.8
30.78	5.64	247.7	219	275.5	241.3	355.2	516.8
32.58	5.68		214	262.8		165.9	517.3
35.64	5.7		182	210.2		204.2	465.6
37.60	5.76	331.2	203	175.1	256.6	206.3	431.7
39.52	6		220	157		185.0	495.6
42.43	6.32		216	238.1		229.7	555.6
44.55	6.43	310.2	207	220.1	308.3	208.4	528.4
46.43	6.26		190	209.2		180.8	530.7
49.49	6.1		196	183.5		138.3	507.7
51.48	6.14	311.5	197	185.2	322.7	321.2	507.9
53.18	6.03		216	195.1		257.4	491.6
56.41	5.98		220	215.4		361.6	506.3
58.43	6.02	300.5	205	216.5	287.9	199.9	504.4
60.41	5.89		202	240.2		240.4	511
63.43	6.01		242	236.3		314.8	537.2
65.47	6.04	299.7	209	238.2	298.8	376.5	537
67.45	5.91		200	227		195.7	532.2
70.54	6.04		216	190.9		293.5	496.4
72.42	6.15	296.9	229	220.5	292.5	197.8	513
74.40	5.94		234	218.8		440.3	512.5
77.39	5.92		212	219.7		231.8	516.5
79.32	5.81	290.5	217	203.1	298.4	221.2	501.5
81.58	5.74		220	191.7		238.2	488.4
84.33	5.92		218	210.2		193.6	506.1

Table C-10. Continued.

Train 3 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
86.33	6.08	287.7	227	216.3	288.2	106.4	504.5
88.58	6.04		218	205.8		180.8	499.1
91.32	5.94		216	211.7		195.7	502.9
93.33	5.79	285.2	217	214.1	283	182.9	497.1
95.67	5.65		208	200.3		242.5	494.6
98.33	5.85		192	192.2		255.2	486.5
100.32	5.81	291.7	199	195	287.5	125.5	482.5
102.34	6.46		182	240.6		110.6	532.7
105.33	5.58		216	168.4		253.1	467
107.34	5.62	303	221	210.7	295.6	242.5	506.3
109.35	5.78		224	206.2		429.7	508.7
112.33	5.91		208	222.3		329.7	518.7
114.33	5.96	276	223	211.2	284.2	285.0	495.4
116.34	5.93		228	203.4		238.2	482.1
119.35	6.06		204	212.3		263.7	497.6
121.33	6.13	288.8	215	193.5	286.6	197.8	480.1
123.31	6.02		224	176.9		204.2	476.2
126.32	5.95		218	226		144.6	512.3
128.31	6.05	292.3	215	196.4	296.7	172.3	493.1
130.31	6.01		232	192.8		225.5	484.1
133.40	6		210	205.1		261.6	513.5
135.36	6.03	302.3	175	207.7	302.3	217.0	510
137.44	6.11		165	180		204.2	501.3
140.33	5.95		216	182.5		206.3	481.6
142.33	5.83	297.6	219	205.6	299.2	423.3	504.8
144.39	5.73		230	191.4		391.4	496.6
147.33	5.68		214	173.1		342.4	453.6
149.33	5.66	280.3	213	175.3	291.1	219.1	466.4
151.33	5.6		212	156.4		268.0	443.2
154.76	5.77		214	196		248.9	490.6
156.75	5.9	285	219	214.2	287.6	225.5	501.8
158.32	5.85		220	190.3		197.8	494.1
163.35	5.76		216	216.1		268.0	514.5

Table C-11. Transfer data for Train 3 Fermentor 2.

Train 3 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
0.00							
2.00							
4.00							
7.00						129.7	
9.67	5.55	302.3	197	223.5	306	1610.1	529.5
11.68	5.66		216	239.5		793.4	510.5
14.69	5.48		264	251.3		584.9	481.7
16.63	5.62	249.5	209	280.6	208.6	319.1	489.2
18.60	5.62		186	283.4		140.4	524
21.00	5.62		222	220.3		172.3	423.7
23.32	5.93	256.3	209	243.3	180.9	153.1	424.2
25.74	5.74		193	237.5		123.4	491.3
28.66	5.79		237	270.6		276.5	442.3
30.78	6.61	241.3	191	221.4	184.4	134.0	405.8
32.58	5.92		181	213.9		153.1	457.1
35.64	6.76		209	178.3		210.6	419.3
37.60	7.42	256.6	197	205.9	237.2	-146.8	443.1
39.52	6.68		199	220.3		138.3	457.9
42.43	7.37		207	210.6		110.6	434.4
44.55	8.3	308.3	209	203.2	219	80.8	422.2
46.43	7.03		193	188		170.2	506.5
49.49	6.81		199	191.3		325.4	506.8
51.48	7.01	322.7	201	194.2	308.5	168.0	502.7
53.18	6.31		225	212.8		217.0	512
56.41	6.37		183	215		223.3	518.6
58.43	6.55	287.9	225	199.8	277.1	248.9	476.9
60.41	6.07		231	195.2		180.8	482.3
63.43	6.34		205	237.5		470.1	510.9
65.47	6.82	298.8	207	204.3	266.1	274.4	470.4
67.45	6.14		209	193.3		195.7	498.2
70.54	6.38		209	210.4		455.2	503.2
72.42	6.57	292.5	209	224.4	265.9	295.7	490.3
74.40	6.08		213	225.9		217.0	511.4
77.39	6.12		217	206.4		433.9	488.3
79.32	6.2	298.4	209	213.2	275	217.0	488.2
81.58	5.79		211	212		189.3	506.7
84.33	6.34		223	211.4		363.7	496.7

Table C-11. Continued.

Train 3 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
86.33	6.48	288.2	205	223.6	273	325.4	496.6
88.58	6.17		205	211.3		199.9	507.3
91.32	6.19		211	208.7		236.1	491.3
93.33	6.23	283	217	210.8	272.7	212.7	483.5
95.67	5.78		205	200.1		225.5	488.5
98.33	6.18		195	190.2		270.1	478.2
100.32	5.84	287.5	219	195.4	280.7	180.8	476.1
102.34	6.17		209	176.4		176.5	477.2
105.33	5.64		207	209.8		217.0	501.2
107.34	5.78	295.6	215	217	271.3	319.1	488.3
109.35	5.94		205	217.6		189.3	507.2
112.33	6.07		223	201.4		217.0	485.3
114.33	6.07	284.2	207	218.9	279.4	287.1	498.3
116.34	5.89		207	221		189.3	498.1
119.35	6.41		211	196.4		291.4	473.9
121.33	6.57	286.6	205	210.5	269.1	157.4	479.6
123.31	6.09		207	215.6		178.7	491.3
126.32	6.28		221	209.9		195.7	472.5
128.31	6.91	296.7	199	210.9	263.1	246.7	474
130.31	6.17		203	224.9		225.5	501.9
133.40	6.58		206	204.3		287.1	468.9
135.36	6.9	302.3	197	172	286.2	336.1	458.2
137.44	6.41		197	161.2		234.0	469.3
140.33	5.96		221	208.8		555.1	497.8
142.33	5.91	299.2	209	215.7	284.2	782.7	499.9
144.39	5.81		199	224.4		251.0	510.2
147.33	6		215	208.5		212.7	489.8
149.33	6.06	291.1	215	209.9	276	510.5	485.9
151.33	5.69		215	207.5		225.5	495.5
154.76	6.09		214	209.2		412.6	491
156.75	6.24	287.6	211	218.4	266.3	353.1	484.7
158.32	6.02		211	212.8		170.2	501.3
163.35	5.99		223	209.7		399.9	491.7

Table C-12. Transfer data for Train 3 Fermentor 1.

Train 3 – Fermentor 4											
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
2.00											
4.00											
7.00			0			153.1	0				
9.67	5.51	306	0	199.5	260.1	1516.6	534.8	0.848	0.359	6.32	8.73
11.68	5.68		200	214.3		723.2	499.5	0.848	0.359	0.00	0.00
14.69	5.71		200	261.0		684.9	482.3	0.848	0.359	0.00	0.00
16.63	6.4	208.6	0	209.6	133.4	242.5	417.6	0.810	0.425	4.15	5.77
18.60	6.84		200	185.4		223.3	413	0.832	0.388	0.00	0.00
21.00	6.28		200	221.9		148.9	426.4	0.829	0.394	0.00	0.00
23.32	7.34	180.9	0	211.0	118.7	85.1	404.3	0.780	0.409	2.16	2.90
25.74	7.12		200	189.5		65.9	387	0.814	0.370	0.00	0.00
28.66	7.54		200	237.5		178.7	396	0.812	0.365	4.67	6.20
30.78	7.33	184.4	0	192.0	91.5	44.7	357.9	0.757	0.410	1.09	1.34
32.58	7.24		200	181.2		121.2	372.2	0.803	0.374	3.75	5.16
35.64	8.17		200	207.5		83.0	389.7	0.797	0.368	2.27	3.28
37.60	8.36	237.2	0	196.2	101.7	38.3	381.3	0.800	0.263	0.89	1.18
39.52	8.73		200	201.3		46.8	428.4	0.791	0.336	2.61	3.54
42.43	8.93		200	205.5		34.0	430.3	0.798	0.321	1.33	1.72
44.55	8.56	219	0	205.8	143.2	48.9	423.2	0.808	0.283	0.48	0.52
46.43	8.42		200	194.1		59.6	421.2	0.800	0.299	2.13	2.88
49.49	8.83		200	198.3		253.1	425.3	0.800	0.306	1.01	1.28
51.48	8.88	308.5	0	199.8	148.2	8.5	422.1	0.798	0.363	0.29	0.29
53.18	8.3		200	225.1		72.3	502	0.802	0.308	3.05	4.73
56.41	8.27		200	180.2		70.2	475.2	0.801	0.313	1.75	2.50
58.43	8.62	277.1	0	221.6	203.9	53.2	499.2	0.833	0.343	1.09	1.44
60.41	8.09		200	229.3		102.1	494.2	0.807	0.327	2.11	3.30
63.43	8.54		200	202.4		83.0	463	0.808	0.331	2.31	3.40
65.47	8.67	266.1	0	204.0	179.9	40.4	458.3	0.818	0.375	1.12	1.55
67.45	7.74		200	204.0		227.6	464.9	0.813	0.338	4.71	7.49
70.54	8.24		200	203.9		61.7	459.2	0.816	0.343	2.77	3.99
72.42	8.74	265.9	0	205.0	173.4	44.7	453.5	0.816	0.391	1.40	1.92
74.40	6.81		200	207.9		89.3	466.1	0.814	0.355	5.26	8.40
77.39	7.6		200	211.8		182.9	456.5	0.816	0.363	3.41	5.45
79.32	8.19	275	0	205.7	163.5	97.8	442.5	0.810	0.381	2.10	3.12
81.58	7.39		200	207.8		119.1	475	0.815	0.368	5.17	7.98
84.33	8.51		200	218.2		87.2	465.4	0.815	0.372	11.42	15.24

Table C-12. Continued.

Train 3 – Fermentor 4											
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
86.33	8.87	273	0	199.7	172.1	178.7	446	0.803	0.318	1.60	2.23
88.58	6.78		200	200.2		344.6	467.7	0.812	0.361	5.74	8.38
91.32	7.41		200	206.5		165.9	465.6	0.810	0.360	3.99	6.14
93.33	8.33	272.7	0	212.9	170.4	146.8	457.8	0.825	0.360	2.26	3.26
95.67	6.79		200	201.3		310.5	481.6	0.811	0.355	5.16	7.26
98.33	6.53		200	193.6		348.8	472.9	0.810	0.353	4.38	6.20
100.32	6.68	280.7	0	213.5	190.4	129.7	477.6	0.836	0.344	3.44	4.64
102.34	6.25		200	205.0		385.0	487.5	0.817	0.355	6.24	8.45
105.33	7.16		200	203.4		125.5	481.3	0.821	0.367	3.93	5.39
107.34	8.21	271.3	0	210.5	191.1	100.0	476	0.822	0.370	2.26	3.03
109.35	7.15		200	201.1		389.2	476.8	0.824	0.373	5.79	8.08
112.33	6.3		200	219.4		485.0	473.6	0.828	0.368	5.22	7.01
114.33	7.27	279.4	0	203.7	176.4	110.6	453	0.833	0.349	13.33	18.23
116.34	6.5		200	203.0		257.4	478.5	0.828	0.358	6.77	9.18
119.35	7.09		200	207.4		214.8	474.1	0.831	0.357	4.74	6.53
121.33	7.14	269.1	0	200.9	181.2	197.8	465.2	0.839	0.338	3.36	4.55
123.31	7.7		200	201.4		151.0	463.7	0.834	0.354	5.93	8.22
126.32	8.41		200	216.6		74.4	461	0.838	0.336	3.11	4.20
128.31	8.8	263.1	0	195.3	172.3	12.8	441.8	0.822	0.360	1.46	1.93
130.31	8.39		200	198.5		125.5	453.4	0.837	0.331	4.80	7.26
133.40	8.77		200	201.6		85.1	452.3	0.835	0.333	2.41	3.41
135.36	8.85	286.2	0	192.8	182.6	87.2	449.9	0.829	0.373	5.71	8.28
137.44	6.89		200	194.1		329.7	473.4	0.829	0.352	3.67	5.25
140.33	6.57		200	217.8		425.4	479.7	0.826	0.357	3.44	4.91
142.33	8.37	284.2	0	206.5	179.4	123.4	460	0.834	0.379	2.88	4.43
144.39	6.52		200	215.7		308.4	485.6	0.828	0.361	6.56	9.47
147.33	6.45		200	210.0		268.0	461.8	0.826	0.368	4.51	6.22
149.33	7.94	276	0	210.2	167.4	-861.2	450.6	0.825	0.404	2.47	3.37
151.33	6.76		200	209.8		236.1	480.8	0.826	0.375	5.91	8.49
154.76	8.22		200	209.0		87.2	470.4	0.827	0.381	3.49	4.78
156.75	8.77	266.3	0	207.2	178.2	89.3	460.1	0.816	0.359	1.95	2.62
158.32	6.8		200	207.9		351.0	469.1	0.825	0.381	5.81	8.06
163.35	6.24		200	218.5		412.6	458	0.824	0.381	4.25	5.88

Table C-13. Transfer data for Train 4 Fermentor 4.

Train 4 – Fermentor 4											
Day	pH	Feedstock + nutrient added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
2.00											
5.00											
7.47	6.09			151.3	403.5	855.1	554.8	0.978	0.470	6.19	7.89
9.44	5.82			155.4		570.0	563.2	0.979	0.405	3.71	4.56
12.47	6.16			128.6		412.6	522.7	0.980	0.400	11.49	14.55
14.50	6.11	80	400	140.1	394.8	219.1	534.9	0.979	0.439	11.92	15.61
16.49	5.87			158.2		450.9	562.9	0.980	0.472	7.42	9.47
19.56	6.27			77.3		402.0	487.6	0.979	0.408	11.78	15.40
21.46	6.09	80	400	186.2	410.7	221.2	596.9	0.977	0.489	15.07	19.98
23.44	5.89			161		563.7	554	0.978	0.426	7.99	10.14
26.43	5.73			246.1		348.8	680.7	0.975	0.367	15.43	20.36
28.36	5.63	80	400	298	405.2	202.1	703.2	0.972	0.325	9.98	13.17
30.62	5.83			161.2		604.1	564.7	0.978	0.433	8.78	11.54
33.37	5.73			198.2		331.8	613.8	0.985	0.611	14.15	18.74
35.37	5.9	80	400	219.7	402.1	208.4	621.8	0.970	0.447	18.78	24.72
37.61	5.74			150.1		457.3	546.8	0.978	0.824	8.32	10.88
40.35	6.21			132.9		404.1	543.2	0.975	0.351	13.61	17.98
42.36	5.84	80	400	207.6	409.2	323.3	616.8	0.974	0.341	17.43	22.91
44.70	5.78			152.5		187.2	560.5	0.979	0.400	8.46	10.91
47.36	5.95			187.8		370.1	596.7	0.977	0.375	14.44	18.85
49.36	5.92	80	400	186.3	419.2	263.7	605.5	0.976	0.417	16.79	22.01
51.37	6.25			155.1		389.2	560.8	0.982	0.374	8.57	10.89
54.37	5.66			176.1		408.4	583.8	0.979	0.427	13.96	18.03
56.37	5.56	80	400	271.9	393	404.1	664.9	0.972	0.324	17.88	23.04
58.38	6.01			162.7		370.1	556.2	0.979	0.477	8.23	10.22
61.36	5.84			251.7		455.2	652.3	0.962	0.347	15.90	20.07
63.36	5.91	80	400	259.5	397.5	306.3	657	0.966	0.451	18.47	23.27
65.37	5.89			154.4		429.7	562.3	0.978	0.461	8.42	10.68
68.37	6.06			208.4		406.3	621.9	0.970	0.438	14.77	18.98
70.36	6.58	80	400	200.8	406.2	355.2	607	0.968	0.427	20.57	26.78
72.34	6.1			166.5		287.1	556.7	0.980	0.456	8.90	11.41
75.36	6.21			162.4		410.5	577.8	0.975	0.356	9.47	13.13
77.35	6.06	80	400	210.5	422.7	567.9	633.2	0.973	0.397	20.72	28.83
79.34	5.9			143.7		299.9	560.5	0.980	0.443	8.98	11.76
82.44	6.06			170.1		299.9	607.7	0.978	0.454	15.94	21.66
84.40	5.99	80	400	231.4	461.9	208.4	693.3	0.971	0.359	12.46	16.70

Table C-13. Continued.

Train 4 – Fermentor 4											
Day	pH	Feedstock + nutrient added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
86.47	5.95			137.5		353.1	550.6	0.980	0.425	8.77	11.28
89.37	6.01			177.2		253.1	611.1	0.978	0.352	21.88	29.85
91.35	5.77	80	400	277.7	417.5	234.0	695.2	0.971	0.416	19.91	26.83
93.42	5.63			142.6		380.7	570	0.979	0.381	9.06	11.50
96.36	5.56			254.4		331.8	681.1	0.972	0.325	17.00	22.36
98.36	5.78	80	400	154.3	425.7	178.7	580	0.969	0.408	20.44	27.12
100.37	5.5			129.7		372.2	557.5	0.979	0.405	9.06	11.43
103.81	5.85			173.2		404.1	652.1	0.967	0.493	16.63	21.74
105.79	5.88	80	400	249.6	406.2	231.8	655.8	0.972	0.388	17.25	22.74
107.35	5.84			144.7		240.4	562.7	0.983	0.372	8.55	10.83
110.37	5.95			181.4		251.0	596.3	0.976	0.314	15.38	20.03
112.40	5.85	80	400	159.7	440.2	221.2	599.9	0.975	0.389	10.87	14.24
114.36	5.82			135.3		382.9	560.1	0.981	0.396	7.94	9.94
117.37	5.89			252.3		325.4	671.1	0.978	0.360	16.34	21.38
119.37	5.89	80	400	261.9	402.1	274.4	664	0.976	0.370	17.63	22.91
121.38	5.84			138.2		351.0	559.4	0.981	0.391	6.68	8.32
124.37	5.85			232.3		353.1	651.3	0.979	0.445	14.85	19.06
126.37	5.86	80	400	246.7	402.8	246.7	649.5	0.977	0.425	17.65	22.70
128.39	5.82			151.7		304.2	557.9	0.981	0.412	5.15	6.34
131.34	5.97			189.3		357.3	600	0.980	0.361	10.60	13.56
133.42	5.91	80	400	240.5	404.6	214.8	645.1	0.980	0.407	15.77	20.19

Table C-14. Transfer data for Train 4 Fermentor 3.

Train 4 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
0.00							
2.00							
5.00							
7.47	6.05	403.5	138	139.8	426.2	759.3	566
9.44	5.88		136	123.4		378.6	541.3
12.47	6.07		118	141.9		234.0	547.7
14.50	6.07	394.8	211	111	406.2	221.2	517.2
16.49	5.93		180	83.5		168.0	500.3
19.56	5.86		298	188.6		225.5	589.6
21.46	5.86	410.7	259	294.6	393.4	208.4	688
23.44	5.82		258	290.7		223.3	700.4
26.43	5.69		248	271.2		234.0	657.9
28.36	5.53	405.2	211	238.6	389.4	168.0	628
30.62	5.57		212	216.7		170.2	639.3
33.37	5.84		170	212		219.1	626.4
35.37	6.07	402.1	211	177.8	398	285.0	575.8
37.61	5.88		206	153		199.9	575.3
40.35	5.88		220	208.7		253.1	621
42.36	5.72	409.2	187	215.3	407.6	193.6	622.9
44.70	5.58		188	195.5		214.8	620.4
47.36	5.65		196	198.2		219.1	600.1
49.36	5.77	419.2	209	184.2	409.2	217.0	593.4
51.37	6.02		238	187.9		331.8	598.4
54.37	5.38		274	258.9		512.6	635.9
56.37	5.37	393	245	279.4	366.6	344.6	646
58.38	5.72		246	260.1		304.2	668.8
61.36	5.72		228	258.4		365.8	649.2
63.36	5.76	397.5	211	234.6	379.5	251.0	614.1
65.37	5.98		206	217.1		467.9	627.1
68.37	6.62		182	195.4		542.4	609.2
70.36	6.56	406.2	219	200.3	387.8	344.6	588.1
72.34	6.5		220	190.4		510.5	594.1
75.36	6.07		188	222.3		302.0	615.4
77.35	6.09	422.7	233	179.3	392.7	155.3	572
79.34	6.04		268	194.6		191.4	598
82.44	5.88		192	256.8		310.5	660.4
84.40	5.8	461.9	217	176	414.4	227.6	590.4

Table C-14. Continued.

Train 4 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
86.47	5.78		265	198.1		93.6	623.8
89.37	5.73		272	264.4		323.3	686.2
91.35	5.71	417.5	219	291	395.6	223.3	686.6
93.42	5.67		240	280.3		208.4	702.7
96.36	5.61		208	238.8		263.7	651.3
98.36	5.78	425.7	207	224.6	388.3	227.6	612.9
100.37	5.67		210	230.6		282.9	646.3
103.81	5.78		158	179.1		295.7	614.1
105.79	5.93	406.2	191	200.1	386.9	442.4	587
107.35	5.91		168	190		187.2	601.6
110.37	5.85		286	186.7		282.9	571.3
112.40	5.86	440.2	197	237.7	426.3	140.4	664
114.36	5.85		236	247.8		240.4	671.5
117.37	5.81		226	247.9		355.2	651.3
119.37	5.77	402.1	223	242.7	377.6	431.8	620.3
121.38	5.87		232	232.5		217.0	638.7
124.37	5.81		200	233.4		342.4	630
126.37	5.82	402.8	223	198	391.5	297.8	589.5
128.39	5.91		238	195.6		208.4	596.3
131.34	5.81		238	241.8		308.4	629
133.42	5.82	404.6	204	243	369.3	285.0	612.3

Table C-15. Transfer data for Train 4 Fermentor 2.

Train 4 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
0.00							
2.00							
5.00							
7.47	6.1	426.2	145	135.1	416.9	640.2	552
9.44	6.04		147	133		304.2	559.7
12.47	6.09		197	112.4		225.5	566.8
14.50	5.87	406.2	267	210	423.9	678.5	633.9
16.49	5.78		267	175.8		316.9	610.8
19.56	5.77		232	290.4		274.4	694.5
21.46	5.8	393.4	221	256.1	368.2	242.5	624.3
23.44	5.75		223	250.8		170.2	634.2
26.43	5.7		211	243.2		197.8	599
28.36	5.59	389.4	207	209.5	349.9	195.7	559.4
30.62	5.59		187	205.2		151.0	593.2
33.37	6.37		209	164.1		121.2	551.3
35.37	6.58	398	199	207.4	380.8	134.0	588.2
37.61	5.89		197	200.5		176.5	597.1
40.35	6.07		195	212.8		208.4	589.2
42.36	6.93	407.6	209	183.4	377.9	161.7	561.3
44.70	5.83		201	181.9		476.4	585.8
47.36	6.45		219	193.5		238.2	587.9
49.36	5.73	409.2	199	204.3	384.2	723.2	588.5
51.37	5.96		231	231.1		272.3	608.6
54.37	5.18		237	269.5		438.2	599.9
56.37	5.25	366.6	209	242.1	317.4	319.1	559.5
58.38	5.56		215	241.4		227.6	602.6
61.36	5.65		197	222.5		274.4	567.3
63.36	5.75	379.5	207	208.7	325.4	214.8	534.1
65.37	5.83		179	201.7		240.4	583.2
68.37	6.9		199	176.6		459.4	552
70.36	6.94	387.8	197	215.9	367.6	165.9	583.5
72.34	6.8		191	213.3		259.5	598.5
75.36	6.5		201	182.3		419.0	567
77.35	5.93	392.7	197	228.8	345.8	8.5	574.6
79.34	5.94		225	261.9		323.3	616.2
82.44	5.8		192	190.8		406.3	568.4
84.40	5.64	414.4	217	214.8	343.9	425.4	558.7

Table C-15. Continued.

Train 4 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
86.47	5.7		247	262.5		261.6	622.6
89.37	5.6		207	266.8		263.7	592.2
91.35	5.87	395.6	217	216.6	304.6	327.6	521.2
93.42	5.47		217	236		178.7	605.9
96.36	6.38		209	202.1		159.5	571
98.36	6.48	388.3	201	204.5	362.7	261.6	567.2
100.37	5.84		209	202.8		206.3	587.7
103.81	6.42		145	152.8		257.4	582
105.79	6.27	386.9	273	187.8	379	151.0	566.8
107.35	6.06		269	161.2		187.2	569
110.37	5.94		225	280.8		316.9	667.6
112.40	5.85	426.3	187	194.6	408.1	346.7	602.7
114.36	5.84		227	229.2		242.5	615.9
117.37	6		213	219		236.1	604
119.37	6.07	377.6	197	218.6	371.1	219.1	589.7
121.38	5.76		203	225.3		627.5	591.5
124.37	5.71		213	194.5		523.2	560.6
126.37	5.89	391.5	217	218.4	351.8	891.2	570.2
128.39	5.82		227	231.3		404.1	605.3
131.34	5.82		211	232.9		485.0	593.9
133.42	5.92	369.3	216	197.8	358.3	387.1	556.1

Table C-16. Transfer data for Train 4 Fermentor 1.

Train 4 – Fermentor 4											
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
2.00											
5.00											
7.47	5.7	0	145.8	324.0	704.0	543.6	0.767	0.324	6.36	8.05	
9.44	6.8	200	145.2		306.3	558	0.767	0.324	6.54	8.34	
12.47	6.1	200	185.1		304.2	612	0.767	0.324	10.34	14.08	
14.50	5.73	0	266.7	288.6	1046.5	629.1	0.746	0.352	11.39	15.50	
16.49	5.65	200	265.7		455.2	685	0.762	0.331	15.49	21.04	
19.56	5.93	200	225.5		295.7	515.2	0.760	0.334	10.36	13.83	
21.46	6.15	0	217.8	297.1	187.2	588.7	0.755	0.321	6.67	8.84	
23.44	5.84	200	220.6		204.2	581.5	0.755	0.333	11.20	14.84	
26.43	6.24	200	208.6		280.8	559.1	0.757	0.326	8.17	10.95	
28.36	5.88	0	203.4	271.3	170.2	549	0.759	0.310	5.03	6.67	
30.62	5.92	200	184.3		231.8	547.4	0.755	0.318	10.46	14.15	
33.37	6.33	200	206.9		180.8	560.7	0.755	0.319	5.76	8.03	
35.37	8.8	0	195.9	283.6	80.8	553	0.750	0.329	3.92	5.35	
37.61	7.83	200	194.1		53.2	572.8	0.754	0.305	8.01	10.99	
40.35	7.78	200	189.9		91.5	564.9	0.754	0.306	6.19	8.12	
42.36	7.01	0	205.4	296.8	182.9	577	0.774	0.293	5.22	6.39	
44.70	7.35	200	196.4		193.6	578.6	0.757	0.301	8.84	11.33	
47.36	7.94	200	199.4		127.6	574.5	0.759	0.298	5.54	6.92	
49.36	8.41	0	194.1	294.9	72.3	573.3	0.759	0.343	3.51	4.29	
51.37	5.73	200	229.1		1231.5	571.1	0.762	0.306	12.00	14.90	
54.37	5.06	200	236.9		557.3	538.9	0.762	0.310	8.76	10.62	
56.37	5.32	0	205.3	219.1	272.3	498.8	0.730	0.298	5.22	6.24	
58.38	5.53	200	212.4		261.6	517.5	0.755	0.315	9.25	11.26	
61.36	5.86	200	194.9		261.6	502	0.751	0.315	5.83	7.05	
63.36	7.56	0	201.9	227.5	168.0	504.4	0.726	0.295	3.83	4.68	
65.37	6.98	200	177.0		351.0	522.2	0.743	0.306	11.87	15.45	
68.37	7.79	200	214.4		159.5	542.8	0.740	0.305	7.17	9.25	
70.36	8.56	0	192.3	261.1	93.6	527.8	0.743	0.342	4.30	5.48	
72.34	8.02	200	187.7		134.0	555.5	0.741	0.311	9.86	12.99	
75.36	6.64	200	196.8		93.6	565.9	0.739	0.316	5.23	6.75	
77.35	8.8	0	196.4	297.3	0.0	568.4	0.768	0.302	3.30	4.16	
79.34	5.83	200	221.3		1184.7	534.8	0.745	0.321	13.48	17.63	
82.44	5.77	200	189.2		521.1	509.9	0.748	0.324	10.19	13.38	
84.40	6.51	0	214.8	233.2	308.4	522.6	0.740	0.351	15.04	20.10	

Table C-16. Continued.

Train 4 – Fermentor 4											
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
86.47	5.95		200	239.4		278.6	555.3	0.749	0.323	10.17	14.19
89.37	6.73		200	202.6		161.7	515.2	0.751	0.328	9.78	13.64
91.35	7.2		0	213.0	223.8	168.0	511.1	0.704	0.379	5.79	7.93
93.42	6.65		200	212.2		342.4	512.8	0.740	0.343	13.15	17.87
96.36	7.15		200	204.7		202.1	494	0.733	0.351	8.06	10.84
98.36	7.76		0	197.4	215.7	136.1	487.4	0.689	0.375	4.56	6.08
100.37	7.17		200	204.7		197.8	555.8	0.719	0.359	10.60	14.24
103.81	7.04		200	142.3		242.5	547.5	0.709	0.367	7.21	9.52
105.79	6.42		0	270.4	258.8	421.1	603.5	0.726	0.335	6.71	8.68
107.35	6.84		200	265.3		312.7	635.5	0.710	0.361	11.82	15.65
110.37	5.78		200	220.6		908.2	578.4	0.710	0.359	10.49	13.52
112.40	5.76		0	183.8	288.0	399.9	555.3	0.772	0.349	7.73	9.83
114.36	5.79		200	222.4		304.2	587.4	0.733	0.351	12.71	16.43
117.37	5.91		200	208.7		259.5	563.3	0.734	0.356	7.59	9.76
119.37	6.38		0	192.9	280.9	136.1	547.8	0.746	0.335	5.08	6.51
121.38	5.88		200	199.8		291.4	560.3	0.742	0.348	10.83	14.00
124.37	6.51		200	210.3		567.9	558.7	0.736	0.347	9.64	12.23
126.37	5.94		0	214.1	256.2	1259.2	543.9	0.734	0.368	10.45	13.08
128.39	5.84		200	224.7		967.8	560.9	0.734	0.354	15.96	20.34
131.34	6.11		200	206.4		872.1	533.3	0.736	0.357	11.44	15.27
133.42	6.17		0	210.7	261.3	519.0	519.9	0.735	0.358	6.64	8.77

Table C-17. Transfer data for Train 5 Fermentor 4.

Train 5 – Fermentor 4											
Day	pH	Feedstock + nutrient added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
2.00											
5.00											
7.48	6			98	496.3	861.4	594.3				
9.45	5.78			72.7		614.7	605.1	0.970	0.388	8.07	10.08
12.47	6.51			61.8		665.8	595.8	0.973	0.469	15.06	19.55
14.51	6.43	120	400	115.2	524.2	268.0	639.4	0.973	0.382	13.70	17.87
16.50	5.7			76.5		455.2	600	0.971	0.402	7.21	9.12
19.57	6.38			41.4		691.3	544.2	0.972	0.407	10.46	13.50
21.46	6.03	120	400	207.3	517.1	234.0	724.4	0.973	0.443	18.15	24.15
23.45	5.77			70.9		699.8	596.6	0.971	0.464	10.84	14.20
26.43	5.84			59.1		397.7	583.6	0.971	0.424	15.78	20.85
28.36	5.64	120	400	299.6	519.6	219.1	819.2	0.971	0.432	15.54	20.75
30.63	5.76			58		914.6	592.4	0.971	0.441	10.30	14.60
33.38	5.86			246.2		363.7	805.2	0.973	0.413	16.41	22.52
35.38	5.99	120	400	294.4	542.7	287.1	837.1	0.969	0.377	19.43	26.53
37.62	6.08			83		487.1	579.7	0.968	0.802	9.45	12.64
40.36	5.84			160.9		463.7	694.7	0.969	0.357	14.22	18.96
42.37	5.89	120	400	262.1	539.8	278.6	801.9	0.971	0.380	16.58	22.49
44.71	5.6			83		748.7	601.8	0.972	0.406	11.55	15.54
47.37	5.75			143.1		325.4	682.7	0.968	0.359	7.66	10.08
49.37	5.76	120	400	246.9	535.1	291.4	782	0.971	0.386	5.52	7.12
51.38	5.89			70.2		438.2	596.7	0.973	0.448	8.80	11.53
54.37	5.72			118.4		53.2	637.6	0.974	0.407	15.50	20.67
56.38	5.75	120	400	231.2	516.1	208.4	747.3	0.972	0.394	17.95	24.11
58.39	5.94			91.2		444.5	595	0.974	0.458	10.42	13.33
61.37	6.18			104.2		304.2	638.6	0.966	0.286	16.30	21.46
63.37	6.03	120	400	291.5	539.9	344.6	831.4	0.973	0.370	19.95	26.64
65.38	5.97			89.4		365.8	600.4	0.976	0.430	9.98	12.87
68.37	6.09			265.7		170.2	785.4	0.971	0.357	17.04	22.59
70.37	6.02	120	400	308	520	297.8	828	0.966	0.382	20.60	27.55
72.34	5.92			93.3		531.8	599.9	0.973	0.448	10.77	13.82
75.37	5.58			210.2		382.9	735.3	0.970	0.442	16.41	21.61
77.36	5.99	120	400	235.7	542.2	291.4	777.9	0.967	0.322	19.66	26.21
79.35	5.8			101.5		212.7	600.7	0.972	0.452	9.16	11.49
82.45	6.27			157.8		425.4	683.9	0.972	0.430	17.56	23.08
84.42	6.19	120	400	227.9	547.9	202.1	775.8	0.967	0.294	20.07	26.80

Table C-17. Continued.

Train 5 – Fermentor 4											
Day	pH	Feedstock + nutrient added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
86.49	5.82			104		382.9	601.1	0.974	0.402	10.78	13.72
89.38	5.97			120.8		425.4	659.1	0.977	0.393	16.52	21.82
91.36	5.92	120	400	216.1	530.8	195.7	746.9	0.974	0.374	19.91	26.77
93.43	5.61			73.1		450.9	598.6	0.973	0.400	10.56	13.30
96.36	5.64			252		380.7	764.3	0.974	0.373	17.26	22.90
98.37	5.64	120	400	235.2	520.8	197.8	756	0.972	0.336	20.68	28.04
100.37	5.52			80.3		548.8	601.1	0.973	0.419	10.17	12.84
103.84	5.74			191.5		346.7	810.7	0.965	0.387	18.50	24.74
105.79	5.78	120	400	313.7	535	246.7	848.7	0.968	0.328	19.38	26.06
107.36	5.75			84		323.3	591.9	0.977	0.706	7.79	9.94
110.37	5.93			167.3		527.5	685.9	0.970	0.435	13.89	18.55
112.41	5.9	120	400	185.7	533.9	312.7	719.6	0.968	0.419	19.99	26.96
114.37	5.86			49.3		448.8	585.6	0.980	0.413	6.11	7.72
117.37	5.92			267.1		293.5	801.9	0.976	0.426	13.15	17.37
119.37	6.22	120	400	260.2	543	289.3	803.2	0.973	0.406	21.68	28.97
121.39	5.91			95.4		146.8	635.3	0.981	0.234	5.72	7.25
124.38	6.06			204.6		382.9	749.7	0.978	0.459	13.97	18.40
126.38	5.9	120	400	268.7	525.1	470.1	793.8	0.964	0.238	18.08	23.95
128.40	5.69			83.2		331.8	600.5	0.974	0.415	6.87	8.79
131.34	5.91			213.1		572.2	748.5	0.973	0.436	11.65	15.18
133.43	5.76	120	400	298	524.1	344.6	822.1	0.974	0.356	19.50	25.34

Table C-18. Transfer data for Train 5 Fermentor 3.

Train 5 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
0.00							
2.00							
5.00							
7.48	5.95	496.3	104	87.7	505.9	852.9	593.6
9.45	6.12		118	66.5		510.5	581.8
12.47	6.22		74	109.3		357.3	625
14.51	6.07	524.2	197	73.2	514.6	78.7	587.8
16.50	6.14		242	81.2		253.1	592.9
19.57	5.91		128	224.7		344.6	742.8
21.46	5.92	517.1	277	119.6	517	142.5	636.6
23.45	5.92		320	60.5		114.9	582
26.43	5.75		282	296.5		189.3	832.2
28.36	5.56	519.6	229	290.9	519	155.3	809.9
30.63	5.61		292	273.4		263.7	805.4
33.38	5.87		204	280.8		246.7	815.3
35.38	5.91	542.7	213	195.5	536.7	204.2	732.2
37.62	5.87		288	201		312.7	733.8
40.36	5.77		182	272.1		206.3	813.1
42.37	5.68	539.8	219	182.6	533.3	172.3	715.9
44.71	5.56		260	171.9		304.2	718.5
47.37	5.61		162	244		191.4	792.1
49.37	5.75	535.1	207	169.4	536.9	225.5	706.3
51.38	5.91		252	183.4		199.9	700.3
54.37	5.52		228	231.5		174.4	763.3
56.38	5.65	516.1	299	224.1	526.7	219.1	750.8
58.39	6.11		318	213.3		48.9	735.5
61.37	5.85		287	301.1		553.0	832
63.37	5.82	539.9	235	282.1	522.5	457.3	804.6
65.38	5.74		286	278.9		450.9	815.7
68.37	5.81		228	310.6		529.6	816.4
70.37	5.89	520	213	233	493.5	363.7	726.5
72.34	5.86		264	231.4		293.5	747
75.37	5.82		178	254.9		268.0	770.6
77.36	6.06	542.2	223	172.8	513.8	191.4	686.6
79.35	5.44		288	188.8		261.6	710.8
82.45	6.09		180	250.3		255.2	800.4
84.42	5.98	547.9	169	166.9	516.5	163.8	683.4

Table C-18. Continued.

Train 5 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
86.49	6.23		218	167.1		180.8	708.4
89.38	5.91		248	212.5		240.4	753.2
91.36	5.88	530.8	179	259.7	518.9	263.7	778.6
93.43	5.84		246	247.2		178.7	784.7
96.36	5.68		308	245.9		251.0	768.5
98.37	5.51	520.8	237	300	523	238.2	823
100.37	5.47		282	296.4		234.0	816.7
103.84	5.61		124	231.2		308.4	791.9
105.79	5.68	535	191	180.1	499.5	199.9	679.6
107.36	5.84		202	180.8		299.9	711
110.37	5.79		298	203.5		393.5	726.4
112.41	5.69	533.9	187	253.8	539.2	238.2	793
114.37	5.83		276	267.3		231.8	783.1
117.37	5.77		212	269.3		223.3	784.8
119.37	5.81	543	233	208	514.9	199.9	722.9
121.39	6.45		282	211.8		325.4	738.6
124.38	6.09		202	251		576.4	802.3
126.38	5.61	525.1	237	239.6	506.5	806.1	746.1
128.40	5.62		304	234		629.6	759.4
131.34	5.56		258	295.4		776.4	819.6
133.43	5.61	524.1	226	244.7	522.2	419.0	766.9

Table C-19. Transfer data for Train 5 Fermentor 2.

Train 5 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
0.00							
2.00							
5.00							
7.48	6.04	505.9	95	102.3	495.4	906.1	597.7
9.45	6.08		85	113.5		272.3	611
12.47	6.3		125	71		348.8	571.5
14.51	6.48	514.6	189	195.6	492.2	214.8	687.8
16.50	6		169	236.4		146.8	704.7
19.57	6.18		244	122		227.6	629.6
21.46	5.97	517	237	272.5	468.9	408.4	741.4
23.45	5.8		259	313.1		225.5	784
26.43	5.75		213	276		333.9	721.8
28.36	5.65	519	217	227.1	423.5	259.5	650.6
30.63	5.57		191	285.2		163.8	741.7
33.38	5.9		225	200.7		302.0	639.2
35.38	5.97	536.7	197	209.4	445.1	142.5	654.5
37.62	5.96		185	282.3		185.0	742.2
40.36	5.87		207	176.6		199.9	637.9
42.37	6.6	533.3	199	214.1	446.4	178.7	660.5
44.71	5.86		155	253.3		244.6	742.4
47.37	6.53		203	160.1		170.2	632.1
49.37	6.76	536.9	195	202.9	466.5	163.8	669.4
51.38	6.37		197	247.8		155.3	734.2
54.37	5.85		283	221.8		431.8	676.6
56.38	5.43	526.7	217	295.3	435.4	476.4	730.7
58.39	5.85		197	312.6		219.1	821.9
61.37	5.75		247	275.4		336.1	714.2
63.37	5.77	522.5	199	230.7	445.8	340.3	676.5
65.38	5.71		201	282.1		342.4	747.7
68.37	5.94		225	223.1		346.7	657.5
70.37	6.12	493.5	193	209.9	440.3	248.9	650.2
72.34	5.85		187	257		259.5	698.3
75.37	6.89		205	173		287.1	619.7
77.36	7.08	513.8	219	220.1	420.5	187.2	640.6
79.35	6.24		199	281.9		236.1	729.3
82.45	6.56		187	176.4		295.7	637.4
84.42	6.82	516.5	217	166.7	466.7	172.3	633.4

Table C-19. Continued.

Train 5 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(g)	(g)	(g)	(cm ³)	(g)
86.49	6.23		216	213.4		134.0	673.5
89.38	5.96		161	241.2		344.6	669.6
91.36	5.81	518.9	273	177.4	399.5	508.4	576.9
93.43	5.75		297	240.7		308.4	689.8
96.36	5.43		225	301.6		351.0	730.1
98.37	5.45	523	199	237.9	407.9	338.2	645.8
100.37	5.43		197	278.7		187.2	745.7
103.84	5.64		107	121.8		308.4	650.5
105.79	5.8	499.5	299	190.3	440.6	314.8	630.9
107.36	5.71		269	199		134.0	673.9
110.37	5.58		225	292.7		208.4	736.2
112.41	5.64	539.2	165	184.8	476	208.4	660.8
114.37	5.68		197	270.9		217.0	739.7
117.37	5.7		229	208.6		214.8	659.4
119.37	5.72	514.9	221	230.1	411.8	195.7	641.9
121.39	5.8		194	277.6		89.3	740.8
124.38	5.81		229	197		231.8	646
126.38	5.74	506.5	229	233.5	435.3	238.2	668.8
128.40	5.59		223	296.9		523.2	734.9
131.34	5.61		237	252		527.5	652.4
133.43	5.59	522.2	222	220	404	404.1	624

Table C-20. Transfer data for Train 5 Fermentor 1.

Train 5 – Fermentor 4											
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
2.00											
5.00											
7.48	6.34		0	96.3	427.4	893.3	597.8	0.754	0.308	13.58	17.54
9.45	6.28		200	83.9		419.0	587.8	0.754	0.308	0.00	0.00
12.47	7.37		200	191.5		195.7	703.3	0.754	0.308	11.60	15.73
14.51	8.13		0	187.2	439.7	74.4	701	0.768	0.275	8.24	11.36
16.50	7.51		200	167.8		76.6	670.7	0.758	0.300	13.69	18.81
19.57	6.11		200	238.8		565.8	699.7	0.758	0.300	13.01	17.15
21.46	6.15		0	232.3	352.2	767.8	658.6	0.706	0.297	11.76	16.77
23.45	5.91		200	257.4		493.5	697	0.749	0.296	17.93	24.59
26.43	5.97		200	209.4		391.4	637.6	0.740	0.300	14.17	19.12
28.36	5.8		0	213.0	332.3	306.3	628.2	0.704	0.264	8.47	11.54
30.63	5.78		200	187.9		321.2	631.2	0.722	0.279	17.61	23.73
33.38	6.06		200	221.4		272.3	642	0.726	0.273	10.40	14.34
35.38	6.13		0	193.9	351.1	208.4	619.3	0.704	0.293	7.16	9.77
37.62	6.18		200	181.8		229.7	635.6	0.721	0.272	13.18	18.02
40.36	8.25		200	204.1		102.1	653.8	0.717	0.270	8.38	11.46
42.37	8.65		0	194.5	379.5	55.3	648.4	0.730	0.274	5.05	6.73
44.71	7.85		200	152.4		151.0	638.2	0.719	0.277	11.55	15.54
47.37	8.22		200	202.6		83.0	679	0.718	0.279	7.66	10.08
49.37	8.42		0	190.4	410.8	119.1	675.5	0.757	0.279	5.52	7.12
51.38	6.83		200	195.0		495.6	652.1	0.729	0.277	12.99	16.85
54.37	5.72		200	280.9		989.1	641.9	0.733	0.282	15.20	20.20
56.38	5.31		0	213.9	271.2	450.9	558.6	0.663	0.286	9.52	12.45
58.39	5.65		200	214.6		701.9	645	0.725	0.284	15.89	21.65
61.37	5.67		200	243.2		385.0	629.2	0.718	0.286	10.62	14.09
63.37	5.83		0	195.3	316.5	204.2	585	0.705	0.263	6.36	8.26
65.38	5.98		200	197.7		268.0	636.7	0.702	0.282	12.63	17.29
68.37	6.06		200	220.9		282.9	637.1	0.697	0.278	10.08	13.87
70.37	8		0	190.2	352.0	178.7	615.9	0.712	0.292	7.98	11.61
72.34	7.36		200	183.7		244.6	626.3	0.706	0.276	14.68	20.67
75.37	7.69		200	199.1		246.7	641.8	0.707	0.274	10.18	14.36
77.36	8.19		0	216.5	350.6	125.5	641.5	0.712	0.282	7.31	9.99
79.35	7.78		200	195.8		119.1	632.4	0.710	0.279	13.77	20.40
82.45	8.42		200	185.0		117.0	633.8	0.712	0.282	10.51	14.96
84.42	8.81		0	214.9	407.2	308.4	696.1	0.739	0.312	6.56	9.17

Table C-20. Continued.

Train 5 – Fermentor 4											
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(g)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
86.49	7.16		200	213.6		406.3	675.2	0.715	0.288	15.23	22.34
89.38	5.61		200	61.5		277.2	446.4	0.724	0.292	9.14	12.31
91.36	5.52		0	269.6	238.2	616.8	582.1	0.645	0.328	15.09	19.86
93.43	5.51		200	292.6		482.8	663.8	0.717	0.301	17.41	23.41
96.36	5.42		200	224.0		438.2	562.5	0.707	0.310	10.42	13.59
98.37	5.62		0	198.2	264.7	287.1	536.3	0.680	0.294	6.75	8.70
100.37	5.43		200	195.4		397.7	602	0.685	0.312	14.00	18.62
103.84	5.98		200	106.7		431.8	590.5	0.677	0.313	12.91	17.54
105.79	5.81		0	295.6	313.2	217.0	683.4	0.689	0.303	9.44	12.78
107.36	5.83		200	266.1		236.1	732.1	0.684	0.305	16.18	22.09
110.37	5.73		200	221.8		289.3	664.8	0.682	0.303	11.90	16.99
112.41	5.78		0	161.3	404.2	323.3	640.2	0.758	0.261	8.56	12.30
114.37	5.66		200	194.4		210.6	633.8	0.726	0.295	15.41	21.28
117.37	5.75		200	225.2		191.4	639.1	0.740	0.292	10.01	13.70
119.37	5.74		0	216.2	322.9	323.3	613.4	0.674	0.297	7.08	9.53
121.39	5.77		200	187.6		108.5	654.7	0.734	0.296	12.72	17.28
124.38	5.73		200	224.6		406.3	665.5	0.711	0.296	9.35	13.09
126.38	5.48		0	224.7	340.9	765.7	639.8	0.681	0.311	8.80	11.76
128.40	5.46		200	219.9		604.1	655.1	0.702	0.306	13.83	18.65
131.34	5.38		200	234.7		865.7	633.4	0.706	0.308	14.10	18.80
133.43	5.49		0	216.6	299.4	559.4	590.3	0.701	0.310	6.05	7.98

**SUPPLEMENTAL D. DATA FOR EFFECT OF ONE-TO-SIX STAGES IN
COUNTERCURRENT MIXED-ACID FERMENTATION**

Table D-1. Transfer data for Train 1 Fermentor 1.

Train 1 – Fermentor 1													
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Liquid moisture content	Liquid ash content	Acid conc.	Aceq	Solids moisture content	Solids ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)		
0.00	5.35	4.0	30	93.9	28.2	640.2	508.1	0.98	0.43			0.87	0.31
2.12	5.36	4.0	30	40.8	0.0	421.1	422.5	0.98	0.47			0.87	0.31
4.02	5.63	4.0	30	38.5	0.0	246.7	414.2	0.98	0.49			0.87	0.31
6.14	5.47	4.0	30	62.0	0.0	395.6	405.8	0.97	0.49			0.87	0.31
7.90	5.44	4.0	30	18.9	0.0	268.0	378.8	0.96	0.41	9.88	12.40	0.87	0.31
9.90	5.15	4.0	30	35.0	0.0	278.6	391.4	0.96	0.42	10.28	12.68	0.87	0.31
12.04	5.50	4.0	30	39.3	0.0	297.8	388.1	0.96	0.51	10.86	13.25	0.87	0.31
14.00	5.46	4.0	30	27.8	0.0	189.3	383.1	0.96	0.46	11.55	13.82	0.87	0.31
16.15	5.61	4.0	30	26.0	0.0	370.1	389.5	0.96	0.45	11.99	14.15	0.87	0.31
18.05	5.82	4.0	30	13.4	0.5	248.9	399.9	0.96	0.38	14.36	17.34	0.70	0.33
20.11	5.57	4.0	30	15.8	19.2	365.8	421.0	0.96	0.46	14.86	18.03	0.68	0.42
21.90	5.88	4.0	30	9.2	25.7	368.0	420.9	0.96	0.36	15.10	18.40	0.71	0.35
23.91	5.96	4.0	30	5.1	26.8	270.1	417.9	0.74	0.35	16.78	20.77	0.74	0.35
26.01	6.23	4.0	30	12.2	23.7	323.3	421.9	0.97	0.36	19.97	25.32	0.73	0.39
27.99	5.64	4.0	30	8.4	26.3	584.9	420.7	0.97	0.38	16.18	20.83	0.75	0.37
29.85	5.32	4.0	30	20.3	10.9	948.6	417.2	0.96	0.42	18.26	22.98	0.74	0.34
32.00	5.56	4.0	30	55.8	0.0	512.6	416.4	0.96	0.51	19.53	24.15	0.73	0.36
34.04	5.29	4.0	30	37.8	0.0	487.1	390.9	0.95	0.45	19.95	24.38	0.74	0.36
35.89	5.30	4.0	30	25.5	0.0	323.3	389.8	0.94	0.51	19.80	23.99	0.74	0.36
38.17	5.59	4.0	30	0.0	10.9	359.5	394.7	0.94	0.52	21.64	26.46	0.74	0.36
40.13	5.53	4.0	30	0.0	0.0	414.8	327.7	0.94	0.50	26.53	33.28	0.74	0.36
42.08	0.00	4.0	30	0.0	0.0	404.1	291.7	0.95	0.50	0.00	0.00	0.74	0.36
43.50	5.92	4.0	30	0.0	15.7	274.4	322.4	0.94	0.49	0.00	0.00	0.69	0.38
45.88	6.48	4.0	30	8.4	21.0	261.6	415.4	0.94	0.50	17.52	22.56	0.68	0.36
47.90	5.93	4.0	30	6.7	25.3	304.2	418.0	0.94	0.50	19.21	25.15	0.71	0.35
50.05	6.00	4.0	30	5.6	33.5	268.0	417.1	0.94	0.50	16.66	22.12	0.73	0.35
51.90	5.92	4.0	30	20.9	23.7	240.4	430.6	0.97	0.49	16.60	21.92	0.72	0.36
54.02	5.74	4.0	30	33.6	0.0	259.5	418.7	0.97	0.45	17.12	22.52	0.71	0.36
56.09	6.05	4.0	30	13.4	20.4	214.8	419.8	0.96	0.49	17.03	22.42	0.74	0.36
58.24	5.92	4.0	30	4.3	28.2	297.8	418.5	0.97	0.46	17.23	22.72	0.69	0.36
60.28	6.12	4.0	30	0.0	32.4	261.6	418.3	0.97	0.47	6.80	8.96	0.73	0.36
62.01	6.02	4.0	30	22.4	9.2	259.5	417.6	0.98	0.30	10.66	14.30	0.71	0.36
63.93	6.02	4.0	30	0.0	34.0	148.9	419.8	0.97	0.43	10.54	14.02	0.72	0.35
65.91	6.04	4.0	30	0.0	30.3	178.7	413.2	0.97	0.41	11.21	14.67	0.71	0.36

Table D-1. Continued.

Train 1 – Fermentor 1													
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Liquid moisture content	Liquid ash content	Acid conc.	Aceq	Solids moisture content	Solids ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)		
67.98	5.98	4.0	30	0.0	36.9	365.8	417.6	0.96	0.65	12.05	15.65	0.75	0.34
69.98	5.42	4.0	30	5.3	0.0	610.4	383.9	0.96	0.46	17.39	21.96	0.72	0.35
71.99	5.66	4.0	30	31.2	0.0	404.1	406.4	0.96	0.43	16.13	20.17	0.72	0.35
73.96	5.60	4.0	30	28.6	0.0	272.3	408.9	0.96	0.47	18.22	22.59	0.72	0.35
76.02	5.51	4.0	30	34.0	0.0	219.1	413.0	0.96	0.37	14.96	18.37	0.72	0.35
77.90	5.78	4.0	30	19.0	7.5	365.8	412.5	0.96	0.50	19.21	23.88	0.69	0.34
79.91	6.15	4.0	30	19.9	14.1	463.7	420.0	0.96	0.46	23.52	29.98	0.69	0.34
81.50	5.98	4.0	30	0.0	32.0	274.4	416.9	0.96	0.44	18.35	23.40	0.72	0.35
83.90	5.97	4.0	30	7.8	23.1	261.6	416.9	0.96	0.45	20.62	26.20	0.71	0.34
85.99	6.09	4.0	30	27.8	4.0	251.0	417.8	0.96	0.48	19.84	25.16	0.76	0.33
87.81	5.76	4.0	30	0.0	37.1	234.0	418.2	0.96	0.47	15.90	20.49	0.72	0.34
89.96	5.76	4.0	30	4.8	21.9	268.0	412.7	0.96	0.46	18.44	23.30	0.73	0.35
92.06	5.94	4.0	30	12.6	20.1	265.9	418.7	0.97	0.46	17.97	23.06	0.73	0.36
94.08	5.82	4.0	30	19.2	14.6	238.2	419.8	0.97	0.43	17.36	22.23	0.71	0.34
95.50	5.71	4.0	30	1.7	31.0	259.5	418.7	0.97	0.45	13.48	17.49	0.75	0.35
97.90	6.03	4.0	30	15.0	17.1	242.5	418.1	0.97	0.46	13.48	17.46	0.73	0.33
99.91	6.22	4.0	30	5.4	25.1	229.7	416.5	0.97	0.44	14.70	19.37	0.75	0.34
101.50	5.91	4.0	30	0.0	52.8	223.3	418.6	0.97	0.45	13.59	17.50	0.78	0.32
103.50	5.72	4.0	30	0.0	6.8	189.3	417.7	0.97	0.45	13.71	17.66	0.79	0.29
106.06	5.85	4.0	30	25.0	39.9	268.0	450.9	0.98	0.41	12.88	16.74	0.77	0.33
108.08	6.00	4.0	30	19.9	7.4	257.4	413.3	0.98	0.47	12.51	16.21	0.75	0.32
109.50	5.81	4.0	30	0.4	32.6	331.8	419.0	0.98	0.45	13.49	17.27	0.78	0.34
111.95	5.56	4.0	30	3.4	29.6	331.8	419.0	0.98	0.44	13.98	17.93	0.77	0.35
113.93	5.69	4.0	30	10.3	21.6	302.0	417.9	0.98	0.45	14.96	19.19	0.80	0.33
115.91	5.80	4.0	30	15.8	16.4	312.7	418.2	0.97	0.37	14.45	18.62	0.75	0.38
117.92	5.32	4.0	30	24.4	7.0	287.1	417.4	0.97	0.34	14.42	18.50	0.78	0.35
120.06	5.70	4.0	30	32.1	1.4	299.9	419.5	0.98	0.40	14.79	18.87	0.71	0.31
122.00	5.76	4.0	30	31.3	2.5	304.2	419.8	0.98	0.44	15.99	20.39	0.68	0.37
123.50	6.11	4.0	30	0.0	32.9	293.5	418.3	0.97	0.40	16.34	20.72	0.75	0.36
125.90	5.80	4.0	30	18.6	12.9	365.8	417.5	0.97	0.46	13.79	18.06	0.72	0.36
127.91	5.73	4.0	30	18.1	13.1	555.1	417.2	0.96	0.32	15.07	19.32	0.75	0.36
129.91	5.51	4.0	30	30.3	1.6	423.3	417.9	0.97	0.36	15.24	19.24	0.72	0.35
131.92	5.64	4.0	30	23.5	8.4	363.7	417.9	0.96	0.37	15.48	19.40	0.74	0.34
134.05	5.71	4.0	30	33.7	0.0	299.9	418.0	0.96	0.49	19.73	24.69	0.74	0.36
136.07	5.75	4.0	30	7.6	23.6	331.8	417.2	0.96	0.37	18.76	23.61	0.68	0.38
137.90	5.77	4.0	30	2.7	30.0	310.5	418.7	0.96	0.40	19.09	24.17	0.71	0.37
139.91	5.72	4.0	30	6.6	24.9	231.8	417.5	0.96	0.42	19.61	24.80	0.73	0.35

Table D-1. Continued.

Train 1 – Fermentor 1													
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Liquid moisture content	Liquid ash content	Acid conc.	Aceq	Solids moisture content	Solids ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)		
141.90	5.72	4.0	30	18.0	8.6	165.9	412.6	0.96	0.35	15.70	19.78	0.72	0.37
144.01	5.89	4.0	30	20.6	12.0	229.7	418.6	0.97	0.47	18.80	23.70	0.69	0.36
145.95	6.17	4.0	30	7.2	26.1	263.7	419.3	0.97	0.41	19.02	24.03	0.71	0.37
147.50	6.00	4.0	33	0.0	36.4	180.8	418.8	0.97	0.41	17.68	22.34	0.77	0.35
149.93	6.19	4.0	30	3.2	42.7	242.5	431.9	0.97	0.41	16.13	21.02	0.76	0.34
151.50	6.02	4.0	41	0.0	30.7	193.6	405.6	0.97	0.43	18.98	23.73	0.77	0.32
153.91	5.87	4.0	30	16.8	16.1	340.3	418.9	0.97	0.34	14.66	18.97	0.74	0.38
155.50	5.82	4.0	30	0.0	32.7	610.4	417.8	0.97	0.39	20.91	26.07	0.76	0.39
158.00	5.54	4.0	30	48.4	0.0	497.7	429.6	0.97	0.51	18.21	22.88	0.77	0.34
159.92	5.51	4.0	30	23.1	0.0	448.8	398.2	0.97	0.41	17.19	21.36	0.77	0.35
162.07	5.50	4.0	30	21.3	0.0	416.9	406.0	0.96	0.51	20.60	25.53	0.77	0.35
164.06	5.49	4.0	30	42.3	0.0	425.4	416.6	0.96	0.47	22.32	27.59	0.77	0.35
166.09	5.78	4.0	30	8.8	9.5	382.9	404.3	0.97	0.47	23.47	29.44	0.69	0.39
168.07	5.59	4.0	30	17.0	14.2	219.1	417.2	0.94	0.55	23.64	29.62	0.70	0.38
170.00	5.66	4.0	30	10.2	20.6	242.5	416.8	0.96	0.29	20.36	25.39	0.70	0.38
171.93	5.76	4.0	30	18.2	13.8	251.0	418.0	0.97	0.42	20.59	25.92	0.69	0.38
173.93	5.75	4.0	30	9.9	22.7	270.1	418.6	0.97	0.30	20.09	25.38	0.70	0.40
176.11	6.06	4.0	30	4.4	27.2	240.4	417.6	0.97	0.19	19.47	24.81	0.68	0.38
178.10	5.90	4.0	30	0.0	40.1	299.9	412.6	0.97	0.42	16.18	21.33	0.72	0.37

Table D-2. Transfer data for Train 2 Fermentor 1.

Train 2 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00	5.59	8.0	97	186.3	0.0	1352.8	496.7	0.98	0.41		
2.12	5.68	8.0	38	115.1	0.0	818.9	421.5	0.98	0.35		
4.02	5.77	8.0	150	13.2	0.0	584.9	346.0	0.97	0.38		
6.14	5.50	8.0	122	123.6	0.0	623.2	455.5	0.97	0.45		
7.90	5.35	8.0	74	104.5	8.3	419.0	463.8	0.97	0.47	14.02	18.86
9.89	5.31	8.0	118	94.2	0.0	525.4	427.1	0.95	0.43	14.76	19.12
12.04	5.30	8.0	65	109.5	0.0	467.9	450.6	0.95	0.47	16.04	20.94
14.00	5.22	8.0	62	70.5	0.0	338.2	414.2	0.94	0.48	16.86	21.64
16.14	5.29	8.0	60	57.6	6.6	338.2	415.2	0.94	0.50	15.90	20.06
18.05	5.44	8.0	55	46.3	19.5	236.1	416.8	0.94	0.44	15.98	19.81
20.10	5.53	8.0	56	50.8	6.5	306.3	408.3	0.94	0.44	15.12	18.61
21.90	5.46	8.0	70	43.4	25.7	302.0	420.1	0.94	0.45	14.93	18.35
23.90	5.56	8.0	56	48.6	25.6	385.0	425.2	0.94	0.45	13.44	16.74
26.01	5.91	8.0	64	23.1	35.5	502.0	409.6	0.94	0.43	18.20	23.44
27.99	5.84	8.0	71	33.5	37.5	827.4	422.0	0.95	0.44	28.55	39.35
29.85	5.72	8.0	70	31.5	41.2	302.0	423.7	0.92	0.23	25.98	35.47
31.99	5.76	8.0	75	55.4	18.6	312.7	425.0	0.96	0.49	26.46	35.73
34.04	5.47	8.0	62	55.5	25.9	365.8	432.4	0.95	0.42	25.30	33.86
35.89	5.48	8.0	70	51.3	24.1	282.9	426.4	0.95	0.49	24.36	32.54
38.17	5.54	8.0	47	20.0	52.9	302.0	423.9	0.95	0.49	23.18	30.66
40.13	5.43	8.0	86	115.5	0.0	325.4	404.3	0.95	0.44	23.88	31.66
42.07	5.19	8.0	0	6.7	22.5	340.3	380.2	0.95	0.45	0.00	0.00
43.49	5.65	8.0	62	0.0	48.1	316.9	356.2	0.95	0.46	0.00	0.00
45.87	5.54	8.0	66	41.7	25.9	361.6	418.6	0.95	0.46	21.10	27.72
47.90	5.47	8.0	64	48.5	21.3	327.6	420.8	0.94	0.48	24.03	31.34
50.04	5.55	8.0	47	39.6	25.9	287.1	416.5	0.94	0.47	23.58	31.02
51.90	5.50	8.0	60	31.1	31.6	280.8	413.7	0.94	0.47	24.04	31.59
54.02	5.38	8.0	67	42.0	22.4	304.2	415.4	0.94	0.49	23.84	31.08
56.09	5.65	8.0	66	37.6	37.2	242.5	425.8	0.94	0.49	24.38	31.70
58.23	5.51	8.0	53	34.2	45.0	297.8	423.2	0.94	0.44	24.09	31.20
60.28	5.61	8.0	57	18.3	32.9	255.2	402.2	0.94	0.42	18.05	23.13
62.01	5.65	8.0	63	22.6	38.8	278.6	412.4	0.94	0.46	0.00	0.00
63.93	5.72	8.0	49	80.0	49.3	189.3	480.3	0.95	0.41	20.69	27.26
65.90	5.68	8.0	57	66.5	47.4	187.2	464.9	0.96	0.40	22.48	29.25
67.97	5.71	8.0	63	57.4	42.3	214.8	450.7	0.94	0.47	23.79	30.78
69.97	5.67	8.0	85	66.2	59.0	280.8	476.2	0.95	0.44	24.00	31.07
71.98	6.04	8.0	61	47.5	43.3	410.5	441.8	0.96	0.49	28.38	37.32

Table D-2. Continued.

Train 2 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
73.96	5.70	8.0	65	38.3	30.8	380.7	420.1	0.96	0.39	24.51	31.95
76.01	5.42	8.0	79	53.0	19.9	231.8	423.9	0.96	0.40	26.19	33.76
77.90	5.53	8.0	73	50.6	34.7	231.8	436.3	0.95	0.48	22.44	28.65
79.90	5.59	8.0	69	46.5	32.0	234.0	429.5	0.95	0.48	22.29	28.25
81.96	5.70	8.0	60	27.1	46.8	242.5	424.9	0.95	0.39	22.47	28.26
83.89	5.76	8.0	50	22.4	44.0	236.1	417.4	0.95	0.45	20.75	25.89
85.99	5.73	8.0	70	14.0	41.9	202.1	406.9	0.95	0.44	22.98	28.66
87.80	5.81	8.0	64	20.9	53.2	255.2	425.1	0.95	0.32	22.05	27.58
89.95	5.98	8.0	56	13.8	56.8	336.1	421.6	0.95	0.38	21.34	26.94
92.05	5.84	8.0	60	20.7	40.3	242.5	412.0	0.95	0.49	24.68	31.13
94.07	5.80	8.0	64	26.7	40.6	185.0	418.3	0.96	0.47	23.45	29.48
95.93	5.76	8.0	54	20.2	50.5	212.7	421.7	0.96	0.39	22.80	28.61
97.90	5.95	8.0	56	9.6	48.6	223.3	409.2	0.96	0.43	22.82	28.45
99.49	5.96	8.0	50	1.2	58.1	212.7	410.3	0.96	0.41	22.88	28.52
101.49	5.81	8.0	50	1.3	55.1	227.6	407.4	0.96	0.42	22.83	28.45
103.90	5.73	8.0	48	3.7	53.2	231.8	407.9	0.96	0.41	22.41	28.00
106.06	5.79	8.0	0	20.4	34.1	251.0	405.5	0.96	0.44	22.01	27.39
107.49	5.92	8.0	46	0.0	48.0	259.5	353.2	0.96	0.42	23.33	29.09
109.49	5.99	8.0	28	0.0	44.7	291.4	358.8	0.96	0.43	23.45	29.24
111.49	5.69	8.0	46	0.0	41.3	242.5	389.8	0.96	0.43	23.24	28.94
113.92	5.62	8.0	36	7.6	41.7	257.4	400.3	0.96	0.43	22.52	28.03
115.49	5.86	8.0	64	0.7	41.0	253.1	392.7	0.96	0.43	22.46	27.94
117.91	5.38	8.0	68	17.5	52.8	276.5	421.3	0.96	0.30	23.41	29.23
120.05	5.68	8.0	74	44.5	30.5	357.3	426.0	0.96	0.49	24.94	31.18
121.99	5.66	8.0	72	57.4	24.6	323.3	433.0	0.96	0.45	24.14	30.11
123.91	5.91	8.0	54	41.0	36.6	265.9	428.6	0.96	0.42	21.96	27.14
125.89	5.76	8.0	54	25.8	33.8	289.3	410.6	0.96	0.50	18.19	22.57
127.49	5.83	8.0	62	0.0	64.8	238.2	411.7	0.96	0.46	22.13	27.39
129.91	5.69	8.0	66	28.8	35.3	304.2	415.1	0.96	0.48	24.07	29.83
131.91	5.62	8.0	68	39.6	31.6	327.6	422.2	0.96	0.50	19.51	24.15
134.04	5.71	8.0	72	41.6	32.2	225.5	424.8	0.96	0.49	23.49	28.91
136.07	5.69	8.0	58	58.5	21.0	316.9	430.5	0.95	0.51	24.37	30.01
137.89	5.63	8.0	56	36.5	28.1	280.8	415.6	0.95	0.38	28.77	35.40
139.90	5.71	8.0	56	11.0	52.6	227.6	414.6	0.95	0.45	22.08	27.28
141.90	5.69	8.0	62	9.6	46.7	240.4	407.3	0.95	0.41	29.98	37.16
144.00	5.76	8.0	58	38.7	28.2	302.0	417.9	0.96	0.49	26.44	32.81
145.94	5.68	8.0	44	20.0	42.4	291.4	413.4	0.95	0.45	20.70	25.57

Table D-2. Continued.

Train 2 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
147.49	5.59	8.0	72	0.0	53.8	242.5	401.1	0.95	0.47	25.39	31.37
149.93	5.31	8.0	62	29.9	61.6	289.3	442.5	0.96	0.42	20.57	25.41
152.15	5.48	8.0	48	22.3	31.4	314.8	404.7	0.96	0.47	29.59	36.81
153.90	5.59	8.0	62	19.6	35.3	291.4	405.9	0.95	0.40	25.90	32.24
155.90	5.67	8.0	38	21.2	45.7	225.5	417.9	0.97	0.31	29.45	36.66
158.00	5.72	8.0	61	18.8	39.0	261.6	408.8	0.95	0.46	27.90	34.66
159.92	5.62	8.0	48	12.1	43.5	240.4	406.6	0.95	0.18	28.74	35.70
162.06	5.58	8.0	62	26.8	25.2	253.1	403.0	0.95	0.51	27.22	33.94
164.05	5.53	8.0	70	33.4	35.1	280.8	419.5	0.95	0.47	30.92	38.55
166.08	5.58	8.0	64	44.0	31.8	263.7	426.8	0.95	0.50	25.39	31.46
168.07	5.59	8.0	58	18.3	49.5	257.4	418.8	0.94	0.44	26.12	32.58
170.00	5.55	8.0	72	43.6	19.2	227.6	413.8	0.95	0.39	26.86	33.44
171.92	5.67	8.0	60	44.0	34.0	238.2	429.0	0.95	0.45	25.96	32.33
173.93	5.62	8.0	70	34.1	33.3	263.7	418.4	0.96	0.38	25.81	32.19
176.10	5.70	8.0	60	28.1	47.9	270.1	427.0	0.96	0.39	24.55	30.70
178.09	5.74	8.0	114	9.2	51.9	291.4	412.1	0.96	0.42	29.33	36.81

Table D-3. Transfer data for Train 2 Fermentor 2.

Train 2 – Fermentor 2									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00	6.01	0.0	60	97.0	52.5	274.4	510.7	0.85	0.38
2.12	5.63	0.0	60	38.0	23.6	940.1	418.5	0.86	0.33
4.02	5.60	0.0	60	150.0	0.0	982.7	416.9	0.85	0.36
6.14	5.43	0.0	60	122.0	0.0	978.4	358.1	0.85	0.36
7.90	5.74	8.3	60	74.0	0.0	297.8	295.0	0.85	0.36
9.89	5.94	0.0	60	118.0	0.0	331.8	331.3	0.85	0.36
12.04	6.04	0.0	60	65.0	0.0	268.0	277.3	0.85	0.35
14.00	6.34	0.0	60	62.0	0.0	155.3	276.3	0.85	0.36
16.14	6.63	6.6	60	60.0	0.0	161.7	274.2	0.85	0.36
18.05	6.88	19.5	60	55.0	0.0	114.9	281.4	0.85	0.36
20.10	6.42	6.5	60	56.0	0.0	282.9	302.9	0.85	0.36
21.90	6.43	25.7	60	70.0	0.0	340.3	312.4	0.85	0.36
23.90	6.25	25.6	60	56.0	0.0	429.7	330.7	0.85	0.36
26.01	5.81	35.5	60	64.0	0.0	391.4	361.2	0.85	0.36
27.99	5.81	37.5	60	71.0	0.0	376.5	389.1	0.85	0.36
29.85	6.05	41.2	60	70.0	32.7	372.2	416.3	0.65	0.44
31.99	6.04	18.6	60	75.0	3.5	314.8	417.6	0.63	0.37
34.04	5.80	25.9	60	62.0	18.6	465.8	416.8	0.64	0.44
35.89	5.80	24.1	60	70.0	16.4	587.1	418.6	0.68	0.68
38.17	5.77	52.9	60	47.0	63.0	763.6	416.3	0.67	0.43
40.13	5.80	0.0	60	86.0	0.0	540.3	356.2	0.65	0.47
42.07	5.82	22.5	60	0.0	0.0	410.5	331.7	0.66	0.48
43.49	5.87	48.1	60	62.0	40.2	693.4	412.4	0.64	0.40
45.87	5.83	25.9	60	66.0	18.7	599.8	416.0	0.66	0.44
47.90	5.86	21.3	60	64.0	16.6	440.3	416.3	0.67	0.42
50.04	5.92	25.9	60	47.0	26.4	391.4	408.6	0.66	0.39
51.90	5.85	31.6	60	60.0	32.7	344.6	417.6	0.68	0.40
54.02	5.71	22.4	60	67.0	9.7	453.1	415.9	0.68	0.40
56.09	5.97	37.2	60	66.0	33.2	336.1	420.1	0.68	0.37
58.23	5.83	45.0	60	53.0	47.3	414.8	416.7	0.64	0.45
60.28	5.98	32.9	60	57.0	33.2	412.6	416.8	0.69	0.38
62.01	5.84	38.8	60	63.0	30.7	529.6	415.4	0.66	0.43
63.93	5.68	49.3	60	49.0	58.1	612.6	418.6	0.67	0.45
65.90	5.75	47.4	60	57.0	46.8	363.7	416.4	0.67	0.45
67.97	5.71	42.3	60	63.0	39.9	265.9	421.8	0.75	0.39
69.97	5.77	59.0	60	85.0	10.7	153.1	398.4	0.77	0.37
71.98	5.84	43.3	60	61.0	38.4	440.3	416.7	0.74	0.40

Table D-3. Continued.

Train 2 – Fermentor 2									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
73.96	5.69	30.8	60	65.0	20.4	365.8	416.8	0.75	0.36
76.01	5.53	19.9	60	79.0	0.0	261.6	417.0	0.74	0.39
77.90	5.62	34.7	60	73.0	16.8	187.2	415.0	0.69	0.40
79.90	5.59	32.0	60	69.0	18.8	244.6	417.2	0.70	0.37
81.96	5.75	46.8	60	60.0	48.2	257.4	418.1	0.70	0.33
83.89	5.92	44.0	60	50.0	47.8	276.5	413.2	0.70	0.37
85.99	5.76	41.9	60	70.0	31.1	229.7	415.9	0.73	0.36
87.80	5.69	53.2	60	64.0	48.9	229.7	418.2	0.75	0.36
89.95	5.75	56.8	60	56.0	61.7	278.6	417.3	0.74	0.36
92.05	5.87	40.3	60	60.0	39.4	191.4	417.9	0.75	0.36
94.07	5.80	40.6	60	64.0	36.1	210.6	418.2	0.75	0.35
95.93	5.74	50.5	60	54.0	56.2	199.9	417.2	0.77	0.36
97.90	6.00	48.6	60	56.0	54.7	191.4	417.5	0.78	0.35
99.49	5.97	58.1	60	50.0	68.9	144.6	419.4	0.77	0.34
101.49	5.85	55.1	60	50.0	63.7	202.1	417.5	0.78	0.34
103.90	5.95	53.2	60	48.0	64.1	195.7	417.9	0.78	0.34
106.06	7.23	34.1	60	0.0	33.7	195.7	358.5	0.78	0.33
107.49	7.30	48.0	60	46.0	55.8	161.7	413.1	0.78	0.35
109.49	7.40	44.7	60	28.0	72.1	195.7	413.0	0.81	0.31
111.49	5.66	41.3	60	46.0	67.6	623.2	430.1	0.80	0.33
113.92	5.62	41.7	60	36.0	51.5	578.5	403.3	0.82	0.37
115.49	5.86	41.0	60	64.0	35.5	429.7	416.4	0.80	0.35
117.91	5.35	52.8	60	68.0	43.2	280.8	417.0	0.78	0.36
120.05	5.75	30.5	60	74.0	14.4	302.0	417.5	0.77	0.37
121.99	5.77	24.6	60	72.0	12.2	231.8	418.2	0.76	0.37
123.91	6.13	36.6	60	54.0	42.3	229.7	418.0	0.78	0.36
125.89	6.11	33.8	60	54.0	38.6	331.8	417.5	0.77	0.38
127.49	5.71	64.8	60	62.0	65.7	721.1	416.7	0.78	0.37
129.91	5.59	35.3	60	66.0	28.2	450.9	416.5	0.80	0.30
131.91	5.62	31.6	60	68.0	21.9	344.6	416.4	0.79	0.35
134.04	5.77	32.2	60	72.0	18.1	257.4	417.4	0.77	0.36
136.07	5.85	21.0	60	58.0	22.5	289.3	418.3	0.71	0.39
137.89	5.94	28.1	60	56.0	30.2	231.8	417.4	0.76	0.38
139.90	5.90	52.6	60	56.0	54.9	204.2	415.9	0.75	0.40
141.90	5.84	46.7	60	62.0	40.1	204.2	412.7	0.75	0.38
144.00	5.76	28.2	60	58.0	30.4	459.4	416.7	0.78	0.35
145.94	5.57	42.4	60	44.0	56.5	533.9	417.0	0.77	0.33

Table D-3. Continued.

Train 2 – Fermentor 2									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
147.49	5.57	53.8	60	72.0	43.1	329.7	417.0	0.78	0.40
149.93	5.84	61.6	60	62.0	72.6	308.4	429.7	0.77	0.35
152.15	5.54	31.4	60	48.0	27.9	272.3	404.0	0.75	0.37
153.90	5.70	35.3	60	62.0	34.1	342.4	418.7	0.77	0.38
155.90	5.59	45.7	60	38.0	66.3	457.3	416.5	0.79	0.35
158.00	5.58	39.0	60	61.0	31.9	323.3	413.2	0.77	0.38
159.92	5.66	43.5	60	48.0	34.4	268.0	396.2	0.77	0.39
162.06	5.67	25.2	60	62.0	20.3	270.1	415.9	0.77	0.39
164.05	5.66	35.1	60	70.0	22.3	265.9	416.8	0.72	0.42
166.08	5.70	31.8	60	64.0	23.5	238.2	414.3	0.73	0.38
168.07	5.68	49.5	60	58.0	46.2	263.7	413.4	0.72	0.39
170.00	5.68	19.2	60	72.0	7.9	253.1	418.2	0.76	0.35
171.92	5.90	34.0	60	60.0	33.0	231.8	417.9	0.74	0.37
173.93	5.94	33.3	60	70.0	24.5	238.2	419.3	0.73	0.35
176.10	5.76	47.9	60	60.0	47.0	316.9	417.5	0.72	0.41
178.09	5.65	51.9	60	114.0	51.2	493.5	412.4	0.73	0.39

Table D-4. Transfer data for Train 3 Fermentor 1.

Train 3 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00	6.09	12.0	133	133.0	63.8	246.7	513.8	0.99			
2.12	5.71	12.0	78	68.1	71.3	1131.6	456.4	0.98	0.46		
4.01	5.91	12.0	90	47.2	37.7	523.2	401.9	0.98	0.50		
6.14	5.76	12.0	164	65.1	34.3	455.2	417.4	0.97	0.47		
7.89	5.36	12.0	218	117.5	50.5	295.7	485.0	0.97	0.45	13.94	19.24
9.89	5.37	12.0	160	192.6	33.9	355.2	543.5	0.96	0.47	15.03	20.71
12.04	5.40	12.0	139	141.0	26.1	325.4	484.1	0.96	0.47	17.52	23.97
14.00	5.34	12.0	130	130.8	19.6	287.1	467.4	0.95	0.43	17.58	23.62
16.13	5.28	12.0	114	118.0	20.7	357.3	455.7	0.94	0.48	17.73	23.23
18.04	5.39	12.0	110	98.1	25.3	370.1	440.4	0.94	0.46	19.02	24.36
20.10	5.20	12.0	104	99.8	20.0	450.9	436.8	0.93	0.44	0.00	0.00
21.89	5.32	12.0	90	66.3	52.3	427.5	435.6	0.94	0.46	0.00	0.00
23.90	5.44	12.0	102	49.2	51.0	380.7	417.2	0.93	0.44	16.57	20.53
26.00	5.32	12.0	95	70.9	39.7	404.1	427.6	0.93	0.43	17.73	22.16
27.98	5.55	12.0	92	55.6	51.9	276.5	424.5	0.94	0.43	18.17	23.37
29.85	5.68	12.0	108	20.5	82.1	331.8	419.6	0.93	0.35	20.13	26.46
31.98	5.75	12.0	110	70.0	45.9	316.9	432.9	0.95	0.45	23.50	31.14
34.03	5.62	12.0	113	57.1	59.6	412.6	433.8	0.95	0.39	19.46	26.18
35.89	5.74	12.0	112	44.1	80.3	374.4	441.4	0.95	0.45	25.50	34.91
38.16	5.70	12.0	89	53.4	65.6	351.0	436.0	0.95	0.46	29.27	40.18
40.11	5.64	12.0	152	93.0	35.3	295.7	415.3	0.94	0.42	27.80	37.93
42.06	5.49	12.0	82	79.7	55.3	319.1	452.0	0.95	0.48	26.41	35.92
44.12	5.65	12.0	86	45.9	48.0	219.1	410.9	0.94	0.44	23.58	31.77
45.87	5.63	12.0	108	37.1	58.2	214.8	412.3	0.94	0.45	25.37	33.88
47.89	5.57	12.0	114	55.2	64.1	291.4	436.3	0.94	0.48	27.25	36.19
50.04	5.52	12.0	110	68.9	54.0	355.2	439.9	0.93	0.46	25.06	33.49
51.89	5.51	12.0	100	62.5	54.1	323.3	433.6	0.93	0.49	24.90	33.23
54.02	5.49	12.0	146	60.3	45.7	333.9	423.0	0.93	0.48	23.29	30.87
56.08	5.75	12.0	96	77.3	78.3	214.8	472.6	0.93	0.46	0.00	0.00
58.23	5.59	12.0	41	53.5	51.6	295.7	422.1	0.92	0.40	25.04	32.86
60.28	5.66	12.0	90	0.0	52.8	229.7	369.4	0.93	0.46	0.00	0.00
62.00	5.56	12.0	96	47.5	52.3	448.8	416.8	0.93	0.45	25.13	32.70
63.92	5.64	12.0	117	66.4	69.4	185.0	452.8	0.93	0.44	23.88	31.05
65.90	5.62	12.0	110	92.4	69.9	255.2	479.3	0.93	0.44	24.95	32.13
67.97	5.63	12.0	90	101.4	60.1	231.8	478.5	0.92	0.51	25.78	33.17
69.96	5.68	12.0	96	49.9	96.5	244.6	463.4	0.94	0.45	24.96	31.76
71.98	6.01	12.0	141	38.3	68.5	208.4	423.8	0.94	0.47	28.67	37.75

Table D-4. Continued.

Train 3 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
73.95	5.72	12.0	128	79.2	73.8	212.7	470.0	0.94	0.40	26.36	33.96
76.00	5.53	12.0	114	83.1	56.8	244.6	456.9	0.94	0.41	24.70	31.54
77.89	5.60	12.0	85	71.3	53.9	248.9	442.2	0.94	0.49	23.43	29.85
79.89	5.63	12.0	102	22.0	74.9	227.6	413.9	0.94	0.43	27.82	35.26
81.96	5.71	12.0	72	41.4	71.8	210.6	430.2	0.93	0.47	27.43	34.64
83.89	5.87	12.0	76	22.7	61.1	225.5	400.8	0.93	0.45	25.94	32.40
85.98	5.84	12.0	80	21.7	64.5	210.6	403.2	0.94	0.45	25.66	31.93
87.47	5.81	12.0	78	0.0	77.5	223.3	389.9	0.94	0.45	29.15	37.15
89.95	5.84	12.0	78	45.1	57.7	261.6	419.8	0.94	0.47	26.13	32.56
92.05	6.13	12.0	66	36.9	58.3	238.2	412.2	0.95	0.50	27.37	34.57
94.06	6.83	12.0	84	8.1	69.9	448.8	395.0	0.95	0.38	30.33	39.26
95.92	5.95	12.0	76	23.1	72.2	265.9	412.3	0.95	0.49	30.94	39.91
97.90	6.12	12.0	78	27.3	58.5	227.6	402.8	0.95	0.46	28.81	36.60
99.90	5.95	12.0	64	22.8	64.4	191.4	404.2	0.95	0.45	31.33	40.03
101.47	5.86	12.0	82	0.0	7.6	255.2	321.2	0.95	0.45	28.24	35.80
103.90	5.81	12.0	76	46.5	137.1	210.6	500.6	0.95	0.48	28.43	36.21
106.05	5.93	12.0	72	21.7	66.6	223.3	405.3	0.96	0.40	28.20	35.85
108.07	5.98	12.0	56	16.9	62.5	214.8	396.4	0.96	0.50	28.51	36.18
109.47	5.99	12.0	76	0.0	69.5	242.5	384.7	0.96	0.45	28.17	35.53
111.96	5.68	12.0	24	4.7	81.0	238.2	402.7	0.96	0.47	28.51	36.30
113.91	5.64	12.0	48	15.5	105.0	312.7	437.5	0.95	0.38	27.62	34.72
115.47	5.91	12.0	86	0.0	78.9	255.2	375.4	0.96	0.43	27.54	34.63
117.91	5.39	12.0	60	28.6	70.5	263.7	416.1	0.96	0.38	27.86	35.25
120.05	5.76	12.0	86	15.0	55.8	276.5	387.8	0.96	0.50	28.65	36.08
121.99	5.77	12.0	84	35.1	62.3	248.9	414.4	0.95	0.46	28.85	36.21
123.91	6.00	12.0	94	21.6	73.0	229.7	411.6	0.95	0.47	24.28	30.48
125.90	5.90	12.0	88	33.2	62.9	178.7	423.1	0.95	0.46	28.55	35.69
127.90	6.02	12.0	78	46.7	61.4	202.1	425.1	0.95	0.48	27.09	34.07
129.90	5.86	12.0	58	12.0	76.0	240.4	405.0	0.95	0.47	29.36	36.92
131.91	5.91	12.0	92	5.8	62.8	257.4	385.6	0.95	0.47	28.61	36.04
134.04	5.96	12.0	80	39.6	62.5	219.1	419.1	0.96	0.50	25.68	32.35
136.06	5.96	12.0	98	33.1	57.7	238.2	407.8	0.95	0.48	28.98	36.38
137.89	5.92	12.0	76	39.2	70.1	191.4	426.3	0.95	0.46	32.31	40.40
139.89	5.87	12.0	80	18.1	69.3	197.8	404.4	0.95	0.45	25.27	31.47
141.89	5.98	12.0	80	18.0	67.9	163.8	402.9	0.95	0.44	23.69	29.44
144.00	5.91	12.0	96	29.3	60.5	210.6	406.8	0.95	0.48	28.92	35.95
145.94	5.89	12.0	88	38.4	65.7	221.2	421.1	0.95	0.47	26.49	32.81

Table D-4. Continued.

Train 3 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
147.89	5.84	12.0	78	34.8	64.0	189.3	415.8	0.95	0.45	26.50	32.75
149.93	6.21	12.0	88	32.4	71.1	240.4	420.5	0.95	0.48	25.72	31.98
152.15	5.67	12.0	86	19.1	63.3	255.2	399.4	0.95	0.43	29.59	36.78
153.90	5.81	12.0	90	25.6	73.0	214.8	415.6	0.95	0.39	22.00	27.26
155.90	5.80	12.0	86	42.8	57.3	172.3	417.1	0.95	0.49	25.47	31.44
157.99	5.90	12.0	72	28.9	81.4	195.7	427.3	0.96	0.43	29.67	36.63
159.47	5.86	12.0	84	0.0	69.5	214.8	384.4	0.95	0.46	26.53	32.40
162.05	5.87	12.0	56	32.1	59.9	202.1	409.0	0.96	0.50	28.49	35.06
164.04	5.84	12.0	80	21.8	45.4	187.2	384.2	0.95	0.49	27.81	34.06
166.08	5.83	12.0	84	22.8	68.6	174.4	408.4	0.95	0.40	21.36	25.99
168.07	5.87	12.0	76	23.8	68.9	189.3	409.7	0.95	0.42	27.03	32.95
169.99	5.84	12.0	90	19.5	68.1	191.4	404.6	0.95	0.49	26.90	32.75
171.92	5.84	12.0	80	36.5	64.7	134.0	418.2	0.95	0.46	27.59	33.56
173.93	5.80	12.0	84	34.5	56.1	187.2	407.6	0.95	0.40	28.95	35.15
176.09	5.85	12.0	112	25.4	69.3	206.3	411.7	0.95	0.41	28.38	34.45
178.08	5.80	12.0	154	45.3	72.8	270.1	435.1	0.95	0.48	32.36	39.24

Table D-5. Transfer data for Train 3 Fermentor 2.

Train 3 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	6.23	63.8	113	133.0	115	370.1	510.3
2.12	7.46	71.3	90	78.0	105	306.3	439.3
4.01	6.28	37.7	100	90.0	33	750.8	413.2
6.14	5.59	34.3	172	164.0	0	1057.1	430.9
7.89	5.51	50.5	130	218.0	0	359.5	473.8
9.89	5.60	33.9	110	160.0	0	353.1	432.2
12.04	5.54	26.1	112	139.0	0	408.4	412.6
14.00	5.47	19.6	88	130.0	0	246.7	414.1
16.13	5.51	20.7	98	114.0	0	274.4	395.3
18.04	5.68	25.3	90	110.0	0	223.3	396.1
20.10	5.50	20.0	84	104.0	0	440.3	399.1
21.89	5.73	52.3	96	90.0	32	372.2	398.0
23.90	5.83	51.0	96	102.0	41	512.6	418.8
26.00	6.15	39.7	88	95.0	33	676.4	417.7
27.98	6.18	51.9	101	92.0	43	423.3	413.0
29.85	6.34	82.1	98	108.0	78	410.5	430.6
31.98	5.96	45.9	105	110.0	31	533.9	421.9
34.03	5.66	59.6	105	113.0	50	374.4	431.7
35.89	5.65	80.3	90	112.0	77	280.8	436.0
38.16	5.68	65.6	90	89.0	63	225.5	414.2
40.11	5.68	35.3	105	152.0	2	255.2	416.2
42.06	5.57	55.3	66	82.0	48	236.1	404.2
44.12	5.57	48.0	100	86.0	28	246.7	393.6
45.87	5.53	58.2	108	108.0	46	289.3	425.0
47.89	5.49	64.1	95	114.0	54	265.9	432.1
50.04	5.50	54.0	86	110.0	37	231.8	423.7
51.89	5.53	54.1	132	100.0	38	229.7	415.1
54.02	5.51	45.7	73	146.0	25	197.8	454.2
56.08	5.56	78.3	20	96.0	60	180.8	405.3
58.23	5.43	51.6	87	41.0	26	248.9	346.9
60.28	5.48	52.8	81	90.0	51	187.2	415.5
62.00	5.50	52.3	95	96.0	34	208.4	405.5
63.92	5.59	69.4	87	117.0	71	157.4	451.1
65.90	5.65	69.9	87	110.0	74	176.5	442.0
67.97	5.70	60.1	83	90.0	78	119.1	437.5
69.96	5.52	96.5	123	96.0	84	102.1	412.2
71.98	5.69	68.5	113	141.0	46	202.1	448.7

Table D-5. Continued.

Train 3 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.95	5.56	73.8	109	128.0	55	212.7	438.2
76.00	5.46	56.8	87	114.0	52	172.3	437.1
77.89	5.49	53.9	97	85.0	50	153.1	412.5
79.89	5.46	74.9	87	102.0	69	140.4	423.2
81.96	5.48	71.8	88	72.0	85	53.2	414.3
83.89	5.67	61.1	82	76.0	76	157.4	419.7
85.98	5.76	64.5	102	80.0	63	144.6	407.4
87.47	5.83	77.5	90	78.0	97	227.6	425.6
89.95	6.99	57.7	80	78.0	62	357.3	411.0
92.05	6.98	58.3	88	66.0	68	257.4	405.5
94.06	5.98	69.9	90	84.0	73	285.0	416.0
95.92	5.71	72.2	94	76.0	86	187.2	416.8
97.90	5.77	58.5	80	78.0	72	153.1	418.0
99.90	5.79	64.4	100	64.0	77	74.4	405.2
101.47	5.52	7.6	92	82.0	23	189.3	426.6
103.90	5.65	137.1	72	76.0	154	210.6	420.2
106.05	5.96	66.6	88	72.0	61	185.0	396.0
108.07	5.97	62.5	80	56.0	71	229.7	393.5
109.47	5.82	69.5	46	76.0	90	314.8	425.7
111.96	5.49	81.0	62	24.0	100	227.6	370.6
113.91	5.51	105.0	106	48.0	95	83.0	366.1
115.47	5.78	78.9	70	86.0	93	193.6	429.2
117.91	5.21	70.5	98	60.0	77	199.9	395.1
120.05	5.66	55.8	100	86.0	66	172.3	424.7
121.99	5.64	62.3	104	84.0	77	159.5	427.4
123.91	6.03	73.0	94	94.0	79	189.3	428.5
125.90	5.76	62.9	84	88.0	62	236.1	415.6
127.90	5.76	61.4	62	78.0	63	161.7	407.9
129.90	5.67	76.0	102	58.0	78	172.3	388.7
131.91	5.76	62.8	84	92.0	68	191.4	425.2
134.04	5.80	62.5	104	80.0	65	178.7	411.2
136.06	5.80	57.7	84	98.0	63	193.6	431.4
137.89	5.77	70.1	92	76.0	78	168.0	412.3
139.89	5.71	69.3	82	80.0	78	272.3	417.0
141.89	5.63	67.9	98	80.0	63	157.4	403.5
144.00	5.73	60.5	94	96.0	63	163.8	424.9
145.94	5.69	65.7	94	88.0	68	204.2	419.3

Table D-5. Continued.

Train 3 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
147.89	5.66	64.0	88	78.0	77	193.6	419.8
149.93	6.05	71.1	106	88.0	85	225.5	428.6
152.15	5.52	63.3	94	86.0	67	197.8	419.7
153.90	5.62	73.0	96	90.0	78	180.8	422.4
155.90	5.72	57.3	74	86.0	66	138.3	422.5
157.99	5.75	81.4	104	72.0	100	202.1	416.7
159.47	5.73	69.5	68	84.0	76	178.7	417.6
162.05	5.79	59.9	102	56.0	70	134.0	395.1
164.04	5.73	45.4	106	80.0	67	172.3	431.0
166.08	5.67	68.6	90	84.0	90	180.8	433.1
168.07	5.69	68.9	88	76.0	80	225.5	415.3
169.99	5.62	68.1	76	90.0	64	223.3	413.8
171.92	5.68	64.7	80	80.0	61	225.5	403.6
173.93	5.62	56.1	116	84.0	51	278.6	407.3
176.09	5.55	69.3	130	112.0	71	336.1	443.3
178.08	5.56	72.8	138	154.0	72	327.6	452.1

Table D-6. Transfer data for Train 3 Fermentor 3.

Train 3 – Fermentor 3									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00	8.11	114.5	90	113.0	191.6	159.5	516.6	0.86	0.31
2.12	7.22	105.4	90	90.0	110.5	236.1	420.1	0.83	0.38
4.01	6.71	32.5	90	100.0	21.9	497.7	417.4	0.85	0.38
6.14	5.62	0.0	90	172.0	0.0	1114.5	417.1	0.85	0.36
7.89	5.66	0.0	90	130.0	0.0	472.2	337.4	0.85	0.36
9.89	5.48	0.0	90	110.0	0.0	1244.3	300.6	0.85	0.36
12.04	5.43	0.0	90	112.0	0.0	1001.8	283.8	0.85	0.37
14.00	5.85	0.0	90	88.0	0.0	174.4	261.5	0.85	0.37
16.13	7.26	0.0	90	98.0	0.0	108.5	269.0	0.85	0.36
18.04	7.53	0.0	90	90.0	0.0	65.9	265.6	0.85	0.36
20.10	7.46	0.0	90	84.0	0.0	148.9	266.1	0.85	0.36
21.89	8.39	31.5	90	96.0	0.0	95.7	275.8	0.85	0.36
23.90	7.82	40.5	90	96.0	0.0	153.1	305.8	0.85	0.36
26.00	7.02	33.4	90	88.0	0.0	174.4	343.4	0.85	0.36
27.98	7.03	43.3	90	101.0	0.0	151.0	378.4	0.85	0.36
29.85	6.98	78.0	90	98.0	63.8	331.8	409.8	0.64	0.48
31.98	6.07	31.4	90	105.0	10.9	842.3	414.3	0.65	0.42
34.03	5.64	49.8	90	105.0	27.1	901.8	413.1	0.62	0.48
35.89	5.90	77.1	90	90.0	79.4	516.9	419.2	0.65	0.44
38.16	5.99	63.2	90	90.0	58.9	450.9	415.9	0.67	0.44
40.11	5.93	1.5	90	105.0	0.0	487.1	386.9	0.64	0.45
42.06	5.81	48.2	90	66.0	23.9	780.6	370.1	0.65	0.44
44.12	5.67	28.3	90	100.0	17.0	1325.1	415.3	0.67	0.45
45.87	5.75	46.3	90	108.0	29.2	667.9	417.6	0.66	0.44
47.89	5.85	54.2	90	95.0	45.3	559.4	415.9	0.68	0.39
50.04	5.91	37.3	90	86.0	35.8	512.6	416.2	0.69	0.36
51.89	5.96	38.4	90	132.0	1.1	557.3	420.8	0.67	0.41
54.02	5.55	25.4	90	73.0	36.0	887.0	414.6	0.69	0.37
56.08	5.74	59.9	90	20.0	39.9	474.3	329.1	0.65	0.39
58.23	5.96	25.5	90	87.0	22.6	380.7	416.3	0.65	0.39
60.28	6.17	50.5	90	81.0	57.8	574.8	417.3	0.68	0.38
62.00	6.79	33.9	90	95.0	25.8	579.2	416.7	0.62	0.47
63.92	6.63	70.9	90	87.0	72.8	502.3	418.0	0.66	0.42
65.90	6.69	73.8	90	87.0	71.4	509.3	415.1	0.68	0.39
67.97	6.55	77.9	90	83.0	78.4	714.7	415.1	0.71	0.35
69.96	5.48	84.4	90	123.0	53.9	519.0	425.0	0.71	0.38
71.98	5.71	45.6	90	113.0	23.0	402.0	419.2	0.67	0.42

Table D-6. Continued.

Train 3 – Fermentor 3									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
73.95	5.72	54.8	90	109.0	29.1	278.6	414.5	0.64	0.42
76.00	5.58	52.4	90	87.0	53.2	202.1	417.9	0.64	0.42
77.89	5.67	49.6	90	97.0	40.3	231.8	416.7	0.67	0.39
79.89	5.80	68.5	90	87.0	66.6	378.6	416.2	0.69	0.36
81.96	5.97	85.4	90	88.0	85.8	276.5	416.9	0.73	0.33
83.89	6.19	75.7	90	82.0	79.9	351.0	413.2	0.70	0.36
85.98	6.10	62.9	90	102.0	49.6	259.5	414.2	0.76	0.32
87.47	7.33	96.9	90	90.0	96.7	305.2	418.1	0.74	0.36
89.95	7.30	62.2	90	80.0	71.8	299.9	416.5	0.78	0.35
92.05	5.92	68.4	90	88.0	69.7	589.2	416.8	0.78	0.36
94.06	5.72	73.4	90	90.0	71.6	410.5	416.1	0.78	0.37
95.92	5.76	86.0	90	94.0	81.0	282.9	416.9	0.78	0.34
97.90	5.97	71.8	90	80.0	79.8	234.0	416.0	0.79	0.34
99.90	5.93	77.0	90	100.0	64.6	144.6	416.3	0.80	0.32
101.47	5.67	23.3	90	92.0	20.0	189.3	417.3	0.81	0.30
103.90	7.40	153.5	90	72.0	172.4	155.3	418.2	0.80	0.36
106.05	7.07	61.0	90	88.0	60.8	204.2	417.7	0.79	0.35
108.07	5.87	71.2	90	80.0	74.0	576.4	412.1	0.80	0.36
109.47	5.80	90.4	90	46.0	134.1	390.3	417.2	0.82	0.34
111.96	5.60	100.2	90	62.0	125.0	483.4	415.2	0.83	0.35
113.91	5.60	94.6	90	106.0	79.0	242.5	416.7	0.81	0.36
115.47	5.86	93.0	90	70.0	110.6	362.9	415.0	0.80	0.36
117.91	5.38	77.0	90	98.0	67.8	185.0	417.4	0.81	0.34
120.05	5.81	66.2	90	100.0	55.8	223.3	418.1	0.79	0.38
121.99	6.79	76.7	90	104.0	63.4	289.3	418.8	0.77	0.37
123.91	5.97	79.0	90	94.0	74.7	814.6	417.3	0.79	0.37
125.90	5.73	62.0	90	84.0	66.4	482.8	415.8	0.78	0.37
127.90	5.90	63.0	90	62.0	56.0	333.9	384.1	0.80	0.36
129.90	6.08	78.4	90	102.0	65.8	408.4	417.5	0.76	0.39
131.91	5.96	67.8	90	84.0	71.9	371.2	415.9	0.77	0.38
134.04	5.75	65.2	90	104.0	50.3	536.0	417.6	0.78	0.37
136.06	5.81	62.5	90	84.0	66.7	536.0	418.2	0.78	0.38
137.89	5.87	77.5	90	92.0	74.8	423.3	417.6	0.78	0.41
139.89	5.81	77.7	90	82.0	84.4	297.8	416.9	0.79	0.38
141.89	6.29	62.9	90	98.0	47.8	185.0	411.7	0.80	0.36
144.00	5.71	62.7	90	94.0	59.7	529.6	417.3	0.79	0.38
145.94	5.68	68.4	90	94.0	62.3	601.9	416.7	0.76	0.39

Table D-6. Continued.

Train 3 – Fermentor 3									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
147.89	5.57	77.1	90	88.0	75.5	359.5	414.7	0.77	0.40
149.93	6.09	84.9	90	106.0	83.1	248.9	431.0	0.76	0.41
152.15	5.43	67.2	90	94.0	48.5	259.5	403.9	0.77	0.36
153.90	5.74	78.0	90	96.0	71.4	265.9	416.8	0.77	0.36
155.90	5.74	65.9	90	74.0	80.8	382.9	417.6	0.77	0.39
157.99	5.82	99.7	90	104.0	101.1	482.8	431.7	0.77	0.39
159.47	5.77	75.8	90	68.0	83.2	432.8	402.9	0.80	0.39
162.05	5.75	70.3	90	102.0	55.4	559.4	416.3	0.78	0.39
164.04	5.66	66.7	90	106.0	49.0	587.1	417.5	0.77	0.40
166.08	5.66	90.4	90	90.0	85.8	504.1	414.4	0.78	0.38
168.07	5.74	79.6	90	88.0	79.1	457.3	415.2	0.79	0.35
169.99	5.71	63.7	90	76.0	76.6	425.4	417.5	0.80	0.37
171.92	5.73	60.7	90	80.0	70.2	633.8	417.7	0.80	0.38
173.93	5.54	51.1	90	116.0	21.6	778.5	416.3	0.80	0.37
176.09	5.50	71.3	90	130.0	29.4	665.8	417.5	0.77	0.36
178.08	5.57	72.1	90	138.0	47.7	616.8	411.7	0.73	0.42

Table D-7. Transfer data for Train 4 Fermentor 1.

Train 4 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00	5.51	16.0	160	211.5	9.4	255.2	503.9	0.98	0.47		
2.13	6.12	16.0	90	110.8	61.8	446.7	455.6	0.98	0.35		
4.00	6.24	16.0	175	48.3	53.2	506.2	384.5	0.98	0.51		
6.17	5.77	16.0	175	103.0	86.9	1042.2	473.9	0.98	0.43		
7.89	5.46	16.0	244	134.3	55.4	463.7	472.7	0.96	0.47	18.75	24.75
9.89	5.44	16.0	276	181.2	72.2	376.5	536.4	0.98	0.43	16.82	22.20
12.04	5.48	16.0	188	228.1	59.8	357.3	570.9	0.96	0.47	16.67	22.44
14.01	5.49	16.0	226	153.3	27.7	46.8	464.0	0.95	0.46	17.88	23.87
16.13	5.43	16.0	184	192.8	35.1	72.3	510.9	0.95	0.47	20.93	27.67
18.03	5.52	16.0	150	135.0	63.3	272.3	481.3	0.95	0.46	17.89	23.17
20.12	5.35	16.0	140	103.5	59.9	287.1	446.4	0.95	0.46	18.65	23.85
21.89	5.65	16.0	166	71.2	86.3	246.7	440.5	0.94	0.46	17.25	21.97
23.89	5.58	16.0	146	106.4	75.0	293.5	464.4	0.94	0.45	25.35	33.74
26.00	5.38	16.0	150	76.1	83.5	387.1	442.6	0.93	0.44	19.78	25.45
27.98	5.53	16.0	135	88.3	74.7	346.7	446.0	0.93	0.48	21.03	27.40
29.84	5.61	16.0	142	56.1	94.9	374.4	434.0	0.85	0.20	28.37	38.27
31.98	5.70	16.0	140	74.9	82.7	444.5	440.6	0.93	0.43	23.65	31.15
34.04	5.67	16.0	139	72.7	82.9	627.5	438.6	0.91	0.02	28.65	38.77
35.89	5.69	16.0	140	66.8	89.6	395.6	439.4	0.94	0.44	30.58	41.42
38.16	5.76	16.0	117	56.3	95.6	321.2	434.9	0.94	0.43	30.01	40.90
40.25	5.69	16.0	135	55.9	74.0	278.6	412.9	0.93	0.44	29.25	39.57
42.06	5.67	16.0	148	79.1	74.2	297.8	436.3	0.93	0.45	28.09	37.79
44.12	5.96	16.0	206	9.1	97.0	159.5	389.1	0.93	0.44	29.07	39.54
45.87	5.69	16.0	124	54.4	80.9	176.5	418.3	0.94	0.44	36.87	49.76
47.90	5.67	16.0	172	61.3	76.6	353.1	420.9	0.94	0.44	30.20	40.99
50.05		16.0	150	125.3	60.6	348.8	468.9	0.93	0.46	25.41	34.52
51.89	5.48	16.0	152	87.0	78.2	312.7	448.2	0.93	0.47	25.88	34.82
54.02	5.49	16.0	148	109.1	55.1	346.7	447.2	0.93	0.47	28.15	37.58
56.10	5.69	16.0	172	70.6	92.6	265.9	446.2	0.92	0.47	28.11	37.48
58.23	5.68	16.0	143	102.6	82.4	280.8	468.0	0.92	0.43	27.06	35.99
60.29	5.65	16.0	140	66.7	89.9	299.9	439.6	0.92	0.42	27.18	35.77
62.00	5.55	16.0	126	105.9	48.6	297.8	437.5	0.92	0.34	26.00	33.92
63.92	5.67	16.0	153	71.8	68.7	210.6	423.5	0.93	0.44	25.54	33.11
65.90	5.60	16.0	160	88.9	79.5	287.1	451.4	0.92	0.34	26.18	33.82
67.99	5.51	16.0	136	100.4	80.4	353.1	463.8	0.91	0.48	26.97	34.61
69.96	5.42	16.0	140	96.1	121.3	268.0	500.4	0.93	0.45	24.34	30.67
71.97	5.67	16.0	141	53.5	99.2	261.6	435.7	0.93	0.48	24.74	31.25

Table D-7. Continued.

Train 4 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
73.94	5.65	16.0	202	56.7	100.4	214.8	440.1	0.93	0.38	25.44	32.13
76.00	5.42	16.0	146	172.0	46.3	314.8	501.3	0.93	0.40	24.43	30.91
77.89	5.56	16.0	165	77.7	84.1	251.0	444.8	0.92	0.45	25.14	31.70
79.89	5.51	16.0	138	113.4	65.6	295.7	462.0	0.93	0.40	27.06	35.99
81.96	5.57	16.0	124	74.1	79.1	202.1	436.2	0.93	0.43	26.36	33.21
83.89	5.76	16.0	114	49.0	90.7	223.3	422.7	0.93	0.42	26.42	33.29
85.98	5.78	16.0	116	43.9	84.0	221.2	410.9	0.93	0.45	24.52	30.46
87.79	5.90	16.0	130	44.0	86.9	306.3	413.9	0.94	0.40	25.08	31.45
89.95	5.89	16.0	118	52.8	86.0	295.7	421.8	0.93	0.41	27.03	34.16
92.05	5.83	16.0	128	58.8	73.4	342.4	415.2	0.94	0.44	28.21	35.93
94.06	5.74	16.0	120	75.2	67.6	217.0	425.8	0.93	0.46	26.90	33.98
95.93	5.70	16.0	114	49.6	85.5	248.9	418.1	0.93	0.46	26.77	33.78
97.90	5.88	16.0	46	53.8	74.7	261.6	411.5	0.94	0.39	30.24	40.14
99.46		16.0	124	0.0	61.3	36.2	344.3	0.94	0.43	30.26	40.08
101.91	6.13	16.0	140	48.3	90.3	42.5	421.6	0.94	0.36	31.14	41.42
103.90	5.99	16.0	132	63.9	89.3	53.2	436.2	0.95	0.47	29.20	38.95
106.05	6.16	16.0	84	56.4	90.5	357.3	429.9	0.95	0.42	30.28	40.48
108.06	6.01	16.0	84	11.3	82.9	199.9	377.2	0.95	0.46	29.73	39.55
109.92	5.99	16.0	108	16.1	82.3	78.7	381.4	0.95	0.45	30.82	40.33
111.46	5.58	16.0	110	29.6	92.7	114.9	405.3	0.95	0.45	30.42	39.76
113.92	5.56	16.0	74	33.8	90.8	65.9	407.6	0.95	0.48	30.41	39.71
115.90	5.88	16.0	124	14.6	74.5	185.0	372.1	0.95	0.47	31.59	41.53
117.91	5.40	16.0	124	61.9	77.5	31.9	422.4	0.95	0.43	31.80	41.83
120.04	5.87	16.0	114	54.5	85.6	125.5	423.1	0.95	0.48	30.62	39.99
121.99	5.89	16.0	104	50.6	77.0	208.4	410.6	0.95	0.52	30.06	39.14
123.91	6.08	16.0	96	17.7	100.9	219.1	401.6	0.94	0.44	28.04	36.33
125.90	6.02	16.0	106	21.8	89.3	189.3	394.1	0.94	0.48	30.35	39.44
127.90	6.05	16.0	96	30.2	87.7	61.7	400.9	0.95	0.38	30.15	39.17
129.90	6.06	16.0	100	40.5	70.0	0.0	393.5	0.95	0.42	30.57	39.68
131.91	5.96	16.0	92	37.5	78.5	80.8	399.0	0.95	0.43	30.07	38.92
134.03	6.14	16.0	100	35.3	74.8	74.4	393.1	0.95	0.51	30.71	39.66
136.06	6.12	16.0	94	34.3	81.8	110.6	399.1	0.95	0.45	30.34	39.12
137.90	6.01	16.0	98	32.0	79.0	44.7	394.0	0.95	0.47	30.62	39.44
139.90	5.90	16.0	108	37.3	77.3	42.5	397.6	0.95	0.41	30.51	39.28
141.89	5.99	16.0	106	43.8	74.1	38.3	400.9	0.95	0.46	30.57	39.36
144.00	6.10	16.0	82	32.7	86.8	114.9	402.5	0.95	0.41	30.76	39.75
145.95	5.79	16.0	88	20.3	77.1	246.7	380.4	0.95	0.36	31.75	41.15

Table D-7. Continued.

Train 4 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
147.91	5.88	16.0	64	40.0	96.6	10.6	419.6	0.95	0.49	27.26	35.42
149.93	6.32	16.0	120	14.8	77.7	210.6	375.5	0.95	0.30	28.11	36.41
152.14	5.70	16.0	104	64.4	55.9	255.2	403.3	0.95	0.41	30.47	39.58
153.91	5.84	16.0	126	15.2	104.1	255.2	402.3	0.94	0.54	30.18	39.11
155.90	5.77	16.0	108	54.0	83.6	197.8	420.6	0.95	0.49	31.83	41.25
157.99	5.81	16.0	102	53.3	84.5	80.8	420.8	0.95	0.49	31.98	41.48
159.92	5.82	16.0	128	22.4	79.5	182.9	384.9	0.95	0.49	32.69	42.22
162.05	5.85	16.0	110	79.1	64.1	231.8	426.2	0.95	0.50	31.69	40.83
164.04	5.84	16.0	86	48.5	76.7	280.8	408.2	0.95	0.50	31.99	41.18
166.08	5.79	16.0	128	18.4	83.3	238.2	384.7	0.94	0.49	32.92	42.35
168.08	5.92	16.0	102	36.4	104.1	227.6	423.5	0.94	0.52	30.67	39.47
169.99	5.76	16.0	96	33.5	84.2	195.7	400.7	0.95	0.50	31.48	40.09
171.92	5.82	16.0	108	40.0	73.0	210.6	396.0	0.95	0.46	32.46	41.06
173.93	5.75	16.0	98	55.4	68.4	182.9	406.8	0.95	0.48	32.94	41.43
176.09	5.90	16.0	90	51.8	62.3	189.3	397.1	0.95	0.49	31.92	40.08
178.08	6.03	16.0	85	13.1	87.2	204.2	383.3	0.93	0.42	33.10	41.43

Table D-8. Transfer data for Train 4 Fermentor 2.

Train 4 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	8.01	9.4	130	153.2	70	168.0	514.5
2.13	7.72	61.8	162	85.9	106	172.3	428.9
4.00	6.53	53.2	160	176.6	33	502.0	454.9
6.17	5.72	86.9	257	174.0	70	323.3	456.6
7.89	5.62	55.4	244	239.3	12	321.2	494.5
9.89	5.67	72.2	164	274.7	37	289.3	538.0
12.04	5.64	59.8	186	187.2	31	316.9	457.1
14.01	5.55	27.7	160	225.1	0	174.4	481.7
16.13	5.55	35.1	130	183.1	0	217.0	445.0
18.03	5.67	63.3	115	150.8	34	238.2	420.6
20.12	5.42	59.9	136	138.7	33	259.5	410.7
21.89	5.56	86.3	148	166.6	58	261.6	437.2
23.89	5.38	75.0	116	144.9	75	346.7	443.8
26.00	5.24	83.5	119	149.4	47	361.6	411.6
27.98	5.33	74.7	129	133.5	57	306.3	414.5
29.84	5.56	94.9	132	141.8	81	336.1	427.0
31.98	5.59	82.7	135	141.8	69	312.7	426.6
34.04	5.58	82.9	134	138.3	75	508.4	428.9
35.89	5.56	89.6	136	138.9	85	321.2	433.5
38.16	5.65	95.6	116	116.2	109	280.8	428.2
40.25	5.66	74.0	142	134.8	50	208.4	410.2
42.06	5.51	74.2	202	148.5	65	236.1	438.4
44.12	5.65	97.0	120	205.8	92	217.0	499.9
45.87	5.54	80.9	152	123.8	74	272.3	415.8
47.90	5.47	76.6	140	171.7	55	272.3	448.7
50.05		60.6	144	151.5	44	225.5	433.7
51.89	5.53	78.2	126	151.0	69	206.3	440.5
54.02	5.46	55.1	173	146.9	30	259.5	420.9
56.10	5.56	92.6	140	170.9	91	185.0	468.2
58.23	5.48	82.4	137	146.5	76	223.3	439.0
60.29	5.52	89.9	114	139.2	86	221.2	434.2
62.00	5.49	48.6	138	125.7	30	212.7	406.1
63.92	5.51	68.7	159	155.7	51	172.3	436.9
65.90	5.50	79.5	120	159.3	78	212.7	457.1
67.99	5.47	80.4	116	135.3	82	217.0	435.4
69.96	5.38	121.3	138	140.6	98	55.3	416.2
71.97	5.52	99.2	213	144.2	93	185.0	437.4

Table D-8. Continued.

Train 4 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.94	5.49	100.4	142	201.2	107	172.3	506.5
76.00	5.38	46.8	166	144.2	47	157.4	443.1
77.89	5.53	84.1	137	166.3	80	225.5	462.4
79.89	5.40	65.6	138	137.7	63	161.7	434.4
81.96	5.46	79.1	130	124.9	91	170.2	435.9
83.89	5.56	90.7	142	113.0	109	151.0	430.6
85.98	5.55	84.0	138	116.0	109	140.4	439.6
87.79	5.54	86.9	142	129.8	91	168.0	432.9
89.95	5.49	86.0	136	117.0	112	176.5	441.5
92.05	5.60	73.4	128	127.7	79	138.3	432.1
94.06	5.63	67.6	142	119.7	77	151.0	427.7
95.93	5.64	85.5	74	113.9	112	151.0	439.8
97.90	5.69	74.7	126	45.1	103	142.5	372.4
99.46	5.68	61.3	164	124.0	60	131.9	421.7
101.91	5.72	90.3	166	137.8	114	170.2	460.5
103.90	5.63	89.3	94	131.4	120	165.9	461.1
106.05	6.24	90.5	96	83.9	98	372.2	390.2
108.06	5.87	82.9	126	82.8	90	210.6	389.3
109.92	5.69	82.3	134	107.1	101	246.7	425.2
111.46	5.39	92.7	88	109.0	116	127.6	430.9
113.92	5.39	90.8	134	72.5	105	138.3	385.4
115.90	5.67	74.5	142	122.9	85	100.0	432.2
117.91	5.26	77.5	128	124.2	94	127.6	439.7
120.04	5.82	85.6	118	112.8	99	134.0	424.7
121.99	5.87	77.0	122	103.5	92	202.1	417.2
123.91	6.00	100.9	122	95.2	128	159.5	421.0
125.90	5.68	89.3	98	104.6	104	159.5	418.3
127.90	5.73	87.7	108	94.7	89	134.0	395.4
129.90	5.77	70.0	112	99.7	77	100.0	405.5
131.91	5.67	78.5	114	91.8	98	151.0	409.9
134.03	5.84	74.8	126	100.7	87	114.9	411.9
136.06	5.88	81.8	134	94.9	112	159.5	423.7
137.90	5.63	79.0	128	98.0	115	157.4	432.8
139.90	5.72	77.3	128	107.3	97	95.7	426.1
141.89	5.57	74.1	94	104.0	92	95.7	420.5
144.00	5.80	86.8	98	82.3	98	97.8	392.5
145.95	5.63	77.1	100	88.1	87	146.8	397.4

Table D-8. Continued.

Train 4 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
147.91	5.78	96.6	122	62.3	134	85.1	398.2
149.93	5.96	77.7	112	118.9	95	178.7	434.7
152.14	5.53	55.9	142	104.1	47	180.8	393.8
153.91	5.53	104.1	120	124.5	121	176.5	440.7
155.90	5.64	83.6	96	107.8	94	159.5	417.5
157.99	5.62	84.5	156	99.5	95	199.9	409.2
159.92	5.62	79.5	108	127.8	91	140.4	438.6
162.05	5.63	64.1	106	109.6	61	127.6	405.6
164.04	5.60	76.7	152	86.0	96	121.2	403.8
166.08	5.50	83.3	112	126.6	107	127.6	448.8
168.08	5.73	104.1	118	101.7	116	125.5	412.7
169.99	5.70	84.2	122	95.7	105	123.4	415.1
171.92	5.74	73.0	107	107.3	86	127.6	419.4
173.93	5.64	68.4	94	96.9	79	72.3	406.2
176.09	5.64	62.3	116	90.0	67	65.9	393.2
178.08	5.74	87.2	126	85.3	111	138.3	407.9

Table D-9. Transfer data for Train 4 Fermentor 3.

Train 4 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	6.10	69.7	157	128.0	164.5	1050.7	522.8
2.13	6.51	105.8	132	158.6	96.6	527.5	448.4
4.00	6.10	32.5	200	160.3	6.0	829.5	432.8
6.17	5.44	69.5	171	256.1	7.8	855.1	494.4
7.89	5.51	11.6	134	239.7	0.0	421.1	525.4
9.89	5.71	36.5	130	160.0	6.2	389.2	428.7
12.04	5.70	30.7	136	184.6	0.0	408.4	422.2
14.01	5.67	0.0	121	159.3	0.0	253.1	402.7
16.13	6.59	0.0	120	126.9	0.0	223.3	364.2
18.03	6.49	34.1	120	112.9	0.0	263.7	354.3
20.12	5.62	32.9	97	135.0	0.0	921.0	387.8
21.89	5.73	57.9	120	144.7	17.2	1463.4	403.0
23.89	5.81	74.9	120	114.6	70.8	1035.8	409.5
26.00	5.63	46.7	130	118.1	40.2	506.2	410.6
27.98	5.86	56.7	130	128.2	57.3	431.8	427.8
29.84	6.15	81.1	130	129.6	77.1	508.4	424.6
31.98	6.00	68.5	125	132.0	63.4	487.1	425.9
34.04	5.80	74.5	132	134.0	63.3	533.9	421.8
35.89	5.88	85.2	120	133.3	81.2	523.2	428.3
38.16	5.93	108.6	117	114.9	111.4	489.2	416.7
40.25	5.76	50.4	172	140.2	20.7	419.0	409.5
42.06	5.65	65.1	108	201.6	33.7	399.9	469.2
44.12	5.62	92.1	134	118.8	80.5	504.1	406.2
45.87	5.52	73.9	134	151.0	54.3	368.0	430.4
47.90	5.55	54.6	130	138.7	47.3	331.8	430.4
50.05	5.69	43.8	124	146.4	24.4	433.9	426.0
51.89	5.67	68.7	152	125.0	64.5	265.9	419.8
54.02	5.55	30.1	125	171.1	5.7	206.3	445.7
56.10	5.62	90.9	128	138.5	78.3	223.3	424.9
58.23	5.61	75.9	119	139.4	61.1	217.0	423.6
60.29	5.60	85.9	117	112.5	92.2	210.6	417.8
62.00	5.53	30.0	151	137.5	7.7	246.7	414.2
63.92	5.54	50.9	117	160.1	37.6	224.4	445.8
65.90	5.55	78.3	131	118.9	72.7	310.5	412.3
67.99	5.56	81.5	125	116.9	88.0	195.7	422.4
69.96	5.50	97.9	199	138.7	85.7	210.6	425.5
71.97	5.53	93.4	123	213.8	77.4	461.6	496.8

Table D-9. Continued.

Train 4 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.94	5.49	106.7	137	142.2	78.3	182.9	412.8
76.00	5.40	46.7	125	164.2	22.1	272.3	438.6
77.89	5.43	80.2	121	136.5	64.3	168.0	419.6
79.89	5.48	63.3	125	135.8	43.7	165.9	415.2
81.96	5.53	91.1	132	128.9	84.0	163.8	420.8
83.89	5.50	109.3	130	142.3	95.4	199.9	427.4
85.98	5.51	108.6	136	136.7	95.5	246.7	422.6
87.79	5.47	91.0	130	142.9	79.5	125.5	430.4
89.95	5.85	111.5	130	134.4	107.0	129.7	428.9
92.05	5.55	78.7	134	128.9	73.5	104.2	422.7
94.06	6.50	76.6	128	141.4	68.2	316.9	432.0
95.93	5.84	112.4	144	74.3	165.7	323.3	426.6
97.90	5.65	103.0	150	124.8	117.1	206.3	437.9
99.46	5.98	60.0	166	163.0	44.7	182.9	446.7
101.91	5.76	114.0	138	164.1	111.2	265.9	460.3
103.90	6.08	120.0	84	92.8	163.6	316.9	435.4
106.05	6.02	97.8	134	95.8	82.1	229.7	379.1
108.06	5.78	90.4	150	126.4	92.6	214.8	427.6
109.92	5.77	101.4	120	132.6	118.1	272.3	448.3
111.46	5.49	115.6	130	87.7	146.7	144.6	417.8
113.92	5.50	104.7	140	133.7	97.4	121.2	425.4
115.90	5.78	84.8	142	141.1	81.0	134.0	436.3
117.91	5.75	94.0	122	126.2	106.9	168.0	438.1
120.04	5.98	98.5	120	117.9	101.0	189.3	419.4
121.99	5.75	91.7	126	122.1	89.7	282.9	419.1
123.91	5.88	127.7	100	120.4	131.7	229.7	423.4
125.90	5.74	104.0	102	96.8	104.2	193.6	396.0
127.90	5.62	89.4	114	106.2	81.5	187.2	397.3
129.90	5.78	76.8	120	111.1	76.8	174.4	410.1
131.91	5.63	97.6	122	113.0	102.0	178.7	416.4
134.03	5.75	87.0	136	124.6	83.2	195.7	419.8
136.06	5.80	111.6	142	134.3	111.5	217.0	433.2
137.90	5.82	114.8	140	127.0	129.0	236.1	440.2
139.90	5.75	97.1	102	127.0	106.3	148.9	435.2
141.89	5.58	91.6	96	93.8	92.2	121.2	393.4
144.00	5.77	98.0	124	98.0	93.4	153.1	392.4
145.95	5.79	87.4	130	99.2	110.4	138.3	421.2

Table D-9. Continued.

Train 4 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
147.91	5.57	133.5	102	120.4	142.0	372.2	427.7
149.93	5.77	94.5	150	108.9	98.0	214.8	411.4
152.14	5.45	46.6	136	141.4	37.6	178.7	431.4
153.91	5.53	121.3	100	119.1	138.5	180.8	435.3
155.90	5.64	94.3	142	95.9	95.8	140.4	396.4
157.99	5.53	95.2	146	153.8	94.5	289.3	452.1
159.92	5.60	91.3	98	107.2	114.2	144.6	429.1
162.05	5.57	61.1	142	105.6	51.1	163.8	394.6
164.04	5.51	95.5	126	153.1	83.8	182.9	440.4
166.08	5.47	106.5	130	111.3	112.8	178.7	416.6
168.08	5.64	116.1	122	117.8	124.8	123.4	425.5
169.99	5.50	104.6	120	121.3	102.9	242.5	418.6
171.92	5.66	86.1	112	106.5	98.4	176.5	417.8
173.93	5.63	78.7	116	94.1	94.7	163.8	409.1
176.09	5.68	66.5	138	115.8	64.7	597.7	413.0
178.08	5.68	110.8	163	125.6	116.0	255.2	429.8

Table D-10. Transfer data for Train 4 Fermentor 4.

Train 4 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00	6.70	164.5	121	156.9	220.6	487.1	513.0	0.85	0.34
2.13	6.17	96.6	121	135.5	82.3	859.3	420.2	0.84	0.36
4.00	5.91	6.0	121	197.1	0.0	793.4	418.5	0.85	0.35
6.17	5.67	7.8	121	171.6	0.0	899.7	349.1	0.85	0.35
7.89	5.82	0.0	121	131.8	0.0	289.3	306.2	0.85	0.35
9.89	6.06	6.2	121	125.5	0.0	285.0	293.6	0.85	0.35
12.04	6.09	0.0	121	138.0	0.0	302.0	293.9	0.85	0.35
14.01	6.44	0.0	121	123.7	0.0	251.0	277.5	0.85	0.35
16.13	8.13	0.0	121	119.1	0.0	53.2	275.9	0.85	0.35
18.03	8.14	0.0	121	117.2	0.0	70.2	279.5	0.85	0.35
20.12	7.96	0.0	121	98.8	0.0	46.8	259.3	0.85	0.35
21.89	8.65	17.2	121	115.4	0.0	55.3	284.4	0.85	0.35
23.89	8.58	70.8	121	117.1	0.0	140.4	307.2	0.85	0.35
26.00	6.96	40.2	121	133.0	0.0	191.4	380.3	0.85	0.35
27.98	7.04	57.3	121	132.0	32.6	433.9	406.3	0.62	0.53
29.84	6.52	77.1	121	130.0	68.1	659.4	420.0	0.58	0.51
31.98	6.17	63.4	121	125.2	57.1	770.0	417.9	0.65	0.42
34.04	6.07	63.3	121	133.9	48.3	572.2	417.9	0.64	0.44
35.89	6.19	81.2	121	119.4	82.5	576.4	419.7	0.68	0.48
38.16	5.87	111.4	121	117.1	109.8	1644.2	414.5	0.69	0.45
40.25	5.74	20.7	121	174.3	0.0	1405.9	414.2	0.67	0.44
42.06	5.63	33.7	121	108.3	5.5	1567.6	379.1	0.66	0.45
44.12	5.61	80.5	121	133.2	66.4	1461.2	418.1	0.68	0.39
45.87	5.72	54.3	121	132.8	40.4	565.8	417.9	0.71	0.45
47.90	6.42	47.3	121	129.2	36.4	874.2	417.3	0.69	0.37
50.05	5.97	24.4	121	126.0	17.6	704.0	418.2	0.71	0.37
51.89	5.75	64.5	121	150.7	35.4	1271.9	420.6	0.67	0.38
54.02	5.62	5.7	121	127.2	0.0	948.6	414.2	0.68	0.40
56.10	6.17	78.3	121	127.2	66.7	463.7	414.6	0.68	0.39
58.23	5.98	61.1	121	122.1	57.5	710.4	417.5	0.65	0.47
60.29	5.72	92.2	121	117.2	93.2	1308.1	417.2	0.67	0.45
62.00	5.58	7.7	121	151.6	0.0	272.3	415.6	0.67	0.44
63.92	5.76	37.6	121	119.1	10.8	688.6	391.3	0.69	0.40
65.90	6.30	72.7	121	130.9	61.8	387.1	419.0	0.67	0.44
67.99	6.19	88.0	121	127.5	74.4	636.0	412.9	0.75	0.29
69.96	5.54	85.7	121	202.2	44.8	955.0	460.3	0.69	0.39
71.97	5.88	77.4	121	121.9	74.9	536.0	418.4	0.67	0.43

Table D-10. Continued.

Train 4 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
73.94	5.90	78.3	121	140.4	57.3	438.2	418.4	0.65	0.45
76.00	5.86	22.1	121	126.8	7.2	590.5	410.9	0.64	0.43
77.89	6.84	64.3	121	121.8	60.3	225.5	416.8	0.68	0.36
79.89	5.81	43.7	121	126.8	34.0	725.3	416.1	0.67	0.37
81.96	5.66	84.0	121	130.7	71.3	808.3	417.0	0.66	0.42
83.89	6.11	95.4	121	126.7	88.7	480.7	419.0	0.67	0.40
85.98	6.28	95.5	121	132.7	80.5	408.4	416.7	0.72	0.30
87.79	5.88	79.5	121	130.1	69.1	338.2	418.7	0.72	0.31
89.95	5.86	107.0	121	126.4	99.4	365.8	417.8	0.71	0.37
92.05	7.20	73.5	121	134.1	59.2	306.3	418.8	0.72	0.35
94.06	5.84	68.2	121	128.9	58.5	744.5	418.2	0.73	0.37
95.93	5.60	165.7	121	141.2	144.3	889.1	418.8	0.73	0.36
97.90	6.31	117.1	121	149.6	85.1	389.2	416.6	0.72	0.46
99.46	5.93	44.7	121	164.5	0.0	265.9	418.1	0.74	0.38
101.91	6.87	111.2	121	138.3	89.8	333.9	415.9	0.75	0.36
103.90	6.19	163.6	121	83.1	196.4	365.8	414.9	0.78	0.39
106.05	5.70	82.1	121	134.2	64.1	957.2	415.2	0.81	0.32
108.06	5.87	92.6	121	150.0	57.1	410.5	413.5	0.80	0.31
109.92	5.84	118.1	121	120.2	116.2	425.4	418.1	0.77	0.37
111.46	5.63	146.7	121	129.4	138.4	251.0	420.1	0.79	0.34
113.92	5.60	97.4	121	139.2	76.0	172.3	416.8	0.79	0.36
115.90	7.42	81.0	121	140.5	59.5	211.6	418.0	0.78	0.34
117.91	6.53	106.9	121	121.3	101.5	159.5	414.9	0.80	0.31
120.04	5.94	101.0	121	120.6	101.1	623.2	419.7	0.80	0.35
121.99	5.67	89.7	121	126.2	82.8	772.1	418.2	0.81	0.38
123.91	6.02	131.7	121	99.5	148.3	376.5	415.1	0.80	0.37
125.90	5.78	104.2	121	100.7	122.3	253.1	417.8	0.80	0.35
127.90	7.13	81.5	121	112.6	87.5	223.3	417.6	0.80	0.37
129.90	5.78	76.8	121	119.7	80.7	793.4	422.6	0.81	0.37
131.91	5.69	102.0	121	122.1	98.4	657.2	417.5	0.80	0.34
134.03	5.84	83.2	121	134.9	67.3	389.2	418.0	0.79	0.41
136.06	5.94	111.5	121	142.5	88.9	676.4	418.9	0.78	0.39
137.90	5.77	129.0	121	138.2	109.3	904.0	417.5	0.78	0.40
139.90	5.68	106.3	121	101.3	124.4	453.1	418.4	0.78	0.42
141.89	5.96	92.2	121	94.6	111.4	678.5	412.8	0.81	0.38
144.00	6.09	93.4	121	123.8	88.8	395.6	418.2	0.80	0.42
145.95	5.64	110.4	121	130.9	97.9	1348.5	417.4	0.80	0.39

Table D-10. Continued.

Train 4 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
147.91	5.67	142.0	121	100.6	160.4	935.9	418.0	0.82	0.38
149.93	5.91	98.0	121	146.9	86.1	421.1	434.0	0.77	0.45
152.14	5.62	37.6	121	136.5	5.4	302.0	403.3	0.77	0.41
153.91	5.89	138.5	121	99.8	159.2	593.4	419.5	0.79	0.39
155.90	5.66	95.8	121	140.2	74.7	1046.5	418.1	0.81	0.34
157.99	5.54	94.5	121	143.5	83.7	984.8	431.7	0.79	0.39
159.92	5.65	114.2	121	96.1	124.0	529.6	404.9	0.80	0.39
162.05	5.69	51.1	121	142.0	29.1	314.8	419.0	0.80	0.37
164.04	5.64	83.8	121	126.5	77.4	665.8	419.1	0.78	0.43
166.08	5.52	112.8	121	129.9	99.4	1078.4	415.5	0.78	0.40
168.08	5.57	124.8	121	122.2	121.3	701.9	417.7	0.79	0.37
169.99	5.69	102.9	121	120.1	101.6	321.2	417.8	0.78	0.38
171.92	5.74	98.4	121	111.8	105.3	276.5	417.7	0.80	0.36
173.93	5.92	94.7	121	115.9	98.8	244.6	419.0	0.80	0.34
176.09	5.77	64.7	121	137.5	46.8	784.9	418.6	0.79	0.38
178.08	5.52	116.0	121	162.7	65.3	1250.7	411.0	0.76	0.43

Table D-11. Transfer data for Train 5 Fermentor 1.

Train 5 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00	5.62	24.0	190	197.6	37.3	627.5	509.7	0.98	0.41		
1.97	5.34	24.0	206	145.9	65.2	1076.3	485.9	0.97	0.41		
3.95	5.57	24.0	220	150.5	74.2	725.3	499.5	0.97	0.36		
5.95	5.38	24.0	320	140.3	96.9	542.4	512.0	0.96	0.48		
7.98	5.22	24.0	310	261.6	98.1	427.5	634.5	0.96	0.42	9.36	12.27
10.07	5.50	24.0	327	165.4	140.7	395.6	580.9	0.96	0.47	0.00	0.00
12.12	5.40	24.0	270	232.7	106.5	478.6	614.0	0.66	0.59	0.00	0.00
13.96	5.55	24.0	270	220.8	70.6	395.6	566.2	0.95	0.46	15.91	20.85
15.99	5.54	24.0	262	166.6	120.6	374.4	562.0	0.95	0.48	16.28	21.30
17.82	5.56	24.0	410	163.7	120.5	523.2	559.0	0.95	0.47	17.10	22.44
20.09	5.56	24.0	226	254.2	169.0	223.3	698.0	0.96	0.47	16.80	22.10
22.02	5.73	24.0	218	177.4	71.0	402.0	523.2	0.95	0.41	17.50	22.71
24.08	5.64	24.0	225	142.2	99.1	410.5	516.1	0.95	0.46	17.51	22.89
26.00	5.73	24.0	183	107.8	138.9	348.8	521.5	0.94	0.44	16.66	21.73
27.96	5.65	24.0	176	132.7	73.3	397.7	480.8	0.94	0.42	17.34	22.54
29.46	5.58	24.0	108	75.3	122.2	385.0	472.3	0.94	0.46	19.05	24.44
31.92	5.58	24.0	208	24.6	104.7	287.1	404.1	0.94	0.47	21.73	27.41
34.16	5.83	24.0	200	137.5	100.3	374.4	512.6	0.94	0.43	26.30	33.67
35.98	5.73	24.0	198	111.5	112.5	706.2	498.8	0.93	0.41	31.74	41.11
38.12	5.89	24.0	216	54.8	161.8	506.2	491.4	0.94	0.48	32.72	42.27
40.19	5.72	24.0	161	92.4	143.8	306.3	511.0	0.94	0.48	30.08	38.43
42.01	5.59	24.0	234	65.2	113.9	291.4	453.9	0.93	0.47	30.89	39.12
43.89	5.51	24.0	165	135.5	122.7	295.7	533.0	0.93	0.44	29.95	38.06
45.88	5.36	24.0	208	92.2	93.9	204.2	460.9	0.93	0.48	30.69	38.85
47.91	5.64	24.0	220	87.7	141.8	442.4	504.3	0.93	0.47	0.00	0.00
49.88	5.44	24.0	183	117.9	128.5	440.3	521.2	0.94	0.49	25.75	33.35
51.89	5.68	24.0	210	78.3	129.3	359.5	482.4	0.94	0.48	27.62	36.05
54.01	5.63	24.0	216	84.9	129.7	163.8	489.4	0.94	0.49	28.36	36.48
55.39	5.80	24.0	146	97.9	128.0	234.0	500.7	0.93	0.49	0.00	0.00
57.91	5.80	24.0	193	57.0	113.9	336.1	445.7	0.93	0.48	35.07	45.61
60.23	5.75	24.0	190	53.5	106.6	446.7	434.9	0.94	0.49	33.87	44.37
61.94	5.71	24.0	176	69.5	132.9	178.7	477.2	0.94	0.47	32.15	42.33
63.85	5.79	24.0	229	90.7	108.7	229.7	474.2	0.94	0.45	31.15	40.46
65.89	5.59	24.0	210	141.0	111.1	251.0	526.9	0.94	0.48	30.73	39.22
67.75	5.63	24.0	208	65.4	114.9	338.2	455.1	0.94	0.43	33.56	43.07
70.04	5.48	24.0	236	115.7	123.1	238.2	513.6	0.94	0.50	33.49	43.05
72.00	5.65	24.0	227	155.6	101.4	327.6	531.8	0.94	0.39	32.62	41.67

Table D-11. Continued.

Train 5 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
73.88	5.52	24.0	224	136.8	113.9	293.5	525.5	0.94	0.46	28.73	36.52
75.86	5.47	24.0	248	121.3	125.7	265.9	521.8	0.93	0.42	28.18	36.05
77.89	5.56	24.0	177	155.3	117.6	342.4	547.7	0.94	0.38	27.78	34.96
79.87	5.58	24.0	176	107.7	95.0	329.7	477.5	0.94	0.40	27.37	34.40
81.88	5.73	24.0	174	66.6	118.2	61.7	459.6	0.94	0.45	29.73	38.76
83.83	5.78	24.0	210	98.0	99.2	297.8	472.0	0.94	0.45	29.71	38.92
85.92	5.88	24.0	182	120.7	112.1	387.1	507.6	0.94	0.43	26.83	33.85
87.85	5.99	24.0	178	86.8	120.3	512.6	481.9	0.94	0.44	27.66	35.43
89.94	5.89	24.0	202	96.9	104.1	495.6	475.8	0.95	0.36	31.54	40.75
92.15	5.40	24.0	168	91.5	131.6	633.8	497.9	0.95	0.34	32.30	42.82
94.16	5.71	24.0	196	83.2	108.0	433.9	466.0	0.95	0.48	30.34	40.77
95.86	5.92	24.0	164	112.1	107.5	425.4	494.4	0.95	0.42	29.63	39.90
97.84	6.00	24.0	184	82.6	106.6	461.6	464.0	0.95	0.45	29.20	37.97
100.01	5.67	24.0	164	63.2	144.1	297.8	482.1	0.94	0.39	29.00	38.19
102.02	5.86	24.0	166	84.0	103.1	310.5	461.9	0.94	0.85	28.68	37.21
103.83	5.77	24.0	116	57.7	101.1	285.0	433.6	0.94	0.46	29.56	38.04
105.66	5.49	24.0	162	32.1	107.9	414.8	414.8	0.94	0.48	29.79	38.72
107.67	5.48	24.0	182	55.9	123.8	431.8	454.5	0.95	0.48	28.99	37.90
110.07	5.37	24.0	146	85.7	121.0	361.6	481.5	0.95	0.44	29.18	37.74
111.77	5.54	24.0	124	59.7	109.5	276.5	444.0	0.94	0.45	28.88	36.92
114.02	5.88	24.0	124	49.8	97.6	278.6	422.2	0.94	0.48	29.09	36.98
115.99	5.90	24.0	148	39.2	107.6	278.6	421.6	0.94	0.38	29.23	37.01
117.72	5.29	24.0	158	63.9	108.0	285.0	446.7	0.94	0.43	28.49	36.00
120.03	5.43	24.0	142	88.7	94.2	295.7	457.7	0.94	0.45	27.87	35.08
122.15	5.75	24.0	126	64.8	112.5	291.4	452.1	0.94	0.47	28.59	35.90
123.71	5.76	24.0	175	29.9	121.5	253.1	426.2	0.94	0.37	28.50	35.57
125.88	5.62	24.0	146	83.3	114.5	289.3	472.6	0.94	0.46	28.54	35.55
128.01	5.85	24.0	174	52.9	101.5	257.4	429.2	0.94	0.46	29.25	36.24
130.00	5.84	24.0	120	101.8	96.1	242.5	472.7	0.94	0.43	29.32	36.33
131.97	5.92	24.0	150	45.7	111.8	282.9	432.3	0.94	0.46	27.06	33.37
134.16	5.94	24.0	134	52.0	120.8	259.5	447.6	0.94	0.48	27.39	33.74
136.19	5.88	24.0	166	46.3	111.0	291.4	432.1	0.94	0.44	28.32	34.80
137.99	5.82	24.0	164	74.1	113.5	242.5	462.4	0.94	0.48	30.94	40.13
139.97	5.76	24.0	132	74.8	113.0	208.4	462.6	0.94	0.41	27.76	34.03
142.05	5.95	24.0	126	41.6	94.0	199.9	410.4	0.94	0.46	28.67	34.85
143.99	5.97	24.0	132	47.3	116.0	285.0	438.1	0.94	0.50	27.88	34.01
146.11	5.80	24.0	92	48.9	105.4	242.5	429.1	0.94	0.46	29.62	35.98

Table D-11. Continued.

Train 5 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
147.86	5.84	24.0	130	10.5	103.3	214.8	388.6	0.94	0.48	30.39	36.73
150.05	6.10	24.0	146	43.7	92.4	246.7	410.9	0.93	0.36	30.76	37.08
151.86	5.92	24.0	132	72.2	112.8	231.8	459.8	0.94	0.49	29.62	35.83
153.85	5.66	24.0	128	33.8	120.1	204.2	428.7	0.94	0.42	30.01	36.20
156.02	5.95	24.0	134	45.1	90.5	231.8	410.4	0.94	0.47	30.94	37.39
158.00	5.95	24.0	132	58.5	98.8	251.0	432.1	0.94	0.47	31.09	37.64
159.75	5.86	24.0	128	59.5	109.7	253.1	444.0	0.94	0.35	29.91	36.24
162.15	5.79	24.0	144	43.1	108.0	276.5	425.9	0.94	0.49	30.63	37.06
164.20	5.82	24.0	172	46.6	120.1	246.7	441.5	0.93	0.43	29.60	35.79
165.81	5.80	24.0	148	90.1	101.0	255.2	465.9	0.94	0.44	29.33	35.50
167.39	5.67	24.0	145	61.6	91.1	151.0	427.5	0.94	0.38	31.81	40.79
170.03	5.75	24.0	144	68.1	101.8	244.6	444.7	0.94	0.42	30.64	36.95
172.01	5.95	24.0	132	44.4	122.8	244.6	442.0	0.94	0.47	30.90	37.32
173.74	5.88	24.0	142	57.1	97.9	242.5	429.8	0.94	0.44	29.93	36.09
176.17	5.83	24.0	166	49.5	113.7	234.0	438.0	0.94	0.50	29.48	35.58
178.18	5.86	24.0	150	60.4	123.0	272.3	458.2	0.95	0.41	30.43	36.77

Table D-12. Transfer data for Train 5 Fermentor 2.

Train 5 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.73	37.3	200	187.1	60	691.3	508.9
1.97	5.48	65.2	188	203.8	62	744.5	498.9
3.95	5.55	74.2	336	211.6	45	593.4	481.2
5.95	5.40	96.9	316	318.2	93	395.6	612.6
7.98	5.30	98.1	326	301.9	106	353.1	608.7
10.07	5.55	140.7	272	314.3	148	253.1	620.4
12.12	5.45	106.5	302	269.3	95	276.5	556.4
13.96	5.49	70.6	262	264.2	58	236.1	549.9
15.99	5.40	120.6	410	258.9	118	389.2	555.2
17.82	5.45	120.5	238	401.4	125	253.1	704.4
20.09	5.45	169.0	180	224.4	170	225.5	523.9
22.02	5.66	71.0	232	215.8	30	268.0	473.3
24.08	5.57	99.1	220	224.9	103	268.0	527.5
26.00	5.64	138.9	175	183.0	173	263.7	516.2
27.96	5.64	73.3	118	173.8	72	295.7	471.2
29.46	5.46	122.2	238	107.6	131	416.9	414.8
31.92	5.49	104.7	198	213.2	125	229.7	533.1
34.16	5.48	100.3	230	195.9	100	295.7	493.9
35.98	5.59	112.5	296	197.4	146	208.4	529.7
38.12	5.65	161.8	182	215.3	243	151.0	595.4
40.19	5.58	143.8	251	160.4	161	242.5	475.9
42.01	5.53	113.9	192	234.7	129	240.4	548.2
43.89	5.50	122.7	235	166.0	147	185.0	488.7
45.88	5.53	93.9	262	206.1	120	182.9	531.4
47.91	5.52	141.8	234	219.3	182	214.8	558.5
49.88	5.34	128.5	254	186.7	174	193.6	530.6
51.89	5.56	129.3	182	209.4	172	210.6	551.3
54.01	5.55	129.7	192	215.1	172	100.0	556.6
55.39	5.63	128.0	236	146.4	164	89.3	480.7
57.91	5.59	113.9	217	196.3	153	210.6	534.1
60.23	5.61	106.6	216	189.7	151	144.6	533.0
61.94	5.58	132.9	240	175.4	153	93.6	494.2
63.85	5.67	108.7	237	232.4	114	202.1	536.2
65.89	5.53	111.1	260	210.9	138	197.8	536.6
67.75	5.59	114.9	252	207.8	127	204.2	518.2
70.04	5.48	123.1	244	234.9	147	100.0	558.0
72.00	5.65	101.4	255	229.2	115	165.9	541.2

Table D-12. Continued.

Train 5 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.88	5.47	113.9	298	224.2	144	59.6	552.9
75.86	5.50	125.7	218	248.9	174	151.0	595.6
77.89	5.44	117.6	187	181.3	155	163.8	517.3
79.87	5.51	95.0	195	176.4	107	172.3	487.3
81.88	5.57	118.2	232	173.3	140	189.3	493.8
83.83	5.64	99.2	222	211.2	122	180.8	532.5
85.92	5.61	112.1	208	183.8	152	193.6	522.5
87.85	5.51	120.3	232	177.4	149	242.5	505.3
89.94	5.42	104.1	204	201.0	137	236.1	533.0
92.15	5.04	131.6	232	166.8	165	244.6	499.4
94.16	5.32	108.0	192	196.1	141	248.9	527.4
95.86	5.58	107.5	214	163.7	133	225.5	487.8
97.84	5.59	106.6	198	183.9	135	229.7	511.3
100.01	5.56	144.1	196	164.0	178	238.2	496.4
102.02	5.66	103.1	150	165.8	133	291.4	494.1
103.83	5.59	101.1	196	115.4	135	108.5	447.9
105.66	5.53	107.9	222	161.3	143	191.4	495.0
107.67	5.46	123.8	176	182.3	155	227.6	512.7
110.07	5.37	121.0	154	145.5	150	251.0	473.6
111.77	5.38	109.5	160	123.5	136	199.9	448.6
114.02	5.66	97.6	166	123.4	132	208.4	456.6
115.99	5.72	107.6	202	148.6	123	227.6	463.0
117.72	5.19	108.0	170	158.4	150	214.8	499.5
120.03	5.39	94.2	152	139.2	124	246.7	467.8
122.15	5.65	112.5	212	125.7	149	261.6	461.3
123.71	5.74	121.5	176	173.5	160	153.1	510.4
125.88	5.68	114.5	202	143.5	145	238.2	473.1
128.01	5.61	101.5	152	174.2	113	214.8	484.4
130.00	5.68	96.1	186	119.9	128	204.2	450.2
131.97	5.88	111.8	180	148.2	154	53.2	489.0
134.16	5.69	120.8	190	131.4	165	187.2	474.6
136.19	5.64	111.0	206	162.4	136	231.8	486.3
137.99	5.75	113.5	166	160.4	156	191.4	501.7
139.97	5.73	113.0	164	129.8	147	182.9	462.1
142.05	5.80	94.0	148	125.3	110	136.1	439.9
143.99	5.79	116.0	126	129.5	149	197.8	461.0
146.11	5.73	105.4	176	90.4	139	153.1	422.6

Table D-12. Continued.

Train 5 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
147.86	5.57	103.3	208	128.2	149	134.0	472.3
150.05	5.86	92.4	142	145.2	137	195.7	488.2
151.86	5.78	112.8	178	128.4	153	172.3	467.5
153.85	5.61	120.1	156	125.2	171	199.9	474.6
156.02	5.76	90.5	176	133.6	96	217.0	437.4
158.00	5.75	98.8	156	131.7	144	185.0	475.8
159.75	5.76	109.7	202	124.5	154	199.9	467.6
162.15	5.73	108.0	200	141.5	166	202.1	497.9
164.20	5.66	120.1	186	167.7	150	221.2	496.2
165.81	5.65	101.0	156	145.4	138	225.5	480.8
167.39	5.62	91.1	178	144.8	83	172.3	435.2
170.03	5.70	101.8	166	143.4	133	174.4	473.3
172.01	5.71	122.8	170	131.2	157	189.3	464.3
173.74	5.67	97.9	184	138.2	129	212.7	468.4
176.17	5.58	113.7	182	163.9	133	242.5	481.7
178.18	5.59	123.0	150	148.1	147	221.2	471.1

Table D-13. Transfer data for Train 5 Fermentor 3.

Train 5 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.58	60.3	196	200.9	81.5	536.0	520.9
1.97	5.56	61.5	300	185.1	72.7	578.5	495.1
3.95	5.62	45.0	274	330.3	9.2	427.5	594.5
5.95	5.48	92.5	278	311.9	54.5	391.4	572.7
7.98	5.39	106.1	256	321.2	58.6	353.1	573.7
10.07	5.56	148.0	283	259.4	142.0	544.5	552.2
12.12	5.56	94.8	192	303.7	60.7	289.3	568.4
13.96	5.53	57.5	380	257.4	43.1	278.6	541.7
15.99	5.58	118.1	204	404.0	84.0	542.4	668.7
17.82	5.57	124.7	208	233.5	85.2	565.8	492.8
20.09	5.75	169.7	208	177.3	190.2	214.8	496.6
22.02	5.75	29.7	208	228.2	3.1	293.5	500.4
24.08	5.69	102.9	185	218.9	87.6	263.7	502.4
26.00	5.71	173.3	79	174.3	184.0	265.9	483.8
27.96	5.56	71.9	246	115.5	33.0	285.0	375.4
29.46	5.52	130.6	190	236.8	136.8	376.5	541.8
31.92	5.52	125.1	192	198.0	109.8	176.5	481.5
34.16	5.52	99.5	276	229.2	62.8	480.7	491.3
35.98	5.58	146.0	198	294.5	123.5	157.4	570.8
38.12	5.61	243.1	225	181.9	217.2	151.0	486.0
40.19	5.63	160.5	171	250.7	162.0	206.3	551.0
42.01	5.53	128.6	232	191.4	106.0	180.8	467.6
43.89	5.49	146.6	252	237.2	140.1	185.0	529.5
45.88	5.51	120.4	210	261.1	107.1	187.2	546.6
47.91	5.43	182.2	254	232.3	159.1	599.8	508.0
49.88	5.32	173.6	191	258.7	167.8	157.4	551.7
51.89	5.57	172.4	216	181.7	176.3	112.7	484.4
54.01	5.54	172.4	210	191.3	171.3	114.9	489.0
55.39	5.62	163.5	224	236.6	142.0	125.5	513.9
57.91	5.59	152.9	215	220.2	174.9	251.0	541.0
60.23	5.62	151.1	220	215.3	168.0	248.9	531.0
61.94	5.60	152.9	226	240.9	122.8	123.4	509.6
63.85	5.65	113.7	251	240.0	97.2	144.6	522.3
65.89	5.52	138.0	232	260.8	129.5	157.4	551.1
67.75	5.47	126.5	238	251.7	114.9	172.3	538.9
70.04	5.47	147.4	238	244.2	133.9	87.2	529.5
72.00	5.56	114.6	273	257.9	94.3	176.5	536.4

Table D-13. Continued.

Train 5 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.88	5.46	143.8	204	296.9	140.5	161.7	592.4
75.86	5.51	173.6	192	218.9	157.3	189.3	501.4
77.89	5.46	154.8	182	191.9	153.7	180.8	489.6
79.87	5.41	107.1	220	195.6	92.7	176.5	480.0
81.88	5.51	139.9	218	231.5	128.4	182.9	518.8
83.83	5.53	121.7	200	224.3	114.6	178.7	516.0
85.92	5.50	152.0	217	208.1	143.1	170.2	498.0
87.85	5.33	149.4	208	230.9	140.0	161.7	520.3
89.94	5.38	137.3	228	204.5	132.9	178.7	498.9
92.15	5.04	165.4	190	230.9	155.6	268.0	519.9
94.16	5.24	140.5	208	191.1	141.9	210.6	491.3
95.86	5.50	132.8	198	213.2	125.0	202.1	504.2
97.84	5.54	135.2	198	197.8	135.4	172.3	496.8
100.01	5.53	177.7	174	196.7	178.5	180.8	496.3
102.02	5.81	132.6	190	150.4	155.8	193.6	472.4
103.83	5.49	134.8	226	196.0	128.1	178.7	488.1
105.66	5.43	142.8	194	221.4	144.1	199.9	521.5
107.67	5.34	155.4	180	175.5	167.5	178.7	486.4
110.07	5.60	150.3	192	153.8	174.5	259.5	476.8
111.77	5.44	135.8	186	159.0	169.6	240.4	491.6
114.02	5.67	132.0	200	166.3	150.8	246.7	483.9
115.99	5.67	123.2	198	202.6	117.1	210.6	495.3
117.72	5.23	150.3	178	169.3	177.0	195.7	494.8
120.03	5.40	124.0	230	148.4	165.8	227.6	489.0
122.15	5.44	149.3	196	212.4	161.9	261.6	523.8
123.71	5.77	159.6	212	174.8	178.9	193.6	492.9
125.88	5.54	145.3	164	200.0	153.6	244.6	507.1
128.01	5.63	112.9	204	152.4	108.6	208.4	446.9
130.00	5.63	127.6	194	186.8	143.8	202.1	501.8
131.97	5.82	153.8	214	176.9	184.6	206.3	506.5
134.16	5.75	165.2	224	188.8	187.0	206.3	509.4
136.19	5.57	136.1	190	202.7	153.6	217.0	519.0
137.99	5.51	156.0	186	163.7	180.4	165.9	486.9
139.97	5.73	146.5	176	161.3	168.0	161.7	481.6
142.05	5.75	109.8	144	148.5	115.3	114.9	452.8
143.99	5.77	148.7	202	123.5	181.4	185.0	455.0
146.11	5.69	138.8	238	173.8	163.2	180.8	497.0

Table D-13. Continued.

Train 5 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
147.86	5.42	148.6	184	205.6	177.3	142.5	533.1
150.05	5.83	136.6	180	139.8	149.3	185.0	451.3
151.86	5.93	153.1	178	175.5	170.1	202.1	491.3
153.85	5.47	170.7	208	152.8	192.0	191.4	472.9
156.02	5.62	95.5	186	177.0	108.9	202.1	489.2
158.00	5.73	144.1	204	155.7	173.8	193.6	484.2
159.75	5.64	154.0	250	198.9	173.2	206.3	516.9
162.15	5.60	165.6	212	196.3	218.3	174.4	547.8
164.20	5.64	149.8	204	183.8	175.0	208.4	507.8
165.81	5.62	137.6	190	153.4	181.7	146.8	496.3
167.39	5.60	82.7	194	175.3	79.7	163.8	471.1
170.03	5.66	132.9	200	165.7	158.6	199.9	490.2
172.01	5.64	157.1	216	169.9	185.6	217.0	497.2
173.74	5.51	129.3	210	183.1	162.8	221.2	515.4
176.17	5.52	132.7	164	179.8	163.1	229.7	509.0
178.18	5.61	147.2	200	148.8	155.1	208.4	455.5

Table D-14. Transfer data for Train 5 Fermentor 4.

Train 5 – Fermentor 4							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.63	81.5	276	194.4	98.4	867.8	510.1
1.97	5.53	72.7	246	298.2	50.3	676.4	574.6
3.95	5.63	9.2	254	271.4	0.0	516.9	538.9
5.95	5.48	54.5	220	275.1	9.0	446.7	528.4
7.98	5.33	58.6	234	253.1	20.4	512.6	514.9
10.07	5.55	142.0	200	271.0	89.7	312.7	517.5
12.12	5.62	60.7	317	192.9	56.8	427.5	487.8
13.96	5.80	43.1	218	368.8	0.0	372.2	615.0
15.99	5.87	84.0	194	196.8	85.1	574.3	496.7
17.82	6.00	85.2	204	200.8	70.2	378.6	484.6
20.09	6.31	190.2	179	203.4	183.0	255.2	495.0
22.02	6.06	3.1	162	202.5	0.0	440.3	475.3
24.08	5.73	87.6	40	185.1	35.8	272.3	432.1
26.00	5.40	184.0	185	77.8	145.1	408.4	337.7
27.96	5.62	33.0	214	242.0	0.0	363.7	479.2
29.46	5.64	136.8	166	187.2	130.0	372.2	479.2
31.92	5.65	109.8	230	191.3	78.3	368.0	458.6
34.16	5.56	62.8	196	272.0	19.3	450.9	527.6
35.98	5.53	123.5	230	194.5	125.1	338.2	494.9
38.12	5.73	217.2	159	223.4	214.5	208.4	519.5
40.19	5.70	162.0	189	170.2	147.8	212.7	454.8
42.01	5.66	106.0	232	232.4	58.5	240.4	483.7
43.89	5.56	140.1	165	254.8	111.1	353.1	524.6
45.88	5.40	107.1	233	210.5	58.4	387.1	460.6
47.91	5.45	159.1	178	254.0	134.4	280.8	528.1
49.88	5.39	167.8	201	194.0	147.9	206.3	472.9
51.89	5.64	176.3	196	216.5	157.9	193.6	496.9
54.01	5.65	171.3	188	211.2	150.8	176.5	489.5
55.39	5.68	142.0	219	223.5	109.6	170.2	489.9
57.91	5.62	174.9	190	218.9	164.8	299.9	507.6
60.23	5.60	168.0	203	220.3	158.4	750.8	509.5
61.94	5.57	122.8	211	225.0	82.4	140.4	483.4
63.85	5.65	97.2	223	254.6	52.0	229.7	508.2
65.89	5.60	129.5	205	231.2	120.5	289.3	521.0
67.75	5.63	114.9	203	238.3	104.9	265.9	527.1
70.04	5.41	133.9	277	238.9	99.9	138.3	503.7
72.00	5.60	94.3	197	298.0	73.0	214.8	575.5

Table D-14. Continued.

Train 5 – Fermentor 4							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.88	5.48	140.5	173	203.2	130.5	214.8	492.0
75.86	5.53	157.3	179	191.3	137.9	293.5	470.7
77.89	5.60	153.7	202	185.5	143.9	229.7	474.5
79.87	5.40	92.7	207	221.0	74.0	246.7	501.1
81.88	5.55	128.4	190	218.1	113.5	242.5	502.0
83.83	5.58	114.6	204	200.1	104.1	229.7	488.4
85.92	5.56	143.1	192	217.4	129.1	180.8	502.2
87.85	5.43	140.0	222	205.7	119.1	180.8	483.6
89.94	5.53	132.9	188	227.6	118.4	270.1	511.9
92.15	5.34	155.6	194	188.3	156.7	344.6	488.2
94.16	5.20	141.9	198	206.8	121.6	238.2	485.3
95.86	5.64	125.0	188	198.2	120.9	246.7	492.9
97.84	5.71	135.4	176	198.3	123.5	234.0	485.2
100.01	5.89	178.5	178	174.4	179.9	278.6	474.6
102.02	5.74	155.8	212	190.0	142.3	291.4	475.3
103.83	5.62	128.1	192	222.9	113.0	268.0	506.6
105.66	5.56	144.1	180	193.5	135.4	285.0	483.6
107.67	5.53	167.5	198	178.9	161.7	308.4	471.9
110.07	5.39	174.5	198	191.2	178.8	319.1	494.3
111.77	5.36	169.6	196	185.7	178.6	236.1	493.5
114.02	5.71	150.8	180	198.7	145.9	261.6	492.6
115.99	5.72	117.1	204	198.1	94.6	231.8	474.4
117.72	5.20	177.0	226	177.4	201.6	306.3	500.8
120.03	5.27	165.8	208	226.3	175.5	370.1	534.8
122.15	5.55	161.9	204	194.8	169.8	314.8	501.5
123.71	5.72	178.9	172	210.3	170.9	272.3	501.1
125.88	5.57	153.6	202	161.7	159.6	291.4	466.5
128.01	5.58	108.6	198	204.0	89.2	280.8	483.4
130.00	5.62	143.8	202	194.5	146.7	299.9	496.2
131.97	5.73	184.6	224	212.2	186.3	295.7	512.7
134.16	5.72	187.0	192	221.2	186.9	276.5	519.9
136.19	5.56	153.6	192	187.5	144.8	287.1	477.5
137.99	5.78	180.4	180	183.3	185.0	176.5	486.7
139.97	5.88	168.0	170	173.9	169.3	225.5	474.0
142.05	5.80	115.3	194	143.3	93.1	193.6	419.9
143.99	5.75	181.4	228	198.4	188.6	274.4	504.4
146.11	5.52	163.2	182	234.8	152.7	323.3	523.1

Table D-14. Continued.

Train 5 – Fermentor 4							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
147.86	5.40	177.3	202	181.4	167.5	208.4	470.4
150.05	5.95	149.3	174	178.4	155.1	223.3	483.0
151.86	5.70	170.1	232	174.4	181.0	272.3	484.1
153.85	5.43	192.0	188	204.8	214.1	321.2	525.7
156.02	5.65	108.9	210	186.5	91.1	263.7	467.5
158.00	5.71	173.8	246	204.4	177.3	306.3	506.7
159.75	5.51	173.2	216	249.8	181.6	402.0	557.0
162.15	5.57	218.3	194	208.0	212.9	287.1	511.9
164.20	5.64	175.0	190	200.6	170.6	246.7	495.0
165.81	5.67	181.7	182	187.4	180.7	225.5	485.2
167.39	5.50	79.7	198	192.3	52.3	265.9	463.7
170.03	5.62	158.6	236	199.4	154.0	291.4	493.6
172.01	5.57	185.6	218	217.2	202.6	308.4	533.0
173.74	5.46	162.8	164	209.3	190.0	285.0	515.7
176.17	5.50	163.1	204	161.3	190.2	265.9	487.2
178.18	5.56	155.1	176	196.5	152.3	206.3	492.5

Table D-15. Transfer data for Train 5 Fermentor 5.

Train 5 – Fermentor 5									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00	5.56	98.4	183	274.4	95.8	940.1	570.6		
1.97	5.51	50.3	183	241.6	0.0	1301.7	478.4		
3.95	5.46	0.0	183	250.0	0.0	1595.3	465.5		
5.95	5.38	9.0	183	219.0	0.0	1263.4	403.3		
7.98	5.33	20.4	183	220.9	0.0	974.2	386.0		
10.07	5.90	89.7	183	190.1	0.0	546.6	367.4		
12.12	6.68	56.8	183	320.7	0.0	397.7	544.8		
13.96	6.62	0.0	183	209.8	0.0	314.8	461.5		
15.99	7.54	85.1	183	187.3	38.2	499.8	439.2	0.60	0.50
17.82	6.77	70.2	183	197.9	57.9	361.6	484.4	0.65	0.48
20.09	6.08	183.0	183	180.9	186.0	1031.6	482.7	0.62	0.53
22.02	5.80	0.0	183	156.7	0.0	361.6	421.8		
24.08	6.25	35.8	183	39.2	0.0	0.0	194.7		
26.00	6.18	145.1	183	185.3	34.6	402.0	373.6	0.59	0.52
27.96	6.00	0.0	183	209.9	0.0	735.9	475.3		
29.46	5.78	130.0	183	161.4	124.9	442.4	455.1	0.67	0.43
31.92	5.70	78.3	183	228.1	33.6	1086.9	482.2	0.68	0.38
34.16	5.51	19.3	183	193.7	10.4	419.0	483.6	0.70	
35.98	5.77	125.1	183	224.8	79.6	480.7	478.1	0.65	0.36
38.12	6.32	214.5	183	159.0	235.1	382.9	482.0	0.67	0.44
40.19	6.39	147.8	183	188.9	140.6	457.3	480.5	0.73	0.35
42.01	5.71	58.5	183	232.8	5.7	1142.2	478.8	0.75	0.31
43.89	5.29	111.1	183	166.6	122.1	1805.8	476.4	0.76	0.35
45.88	5.66	58.4	183	235.2	4.1	574.3	479.7	0.72	0.36
47.91	5.71	134.4	183	179.8	137.1	506.2	481.3	0.73	0.34
49.88	5.65	147.9	183	203.9	125.4	529.6	480.2	0.71	0.30
51.89	5.70	157.9	183	194.9	142.7	838.0	478.5	0.75	0.31
54.01	5.71	150.8	183	188.7	130.1	625.3	466.8	0.73	0.30
55.39	5.61	109.6	183	212.1	71.1	491.3	472.4	0.75	0.32
57.91	5.92	164.8	183	190.4	156.0	508.4	480.4	0.74	0.39
60.23	5.87	158.4	183	205.4	153.7	246.7	499.5	0.75	0.33
61.94	5.83	82.4	183	214.3	43.8	544.5	474.5	0.78	0.29
63.85	5.92	52.0	183	226.7	7.2	521.1	480.7	0.73	0.37
65.89	5.61	120.5	183	208.9	93.5	1191.1	480.7	0.73	0.38
67.75	5.61	104.9	183	206.1	81.5	789.1	481.5	0.73	0.41
70.04	5.51	99.9	183	280.1	10.4	636.0	489.6	0.70	0.41
72.00	5.75	73.0	183	197.1	59.3	459.4	482.2	0.69	0.42

Table D-15. Continued.

Train 5 – Fermentor 5									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
73.88	6.52	130.5	183	175.7	136.8	272.3	480.8	0.75	0.35
75.86	6.50	137.9	183	182.8	137.5	436.0	481.2	0.76	0.35
77.89	5.70	143.9	183	204.1	121.9	1099.7	480.9	0.73	0.38
79.87	5.59	74.0	183	209.8	45.1	810.4	479.7	0.75	0.31
81.88	5.75	113.5	183	189.3	105.7	1082.6	480.3	0.77	0.35
83.83	5.67	104.1	183	203.6	81.1	1263.4	479.4	0.76	0.36
85.92	5.77	129.1	183	191.5	127.4	931.6	477.8	0.77	0.34
87.85	6.43	119.1	183	216.9	74.4	440.3	471.0	0.76	0.36
89.94	5.74	118.4	183	185.9	113.9	901.8	480.2	0.63	0.36
92.15	5.28	156.7	183	192.6	144.5	1291.1	479.2	0.75	0.39
94.16	5.50	121.6	183	196.1	111.7	397.7	485.0	0.74	0.41
95.86	5.91	120.9	183	187.1	121.4	236.1	486.4	0.76	0.34
97.84	7.05	123.5	183	176.3	130.5	191.4	482.1	0.74	0.41
100.01	5.80	179.9	183	178.2	182.2	933.8	479.3	0.78	0.34
102.02	5.86	142.3	183	211.0	112.0	935.9	479.5	0.76	0.44
103.83	5.67	113.0	183	191.8	112.1	531.8	489.7	0.76	0.38
105.66	6.23	135.4	183	180.2	138.2	499.8	481.8	0.79	0.35
107.67	5.52	161.7	183	197.7	142.2	1023.1	477.0	0.76	0.39
110.07	5.45	178.8	183	196.8	162.2	984.8	479.0	0.80	0.33
111.77	5.72	178.6	183	195.5	163.3	455.2	479.0	0.77	0.35
114.02	5.78	145.9	183	177.2	149.2	746.6	479.3	0.82	0.32
115.99	5.77	94.6	183	204.6	70.2	1061.4	479.0	0.81	0.32
117.72	5.21	201.6	183	223.0	159.3	1178.4	479.5	0.78	0.34
120.03	5.51	175.5	183	204.1	165.4	780.6	492.8	0.80	0.37
122.15	5.55	169.8	183	203.9	146.3	1210.3	479.2	0.81	0.34
123.71	5.97	170.9	183	172.3	179.2	629.6	479.4	0.82	0.36
125.88	5.68	159.6	183	200.0	141.3	865.7	480.5	0.80	0.32
128.01	5.62	89.2	183	198.7	57.7	946.5	466.0	0.81	0.32
130.00	5.57	146.7	183	202.1	125.8	1237.9	480.0	0.79	0.36
131.97	5.80	186.3	183	222.1	160.2	918.9	494.8	0.77	0.39
134.16	5.95	186.9	183	190.4	186.6	595.6	488.9	0.81	0.32
136.19	5.79	144.8	183	188.8	136.7	402.0	479.5	0.76	0.38
137.99	5.89	185.0	183	176.3	191.3	312.7	481.4	0.79	0.37
139.97	6.88	169.3	183	169.9	190.6	295.7	490.0	0.82	0.34
142.05	5.70	93.1	183	193.2	79.4	1012.5	478.3	0.84	0.31
143.99	5.63	188.6	183	225.8	157.1	1403.8	493.1	0.79	0.37
146.11	5.61	152.7	183	178.6	161.0	391.4	485.7	0.79	0.40

Table D-15. Continued.

Train 5 – Fermentor 5									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
147.86	5.74	167.5	183	198.6	150.8	236.1	480.7	0.80	0.33
150.05	5.85	155.1	183	171.1	151.3	1218.8	466.1	0.83	0.32
151.86	5.62	181.0	183	227.7	151.5	1327.2	497.0	0.80	0.36
153.85	5.55	214.1	183	184.0	211.8	661.5	480.5	0.80	0.37
156.02	5.83	91.1	183	209.5	57.2	940.1	474.4	0.83	0.35
158.00	5.56	177.3	183	246.7	108.9	1933.4	477.1	0.79	0.37
159.75	5.63	181.6	183	211.4	166.7	1040.1	495.3	0.79	0.35
162.15	5.81	212.9	183	191.8	187.1	544.5	479.9	0.81	0.36
164.20	6.23	170.6	183	187.6	178.9	416.9	494.7	0.80	0.34
165.81	5.68	180.7	183	179.8	189.0	999.7	486.9	0.81	0.37
167.39	5.60	52.3	183	195.8	21.5	801.9	463.8	0.82	0.33
170.03	5.60	154.0	183	235.8	98.9	1442.1	489.9	0.78	0.35
172.01	5.53	202.6	183	217.9	165.3	1465.5	479.4	0.79	0.38
173.74	5.69	170.4	183	188.1	163.8	565.8	480.3	0.82	0.34
176.17	5.54	190.2	183	200.4	171.9	584.9	480.9	0.81	0.34
178.18	5.82	152.3	183	172.5	157.8	323.3	476.8	0.73	0.32

Table D-16. Transfer data for Train 6 Fermentor 1.

Train 6 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00	5.87	36.4	170	171.6	80.1	731.7	513.8	0.99	0.45		
1.97	5.55	36.4	276	134.2	74.1	1046.5	470.4	0.96	0.65		
3.95	5.65	36.4	218	188.1	116.2	531.8	566.4	0.97	0.36		
5.95	5.63	36.4	170	46.5	183.5	293.5	492.1	0.96	0.46		
7.98	5.45	36.4	188	48.6	147.9	34.0	458.6	0.96	0.42	14.96	20.30
10.00	5.64	36.4	214	66.9	153.1	397.7	482.1	0.95	0.44	18.78	25.26
12.13	5.73	36.4	387	83.0	169.0	467.9	514.1	0.95	0.47	23.03	31.13
13.96	5.62	36.4	274	289.6	136.9	389.2	688.6	0.96	0.46	22.55	30.84
15.99	5.66	36.4	228	145.5	160.6	499.8	568.2	0.95	0.49	23.38	31.72
17.82	5.68	36.4	400	114.9	148.5	448.8	525.5	0.95	0.38	26.40	35.95
20.12	5.63	36.4	91	216.6	208.2	282.9	686.9	0.95	0.47	23.29	31.20
21.38		36.4	248		125.2	536.0	387.3	0.94	0.49		
24.08	5.86	36.4	235	128.2	152.4	589.2	542.7	0.94	0.46	24.31	32.47
26.01	5.98	36.4	283	79.8	190.4	674.3	532.3	0.93	0.39	39.10	52.82
27.98	5.57	36.4	156	158.5	159.0	593.4	579.6	0.97	0.45	34.09	45.41
29.46	5.62	36.4	368	34.7	157.7	448.8	454.5	0.94	0.48	35.62	46.60
31.92	5.65	36.4	274	255.0	145.0	436.0	662.1	0.94	0.50	32.18	42.07
34.13	5.67	36.4	280	152.3	155.0	485.0	569.4	0.94	0.43	34.05	44.07
35.98	5.72	36.4	244	131.6	182.2	533.9	575.9	0.95	0.47	34.73	44.93
38.13	6.11	36.4	219	80.9	196.9	623.2	539.9	0.94	0.51	37.79	49.08
40.20	6.11	36.4	154	79.8	177.8	514.7	514.7	0.94	0.49	38.00	49.12
42.02	5.77	36.4	264	37.7	151.4	423.3	451.2	0.94	0.50	37.72	48.36
43.90	5.80	36.4	232	139.8	159.1	446.7	561.6	0.94	0.50	38.70	49.70
45.89	5.76	36.4	256	101.5	163.7	368.0	527.3	0.94	0.50	35.55	45.71
47.93	5.80	36.4	166	119.4	171.9	491.3	553.4	0.94	0.51	35.73	46.20
49.89	5.53	36.4	221	48.1	154.5	240.4	464.7	0.94	0.50	38.16	49.22
51.90	5.85	36.4	168	54.3	203.5	348.8	519.9	0.94	0.49	36.49	47.35
54.04	5.82	36.4	198	59.1	169.4	97.8	490.6	0.94	0.50	44.09	58.59
55.38	6.35	36.4	248	29.6	171.5	185.0	463.2	0.94	0.51	38.08	49.65
57.92	5.85	36.4	197	88.0	193.8	446.7	543.9	0.94	0.48	41.92	55.18
60.24	5.83	36.4	196	85.4	177.8	372.2	525.3	0.94	0.49	43.33	57.35
61.96	5.79	36.4	220	67.2	144.7	157.4	474.0	0.94	0.48	43.27	57.33
63.86	5.78	36.4	237	81.3	175.3	304.2	518.7	0.94	0.47	36.88	47.28
65.91	5.60	36.4	226	79.7	193.1	285.0	534.9	0.94	0.51	36.23	47.01
67.76	5.66	36.4	232	81.5	179.4	289.3	523.0	0.93	0.49	38.15	48.91
70.05	5.85	36.4	222	122.5	165.2	251.0	549.8	0.95	0.49	31.46	41.03
72.01	5.80	36.4	267	83.1	174.5	234.0	519.7	0.94	0.42	34.86	44.57

Table D-16. Continued.

Train 6 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
73.89	5.65	36.4	202	128.9	172.6	221.2	563.6	0.94	0.48	29.72	37.68
75.87	5.66	36.4	194	90.5	149.2	229.7	501.8	0.94	0.42	50.85	64.51
77.90	5.55	36.4	217	75.3	157.0	321.2	494.4	0.94	0.46	33.31	41.64
79.88	5.89	36.4	168	107.2	144.9	274.4	514.2	0.94	0.50	32.97	41.32
81.89	6.01	36.4	144	56.9	154.9	382.9	473.9	0.94	0.50	32.96	41.70
83.84	6.38	36.4	144	25.2	154.9	453.1	442.2	0.94	0.49	34.58	44.32
85.93	6.26	36.4	170	23.7	156.9	397.7	442.7	0.94	0.46	33.99	43.72
87.85	5.93	36.4	184	40.2	167.8	338.2	470.1	0.94	0.48	33.17	42.42
89.96	5.90	36.4	182	49.1	171.0	355.2	482.2	0.94	0.46	30.11	38.66
92.17	5.56	36.4	158	66.0	152.7	359.5	480.8	0.94	0.48	38.17	49.49
93.38	5.54	36.4	180	43.1	150.8	295.7	456.0	0.94	0.50	34.95	45.20
95.38	5.84	36.4	176	64.2	152.2	257.4	478.5	0.95	0.44	34.03	43.71
97.38	5.91	36.4	163	64.9	149.6	231.8	476.6	0.95	0.47	32.76	42.13
100.01	5.90	36.4	180	47.1	153.3	327.6	462.5	0.95	0.46	33.96	43.86
102.03	6.03	36.4	172	68.1	149.4	351.0	479.6	0.95	0.88	29.43	38.08
103.38	5.79	36.4	170	47.4	159.7	280.8	469.2	0.95	0.48	26.33	33.64
105.38	5.72	36.4	126	61.6	143.5	355.2	467.2	0.95	0.49	28.20	36.36
107.38	5.65	36.4	220	11.2	146.9	329.7	420.2	0.95	0.37	27.30	35.11
109.38	5.73	36.4	100	106.8	149.3	333.9	518.2	0.96	0.48	27.65	35.46
111.38		36.4	112	0.0	137.4	289.3	399.5	0.95	0.42	30.32	38.42
114.03	6.10	36.4	172	4.3	144.9	389.2	411.3	0.96	0.18	26.79	34.48
115.99	5.98	36.4	170	57.8	149.8	299.9	469.7	0.95	0.43	30.37	38.55
117.74	5.43	36.4	202	56.1	151.1	278.6	469.3	0.95	0.45	32.43	41.01
120.05	5.57	36.4	184	52.2	200.6	93.6	514.9	0.95	0.38	31.39	39.71
122.16	5.91	36.4	194	53.3	166.4	397.7	481.8	0.95	0.48	29.34	36.98
123.72	5.91	36.4	200	82.1	147.7	316.9	491.9	0.95	0.42	31.61	39.79
125.89	5.82	36.4	172	100.8	134.3	365.8	497.2	0.95	0.48	30.20	38.29
128.01	5.92	36.4	194	48.1	145.3	414.8	455.5	0.94	0.39	30.97	39.71
130.01	5.98	36.4	200	102.7	127.8	412.6	492.6	0.95	0.43	32.13	41.42
131.99	6.07	36.4	208	98.8	152.7	380.7	513.6	0.95	0.47	30.46	39.22
134.17	5.94	36.4	148	99.6	143.8	336.1	505.5	0.95	0.49	29.90	38.60
136.20	6.04	36.4	168	45.3	144.4	359.5	451.8	0.94	0.46	30.38	39.31
138.00	5.86	36.4	164	62.7	138.9	325.4	463.7	0.95	0.48	27.18	33.41
139.90	6.03	36.4	178	48.4	150.3	295.7	460.8	0.95	0.46	30.81	40.09
142.05	6.07	36.4	164	33.1	160.9	336.1	456.1	0.95	0.39	30.61	39.72
144.00	5.89	36.4	182	67.6	147.5	355.2	477.2	0.95	0.51	30.62	39.42
146.13	6.04	36.4	170	54.2	160.0	325.4	476.3	0.95	0.42	29.76	38.36

Table D-16. Continued.

Train 6 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
147.88	5.66	36.4	168	58.2	146.8	214.8	467.1	0.95	0.49	29.60	37.72
150.06	6.08	36.4	132	48.0	140.1	297.8	450.2	0.94	0.46	32.89	42.14
151.88	6.08	36.4	162	26.9	155.2	276.5	444.2	0.95	0.40	31.05	40.10
153.85	5.79	36.4	178	28.8	148.1	270.1	439.0	0.95	0.43	30.29	39.27
156.02	5.90	36.4	138	66.5	130.5	321.2	459.1	0.95	0.50	32.35	41.99
158.00	5.96	36.4	198	50.6	123.9	280.8	436.6	0.94	0.40	32.22	41.70
159.76	5.83	36.4	184	95.8	151.2	80.8	509.1	0.95	0.13	30.59	39.24
162.16	5.76	36.4	172	74.1	145.2	146.8	481.4	0.95	0.47	29.87	38.26
164.21	5.90	36.4	204	62.6	143.5	359.5	468.2	0.94	0.46	30.99	40.14
166.10	5.95	36.4	172	59.0	163.2	495.6	484.3	0.94	0.38	31.69	41.38
167.38	5.81	36.4	172	59.0	146.9	223.3	468.0	0.94	0.41	29.22	35.75
170.03	5.86	36.4	198	75.6	133.4	278.6	471.1	0.94	0.36	30.21	38.28
172.01	5.92	36.4	192	103.2	132.3	242.5	497.6	0.94	0.49	30.79	38.75
173.76	5.81	36.4	170	95.1	134.8	238.2	492.0	0.95	0.48	30.48	38.20
176.18	5.75	36.4	178	63.6	139.9	163.8	465.6	0.95	0.47	30.56	38.75
178.20	5.96	36.4	186	63.0	143.7	248.9	468.8	0.95	0.50	30.65	37.94

Table D-17. Transfer data for Train 6 Fermentor 2.

Train 6 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.57	80.1	244	169.8	123	1240.0	511.2
1.97	5.55	74.1	236	274.4	43	876.3	541.3
3.95	5.67	116.2	240	210.1	136	625.3	528.8
5.95	5.55	183.5	181	166.3	249	470.1	530.4
7.98	5.23	147.9	282	181.7	143	387.1	475.6
10.00	5.52	153.1	488	218.3	211	180.8	575.1
12.13	5.55	169.0	335	389.9	254	178.7	772.9
13.96	5.61	136.9	292	267.3	204	282.9	632.8
15.99	5.58	160.6	440	227.3	216	425.4	581.6
17.82	5.53	148.5	144	391.1	192	385.0	733.2
20.12	5.72	208.2	295	90.1	254	170.2	434.8
21.38	5.57	125.2	268	247.6	164	299.9	584.4
24.08	5.58	152.4	350	233.9	185	268.0	565.1
26.01	5.63	190.4	180	281.6	256	238.2	645.3
27.98	5.66	159.0	408	155.4	181	287.1	475.9
29.46	5.54	157.7	352	365.9	197	348.8	703.5
31.92	5.52	145.0	336	269.6	224	193.6	647.4
34.13	5.56	155.0	306	276.7	208	436.0	628.5
35.98	5.59	182.2	306	244.0	234	202.1	594.3
38.13	5.69	196.9	275	219.1	284	155.3	604.5
40.20	5.74	177.8	316	154.0	246	176.5	520.8
42.02	5.63	151.4	302	263.3	212	225.5	622.0
43.90	5.50	159.1	322	234.3	225	208.4	598.6
45.89	5.52	163.7	216	255.8	225	182.9	615.7
47.93	5.60	171.9	278	164.4	222	210.6	513.2
49.89	5.42	154.5	237	224.2	207	204.2	574.9
51.90	5.60	203.5	286	167.7	270	161.7	533.0
54.04	5.58	169.4	234	198.2	226	106.4	553.6
55.38	5.63	171.5	268	247.7	218	61.7	592.6
57.92	5.76	193.8	259	199.4	250	157.4	554.5
60.24	5.77	177.8	258	196.7	232	246.7	549.1
61.96	5.78	144.7	290	220.8	182	100.0	756.1
63.86	5.72	175.3	289	239.8	224	136.1	587.0
65.91	5.54	193.1	256	225.3	253	57.4	584.0
67.76	5.71	179.4	272	232.3	234	148.9	585.6
70.05	5.51	165.2	304	222.1	199	51.0	554.6
72.01	5.68	174.5	269	268.2	213	114.9	605.5

Table D-17. Continued.

Train 6 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.89	5.60	172.6	244	202.3	237	93.6	565.6
75.87	5.62	149.2	300	194.8	200	112.7	543.9
77.90	5.65	157.0	237	217.3	237	168.0	595.9
79.88	5.59	144.9	210	169.4	213	157.4	536.4
81.89	5.76	154.9	218	144.0	212	191.4	499.9
83.84	5.81	154.9	228	144.3	228	153.1	516.1
85.93	5.88	156.9	246	171.2	214	93.6	526.6
87.85	5.75	167.8	246	183.1	232	121.2	545.4
89.96	5.77	171.0	218	181.9	230	148.9	539.0
92.17	5.52	152.7	250	157.3	219	123.4	522.2
93.38	5.50	150.8	255	179.3	224	146.8	550.6
95.38	5.79	152.2	233	176.4	232	161.7	554.7
97.38	5.89	149.6	265	162.5	220	153.1	531.8
100.01	5.73	153.3	266	181.3	235	178.7	561.0
102.03	5.84	149.4	226	171.3	243	219.1	563.0
103.38	5.78	159.7	184	167.4	218	217.0	523.8
105.38	5.63	143.5	305	126.0	197	195.7	478.4
107.38	5.58	146.9	180	219.4	226	268.0	597.0
109.38	5.56	149.3	168	100.8	228	219.1	477.8
111.38	5.40	137.4	244	112.4	197	168.0	470.8
114.03	5.75	144.9	240	171.9	217	191.4	542.3
115.99	5.79	149.8	284	170.6	218	191.4	537.2
117.74	5.31	151.1	250	201.6	232	174.4	581.4
120.05	5.48	200.6	260	181.4	282	144.6	561.0
122.16	5.75	166.4	260	193.5	234	225.5	560.0
123.72		147.7	234	198.1	212	187.2	560.6
125.89	5.78	134.3	270	170.5	196	202.1	530.5
128.01	5.70	145.3	272	194.1	207	172.3	554.1
130.01	5.78	127.8	274	200.6	199	180.8	569.9
131.99	5.97	152.7	215	205.3	234	189.3	585.2
134.17	5.96	143.8	234	145.1	212	127.6	511.7
136.20	5.97	144.4	224	165.1	209	136.1	528.3
138.00	5.95	138.9	246	161.6	198	121.2	518.9
139.90	5.94	150.3	240	175.4	217	125.5	540.6
142.05	5.95	160.9	240	164.5	213	119.1	515.4
144.00	5.83	147.5	234	178.8	222	174.4	551.6
146.13	5.91	160.0	244	167.6	223	159.5	529.2

Table D-17. Continued.

Train 6 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
147.88	5.62	146.8	226	165.0	222	153.1	538.7
150.06	6.04	140.1	194	131.4	218	142.5	508.0
151.88	5.88	155.2	242	158.5	204	153.1	505.9
153.85	5.70	148.1	196	175.4	231	117.0	557.1
156.02	5.83	130.5	250	137.7	172	155.3	477.4
158.00	5.80	123.9	244	198.4	175	106.4	548.0
159.76	5.77	151.2	244	181.5	232	174.4	560.3
162.16	5.77	145.2	275	169.8	214	134.0	536.9
164.21	5.71	143.5	245	200.7	219	136.1	574.3
166.10	5.84	163.2	242	171.8	218	289.3	525.1
167.38	5.70	146.9	245	171.8	215	117.0	537.9
170.03	5.78	133.4	242	198.7	174	172.3	537.5
172.01	5.73	132.3	228	192.7	182	193.6	541.1
173.76	5.69	134.8	240	167.4	195	117.0	526.2
176.18	5.67	139.9	236	174.1	202	121.2	534.8
178.20	5.72	143.7	240	184.7	187	138.3	526.4

Table D-18. Transfer data for Train 6 Fermentor 3.

Train 6 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.70	123.0	170	242.0	92.6	1233.7	510.1
1.97	5.70	42.50	186	232.20	0.00	1089.02	463.5
3.95	5.64	136.40	162	230.80	61.50	769.97	454.4
5.95	5.59	249.10	228	177.60	221.70	676.39	480.6
7.98	5.32	143.30	466	277.40	121.90	353.08	554.5
10.00	5.56	211.40	344	479.20	186.40	157.40	752.7
12.13	5.57	253.50	250	336.90	217.30	204.19	632.8
13.96	5.57	203.90	430	284.90	201.60	202.07	581.1
15.99	5.48	216.40	118	436.70	202.40	557.27	721.2
17.82	5.53	192.10	370	139.10	167.80	242.48	413.3
20.12	5.52	254.40	302	295.60	285.10	116.99	660.0
21.38	5.58	163.50	356	264.60	233.70	240.35	633.6
24.08	5.60	185.10	215	349.70	187.70	178.67	650.8
26.01	5.65	255.60	395	179.50	254.40	189.30	511.2
27.98	5.60	181.00	344	405.00	201.20	180.80	723.7
29.46	5.54	196.80	332	350.30	206.10	321.18	658.1
31.92	5.58	224.30	292	332.00	210.40	161.65	624.2
34.13	5.53	208.30	318	300.80	205.60	357.34	596.6
35.98	5.62	234.00	310	302.50	225.10	108.48	605.0
38.13	5.64	283.80	308	274.10	266.90	95.72	617.3
40.20	5.64	246.10	308	314.40	271.00	142.51	663.0
42.02	5.63	211.60	334	302.20	241.00	146.76	630.1
43.90	5.47	224.90	218	322.10	231.50	146.76	630.7
45.89	5.55	225.10	280	216.60	223.70	148.89	517.8
47.93	5.56	222.20	261	277.00	224.80	170.16	579.3
49.89	5.55	206.70	313	239.60	226.40	163.78	557.8
51.90	5.61	270.30	280	286.10	244.50	155.27	609.8
54.04	5.61	226.30	248	234.10	228.70	121.24	554.3
55.38	5.66	217.90	290	268.50	278.20	221.21	627.3
57.92	5.60	250.10	305	262.40	244.00	153.14	583.3
60.24	5.66	231.70	304	258.40	237.80	193.56	585.5
61.96	5.63	181.50	302	290.90	221.40	93.59	629.3
63.86	5.64	224.00	289	291.50	225.30	129.75	599.5
65.91	5.60	253.30	304	255.70	262.20	131.87	596.3
67.76	5.61	234.20	298	271.50	231.80	140.38	584.2
70.05	5.48	199.20	296	304.00	226.00	76.57	629.3
72.01	5.70	213.30	287	271.10	236.70	121.24	593.0

Table D-18. Continued.

Train 6 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.89	5.59	237.40	324	244.80	262.10	134.00	583.7
75.87	5.61	199.80	274	300.10	237.40	110.60	636.2
77.90	5.57	237.10	237	240.10	251.70	146.76	569.7
79.88	5.58	213.40	255	207.70	258.70	157.40	551.5
81.89	5.71	212.30	278	217.60	256.80	168.03	551.3
83.84	5.77	228.20	285	228.10	261.80	159.53	567.0
85.93	5.65	213.80	280	247.00	256.70	151.02	588.4
87.85	5.66	231.60	255	242.90	265.50	65.94	584.9
89.96	5.68	229.60	295	215.90	266.60	119.11	558.7
92.17	5.50	219.10	310	253.30	256.50	163.78	589.2
93.38	5.48	223.60	275	258.40	272.60	159.53	607.8
95.38	5.91	232.00	270	232.80	269.20	172.29	577.7
97.38	5.79	220.40	235	263.70	274.10	138.26	615.9
100.01	5.80	234.50	262	265.80	263.30	138.26	605.0
102.03	6.06	242.60	194	225.80	270.10	182.92	571.6
103.38	5.69	217.60	360	180.20	250.80	161.65	511.9
105.38	5.75	197.40	225	305.30	255.90	189.30	662.3
107.38	5.50	226.00	210	178.60	261.40	161.65	515.6
109.38	5.46	227.80	290	168.50	262.70	242.48	507.1
111.38	5.41	197.30	275	244.40	245.20	163.78	590.8
114.03	5.69	216.80	320	240.60	246.80	204.19	569.1
115.99	5.69	217.90	312	283.50	251.50	153.14	615.6
117.74	5.19	232.40	295	250.90	277.60	161.65	606.1
120.05	5.34	281.70	290	261.70	261.40	165.91	615.9
122.16	5.52	234.40	265	262.70	310.10	168.03	663.2
123.72	5.83	211.70	295	232.80	267.80	159.53	589.9
125.89	5.67	195.80	295	270.20	224.60	161.65	597.5
128.01	5.67	206.80	302	272.00	214.60	129.75	578.3
130.01	5.68	198.60	226	273.30	226.80	110.60	600.0
131.99	5.88	234.10	260	215.10	233.20	161.65	538.6
134.17	5.88	211.90	255	230.10	266.50	138.26	586.8
136.20	5.77	209.10	280	220.50	242.80	140.38	552.7
138.00	5.86	197.70	280	242.20	232.20	131.87	575.2
139.90	5.70	217.00	275	236.50	246.90	123.37	575.6
142.05	5.82	213.30	258	239.80	236.40	99.97	561.4
144.00	5.82	221.80	280	229.80	250.90	142.51	570.2
146.13	5.74	223.10	270	240.20	257.70	153.14	588.1

Table D-18. Continued.

Train 6 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
147.88	5.47	222.00	240	223.90	263.10	144.64	580.0
150.06	5.83	218.20	258	191.70	263.30	116.99	535.3
151.88	5.70	204.10	240	237.40	238.40	144.64	570.2
153.85	5.60	231.30	295	192.10	251.10	97.84	533.8
156.02	5.72	171.70	272	249.80	223.50	119.11	600.0
158.00	5.75	175.00	270	244.70	198.90	131.87	567.1
159.76	5.65	231.50	310	240.80	252.10	134.00	582.3
162.16	5.64	213.80	280	274.70	266.40	125.49	631.9
164.21	5.68	218.60	285	244.10	245.40	134.00	579.9
166.10	5.64	218.00	275	241.30	255.10	331.81	576.9
167.38	5.63	214.50	275	241.10	241.30	114.86	566.4
170.03	5.70	173.70	258	242.70	201.60	146.76	569.1
172.01	5.63	182.20	270	226.80	213.20	170.16	556.3
173.76	5.60	195.10	265	237.10	225.00	144.64	565.5
176.18	5.55	202.10	255	233.70	235.90	174.41	566.0
178.20	5.63	186.90	275	237.90	198.40	178.67	577.9

Table D-19. Transfer data for Train 6 Fermentor 4.

Train 6 – Fermentor 4							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	6.30	92.6	132	166.3	142.3	506.2	514.5
1.97	5.76	0.0	130	183.7	0.0	1284.7	428.1
3.95	5.74	61.5	210	156.2	0.0	774.2	371.4
5.95	5.62	221.7	394	224.1	147.3	697.7	455.7
7.98	5.47	121.9	336	454.3	59.9	353.1	690.8
10.00	5.69	186.4	248	336.7	180.4	231.8	629.2
12.13	5.73	217.3	402	251.1	196.1	272.3	530.0
13.96	5.56	201.6	82	423.1	181.5	225.5	701.5
15.99	5.49	202.4	350	114.7	166.0	746.6	376.8
17.82	5.47	167.8	320	364.0	147.5	631.7	642.2
20.12	5.46	285.1	292	302.0	226.0	170.2	608.6
21.38	5.58	233.7	174	348.5	227.1	202.1	656.4
24.08	5.47	187.7	380	213.1	162.3	251.0	486.2
26.01	5.59	254.4	339	392.5	206.3	140.4	675.3
27.98	5.53	201.2	336	340.0	231.4	199.9	668.7
29.46	5.58	206.1	296	329.5	187.7	527.5	609.6
31.92	5.56	210.4	300	289.5	212.3	127.6	589.9
34.13	5.58	205.6	310	314.6	192.1	453.1	599.6
35.98	5.66	225.1	314	308.8	215.1	121.2	605.7
38.13	5.64	266.9	285	305.6	233.4	119.1	617.9
40.20	5.63	271.0	308	306.5	234.5	142.5	622.6
42.02	5.56	241.0	188	333.4	243.0	172.3	658.3
43.90	5.48	231.5	282	220.8	206.4	185.0	507.4
45.89	5.58	223.7	256	280.4	231.9	168.0	590.8
47.93	5.55	224.8	310	258.8	218.0	191.4	554.5
49.89	5.58	226.4	289	315.3	210.1	142.5	610.9
51.90	5.57	244.5	268	279.2	236.1	178.7	599.2
54.04	5.59	228.7	262	247.3	217.5	100.0	554.9
55.38	5.73	278.2	294	289.2	221.0	148.9	593.3
57.92	5.53	244.0	283	307.9	263.8	199.9	652.9
60.24	5.56	237.8	280	304.8	247.1	199.9	648.0
61.96	5.55	221.4	290	302.6	226.5	91.5	606.2
63.86	5.65	225.3	305	292.0	215.8	136.1	586.7
65.91	5.55	262.2	270	303.0	229.9	161.7	610.0
67.76	5.53	231.8	276	298.4	227.3	176.5	592.4
70.05	5.67	226.0	298	296.8	233.4	178.7	607.7
72.01	5.66	236.7	337	288.3	234.9	142.5	599.5

Table D-19. Continued.

Train 6 – Fermentor 4							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.89	5.54	262.1	284	323.3	247.2	178.7	647.2
75.87	5.52	237.4	278	273.4	272.5	97.8	621.9
77.90	5.74	251.7	277	238.8	272.9	1510.2	589.1
79.88	5.74	258.7	285	254.9	268.2	238.2	600.4
81.89	5.77	256.8	296	278.3	264.9	193.6	619.5
83.84	5.77	261.8	290	285.0	271.3	168.0	626.5
85.93	5.78	256.7	273	280.5	264.5	163.8	622.2
87.85	5.70	265.5	300	250.9	277.2	187.2	599.2
89.96	5.63	266.6	310	290.3	272.1	163.8	638.7
92.17	5.49	256.5	280	310.2	272.1	174.4	652.9
93.38	5.69	272.6	275	277.0	254.6	168.0	608.7
95.38	5.74	269.2	270	270.1	277.2	153.1	624.0
97.38	5.76	274.1	255	235.0	272.1	172.3	577.8
100.01	6.20	263.3	192	261.8	275.6	223.3	614.1
102.03	5.90	270.1	296	193.4	262.2	174.4	532.1
103.38	5.95	250.8	235	363.1	200.4	217.0	637.1
105.38	5.64	255.9	225	223.5	261.0	174.4	561.3
107.38	5.48	261.4	335	210.0	268.7	276.5	554.7
109.38	5.35	262.7	290	292.2	304.1	329.7	668.1
111.38	5.35	245.2	320	273.2	280.2	163.8	629.3
114.03	5.64	246.8	312	318.8	245.2	257.4	640.0
115.99	5.71	251.5	318	310.8	243.9	182.9	631.2
117.74	5.12	277.6	275	293.0	272.9	172.3	642.9
120.05	5.31	261.4	255	290.3	260.6	180.8	642.5
122.16	5.49	310.1	290	265.3	248.7	187.2	605.1
123.72	5.72	267.8	285	294.2	308.3	146.8	686.2
125.89	5.68	224.6	300	294.2	253.4	199.9	637.3
128.01	5.73	214.6	242	302.4	212.1	193.6	598.4
130.01	5.70	226.8	262	226.8	236.6	185.0	539.7
131.99	5.80	233.2	250	261.4	225.9	163.8	577.2
134.17	5.90	266.5	275	252.2	231.5	176.5	574.3
136.20	5.83	242.8	290	277.4	264.1	142.5	631.1
138.00	5.72	232.2	280	278.4	252.7	161.7	620.6
139.90	5.64	246.9	260	273.2	237.4	165.9	600.8
142.05	5.78	236.4	284	257.3	244.2	168.0	577.4
144.00	5.71	250.9	270	278.3	240.7	176.5	609.0
146.13	5.70	257.7	255	268.4	250.4	157.4	608.5

Table D-19. Continued.

Train 6 – Fermentor 4							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
147.88	5.36	263.1	275	240.1	269.4	170.2	600.3
150.06	5.67	263.3	203	256.8	279.2	197.8	613.2
151.88	5.64	238.4	295	235.3	232.1	144.6	561.4
153.85	5.60	251.1	275	292.7	237.9	136.1	621.3
156.02	5.72	223.5	278	272.4	249.6	197.8	597.5
158.00	5.67	198.9	330	270.3	205.3	153.1	575.2
159.76	5.62	252.1	270	308.4	242.2	199.9	640.4
162.16	5.62	266.4	280	275.6	244.9	176.5	610.1
164.21	5.60	245.4	280	283.3	261.6	189.3	634.0
166.10	5.64	255.1	280	271.8	247.1	304.2	594.7
167.38	5.55	241.3	275	271.9	251.2	114.9	599.5
170.03	5.58	201.6	286	258.6	235.2	255.2	590.7
172.01	5.68	213.2	290	267.0	232.2	189.3	584.5
173.76	5.53	225.0	260	264.9	241.4	199.9	585.0
176.18	5.54	235.9	270	255.4	226.3	227.6	558.2
178.20	5.57	198.4	335	272.2	203.1	178.7	575.4

Table D-20. Transfer data for Train 6 Fermentor 5.

Train 6 – Fermentor 5							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	6.28	142.3	122	130.4	179.1	299.9	465.7
1.97	5.98	0.0	154	130.4	0.0	861.4	410.3
3.95	5.76	0.0	330	202.0	0.0	1006.1	430.6
5.95	5.74	147.3	322	388.4	16.9	559.4	556.5
7.98	5.60	59.9	240	330.7	45.1	604.1	614.4
10.00	6.19	180.4	392	237.9	178.9	372.2	534.9
12.13	5.68	196.1	44	403.0	175.8	455.2	681.2
13.96	5.54	181.5	310	78.5	144.3	327.6	339.8
15.99	5.44	166.0	296	345.0	126.3	240.4	603.8
17.82	5.57	147.5	316	312.4	123.5	650.9	586.9
20.12	5.64	226.0	128	291.1	234.3	221.2	607.8
21.38	5.42	227.1	328	172.9	176.7	244.6	434.6
24.08	5.54	162.3	325	377.5	125.1	234.0	638.8
26.01	5.53	206.3	307	337.4	190.6	253.1	620.2
27.98	5.58	231.4	266	334.4	182.3	261.6	601.0
29.46	5.60	187.7	294	293.0	174.5	270.1	578.3
31.92	5.65	212.3	280	297.9	202.8	180.8	586.9
34.13	5.92	192.1	296	306.7	163.4	584.9	576.5
35.98	5.66	215.1	284	313.0	192.7	331.8	591.6
38.13	5.71	233.4	278	279.8	221.4	170.2	581.7
40.20	5.67	234.5	169	307.0	201.0	421.1	588.6
42.02	5.51	243.0	278	188.4	212.4	285.0	480.7
43.90	5.43	206.4	262	283.4	220.6	376.5	596.1
45.89	5.56	231.9	285	256.0	215.8	280.8	555.0
47.93	5.58	218.0	285	309.0	208.8	268.0	598.3
49.89	5.68	210.1	269	292.6	200.6	217.0	581.6
51.90	5.63	236.1	274	268.1	207.3	246.7	563.1
54.04	5.64	217.5	276	261.2	203.3	246.7	551.2
55.38	5.71	221.0	295	293.7	218.3	148.9	593.1
57.92	5.55	263.8	271	286.7	229.2	370.1	595.4
60.24	5.50	247.1	275	279.7	217.5	325.4	580.4
61.96	5.48	226.5	295	289.5	240.9	136.1	610.8
63.86	5.64	215.8	269	308.2	207.8	242.5	598.7
65.91	5.77	229.9	273	270.0	214.9	199.9	565.9
67.76	5.81	227.3	269	276.1	225.9	229.7	573.2
70.05	5.61	233.4	337	297.5	201.3	106.4	582.3
72.01	5.67	234.9	283	337.9	235.3	263.7	651.3

Table D-20. Continued.

Train 6 – Fermentor 5							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.89	5.59	247.2	271	283.5	232.4	270.1	595.1
75.87	5.58	272.5	261	277.5	239.4	174.4	596.4
77.90	5.65	272.9	272	277.8	257.1	185.0	612.2
79.88	5.73	268.2	262	283.6	256.5	134.0	618.2
81.89	5.78	264.9	282	295.2	229.6	121.2	602.1
83.84	5.78	271.3	270	286.4	265.4	140.4	626.4
85.93	5.79	264.5	280	272.3	263.8	131.9	613.0
87.85	5.63	277.2	295	298.3	241.4	151.0	618.1
89.96	5.68	272.1	265	311.9	252.4	153.1	641.6
92.17	6.01	272.1	280	277.8	258.6	229.7	613.0
93.38	5.48	254.6	265	276.5	270.9	129.7	619.6
95.38	6.40	277.2	265	267.2	250.7	225.5	594.9
97.38	6.00	272.1	270	255.7	278.6	140.4	612.7
100.01	5.73	275.6	294	193.0	263.4	148.9	533.3
102.03	6.40	262.2	280	295.7	273.6	219.1	646.3
103.38	5.77	200.4	280	231.3	288.3	195.7	617.7
105.38	5.51	261.0	335	227.6	265.2	695.5	572.3
107.38	5.29	268.7	285	332.5	256.1	523.2	669.1
109.38	5.41	304.1	295	291.1	248.4	380.7	632.1
111.38	5.33	280.2	285	320.1	275.4	289.3	674.1
114.03	5.71	245.2	306	311.1	249.3	274.4	638.3
115.99	5.75	243.9	294	317.7	231.3	282.9	626.5
117.74	5.28	272.9	250	274.5	262.7	257.4	613.5
120.05	5.46	260.6	300	253.8	266.7	227.6	613.0
122.16	5.61	248.7	280	291.5	260.4	248.9	644.7
123.72	5.87	308.3	290	281.9	248.0	174.4	621.4
125.89	5.85	253.4	235	298.3	294.8	202.1	686.4
128.01	5.67	212.1	266	241.6	242.3	227.6	570.3
130.01	5.73	236.6	260	262.3	222.7	244.6	562.4
131.99	5.92	225.9	280	251.7	240.2	274.4	586.7
134.17	5.86	231.5	290	274.4	229.6	187.2	595.8
136.20	5.80	264.1	280	288.5	229.9	242.5	610.6
138.00	5.74	252.7	275	278.1	263.3	204.2	633.9
139.90	5.71	237.4	290	260.5	263.5	217.0	616.3
142.05	5.78	244.2	278	284.1	234.0	227.6	595.5
144.00	5.74	240.7	260	267.6	252.6	195.7	612.5
146.13	5.71	250.4	295	252.8	247.4	161.7	592.7

Table D-20. Continued.

Train 6 – Fermentor 5							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
147.88	5.44	269.4	210	273.2	264.4	285.0	633.5
150.06	5.70	279.2	288	200.5	278.2	206.3	556.2
151.88	5.50	232.1	295	291.1	269.2	285.0	651.8
153.85	5.62	237.9	270	270.9	246.9	202.1	613.7
156.02	5.68	249.6	316	277.4	235.0	274.4	589.7
158.00	5.66	205.3	278	329.8	218.4	302.0	641.4
159.76	5.70	242.2	280	269.8	226.4	223.3	589.1
162.16	5.65	244.9	285	278.3	239.3	221.2	609.1
164.21	5.65	261.6	270	277.1	250.7	253.1	620.5
166.10	5.62	247.1	285	274.1	251.2	529.6	602.2
167.38	5.49	251.2	280	274.2	247.9	265.9	600.4
170.03	5.87	235.2	286	286.6	243.1	208.4	606.5
172.01	5.59	232.2	285	287.1	232.5	310.5	596.5
173.76	5.55	241.4	260	258.6	241.3	368.0	579.6
176.18	5.53	226.3	325	268.6	228.9	329.7	579.3
178.20	5.56	203.1	295	331.0	198.1	380.7	624.5

Table D-21. Transfer data for Train 6 Fermentor 6.

Train 6 – Fermentor 6									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(g)	(g)	(g)	(cm ³)	(g)		
0.00	5.84	179.1	277.0	122	231.8	931.6	444.9	0.82	0.35
1.97	5.64	0.0	277.0	154	0.0	770.0	431.6	0.82	0.35
3.95	5.77	0.0	277.0	330	0.0	612.6	553.4	0.82	0.35
5.95	6.28	16.9	277.0	325	0.0	219.1	509.2	0.82	0.35
7.98	5.84	45.1	277.0	240	0.0	457.3	485.2	0.82	0.35
10.00	5.63	178.9	277.0	392	61.1	2133.4	562.6	0.82	0.96
12.13	6.26	175.8	277.0	47	0.0	0.0	187.7	0.82	0.47
13.96	5.58	144.3	277.0	310	132.7	1495.3	592.7	0.66	0.54
15.99	5.89	126.3	277.0	296	120.2	514.7	581.9	0.79	0.53
17.82	5.83	123.5	277.0	316	84.8	457.3	573.5	0.69	0.38
20.12	5.49	234.3	277.0	131	176.4	106.4	398.3	0.66	0.52
21.38	5.64	176.7	277.0	328	155.3	1495.3	601.9	0.76	0.34
24.08	5.57	125.1	277.0	325	80.6	1476.1	576.0	0.74	0.38
26.01	5.66	190.6	277.0	310	156.7	1401.7	571.4	0.75	0.30
27.98	6.09	182.3	277.0	266	189.2	508.4	570.1	0.77	0.30
29.46	5.86	174.5	277.0	294	162.2	295.7	577.7	0.77	0.30
31.92	5.67	202.8	277.0	280	200.0	935.9	573.4	0.78	0.36
34.13	5.57	163.4	277.0	296	148.8	1201.8	578.8	0.79	0.16
35.98	5.61	192.7	277.0	284	185.8	1440.0	574.4	0.76	0.38
38.13	5.93	221.4	277.0	281	212.5	950.8	575.1	0.78	0.38
40.20	5.94	201.0	277.0	172	134.4	117.0	402.4	0.79	0.34
42.02	5.60	212.4	277.0	278	205.1	1676.1	568.8	0.78	0.38
43.90	5.40	220.6	277.0	265	219.2	1505.9	569.1	0.83	0.28
45.89	5.62	215.8	277.0	288	210.9	1303.9	581.5	0.81	0.14
47.93	5.68	208.8	277.0	288	197.5	706.2	574.6	0.80	0.35
49.89	5.78	200.6	277.0	272	202.2	725.3	571.9	0.82	0.33
51.90	5.61	207.3	277.0	274	202.3	1246.4	565.7	0.81	0.33
54.04	5.58	203.3	277.0	276	199.6	723.2	570.1	0.81	0.34
55.38	5.60	218.3	277.0	298	164.4	1244.3	553.3	0.80	0.34
57.92	5.61	229.2	277.0	274	229.6	453.1	585.6	0.81	0.33
60.24	5.62	217.5	277.0	278	221.5	378.6	592.1	0.80	0.34
61.96	5.65	240.9	277.0	298	195.0	829.5	573.7	0.79	0.34
63.86	5.94	207.8	277.0	272	225.8	163.8	589.2	0.80	0.30
65.91	5.94	214.9	277.0	276	210.2	208.4	569.3	0.77	0.34
67.76	5.90	225.9	277.0	272	230.2	138.3	581.4	0.81	0.32
70.05	5.66	201.3	277.0	340	158.3	1195.4	595.4	0.82	0.35
72.01	5.74	235.3	277.0	286	199.8	718.9	565.8	0.80	0.32

Table D-21. Continued.

Train 6 – Fermentor 6									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(g)	(g)	(g)	(cm ³)	(g)		
73.89	5.88	232.4	277.0	274	238.7	219.1	591.6	0.81	0.32
75.87	5.91	239.4	277.0	264	238.6	140.4	580.3	0.81	0.29
77.90	5.97	257.1	277.0	275	239.8	165.9	587.3	0.80	0.32
79.88	5.85	256.5	277.0	265	266.8	151.0	609.3	0.81	0.30
81.89	5.93	229.6	277.0	282	250.7	153.1	610.3	0.81	0.31
83.84	6.02	265.4	277.0	270	238.6	148.9	582.8	0.82	0.29
85.93	5.93	263.8	277.0	280	263.2	125.5	612.3	0.79	0.34
87.85	5.86	241.4	277.0	295	249.9	138.3	618.2	0.81	0.31
89.96	5.67	252.4	277.0	265	258.4	112.7	593.2	0.81	0.27
92.17	5.80	258.6	277.0	280	258.5	144.6	606.3	0.82	0.28
93.38	7.14	270.9	277.0	265	270.3	112.7	611.3	0.79	0.38
95.38	6.03	250.7	277.0	265	279.3	202.1	618.2	0.82	0.28
97.38	7.49	278.6	277.0	270	264.6	131.9	604.0	0.82	0.30
100.01	7.38	263.4	277.0	294	260.5	112.7	631.4	0.81	0.30
102.03	6.06	273.6	277.0	280	258.7	174.4	615.1	0.82	0.37
103.38	5.61	288.3	277.0	280	277.4	1435.7	623.5	0.81	0.35
105.38	5.52	265.2	277.0	335	179.8	2112.1	602.7	0.80	0.36
107.38	5.45	256.1	277.0	285	248.1	1344.3	620.3	0.82	0.28
109.38	5.56	248.4	277.0	295	244.2	776.4	618.3	0.81	0.29
111.38	5.59	275.4	277.0	285	269.9	701.9	613.0	0.81	0.34
114.03	5.85	249.3	277.0	306	246.6	878.5	628.4	0.81	0.33
115.99	5.94	231.3	277.0	294	229.7	746.6	601.0	0.80	0.35
117.74	5.71	262.7	277.0	250	254.5	572.2	581.5	0.82	0.33
120.05	5.36	266.7	277.0	300	257.4	1248.5	611.3	0.82	0.32
122.16	5.93	260.4	277.0	280	263.4	640.2	635.7	0.82	0.31
123.72	6.14	248.0	277.0	290	247.6	242.5	628.8	0.80	0.32
125.89	5.92	294.8	277.0	235	372.4	806.1	607.3	0.82	0.31
128.01	5.75	242.3	277.0	266	309.5	765.7	651.8	0.82	0.29
130.01	5.88	222.7	277.0	260	256.7	689.1	593.7	0.82	0.32
131.99	6.06	240.2	277.0	280	227.4	780.6	588.8	0.82	0.34
134.17	5.97	229.6	277.0	290	225.7	848.7	609.7	0.82	0.32
136.20	6.03	229.9	277.0	280	230.2	887.0	600.4	0.79	0.37
138.00	6.03	263.3	277.0	275	229.1	595.6	597.2	0.81	0.33
139.90	6.24	263.5	277.0	290	255.7	976.3	635.2	0.81	0.30
142.05	5.99	234.0	277.0	278	256.9	497.7	610.8	0.83	0.27
144.00	5.92	252.6	277.0	260	244.7	757.2	600.6	0.81	0.35
146.13	5.73	247.4	277.0	295	235.1	1578.2	622.6	0.78	0.43

Table D-21. Continued.

Train 6 – Fermentor 6									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(g)	(g)	(g)	(cm ³)	(g)		
147.88	5.69	264.4	277.0	210	320.3	891.2	619.4	0.85	0.33
150.06	5.79	278.2	277.0	288	253.2	976.3	616.9	0.82	0.31
151.88	5.91	269.2	277.0	295	261.3	548.8	646.2	0.81	0.35
153.85	5.63	246.9	277.0	270	269.4	1135.8	638.0	0.82	0.34
156.02	5.70	235.0	277.0	316	214.0	1291.1	606.3	0.81	0.35
158.00	5.83	218.4	277.0	278	222.9	827.4	581.1	0.80	0.37
159.76	5.87	226.4	277.0	280	219.4	991.2	588.2	0.79	0.39
162.16	5.76	239.3	277.0	285	219.3	995.4	596.5	0.82	0.34
164.21	5.89	250.7	277.0	270	251.1	697.7	609.7	0.84	0.30
166.10	5.59	251.2	277.0	285	243.9	1610.1	600.3	0.84	0.35
167.38	5.76	247.9	277.0	280	244.2	436.0	602.1	0.78	0.29
170.03	5.68	243.1	277.0	286	234.2	1250.7	597.4	0.83	0.29
172.01	5.68	232.5	277.0	285	234.1	1535.7	595.2	0.80	0.37
173.76	5.77	241.3	277.0	260	247.2	914.6	585.2	0.84	0.32
176.18	5.53	228.9	277.0	325	190.8	1646.3	596.9	0.82	0.33
178.20	5.74	198.1	277.0	295	187.9	1031.6	581.7	0.78	0.41

**SUPPLEMENTAL E. DATA FOR RESIDUAL BIOMASS RECYCLE IN
COUNTERCURRENT MIXED-ACID FERMENTATION: EFFECT OF DIFFERENT
RECYCLE POINTS AND REFLUX RATIOS**

Table E-1. Transfer data for Train C Fermentor 1.

Train C – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00	5.84	27.3	234.0	92.5	167.5	372.2	430.8	0.98	0.47	10.83	14.52
1.81	5.76	27.3	244.0	123.0	134.6	314.8	428.4	0.98	0.44	11.67	15.59
3.94	5.82	27.3	229.0	136.3	134.0	302.0	441.1	0.98	0.43	10.23	13.67
6.11	6.89	27.3	280.0	84.3	170.0	423.3	425.1	0.98	0.43	11.47	15.21
7.35	6.46	27.3	393.0	220.3	88.4	178.7	479.5	0.98	0.44	10.90	14.43
10.11	5.87	27.3	228.0	202.0	213.7	812.5	586.5	0.97	0.35	11.02	14.69
12.04	7.51	27.3	276.0	161.0	202.5	714.7	534.3	0.97	0.49	15.45	24.86
14.16	5.46	27.3	322.0	192.3	112.2	453.1	475.3	0.98	0.42	19.24	31.72
15.79	5.45	27.3	350.0	207.9	136.5	295.7	515.2	0.97	0.34	16.81	27.87
17.91	6.00	27.3	267.0	235.1	142.0	312.7	547.9	0.97	0.43	17.69	25.68
20.09	6.00	27.3	194.0	143.2	152.5	446.7	466.5	0.97	0.38	16.04	24.96
22.06	6.00	27.3	283.0	133.0	238.0	457.3	541.8	0.97	0.42	17.78	26.84
24.12	6.50	27.3	202.0	110.3	207.8	510.5	488.9	0.97	0.39	17.21	26.63
25.99	5.66	27.3	199.0	79.5	146.5	404.1	396.8	0.97	0.41	19.73	30.01
28.18	5.27	27.3	114.0	53.8	171.7	763.6	396.3	0.97	0.44	17.22	26.23
29.80	5.34	27.3	274.0	6.1	86.5	465.8	266.4	0.97	0.41	17.37	26.10
32.05	5.08	27.3	265.0	119.6	182.6	246.7	473.0	0.96	0.43	18.80	27.99
33.80	5.41	27.3	320.0	139.3	152.9	429.7	463.0	0.97	0.43	16.06	24.20
36.18	4.94	27.3	266.0	184.3	165.4	444.5	518.5	0.97	0.39	17.90	26.81
38.06	5.11	27.3	123.0	142.3	143.4	436.0	456.5	0.96	0.39	15.75	23.51
40.08	5.14	27.3	314.0	133.1	160.9	487.1	464.8	0.97	0.37	18.49	27.43
41.93	5.37	27.3	295.0	185.1	155.6	382.9	511.5	0.97	0.39	17.13	25.50
44.04	5.39	27.3	276.0	182.1	138.5	438.2	491.4	0.97	0.39	15.86	24.01
46.01	5.51	27.3	267.0	193.7	111.8	329.7	476.3	0.97	0.39	15.79	23.64
48.16	5.46	27.3	255.0	162.7	130.6	348.8	464.1	0.97	0.41	15.32	22.80
49.97	5.54	27.3	256.0	101.3	181.2	436.0	452.3	0.97	0.42	17.46	25.37
52.15	5.77	27.3	256.0	82.0	193.5	433.9	446.3	0.97	0.39	17.17	25.02
53.35		27.3	255.0	0.0	95.5	55.3	266.3	0.97	0.40	18.74	26.68
56.26	5.63	27.3	158.0	114.4	170.6	436.0	454.8	0.97	0.42	20.68	29.28
57.86	5.60	27.3	352.0	57.1	126.9	270.1	354.8	0.96	0.44	17.87	25.83
59.88	5.59	27.3	383.0	183.7	193.3	761.5	547.8	0.97	0.39	20.51	29.10
61.78	5.34	27.3	378.0	258.2	154.1	1116.7	583.1	0.97	0.40	17.32	25.30

Table E-1. Continued.

Train C – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
63.90	5.27	27.3	368.0	221.9	191.6	993.3	584.3	0.97	0.36	20.67	30.88
66.27	4.78	27.3	395.0	206.1	181.5	852.9	557.4	0.97	0.38	17.18	26.54
68.18	4.88	27.3	357.0	225.3	196.2	931.1	591.3	0.97	0.37	16.45	25.45
70.24	5.26	27.3	360.0	217.3	160.5	973.5	547.6	0.97	0.38	18.11	28.04
71.90	5.18	27.3	334.0	260.8	173.5	937.7	605.1	0.97	0.39	19.46	30.05
73.97	5.21	27.3	330.0	163.5	199.3	923.8	533.6	0.97	0.35	14.69	23.29
76.26	5.09	27.3	335.0	170.8	184.8	493.5	525.4	0.97	0.40	16.32	25.63
78.02	5.18	27.3	365.0	175.7	183.8	246.7	530.3	0.97	0.38	18.79	29.14
80.02	5.18	27.3	365.0	175.7	183.8	246.7	530.3	0.97	0.38	15.83	25.04
82.08	5.09	27.3	394.0	203.6	187.7	302.0	562.1	0.97	0.38	15.44	24.34
84.25	5.28	27.3	347.0	229.2	190.4	238.2	589.4	0.97	0.35	16.52	25.69
86.34	5.45	27.3	322.0	171.9	204.3	336.1	546.0	0.97	0.35	13.89	21.48
88.12	5.66	27.3	388.0	149.5	177.9	355.2	498.2	0.97	0.35	16.58	25.41
90.06	5.47	27.3	335.0	203.5	203.1	440.3	577.4	0.97	0.33	17.86	27.10
91.94	5.47	27.3	116.0	159.5	177.8	1057.1	508.1	0.97	0.35	21.57	33.22
94.29	5.58	27.3	298.0	25.9	116.3	276.5	313.0	0.97	0.43	20.33	30.59
96.13	5.05	27.3	372.0	136.5	179.7	348.8	487.0	0.97	0.36	19.63	29.62
98.14	5.00	27.3	360.0	202.2	192.7	492.0	565.7	0.97	0.39	18.62	28.65
100.08	5.06	27.3	284.0	156.4	226.2	433.9	553.4	0.96	0.37	18.00	27.77
102.16	5.01	27.3	292.0	156.4	148.9	365.8	476.1	0.97	0.38	16.17	25.11
103.94	4.86	27.3	288.0	157.2	146.8	1027.3	474.8	0.97	0.21	18.22	28.27
106.20	4.68	27.3	325.0	154.8	156.7	755.1	482.3	0.97	0.34	16.08	25.78
108.19	5.04	27.3	295.0	156.4	188.5	333.9	515.7	0.96	0.37	17.26	27.48
110.06	5.10	27.3	282.0	156.4	158.2	378.6	485.4	0.97	0.23	18.35	29.12
112.09	4.73	27.3	299.0	136.9	173.5	427.5	481.2	0.97	0.36	18.32	29.18
114.15	4.71	27.3	340.0	160.5	168.8	293.5	500.1	0.97	0.24	17.36	27.78
116.11	5.33	27.3	372.0	185.9	181.3	142.5	538.0	0.97	0.36	14.34	23.00
118.09	5.48	27.3	394.0	181.6	202.5	306.3	554.9	0.97	0.34	13.76	22.21
120.00	5.40	27.3	332.0	250.5	169.9	259.5	591.2	0.97	0.30	14.36	23.19
122.12	5.58	27.3	342.0	219.7	143.6	123.4	534.1	0.97	0.32	16.78	26.24
124.10	5.76	27.3	350.2	168.6	181.6	63.8	521.0	0.97	0.36	15.91	24.77
126.13	5.81	27.3	390.0	160.2	187.5	234.0	518.5	0.97	0.34	16.13	24.74
127.89	5.52	27.3	370.0	254.9	155.2	344.6	580.9	0.97	0.33	17.71	27.14
130.21	5.39	27.3	402.0	212.0	140.1	246.7	522.9	0.97	0.33	16.62	25.29
132.23	5.45	27.3	411.0	290.2	130.0	399.9	591.0	0.97	0.34	12.24	18.82
134.27	5.15	27.3	334.0	235.5	191.5	791.2	597.8	0.97	0.39	15.72	24.15
136.08	5.25	27.3	390.0	206.9	134.4	869.9	512.1	0.97	0.40	13.73	21.74

Table E-1. Continued.

Train C – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
138.08	5.49	27.3	417.0	187.9	115.0	540.3	473.7	0.97	0.36	13.61	21.62
140.09	5.58	27.3	396.0	205.2	162.5	576.4	538.5	0.97	0.40	15.31	24.90
142.03	5.46	27.3	284.0	156.4	222.9	765.7	550.1	0.97	0.32	14.90	24.41
144.09	5.47	27.3	391.0	212.5	102.0	784.9	485.3	0.97	0.36	15.44	25.41
146.12	5.54	27.3	416.0	262.2	143.0	234.0	576.0	0.97	0.30	16.43	27.07
148.07	5.51	27.3	393.0	281.6	157.0	436.0	609.4	0.97	0.35	16.44	27.41
150.05	5.50	27.3	377.0	231.4	121.3	338.2	523.5	0.98	0.35	15.39	25.49
152.07	5.54	27.3	357.0	253.6	135.7	404.1	560.1	0.97	0.35	15.72	25.96
154.12	5.68	27.3	276.0	189.3	183.4	353.1	543.5	0.98	0.26	14.38	23.63
156.03	5.58	27.3	334.0	151.4	144.6	227.6	466.8	0.97	0.34	15.17	24.66
157.90	5.69	27.3	363.0	200.7	161.8	223.3	533.3	0.97	0.34	14.18	22.83
160.07	5.49	27.3	287.0	183.3	206.3	578.5	560.4	0.97	0.33	13.60	21.70
162.10	5.56	27.3	330.0	182.5	130.4	1212.4	483.7	0.97	0.39	16.28	25.26
164.01	6.02	27.3	350.0	213.4	148.1	642.4	532.3	0.98	0.39	16.57	26.22
166.09	5.73	27.3	327.0	185.7	187.7	950.8	544.2	0.98	0.38	16.58	26.25
168.17	5.89	27.3	330.0	165.0	190.8	746.6	526.6	0.98	0.52	15.28	24.30
170.11	5.68	27.3	352.0	210.4	140.6	999.7	521.8	0.98	0.33	17.00	26.48
172.08	5.48	27.3	408.0	238.4	136.5	984.8	545.7	0.98	0.39	16.97	26.26
174.12	5.39	27.3	407.0	230.2	197.6	1123.1	598.6	0.98	0.40	17.97	28.51
175.95	5.50	27.3	364.0	272.1	151.7	1084.8	594.6	0.98	0.38	17.44	28.29
178.06	5.48	27.3	380.0	260.0	136.6	908.2	567.5	0.97	0.37	17.76	28.58
180.25	5.35	27.3	430.0	230.4	172.6	714.7	573.8	0.97	0.32	17.77	28.75
182.07	5.51	27.3	438.0	297.0	161.5	310.5	629.3	0.97	0.34	17.06	27.33
184.16	5.42	27.3	378.0	307.7	153.7	406.3	632.2	0.97	0.36	18.48	29.17
186.14	5.38	27.3	360.0	208.3	184.3	355.2	563.4	0.97	0.35	18.52	29.18
187.99	5.33	27.3	372.0	227.3	159.8	365.8	557.9	0.97	0.33	19.67	30.93
190.13	5.43	27.3	390.0	249.5	129.4	397.7	549.7	0.97	0.32	18.90	29.54
191.94	5.51	27.3	386.0	234.1	177.3	612.6	582.2	0.97	0.35	17.92	28.51
194.11	5.37	27.3	381.0	261.7	152.7	553.0	585.2	0.97	0.36	17.87	28.50
195.75	5.43	27.3	344.0	240.2	163.1	519.0	574.1	0.97	0.29	16.89	27.10
197.84	5.43	27.3	310.0	224.6	143.7	287.1	539.1	0.97	0.33	17.69	28.35
199.89	5.54	27.3	302.0	159.3	179.4	261.6	509.5	0.97	0.26	16.33	26.24
201.91	5.31	27.3	361.0	154.4	169.5	361.6	494.0	0.97	0.45	15.12	23.37
204.18	5.52	27.3	348.0	215.5	172.3	225.5	558.6	0.97	0.35	16.02	24.38
206.18	5.60	27.3	344.0	239.7	158.1	329.7	567.6	0.97	0.38	13.10	20.42
208.24	5.62	27.3	269.0	201.2	171.7	329.7	543.7	0.97	0.40	15.81	24.31
210.07	5.62	27.3	380.0	152.6	144.1	543.4	467.5	0.97	0.36	15.24	22.50

Table E-1. Continued.

Train C – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
212.00	5.62	27.3	370.0	230.4	175.1	904.0	576.3	0.97	0.39	17.89	27.34
213.99	5.49	27.3	362.0	255.9	137.3	1254.9	564.0	0.97	0.39	17.80	27.12
216.17	5.38	27.3	398.0	231.0	158.8	1280.5	560.6	0.98	0.38	14.44	22.37
218.13	5.40	27.3	196.0	251.6	170.4	234.0	592.8	0.98	0.41	17.44	27.05
220.05	5.33	27.3	415.0	255.9	166.5	918.3	593.2	0.98	0.41	13.81	21.54
222.18	5.49	27.3	359.0	261.1	182.7	921.9	614.6	0.97	0.33	15.55	24.37
224.04	5.46	27.3	386.0	200.8	183.3	838.7	554.9	0.97	0.38	15.65	24.55
226.12	5.47	27.3	402.0	262.5	145.8	728.2	579.1	0.98	0.41	16.80	26.24
228.00	5.48	27.3	312.0	236.7	190.4	253.1	597.9	0.97	0.39	16.05	25.32
230.04	5.65	27.3	396.0	188.0	151.9	304.2	510.7	0.97	0.38	15.40	24.21
232.14	5.39	27.3	374.0	212.0	203.9	376.5	586.7	0.97	0.38	15.66	24.84
234.06	5.59	27.3	374.0	228.7	170.4	263.7	569.9	0.98	0.39	15.77	24.98
236.20	5.56	27.3	414.0	255.4	143.0	321.2	569.2	0.97	0.39	12.71	19.67
238.12	5.42	27.3	330.0	249.9	185.6	818.9	606.3	0.98	0.38	14.75	22.86
240.12	5.56	27.3	316.0	191.0	164.3	967.8	526.1	0.98	0.39	16.45	26.21
242.06	5.48	27.3	431.0	175.6	162.6	895.5	509.0	0.98	0.39	13.35	21.40
244.20	5.55	27.3	422.0	283.4	169.4	967.8	623.6	0.94	0.76	15.86	25.46
246.15	5.63	27.3	438.0	310.7	136.8	774.2	618.3	0.97	0.40	15.87	25.63
248.24	5.50	27.3	360.0	303.3	158.4	474.3	632.5	0.98	0.39	15.53	25.04
250.23	5.61	27.3	339.0	236.9	175.2	627.5	582.9	0.97	0.39	14.86	24.12
252.05	5.71	27.3	387.0	215.6	151.4	374.4	537.8	0.97	0.40	16.42	26.15
253.98	5.71	27.3	352.0	207.3	207.5	565.8	585.6	0.97	0.36	15.67	25.24
256.30	5.74	27.3	311.0	214.4	162.9	691.3	548.1	0.97	0.39	14.83	23.81
258.09	5.70	27.3	360.0	140.4	194.6	1031.6	505.8	0.97	0.40	15.79	25.00

Table E-2. Transfer data for Train C Fermentor 2.

Train C – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.71	167.5	289.0	231.0	234.7	225.5	596.3
1.81	5.71	134.6	292.0	244.0	176.2	172.3	583.7
3.94	5.77	134.0	279.0	233.5	191.8	185.0	589.4
6.11	6.54	170.0	353.0	279.8	166.0	353.1	573.9
7.35	6.02	88.4	455.0	395.7	17.6	755.1	623.0
10.11	5.90	213.7	307.0	337.6	325.7	661.5	747.7
12.04	7.33	202.5	294.0	280.7	231.0	514.7	607.3
14.16	5.48	112.2	380.0	318.7	104.9	306.3	609.5
15.79	5.59	136.5	342.0	348.9	163.2	219.1	673.7
17.91	6.00	142.0	259.0	272.9	210.1	308.4	639.1
20.09	6.00	152.5	311.0	190.9	221.3	368.0	557.8
22.06	6.00	238.0	295.0	282.7	95.2	310.5	456.1
24.12	6.00	207.8	263.0	199.4	318.7	304.2	608.4
25.99	5.55	146.5	151.0	203.2	204.3	342.4	559.1
28.18	5.23	171.4	308.0	114.7	205.4	502.0	446.8
29.80	5.19	86.5	308.0	273.9	116.9	448.8	602.4
32.05	5.18	182.6	351.0	268.1	221.3	382.9	604.9
33.80	5.43	152.9	306.0	320.7	187.8	357.3	653.7
36.18	4.87	165.4	330.0	260.6	211.1	429.7	602.4
38.06		143.4	341.0	123.4	195.0	455.2	473.1
40.08	5.20	160.9	323.0	317.3	180.9	404.1	635.4
41.93	5.23	155.6	320.0	294.9	181.1	278.6	618.5
44.04	5.05	138.5	314.0	277.5	181.4	491.3	618.5
46.01	5.35	111.8	319.0	296.8	156.2	299.9	639.3
48.16	5.27	130.6	326.0	255.1	192.6	408.4	615.2
49.97	5.29	181.2	326.0	254.5	253.6	351.0	624.0
52.15	5.40	193.5	172.0	256.4	270.2	382.9	631.2
53.35	5.54	95.5	211.0	262.0	163.7	293.5	628.3
56.26	5.48	170.6	369.0	158.1	225.7	721.1	510.3
57.86	5.76	126.9	440.0	354.2	138.8	814.6	664.2
59.88	5.65	193.3	389.0	389.8	247.8	995.4	742.4
61.78	5.37	154.1	364.0	377.0	157.6	827.4	678.6
63.90	5.29	191.6	372.0	370.6	212.5	636.0	689.6
66.27	5.17	181.5	350.0	395.8	159.0	482.8	670.4
68.18	5.02	196.2	353.0	361.8	184.8	735.4	647.5
70.24	5.37	160.5	346.0	359.9	150.4	670.4	646.9
71.90	5.72	173.5	330.0	337.2	182.5	631.2	644.3

Table E-2. Continued.

Train C – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.97	5.67	199.3	344.0	332.5	196.6	629.9	627.9
76.26	5.26	184.8	368.0	334.9	192.9	238.2	640.1
78.02	5.32	183.8	400.0	364.5	184.2	336.1	663.0
80.02	5.15	187.7	362.0	394.4	189.2	336.1	692.9
82.08	5.42	190.4	346.0	350.7	200.8	351.0	650.3
84.25	5.41	204.3	324.0	325.4	224.0	416.9	632.9
86.34	5.39	176.1	388.0	325.4	189.7	436.0	642.2
88.12	5.56	177.9	338.0	384.4	172.6	399.9	677.2
90.06	5.68	203.1	127.0	333.3	199.7	714.7	628.0
91.94	5.92	177.8	293.0	144.8	187.8	608.3	452.9
94.29	5.26	166.3	392.0	289.9	111.6	563.7	583.3
96.13	4.92	179.7	371.0	369.9	192.1	567.9	680.4
98.14	5.21	192.7	367.0	358.6	200.1	655.1	664.1
100.08	5.19	226.2	322.0	286.9	293.3	412.6	659.3
102.16	5.64	148.9	325.0	286.9	178.5	659.4	614.6
103.94	5.70	146.8	325.0	286.9	171.6	910.4	609.8
106.20	5.48	156.7	378.0	317.7	159.8	718.9	618.9
108.19	5.28	188.5	327.0	286.9	269.8	457.3	666.3
110.06	5.14	158.2	317.0	286.9	189.9	650.9	616.7
112.09	4.79	173.5	379.0	302.0	188.6	933.8	615.2
114.15	4.98	168.8	418.0	348.3	198.2	653.0	675.8
116.11	5.47	181.3	388.0	381.0	212.6	640.2	710.4
118.09	5.81	202.5	341.0	394.4	193.7	497.7	683.7
120.00	5.54	169.9	340.0	339.5	168.0	361.6	608.7
122.12	5.49	143.6	378.0	341.0	141.6	316.9	636.6
124.10	5.77	181.6	411.0	351.3	199.6	402.0	667.4
126.13	5.62	187.5	377.0	388.2	204.3	1274.1	703.1
127.89	5.44	155.2	378.0	369.7	151.8	444.5	664.4
130.21	5.45	140.1	416.0	402.8	111.4	646.6	612.2
132.23	5.54	130.0	359.0	413.3	126.7	495.6	708.1
134.27	5.38	191.5	334.0	334.6	215.0	584.9	656.2
136.08	5.66	134.4	410.0	337.1	110.6	665.8	611.4
138.08	6.06	115.0	397.0	415.5	84.8	316.9	683.4
140.09	5.95	162.5	353.0	391.3	162.0	699.8	688.9
142.03	5.71	222.9	324.0	286.9	276.4	677.4	640.7
144.09	5.87	102.0	407.0	388.6	36.1	510.5	620.8
146.12	5.89	143.0	384.0	403.6	120.7	538.1	679.4

Table E-2. Continued.

Train C – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
148.07	5.87	157.0	360.0	388.8	149.7	692.3	679.6
150.05	5.77	121.3	364.0	369.7	105.9	712.5	652.4
152.07	5.75	135.7	307.0	361.3	127.7	657.2	651.4
154.12	5.87	183.4	329.0	271.8	212.3	353.1	598.8
156.03	5.61	144.6	346.0	334.4	139.6	227.6	627.5
157.90	5.63	161.8	321.0	365.4	142.2	229.7	643.9
160.07	5.60	206.3	330.0	288.0	238.3	495.6	618.1
162.10	5.91	130.4	336.0	336.0	122.5	695.5	626.2
164.01	6.33	148.1	348.0	350.5	133.9	455.2	634.4
166.09	7.21	187.7	319.0	331.4	200.2	338.2	642.0
168.17	6.54	190.8	328.0	324.6	184.4	512.6	616.3
170.11	6.05	140.6	380.0	347.6	113.6	606.2	618.7
172.08	5.62	136.5	437.0	411.2	101.7	655.1	674.5
174.12	5.72	197.6	343.0	397.3	226.2	648.7	724.0
175.95	5.76	151.7	328.0	363.5	120.7	676.4	630.6
178.06	5.71	136.6	414.0	380.6	82.5	695.5	624.6
180.25	5.59	172.6	417.0	433.3	152.2	642.4	711.0
182.07	5.68	161.5	364.0	432.7	143.2	772.1	712.5
184.16	5.63	153.7	360.0	372.9	146.1	901.8	663.4
186.14	5.50	184.3	349.0	364.3	170.4	806.1	648.5
187.99	5.44	159.8	358.0	368.9	138.8	848.7	646.0
190.13	5.41	129.4	388.0	386.7	97.7	614.7	653.1
191.94	5.62	177.3	358.0	386.2	169.5	1042.2	676.5
194.11	5.64	152.7	353.0	381.6	128.9	918.9	655.9
195.75	5.72	163.1	300.0	340.8	170.0	687.0	645.8
197.84	5.50	143.7	318.0	309.0	130.4	638.1	593.8
199.89	5.48	179.4	379.0	297.1	197.6	404.1	613.4
201.91	5.36	169.5	348.0	363.0	177.7	359.5	668.3
204.18	5.54	172.3	336.0	348.8	170.6	368.0	645.2
206.18	5.54	158.1	330.0	345.9	127.3	397.7	612.2
208.24	6.22	171.7	397.0	272.5	230.4	489.2	629.3
210.07	5.74	144.1	390.0	381.5	159.5	677.4	695.0
212.00	5.63	175.1	360.0	373.3	188.6	765.7	684.9
213.99	5.72	137.3	387.0	364.3	130.2	421.1	655.3
216.17	5.73	158.8	370.0	397.6	151.1	531.8	688.0
218.13	5.55	170.4	424.0	394.9	144.7	268.0	667.3
220.05	5.51	166.5	345.0	416.5	172.1	496.7	720.2

Table E-2. Continued.

Train C – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
222.18	5.55	182.7	397.0	361.0	167.1	429.4	643.5
224.04	5.58	183.3	388.0	382.1	191.6	431.4	688.5
226.12	5.53	145.8	352.0	398.2	132.7	406.4	683.2
228.00	5.75	190.4	362.0	315.1	226.1	263.7	648.9
230.04	5.91	151.9	404.0	393.6	118.6	557.3	658.4
232.14	5.67	166.8	334.0	355.3	189.6	642.4	676.2
234.06	5.60	170.4	363.0	371.1	159.3	344.6	658.1
236.20	5.45	143.0	369.0	408.8	91.8	338.2	655.7
238.12	5.99	185.6	324.0	328.0	224.5	570.0	665.0
240.12	5.66	157.5	408.0	302.7	155.7	623.2	599.0
242.06	5.74	162.6	391.0	428.2	134.5	476.4	698.2
244.20	5.73	169.4	384.0	417.0	134.2	533.9	679.9
246.15	5.87	136.8	356.0	434.0	100.4	512.6	695.7
248.24	5.68	158.4	332.0	358.8	126.4	844.4	624.9
250.23	5.73	175.2	337.0	343.5	159.8	670.0	626.2
252.05	5.69	151.4	377.0	386.8	101.4	316.9	634.9
253.98	5.79	207.5	292.0	352.0	228.8	763.6	671.4
256.30	5.88	162.9	347.0	307.3	147.0	580.7	589.5
258.09	6.06	194.6	350.0	349.6	186.4	491.3	639.5

Table E-3. Transfer data for Train C Fermentor 3.

Train C – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.75	234.7	307.0	288.4	258.2	193.6	623.3
1.81	5.73	176.2	317.0	291.8	200.3	172.3	614.0
3.94	5.90	191.8	280.0	282.4	222.5	136.1	611.2
6.11	6.09	166.0	388.0	352.5	91.0	1012.5	575.6
7.35	5.90	17.6	364.0	453.9	0.0	1165.6	677.6
10.11	5.82	325.7	261.0	306.7	218.0	644.5	603.7
12.04	7.54	231.0	239.0	297.1	263.8	545.6	639.1
14.16	5.57	104.9	325.0	375.3	80.0	323.3	646.5
15.79	5.33	163.2	288.8	342.1	145.3	446.7	622.3
17.91	6.00	210.1	327.5	263.8	233.6	672.1	585.4
20.09	6.00	221.3	341.0	311.3	236.4	454.1	624.5
22.06	6.00	95.2	262.0	295.1	139.3	419.0	637.3
24.12	6.00	318.7	155.0	263.4	316.1	329.7	558.9
25.99	5.56	204.3	305.0	155.6	296.1	378.6	545.5
28.18	5.32	205.4	315.0	307.5	200.9	506.2	601.1
29.80	5.37	116.9	333.0	308.2	121.8	280.8	611.2
32.05	5.34	221.3	313.0	354.2	198.7	282.9	629.7
33.80	5.51	187.8	323.0	305.5	188.4	314.8	604.2
36.18	4.97	211.1	339.0	325.8	208.0	431.8	618.8
38.06	5.13	195.0	316.0	341.1	187.1	333.9	631.3
40.08	5.29	180.9	324.8	325.0	168.1	308.4	710.3
41.93	5.39	181.1	314.0	321.4	188.1	314.8	626.5
44.04	5.16	181.4	329.0	316.1	184.5	427.5	617.3
46.01	5.38	156.2	319.0	321.3	166.1	351.0	629.3
48.16	5.47	192.6	341.0	326.3	183.2	363.7	615.0
49.97	5.30	253.6	297.0	323.2	236.5	436.0	637.3
52.15	5.30	270.2	283.0	172.3	285.2	376.5	534.0
53.35	5.68	163.7	323.0	216.2	201.9	427.5	552.5
56.26	6.28	225.7	391.0	370.3	175.9	1578.2	621.9
57.86	5.41	138.8	382.0	444.9	85.5	1021.0	689.7
59.88	5.48	247.8	337.0	396.6	206.6	1276.2	681.7
61.78	5.39	157.6	367.0	363.8	130.7	921.0	635.0
63.90	5.44	212.5	325.0	374.0	201.6	657.2	661.2
66.27	5.22	159.0	355.0	352.0	133.9	512.6	624.0
68.18	5.36	184.8	345.0	356.1	182.2	841.8	650.6
70.24	5.64	150.4	327.0	348.0	147.4	733.2	642.1
71.90	6.10	182.5	317.0	331.6	177.8	686.2	625.0

Table E-3. Continued.

Train C – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.97	5.73	196.6	356.0	347.0	162.9	693.4	611.4
76.26	5.50	192.9	343.0	367.4	181.2	533.9	652.8
78.02	5.98	184.2	336.0	399.7	124.7	389.2	638.3
80.02	5.89	189.2	394.0	362.3	158.8	389.2	630.0
82.08	5.70	200.8	306.0	348.4	185.0	474.3	640.1
84.25	5.68	244.0	351.0	324.0	215.0	514.7	614.0
86.34	5.72	189.7	325.0	386.7	155.1	533.9	650.2
88.12	5.78	172.6	84.0	335.2	152.7	842.3	613.4
90.06	5.40	199.7	284.0	126.9	153.3	1012.5	378.6
91.94	5.50	187.8	352.0	286.9	179.0	672.1	576.2
94.29	5.37	111.6	372.0	381.6	74.3	767.8	642.4
96.13	5.46	192.1	345.0	370.3	177.8	589.2	654.1
98.14	5.65	200.1	345.0	363.5	175.2	621.1	636.7
100.08	5.53	293.3	332.0	323.3	240.3	631.7	641.1
102.16	5.40	178.5	332.0	323.3	233.2	940.1	676.1
103.94	5.16	171.6	326.0	323.3	165.0	1057.1	614.8
106.20	5.40	159.8	426.0	367.4	113.3	818.9	619.0
108.19	5.55	269.8	329.0	323.3	309.8	825.3	711.4
110.06	5.12	189.9	325.0	323.3	232.2	1033.7	663.7
112.09	5.53	188.6	377.0	379.3	131.5	689.1	620.3
114.15	5.24	198.2	311.0	413.8	160.6	748.7	674.3
116.11	5.74	212.6	365.0	397.9	170.6	670.0	654.0
118.09	5.59	193.7	306.0	341.8	206.4	825.3	652.6
120.00	5.98	168.0	349.0	334.9	133.6	838.0	598.6
122.12	6.09	141.6	382.0	373.1	118.1	710.4	647.7
124.10	5.95	199.6	368.0	403.1	166.8	744.5	668.4
126.13	5.82	204.3	339.0	365.9	193.5	533.9	653.2
127.89	5.71	151.8	373.0	375.3	114.2	789.1	635.8
130.21	6.06	111.4	379.0	416.7	62.4	699.8	665.8
132.23	5.82	126.7	305.0	269.5	126.9	1240.0	567.8
134.27	5.81	215.0	341.0	333.9	182.5	897.6	603.4
136.08	6.20	110.6	387.0	365.9	70.6	610.4	624.0
138.08	6.09	84.8	317.0	394.8	48.3	1078.4	656.4
140.09	6.18	162.0	351.0	344.4	125.4	1344.3	605.9
142.03	6.21	276.4	321.0	323.3	237.4	969.9	639.5
144.09	6.16	36.1	359.0	408.1	2.6	710.4	672.7
146.12	6.20	120.7	341.0	379.9	88.8	740.2	646.1

Table E-3. Continued.

Train C – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
148.07	5.93	149.7	353.0	354.3	133.0	757.2	635.7
150.05	5.92	105.9	303.0	355.1	101.3	657.2	648.6
152.07	5.90	127.7	327.0	305.1	115.8	619.0	591.3
154.12	5.96	212.3	325.0	328.0	205.6	199.9	619.4
156.03	5.70	139.6	313.0	347.4	112.0	95.7	617.9
157.90	5.75	142.2	325.0	323.8	92.9	357.3	608.6
160.07	5.60	230.3	322.0	328.4	251.6	557.3	656.4
162.10	5.66	122.5	311.0	336.4	122.4	629.6	634.4
164.01	6.16	133.9	317.0	344.7	99.6	440.3	608.5
166.09	6.97	200.2	323.0	322.1	194.5	495.6	614.5
168.17	6.22	184.4	331.0	321.1	181.0	1444.2	615.8
170.11	5.88	113.6	309.0	376.1	56.2	1165.6	616.8
172.08	5.74	101.7	372.0	435.8	61.1	876.3	693.3
174.12	5.82	226.2	296.0	333.8	244.6	272.3	655.8
175.95	5.80	120.7	359.0	326.4	84.3	944.4	588.1
178.06	5.81	82.5	377.0	413.8	22.9	693.4	652.3
180.25	5.66	152.2	329.0	419.9	105.2	833.8	671.0
182.07	5.82	143.2	343.0	360.7	107.5	1048.6	623.1
184.16	5.77	146.1	341.0	355.0	126.3	955.0	633.3
186.14	5.64	170.4	321.0	350.1	150.1	810.4	627.9
187.99	5.79	138.8	346.0	356.1	101.3	780.6	616.7
190.13	5.86	97.7	337.0	382.5	58.3	759.3	641.2
191.94	5.91	169.5	337.0	356.8	152.0	757.2	637.4
194.11	5.80	128.9	285.0	350.5	115.2	604.1	634.9
195.75	5.84	170.0	289.0	297.8	150.6	557.3	576.5
197.84	5.64	130.4	353.0	313.8	100.0	536.0	581.5
199.89	5.66	197.6	322.0	371.1	176.0	412.6	647.6
201.91	5.51	177.7	303.0	348.1	144.1	457.3	611.6
204.18	5.59	170.6	310.0	336.3	145.7	110.6	609.5
206.18	6.64	127.3	375.0	331.9	106.1	372.2	607.8
208.24	5.98	230.4	363.0	401.0	194.0	712.5	670.2
210.07	5.67	159.5	329.0	391.6	135.8	673.2	666.0
212.00	5.94	188.6	367.0	363.6	145.2	587.1	618.3
213.99	6.07	130.2	337.0	390.6	103.0	506.2	661.5
216.17	5.84	151.1	387.0	370.9	116.0	640.2	633.9
218.13	5.58	144.7	330.0	418.5	113.9	338.2	685.8
220.05	5.72	172.1	367.0	345.3	154.0	517.9	625.3

Table E-3. Continued.

Train C – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
222.18	5.70	167.1	351.0	397.6	134.3	500.6	662.9
224.04	5.80	191.6	317.0	387.0	153.7	499.2	647.2
226.12	6.10	132.7	329.0	349.9	98.3	464.0	613.6
228.00	6.40	226.1	342.0	363.8	182.9	261.6	625.5
230.04	6.21	118.6	379.0	398.4	68.9	355.2	646.8
232.14	5.94	229.9	309.0	363.7	226.3	521.1	669.1
234.06	5.65	159.3	351.0	359.4	116.5	759.3	614.7
236.20	6.33	91.8	327.0	373.3	63.9	499.8	643.5
238.12	5.72	224.5	365.0	321.2	220.3	901.8	622.4
240.12	5.85	148.3	333.0	408.6	108.5	676.4	666.9
242.06	5.84	134.5	387.0	391.6	67.0	595.6	622.2
244.20	5.82	134.2	319.0	379.5	115.8	621.1	659.2
246.15	5.93	100.4	345.0	353.7	60.6	742.3	612.0
248.24	5.76	126.4	337.0	329.0	138.8	738.1	639.5
250.23	5.87	159.8	335.0	339.8	153.9	716.8	632.0
252.05	6.01	101.4	334.0	375.5	61.3	378.6	633.5
253.98	5.90	228.8	311.0	293.3	260.8	604.1	630.2
256.30	6.08	147.0	311.0	345.3	118.3	404.1	614.7
258.09	6.70	186.4	332.0	364.5	148.0	346.7	624.2

Table E-4. Transfer data for Train C Fermentor 4.

Train C – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00	5.70	258.2	300.0	305.1	229.9	493.5	612.5	0.81	0.41
1.81	6.08	200.3	300.0	317.4	219.1	102.1	634.3	0.82	0.37
3.94	5.95	222.5	300.0	283.4	236.3	331.8	596.4	0.82	0.37
6.11	6.18	91.0	300.0	390.5	16.0	1042.2	596.0	0.82	0.37
7.35	5.97	0.0	300.0	368.9	0.0	1148.6	577.6	0.82	0.38
10.11	6.87	218.0	300.0	261.1	165.5	467.9	506.7	0.80	0.40
12.04	7.58	263.8	300.0	341.8	174.0	540.3	593.8	0.77	0.38
14.16	5.64	80.0	300.0	324.2	97.0	676.4	639.3	0.77	0.37
15.79	5.37	145.3	300.0	291.8	160.9	1703.7	605.5	0.78	0.44
17.91	6.00	233.6	300.0	332.5	172.8	1386.8	586.2	0.78	0.45
20.09	6.00	236.4	300.0	341.4	200.0	1135.8	620.6	0.84	0.39
22.06	6.00	139.3	300.0	264.9	151.9	1006.1	575.6	0.86	0.36
24.12	6.00	316.1	300.0	157.9	187.7	1108.2	424.8	0.85	0.38
25.99	5.69	296.1	300.0	309.8	207.9	661.5	596.0	0.85	0.39
28.18	5.42	200.9	300.0	317.5	257.2	563.7	671.9	0.81	0.31
29.80	5.60	121.8	300.0	336.2	83.6	217.0	596.1	0.80	0.35
32.05	5.17	198.7	300.0	315.8	180.1	1123.1	595.3	0.82	0.37
33.80	5.51	188.4	300.0	326.4	160.9	1048.6	597.0	0.79	0.37
36.18	5.00	208.0	300.0	338.3	169.3	1246.4	595.7	0.79	0.39
38.06	5.29	187.1	300.0	318.5	164.8	684.9	594.3	0.81	0.37
40.08		168.1	300.0	327.0	131.8	808.3	588.8	0.79	0.38
41.93	5.43	188.1	300.0	316.7	168.6	957.2	595.3	0.80	0.36
44.04	5.07	184.5	300.0	334.8	132.9	1533.6	581.3	0.80	0.37
46.01	5.54	166.1	300.0	321.7	144.8	561.5	598.5	0.80	0.37
48.16	5.41	183.2	300.0	344.0	136.9	1001.8	595.8	0.81	0.36
49.97	5.45	236.5	300.0	298.8	219.7	859.3	597.2	0.81	0.37
52.15	5.47	285.2	300.0	285.4	312.8	761.5	611.1	0.84	0.29
53.35	5.63	201.9	300.0	330.4	236.0	876.3	662.6	0.84	0.30
56.26	5.86	175.9	300.0	394.7	79.5	1978.1	594.4	0.82	0.34
57.86	5.65	85.5	300.0	385.8	0.0	1816.5	593.9	0.82	0.33
59.88	5.65	206.6	300.0	342.8	83.4	1038.0	517.7	0.83	0.33
61.78	5.54	130.7	300.0	369.0	57.6	2707.7	594.0	0.83	0.32
63.90	5.57	201.6	300.0	330.3	165.1	2452.4	591.9	0.74	0.56
66.27	5.78	133.9	300.0	358.1	74.9	940.1	595.2	0.83	0.43
68.18	5.27	182.2	300.0	348.1	132.8	1784.6	594.8	0.76	0.43
70.24	5.53	147.4	300.0	332.8	112.8	1971.2	594.3	0.78	0.39
71.90	5.45	177.8	300.0	322.0	152.1	1787.1	594.4	0.81	0.37

Table E-4. Continued.

Train C – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
73.97	5.51	162.9	300.0	359.4	99.1	1620.7	593.7	0.78	0.39
76.26	5.95	181.2	300.0	346.2	132.5	1065.6	593.6	0.77	0.42
78.02	5.73	124.7	300.0	338.9	82.1	1782.4	594.4	0.77	0.41
80.02	5.50	158.8	300.0	366.9	110.0	1782.4	616.2	0.77	0.41
82.08	5.53	185.0	300.0	311.0	173.9	1465.5	596.0	0.78	0.33
84.25	5.77	215.0	300.0	356.2	156.7	1469.8	594.0	0.77	0.41
86.34	6.36	155.1	300.0	328.9	118.8	1629.3	590.7	0.79	0.37
88.12	6.18	152.7	300.0	87.2	10.2	1586.7	222.4	0.78	0.38
90.06	5.49	153.3	300.0	282.6	40.5	1703.7	467.9	0.78	0.43
91.94	5.79	179.0	300.0	348.9	124.3	2548.1	592.3	0.77	0.47
94.29	5.33	74.3	300.0	361.5	10.8	1897.3	596.1	0.79	0.34
96.13	5.14	177.8	300.0	343.7	130.7	1995.1	594.7	0.75	0.41
98.14	5.35	175.2	300.0	346.4	126.3	1978.1	595.6	0.80	0.37
100.08	5.27	240.3	300.0	326.2	190.5	1423.0	594.6	0.79	0.35
102.16	5.40	233.2	300.0	326.2	168.3	1125.2	575.4	0.82	0.28
103.94	5.09	165.0	300.0	326.4	135.3	1465.5	594.8	0.79	0.32
106.20	5.22	113.3	300.0	419.4	0.0	1559.1	594.6	0.79	0.35
108.19	5.76	309.8	300.0	328.2	179.4	2958.7	613.9	0.78	0.52
110.06	5.18	232.2	300.0	326.2	277.9	1565.5	683.5	0.81	0.46
112.09	5.42	131.5	300.0	379.6	51.4	912.5	597.6	0.78	0.34
114.15	5.20	160.6	300.0	357.8	100.4	2831.0	595.7	0.74	0.49
116.11	5.83	170.6	300.0	364.4	101.0	3031.0	592.9	0.73	0.44
118.09	5.92	206.4	300.0	308.9	190.3	2320.6	590.9	0.77	0.52
120.00	5.93	133.6	300.0	347.6	80.8	1771.8	592.9	0.81	0.37
122.12	5.69	118.1	300.0	377.9	40.2	3352.2	598.1	0.79	0.40
124.10	5.90	166.8	300.0	361.3	97.5	3598.9	590.1	0.72	0.54
126.13	5.91	193.5	300.0	342.1	146.6	3150.1	593.3	0.77	0.48
127.89	5.61	114.2	300.0	372.2	40.8	2356.7	596.9	0.77	0.46
130.21	5.67	62.4	300.0	381.4	0.0	3390.4	594.5	0.77	0.45
132.23	5.59	118.9	300.0	314.6	68.0	357.3	561.8	0.77	0.47
134.27	5.38	182.5	300.0	345.1	134.1	1980.2	594.8	0.73	0.45
136.08	6.23	70.6	300.0	334.3	6.7	2012.1	568.5	0.69	0.52
138.08	5.81	48.3	300.0	314.6	18.9	2369.5	583.3	0.75	0.40
140.09	5.85	125.4	300.0	346.7	77.8	1616.5	597.2	0.74	0.46
142.03	5.85	237.4	300.0	326.2	188.3	2473.7	595.0	0.75	0.34
144.09	5.79	2.6	300.0	355.9	34.9	1999.4	616.5	0.73	0.43
146.12	5.68	88.8	300.0	341.0	11.1	978.4	561.4	0.75	0.41

Table E-4. Continued.

Train C – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
148.07	5.81	133.0	300.0	355.2	73.8	2390.7	594.1	0.66	0.50
150.05	5.73	101.3	300.0	300.7	98.5	1684.6	596.0	0.70	0.47
152.07	5.72	115.8	300.0	325.8	86.2	1974.9	594.3	0.72	0.44
154.12	5.63	205.6	300.0	324.0	181.4	1312.4	597.9	0.68	0.46
156.03	5.71	112.0	300.0	314.7	102.6	478.6	603.4	0.73	0.39
157.90	5.40	92.9	300.0	327.1	64.0	2131.3	596.3	0.75	0.39
160.07	5.39	251.6	300.0	323.9	192.0	2088.7	595.5	0.77	0.39
162.10	5.81	122.4	300.0	315.0	139.9	410.5	630.6	0.74	0.36
164.01	7.10	99.6	300.0	320.6	77.5	1208.1	598.5	0.77	0.37
166.09	8.34	194.5	300.0	322.6	175.3	499.8	601.5	0.76	0.38
168.17	6.04	181.0	300.0	328.1	147.2	3088.4	592.4	0.77	0.46
170.11	6.03	56.2	300.0	394.4	0.0	2726.8	595.8	0.76	0.39
172.08	5.83	61.1	300.0	368.2	0.0	3118.2	553.9	0.76	0.39
174.12	5.96	244.6	300.0	291.3	186.4	3469.1	531.2	0.76	0.39
175.95	5.97	84.3	300.0	358.4	0.0	1771.8	568.4	0.76	0.40
178.06	5.88	22.9	300.0	378.8	0.0	3260.7	591.7	0.76	0.43
180.25	5.91	105.2	300.0	333.8	6.2	2901.2	532.9	0.75	0.63
182.07	5.97	107.5	300.0	344.4	59.1	3226.7	594.1	0.74	0.59
184.16	5.86	126.3	300.0	339.6	83.7	3443.6	595.1	0.75	0.57
186.14	5.93	150.1	300.0	324.3	116.9	2322.7	589.2	0.74	0.55
187.99	5.73	101.3	300.0	346.8	52.8	2244.0	596.4	0.71	0.45
190.13	5.60	58.3	300.0	339.9	16.2	2463.1	595.9	0.72	0.40
191.94	5.61	152.0	300.0	339.6	108.8	1357.0	594.5	0.73	0.51
194.11	5.61	115.2	300.0	282.5	98.9	1750.5	564.3	0.74	0.39
195.75	5.61	150.6	300.0	287.6	145.4	1416.6	580.5	0.72	0.47
197.84	5.42	100.0	300.0	352.1	45.3	1708.0	595.5	0.73	0.34
199.89	5.67	176.0	300.0	316.2	160.3	814.6	598.6	0.74	0.37
201.91	5.66	144.1	300.0	297.8	131.4	859.3	580.9	0.76	0.34
204.18	6.77	145.7	300.0	313.0	130.8	831.7	596.2	0.77	0.35
206.18	5.73	106.1	300.0	377.4	25.7	3937.1	594.1	0.72	0.46
208.24	5.92	194.0	300.0	365.4	124.1	2743.8	593.6	0.70	0.49
210.07	5.84	135.8	300.0	329.2	108.7	1488.9	600.2	0.76	0.40
212.00	5.75	145.2	300.0	373.0	68.4	2292.9	594.3	0.76	0.38
213.99	6.08	103.0	300.0	337.0	57.1	2252.5	589.2	0.78	0.34
216.17	5.68	116.0	300.0	393.3	21.6	3639.3	597.0	0.73	0.49
218.13	5.74	113.9	300.0	328.7	81.7	623.2	594.6	0.71	0.52
220.05	5.76	154.0	300.0	367.4	85.1	2202.0	596.6	0.70	0.47

Table E-4. Continued.

Train C – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
222.18	5.89	134.3	300.0	354.3	76.7	2179.2	594.8	0.69	0.46
224.04	5.91	153.7	300.0	319.6	90.0	2160.9	554.0	0.76	0.37
226.12	5.76	98.3	300.0	328.2	68.4	1791.3	596.4	0.74	0.42
228.00	5.97	182.9	300.0	346.6	137.6	1108.2	599.4	0.74	0.40
230.04	5.94	68.9	300.0	375.3	0.0	2945.9	596.1	0.73	0.42
232.14	5.66	226.3	300.0	312.8	190.7	4160.4	586.1	0.73	0.41
234.06	6.00	116.5	300.0	349.0	76.3	965.7	606.9	0.76	0.38
236.20	5.78	63.9	300.0	332.3	27.9	3184.1	594.4	0.74	0.41
238.12	5.97	220.3	300.0	365.3	150.0	2894.8	594.9	0.72	0.44
240.12	5.90	100.9	300.0	335.6	62.4	3026.7	595.2	0.76	0.40
242.06	5.90	67.0	300.0	384.5	0.0	3422.3	594.7	0.75	0.41
244.20	5.78	115.8	300.0	317.9	73.5	3835.0	573.7	0.73	0.44
246.15	6.02	60.6	300.0	344.5	13.7	3152.2	595.7	0.74	0.44
248.24	5.80	138.8	300.0	338.6	97.2	3705.2	595.1	0.70	0.52
250.23	5.94	153.9	300.0	339.0	114.0	1520.8	597.2	0.71	0.44
252.05	5.84	61.3	300.0	334.1	25.7	1035.8	596.6	0.73	0.45
253.98	6.24	260.8	300.0	313.9	208.1	1612.3	598.7	0.67	0.52
256.30	7.69	118.3	300.0	310.3	129.5	187.2	619.6	0.77	0.34
258.09	9.09	148.0	300.0	325.0	126.0	110.6	601.1	0.71	0.43

Table E-5. Transfer data for Train R1 Fermentor 1 at lower reflux.

Train R1 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00	5.91	27.3	177.0	87.7	187.4	302.0	427.9	0.98	0.47	11.19	12.84
2.18	6.60	27.3	156.0	73.3	148.0	667.9	374.1	0.98	0.47	13.51	17.86
4.08	6.29	27.3	333.0	96.8	99.1	716.8	348.7	0.97	0.50	15.88	21.50
6.17	5.99	27.3	363.0	145.6	217.5	787.0	515.9	0.97	0.40	15.68	21.26
8.10	7.49	27.3	292.0	311.0	52.0	365.8	515.8	0.97	0.48	15.27	24.59
10.25	5.43	27.3	310.0	171.6	151.9	663.6	474.3	0.97	0.49	14.30	19.61
11.85	5.43	27.3	270.0	176.7	170.2	316.9	499.7	0.97	0.42	11.87	19.55
13.99	6.00	27.3	319.0	148.1	167.6	446.7	468.5	0.97	0.39	19.75	28.54
16.17	6.00	27.3	253.0	200.1	164.9	407.3	517.8	0.97	0.40	15.37	22.71
18.12	6.00	27.3	243.0	103.0	183.3	597.7	439.1	0.97	0.38	21.27	32.01
20.19	6.00	27.3	264.0	127.7	162.4	331.8	442.9	0.97	0.38	16.51	24.49
22.05	5.60	27.3	167.0	106.8	201.8	782.7	461.4	0.97	0.43	19.78	30.16
24.23	5.09	27.3	216.0	41.7	168.8	1250.7	363.3	0.96	0.45	24.60	37.60
25.85	5.16	27.3	352.0	109.8	150.3	489.2	412.9	0.96	0.46	22.52	33.88
28.10	4.95	27.3	343.0	176.8	219.2	880.6	548.8	0.97	0.39	21.40	32.48
29.85	5.32	27.3	332.0	183.7	183.1	580.7	519.6	0.97	0.35	20.96	31.72
32.25	4.86	27.3	342.0	161.5	212.2	587.1	527.5	0.97	0.39	18.80	28.62
34.13	4.94	27.3	303.0	185.6	196.3	795.5	532.0	0.97	0.35	19.08	29.26
36.21	5.02	27.3	325.0	156.1	190.9	791.2	499.8	0.97	0.40	16.90	25.65
38.00	5.14	27.3	293.0	177.2	173.2	663.6	521.2	0.97	0.43	15.93	24.22
40.09	5.39	27.3	126.0	211.7	143.7	540.3	508.2	0.97	0.39	17.03	26.72
42.07	5.40	27.3	283.0	19.9	153.9	421.1	326.6	0.96	0.38	20.23	30.71
44.18	5.02	27.3	289.0	131.5	194.2	655.1	478.5	0.97	0.41	18.85	28.71
46.02	5.13	27.3	256.0	127.6	207.5	748.7	486.9	0.97	0.35	18.03	27.36
48.17	5.59	27.3	298.0	120.6	178.6	453.1	452.0	0.97	0.37	16.24	24.91
50.03	5.44	27.3	265.0	146.7	195.9	748.7	495.4	0.97	0.39	19.25	29.26
52.27	6.46	27.3	314.0	112.5	199.8	142.5	464.1	0.97	0.42	18.54	28.09
53.91	5.42	27.3	344.0	157.2	184.7	725.3	494.7	0.97	0.40	20.31	30.58
55.95	5.39	27.3	93.0	189.7	201.4	1550.6	543.9	0.97	0.40	23.52	35.88
57.39		27.3	428.0	0.0	138.0	946.5	290.8	0.97	0.40	18.61	29.36
59.95	5.04	27.3	360.0	254.4	201.4	1044.4	608.6	0.97	0.40	22.08	34.50
62.27	4.72	27.3	410.0	230.2	175.2	976.3	557.2	0.97	0.34	18.10	28.20
64.17	4.79	27.3	387.0	253.7	200.5	1129.4	606.0	0.97	0.34	18.86	29.60
66.24	5.11	27.3	350.0	226.6	204.2	1024.2	582.6	0.97	0.31	18.77	29.57
67.96	5.19	27.3	328.0	200.9	191.1	1043.6	544.8	0.97	0.37	19.52	30.73
70.07	5.16	27.3	333.0	188.4	185.3	1043.4	526.5	0.97	0.34	19.68	31.15

Table E-5. Continued.

Train R1 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
72.26	5.07	27.3	330.0	176.5	201.6	1000.0	529.9	0.97	0.38	16.20	25.75
74.11	5.15	27.3	328.0	199.7	174.1	1000.0	526.6	0.99	0.35	17.26	27.02
76.14	4.97	27.3	380.0	159.3	212.4	733.8	524.5	0.97	0.34	17.60	27.50
78.26	5.07	27.3	390.0	211.4	214.8	680.6	578.0	0.98	0.35	18.51	29.15
80.35	5.17	27.3	276.0	222.1	212.7	895.5	586.6	0.97	0.33	16.53	26.03
82.10	5.08	27.3	351.0	142.2	181.1	1000.0	476.1	0.97	0.33	19.67	30.35
84.19	5.35	27.3	310.0	194.6	196.7	812.5	544.1	0.97	0.35	18.08	28.26
86.13	5.22	27.3	300.0	152.2	199.1	1161.3	504.1	0.97	0.39	21.42	33.53
88.00	5.24	27.3	348.0	137.9	194.1	610.4	484.8	0.97	0.42	19.03	29.58
90.30	5.04	27.3	435.0	224.3	159.9	567.9	537.0	0.97	0.38	16.17	25.54
92.18	4.70	27.3	412.0	260.1	201.2	578.5	614.1	0.97	0.35	18.68	29.23
94.14	4.90	27.3	300.0	247.8	200.5	867.8	601.1	0.97	0.39	16.88	26.58
96.18	4.78	27.3	286.0	156.3	182.6	570.0	491.4	0.96	0.42	15.55	24.49
98.26	4.67	27.3	289.0	156.3	160.7	527.5	469.8	0.97	0.36	16.82	26.46
100.11	4.61	27.3	287.0	156.9	149.6	997.6	477.3	0.95	0.44	16.34	25.65
102.26	4.54	27.3	345.0	169.3	179.8	667.9	501.9	0.96	0.35	17.64	27.97
104.20	4.69	27.3	298.0	156.3	222.3	655.1	531.4	0.96	0.44	17.47	27.74
106.14	4.57	27.3	328.0	156.3	175.3	578.5	484.4	0.96	0.32	16.59	26.41
108.15	4.51	27.3	333.0	186.4	180.8	404.1	520.0	0.97	0.37	15.98	25.57
110.21	4.60	27.3	330.0	188.0	191.9	308.4	532.7	0.96	0.37	20.29	31.01
112.17	5.09	27.3	353.0	183.8	188.3	619.0	524.9	0.97	0.37	15.91	24.52
114.10	5.22	27.3	334.0	186.9	201.0	799.8	540.7	0.97	0.35	16.35	25.98
116.05	5.25	27.3	323.0	205.2	171.1	582.8	529.1	0.97	0.34	14.32	22.72
118.17	5.30	27.3	368.0	189.3	173.9	661.5	516.0	0.97	0.37	13.54	21.43
120.16	5.37	27.3	318.0	239.6	159.9	729.6	552.3	0.97	0.37	15.38	24.13
122.13	5.23	27.3	403.0	270.7	191.8	863.6	615.3	0.97	0.38	14.52	23.06
123.95	5.21	27.3	368.0	264.4	181.2	852.9	598.4	0.97	0.34	18.03	28.48
126.27	5.22	27.3	420.0	220.8	176.4	833.8	550.0	0.97	0.36	14.15	22.56
127.99	5.05	27.3	367.0	266.3	218.8	242.5	610.9	0.97	0.36	9.16	14.96

Table E-6. Transfer data for Train R1 Fermentor 2 at lower reflux.

Train R1 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.87	187.4	163.0	182.6	221.4	193.6	514.7
2.18	6.51	148.0	308.0	155.5	151.0	440.3	456.6
4.08	6.07	99.1	453.0	332.4	56.6	616.8	588.0
6.17	5.82	271.5	323.0	362.8	306.5	710.4	749.9
8.10	7.47	52.0	262.0	292.1	80.6	559.4	618.8
10.25	5.61	151.9	296.0	302.1	112.6	329.7	558.9
11.85	5.56	170.2	360.0	269.5	195.9	206.3	593.3
13.99	6.00	167.6	313.0	323.4	203.5	306.3	657.4
16.17	6.00	164.9	295.0	252.6	225.1	447.7	610.9
18.12	6.00	183.3	312.0	245.9	232.0	397.7	592.7
20.19	6.00	162.4	247.0	264.0	208.8	374.4	608.5
22.05	5.55	201.8	265.0	171.0	275.0	450.9	542.3
24.23	5.25	168.8	344.0	215.0	213.9	640.2	558.2
25.85	5.24	150.3	360.0	351.6	142.6	363.7	642.0
28.10	5.12	219.2	302.0	346.2	249.1	440.3	676.1
29.85	5.50	183.1	350.0	331.2	115.5	278.6	601.7
32.25	4.96	212.2	336.0	337.4	225.3	412.6	646.6
34.13	5.11	193.6	327.0	303.0	219.9	406.3	627.4
36.21	5.27	190.9	314.0	328.2	188.3	397.7	623.7
38.00	5.38	173.2	112.0	293.1	191.9	361.6	609.9
40.09	5.00	143.7	332.0	128.8	126.5	548.8	409.7
42.07	5.30	153.9	251.0	285.0	200.6	302.0	629.8
44.18	5.06	194.2	307.0	289.0	256.5	521.1	649.4
46.02	5.39	207.5	326.0	255.6	259.2	368.0	604.4
48.17	5.36	178.6	315.0	297.8	216.1	363.7	633.4
50.03	5.41	195.9	295.0	270.8	238.2	376.5	611.6
52.27	5.70	199.8	360.0	315.5	181.8	897.6	594.6
53.91	5.63	184.7	122.0	347.9	194.4	521.1	655.7
55.95	5.65	201.4	395.0	97.8	227.5	969.9	422.0
57.39	5.40	138.0	402.0	427.0	108.8	1269.8	695.9
59.95	5.25	201.4	392.0	361.4	239.7	606.2	697.8
62.27	5.17	175.2	378.0	409.3	162.9	467.9	694.1
64.17	5.25	200.5	343.0	389.1	188.7	828.5	674.4
66.24	5.58	204.2	330.0	348.8	197.5	793.1	639.2
67.96	6.15	191.1	316.0	330.6	185.4	673.9	623.0
70.07	5.84	185.3	335.0	335.7	165.7	690.9	614.2

Table E-6. Continued.

Train R1 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
72.26	5.46	201.6	350.0	329.3	206.5	800.0	631.3
74.11	5.25	174.1	400.0	327.9	194.1	500.0	646.0
76.14	5.24	212.4	375.0	380.3	211.0	725.3	677.0
78.26	5.54	214.8	274.0	393.1	195.5	455.2	670.9
80.35	5.32	212.7	343.0	279.0	207.1	474.3	570.5
82.10	5.55	181.1	330.0	350.0	174.9	342.4	641.9
84.19	6.16	196.7	300.0	311.5	219.5	523.2	632.4
86.13	6.14	199.1	329.0	297.9	195.5	608.3	592.4
88.00	5.98	194.1	410.0	348.3	168.6	665.8	620.9
90.30	5.39	159.9	430.0	421.7	142.4	680.6	702.3
92.18	4.98	201.2	367.0	409.2	207.1	542.4	713.2
94.14	5.12	200.5	369.0	376.7	181.1	610.4	655.4
96.18	5.01	182.3	330.0	287.6	261.0	502.0	664.4
98.26	4.95	160.7	325.0	287.8	210.8	476.4	536.0
100.11	5.15	149.6	323.0	287.8	179.3	797.6	615.6
102.26	5.10	179.8	350.0	335.1	162.3	612.6	615.7
104.20	5.07	222.3	331.0	287.8	272.7	523.2	638.9
106.14	4.99	175.3	319.0	326.5	170.8	653.0	620.1
108.15	4.97	180.8	334.0	335.4	162.0	621.1	614.7
110.21	4.81	191.9	360.0	330.0	194.3	572.2	630.5
112.17	5.26	188.3	348.0	352.3	189.5	516.9	651.6
114.10	5.64	207.3	314.0	334.4	207.3	723.2	638.8
116.05	5.52	171.1	376.0	322.4	165.5	540.3	614.9
118.17	5.60	173.9	422.0	365.3	176.6	574.3	666.1
120.16	5.76	159.9	400.0	420.0	156.3	550.9	714.5
122.13	5.61	191.8	357.0	402.8	178.0	550.9	687.1
123.95	5.48	181.2	378.0	367.1	167.0	506.2	651.0
126.27	5.79	176.4	360.0	420.4	160.0	325.4	702.1
127.99	5.59	210.8	347.0	373.5	190.4	410.5	651.2

Table E-7. Transfer data for Train R1 Fermentor 3 at lower reflux.

Train R1 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	6.03	221.4	265.0	166.0	246.9	344.6	490.3
2.18	6.15	151.0	378.0	308.0	99.1	852.9	554.2
4.08	5.87	56.6	381.0	454.9	0.0	1095.4	676.1
6.17	5.79	306.5	249.0	322.8	253.1	744.5	634.5
8.10	7.61	80.6	261.0	265.0	144.9	482.8	627.4
10.25	5.59	112.6	329.0	298.2	77.1	606.2	558.8
11.85	5.36	195.9	315.0	360.0	154.8	797.6	617.0
13.99	6.00	203.5	321.0	317.8	198.7	687.0	611.1
16.17	6.00	225.1	347.0	294.5	246.6	523.2	618.3
18.12	6.00	232.0	276.0	311.9	253.8	431.8	646.4
20.19	6.00	208.8	302.0	246.9	250.2	361.6	586.4
22.05	5.57	275.0	301.0	268.8	249.1	412.6	596.4
24.23	5.27	213.9	321.0	344.7	223.5	597.7	652.4
25.85	5.38	142.6	291.0	360.0	102.2	361.6	617.7
28.10	5.31	249.1	306.0	304.6	204.3	240.4	587.3
29.85	5.46	155.5	350.0	350.0	140.8	408.4	633.4
32.25	5.07	225.3	319.0	331.0	207.1	419.0	615.7
34.13	5.27	219.9	298.0	326.8	210.5	363.7	615.5
36.21	5.41	188.3	81.0	316.9	168.5	348.8	595.2
38.00	5.43	191.9	313.0	112.7	158.7	327.6	377.6
40.09	5.19	126.5	339.0	335.5	101.9	402.0	609.0
42.07	5.36	200.6	323.0	353.6	189.0	297.8	640.1
44.18	5.49	256.5	312.0	307.5	234.2	333.9	619.3
46.02	5.40	259.8	307.0	325.1	241.8	370.1	645.9
48.17	5.46	216.1	285.0	315.5	232.8	385.0	630.3
50.03	6.01	238.2	325.0	301.5	208.8	831.7	588.6
52.27	5.70	181.8	85.0	359.9	165.7	1337.9	640.9
53.91	5.44	194.4	363.0	123.5	152.8	153.1	380.0
55.95	5.67	227.4	371.0	401.3	182.0	355.2	660.5
57.39	5.47	108.8	379.0	401.8	87.6	793.4	678.7
59.95	5.78	139.7	333.0	396.8	199.7	589.2	675.4
62.27	5.49	162.9	343.0	377.5	140.6	431.8	652.3
64.17	5.42	188.7	327.0	347.0	183.8	542.4	639.2
66.24	5.73	197.5	327.0	328.8	194.4	589.2	622.8
67.96	6.11	185.4	301.0	318.4	191.6	538.1	622.7
70.07	5.86	165.7	341.0	338.0	128.1	525.4	598.5
72.26	5.66	206.5	345.0	351.9	196.2	784.9	638.7

Table E-7. Continued.

Train R1 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.11	5.98	194.1	341.0	400.4	156.3	1000.0	660.7
76.14	5.75	211.0	256.0	375.1	175.0	440.3	637.2
78.26	5.65	195.5	337.0	277.0	172.5	502.0	551.1
80.35	5.58	207.1	323.0	345.0	199.8	423.3	634.8
82.10	5.58	174.9	315.0	324.2	154.3	346.7	601.7
84.19	5.78	219.5	323.0	299.3	206.2	316.9	584.1
86.13	6.07	195.9	357.0	324.9	183.4	548.8	610.9
88.00	5.56	168.6	399.0	408.9	116.5	1420.8	654.9
90.30	5.33	142.4	372.0	418.9	115.0	1069.9	689.6
92.18	5.28	207.1	343.0	363.1	203.2	770.0	657.3
94.14	5.42	181.1	368.0	368.1	144.1	978.4	629.2
96.18	5.25	261.0	306.0	322.8	258.6	708.3	659.7
98.26	5.50	210.8	303.0	322.8	205.5	861.4	615.6
100.11	5.22	179.3	302.0	322.6	135.2	759.3	576.6
102.26	5.28	162.3	415.0	339.7	121.4	738.1	596.9
104.20	5.33	272.7	309.0	322.8	294.4	676.4	699.4
106.14	5.30	170.8	304.0	322.8	198.2	731.7	648.3
108.15	5.21	162.0	343.0	333.5	128.0	2833.2	597.6
110.21	5.13	194.3	333.0	354.9	177.6	531.8	636.3
112.17	5.83	189.5	336.0	354.5	164.1	597.7	627.2
114.10	6.03	207.3	308.0	316.2	210.7	555.1	617.7
116.05	5.96	165.5	377.0	372.9	119.7	638.1	625.2
118.17	5.00	176.6	373.0	419.4	125.8	695.5	666.7
120.16	5.95	156.3	335.0	392.3	125.1	738.1	659.2
122.13	5.88	178.0	376.0	352.2	153.3	610.4	625.6
123.95	5.96	167.0	335.0	405.0	138.0	755.1	674.1
126.27	5.94	160.0	351.0	359.9	126.9	621.1	624.9
127.99	5.87	182.4	56.0	346.2	172.4	529.6	634.3

Table E-8. Transfer data for Train R1 Fermentor 4 at lower reflux.

Train R1 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00	5.97	246.9	300.0	268.9	350.5	348.8	597.2	0.83	0.35
2.18	6.06	99.1	300.0	381.2	40.7	1340.0	620.9	0.83	0.35
4.08	5.90	0.0	300.0	384.2	0.0	1061.4	596.9	0.83	0.35
6.17	6.15	253.1	300.0	248.3	182.2	580.7	511.4	0.80	0.46
8.10	7.70	144.9	300.0	263.7	241.9	489.2	658.8	0.76	0.38
10.25	5.83	77.1	300.0	327.4	50.5	574.3	596.9	0.77	0.37
11.85	5.44	154.8	300.0	318.6	130.0	1703.7	591.9	0.77	0.39
13.99	6.00	198.7	300.0	326.9	168.7	1380.4	595.0	0.74	0.50
16.17	6.00	246.6	300.0	349.9	163.9	1199.6	593.7	0.79	0.46
18.12	6.00	253.8	300.0	278.6	218.6	1365.5	578.9	0.84	0.37
20.19	6.00	250.2	300.0	304.6	249.9	1365.5	633.0	0.86	0.34
22.05	5.70	249.1	300.0	305.2	240.1	899.7	627.4	0.84	0.40
24.23	5.46	223.5	300.0	324.1	228.9	787.0	627.6	0.84	0.35
25.85	5.46	102.2	300.0	292.8	69.9	355.2	558.6	0.82	0.34
28.10	5.17	204.3	300.0	309.3	193.5	1159.2	596.6	0.80	0.36
29.85	5.61	140.8	300.0	323.2	117.6	725.3	598.1	0.79	0.34
32.25	4.95	207.1	300.0	315.5	191.6	1074.1	596.1	0.79	0.81
34.13	5.34	210.5	300.0	330.7	206.5	863.6	624.8	0.79	0.37
36.21	5.78	168.5	300.0	85.0	34.8	61.7	249.4	0.80	0.35
38.00	5.41	158.7	300.0	315.1	141.4	867.8	595.9	0.83	0.33
40.09	5.25	101.9	300.0	345.3	54.4	1550.6	595.9	0.80	0.44
42.07	5.67	189.0	300.0	325.7	164.2	346.7	599.0	0.77	0.40
44.18	5.50	234.2	300.0	315.4	201.7	680.6	597.6	0.78	0.36
46.02	5.59	241.8	300.0	309.6	226.9	682.8	614.8	0.81	0.34
48.17	6.09	232.8	300.0	288.4	250.1	874.2	619.7	0.84	0.30
50.03	6.18	208.8	300.0	331.2	184.8	1267.7	605.3	0.83	0.36
52.27	6.10	165.7	300.0	87.8	0.0	2163.0	218.0	0.80	0.35
53.91	5.80	152.8	300.0	369.1	78.4	2127.0	592.8	0.79	0.38
55.95	5.78	182.0	300.0	377.7	101.2	2233.4	595.0	0.73	0.43
57.39	5.62	87.6	300.0	382.0	3.4	2365.2	595.9	0.80	0.36
59.95	5.58	199.7	300.0	337.3	158.8	2135.5	594.5	0.70	0.54
62.27	5.42	140.6	300.0	348.4	91.7	2000.0	595.6	0.77	0.42
64.17	5.26	183.8	300.0	331.0	152.4	2183.5	595.7	0.76	0.41
66.24	5.47	194.4	300.0	330.8	161.8	2171.1	594.3	0.78	0.39
67.96	5.53	191.6	300.0	306.1	182.0	2122.5	594.6	0.81	0.34
70.07	5.51	128.1	300.0	343.9	82.0	2119.3	595.9	0.78	0.42
72.26	5.79	196.2	300.0	347.6	148.6	1233.7	596.1	0.77	0.47

Table E-8. Continued.

Train R1 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
74.11	5.79	156.3	300.0	344.1	109.6	1229.4	595.5	0.74	0.44
76.14	5.71	175.0	300.0	258.9	124.4	1500.0	506.4	0.78	0.38
78.26	5.42	172.5	300.0	341.1	130.2	1680.3	594.9	0.77	0.40
80.35	5.37	199.8	300.0	327.5	172.5	1482.5	596.0	0.77	0.35
82.10	5.50	154.3	300.0	313.2	139.3	1500.0	596.3	0.80	0.32
84.19	5.59	206.2	300.0	319.0	199.4	1522.9	610.3	0.81	0.37
86.13	5.82	183.4	300.0	366.4	110.9	2354.6	592.0	0.77	0.41
88.00	5.68	116.5	300.0	401.6	10.0	2067.4	593.2	0.78	0.37
90.30	5.60	115.0	300.0	364.6	44.3	1550.6	592.0	0.77	0.43
92.18	5.71	203.2	300.0	340.8	159.5	1890.9	595.2	0.79	0.47
94.14	5.45	144.1	300.0	366.5	90.9	2252.5	611.4	0.74	0.45
96.18	5.44	258.6	300.0	305.8	213.4	1924.9	602.5	0.80	0.45
98.26	5.44	205.5	300.0	303.8	229.3	742.3	625.7	0.84	0.36
100.11	5.16	135.2	300.0	303.8	118.2	1386.8	584.9	0.88	0.34
102.26	4.89	121.4	300.0	409.4	18.0	2341.8	594.4	0.81	0.41
104.20	4.94	294.4	300.0	303.8	202.2	1737.8	586.4	0.81	0.43
106.14	5.28	198.2	300.0	303.8	270.1	789.1	673.8	0.79	0.46
108.15	5.06	128.0	300.0	346.2	81.0	1408.1	597.3	0.78	0.38
110.21	5.42	177.6	300.0	333.8	139.9	3065.0	594.2	0.75	0.48
112.17	5.00	164.1	300.0	331.8	127.4	2467.3	593.2	0.78	0.44
114.10	5.93	210.7	300.0	330.5	170.6	3677.6	588.5	0.76	0.45
116.05	5.96	119.7	300.0	372.2	45.0	2665.1	595.6	0.76	0.44
118.17	5.75	125.8	300.0	368.4	52.8	4094.5	593.0	0.72	0.47
120.16	6.03	125.1	300.0	331.1	86.7	2648.1	590.8	0.75	0.45
122.13	5.96	153.3	300.0	375.6	75.5	2992.7	595.9	0.75	0.50
123.95	5.80	138.0	300.0	331.7	104.1	2769.4	595.9	0.75	0.42
126.27	5.74	126.9	300.0	354.4	67.1	3162.8	592.7	0.72	0.47
127.99	6.00	164.4	300.0	61.1	0.0	146.8	194.2	0.74	0.46

Table E-9. Transfer data for Train R2 Fermentor 1 at lower reflux.

Train R2 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00	5.78	27.3	229.0	139.7	130.6	342.4	439.6	0.98	0.42	11.49	15.37
1.68	6.70	27.3	268.0	193.5	57.3	397.7	421.6	0.98	0.42	12.68	16.78
3.50	6.33	27.3	377.0	215.3	121.1	70.2	507.2	0.98	0.45	12.18	16.05
5.74	5.78	27.3	329.0	224.8	185.0	716.8	580.6	0.97	0.42	17.85	24.40
7.75	5.72	27.3	219.0	167.6	187.5	750.8	525.9	0.97	0.51	19.80	31.57
9.71	5.49	27.3	286.0	97.8	149.1	561.5	415.7	0.96	0.50	23.95	38.89
11.55	6.00	27.3	248.0	160.0	149.2	261.6	480.0	0.97	0.37	17.56	28.54
13.78	6.00	27.3	227.0	138.3	136.1	427.5	445.2	0.97	0.41	19.07	26.92
15.71	6.00	27.3	237.0	83.0	45.1	380.7	398.9	0.97	0.38	19.10	27.23
17.93		27.3	308.0	104.9	220.5	406.3	494.2	0.97	0.41	19.90	30.63
19.75	6.00	27.3	222.0	161.3	172.8	533.9	504.9	0.97	0.38	17.88	27.19
21.73	5.77	27.3	258.0	95.0	155.0	614.7	420.8	0.97	0.32	20.71	31.82
23.68	5.41	27.3	310.0	120.0	166.7	918.9	455.5	0.97	0.34	21.83	33.00
25.49	5.55	27.3	334.0	175.1	156.5	519.0	502.4	0.96	0.33	20.25	30.92
27.78	5.55	27.3	359.0	207.6	149.5	718.9	527.9	0.97	0.33	20.02	30.64
29.58	5.86	27.3	113.0	217.6	161.3	557.3	549.7	0.97	0.30	19.91	31.14
31.49	5.92	27.3	386.0	19.8	122.1	148.9	312.7	0.96	0.32	21.65	32.10
33.71	5.93	27.3	372.0	230.0	186.0	389.2	586.8	0.97	0.29	17.57	26.08
35.73	4.96	27.3	373.0	235.6	167.0	370.1	573.4	0.97	0.34	18.92	27.75
37.55	4.92	27.3	357.0	214.4	182.7	274.4	565.9	0.97	0.30	18.87	27.45
39.48	5.11	27.3	302.0	212.7	165.8	344.6	549.3	0.98	0.31	18.93	27.37
41.62	5.09	27.3	345.0	166.3	165.3	414.8	502.4	0.97	0.36	19.08	27.49
43.71	4.85	27.3	344.0	216.3	173.9	874.2	560.0	0.97	0.30	19.08	27.65
45.47	4.99	27.3	390.0	211.1	155.8	463.7	537.7	0.97	0.35	18.62	27.11
47.60	5.23	27.3	358.0	223.5	195.2	231.8	588.5	0.97	0.35	18.74	27.76
49.80	5.29	27.3	331.0	221.5	166.7	282.9	558.0	0.97	0.27	17.72	26.51
51.47	5.20	27.3	332.0	213.2	144.1	221.2	528.1	0.97	0.36	18.65	27.30
53.51	5.40	27.3	352.0	200.9	159.8	253.1	531.5	0.97	0.30	18.56	27.27
55.51	5.23	27.3	303.0	206.8	171.1	316.9	548.7	0.97	0.35	16.71	25.00
57.70	5.30	27.3	330.0	158.8	172.4	746.6	501.0	0.97	0.30	18.07	26.77
59.88	5.31	27.3	380.0	216.5	145.2	404.1	531.5	0.97	0.31	18.66	28.06
61.54	4.78	27.3	300.0	223.9	179.6	495.6	574.3	0.97	0.28	18.76	28.59
63.44	4.91	27.3	329.0	159.7	168.7	490.8	499.2	0.97	0.37	20.77	31.72
65.05	4.76	27.3	335.0	164.2	196.4	534.3	530.4	0.97	0.34	17.47	26.89
67.68	5.50	27.3	353.0	200.7	157.4	481.2	527.9	0.97	0.27	18.94	29.10
69.50	5.20	27.3	185.0	215.2	162.0	500.5	548.0	0.98	0.37	17.49	26.72
71.60	4.98	27.3	544.0	56.6	158.2	242.5	385.6	0.97	0.40	18.28	27.47

Table E-9. Continued.

Train R2 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
73.50	5.16	27.3	308.0	374.2	195.5	485.0	740.5	0.98	0.38	16.85	26.23
75.52	5.18	27.3	334.0	184.7	148.4	508.4	503.9	0.97	0.34	18.48	28.53
77.78	5.26	27.3	363.0	187.4	170.6	223.3	528.8	0.97	0.35	17.85	27.51
79.53	5.37	27.3	335.0	196.3	191.7	255.2	558.8	0.97	0.30	17.79	27.29
81.66	5.50	27.3	368.0	198.9	158.7	319.1	528.4	0.97	0.31	17.85	27.41
83.55	5.50	27.3	339.0	207.0	175.6	333.9	553.4	0.97	0.38	17.76	27.39
85.50	5.62	27.3	330.0	221.5	144.0	348.8	536.3	0.97	0.27	17.01	26.12
87.92	5.45	27.3	65.0	159.5	198.8	610.4	529.1	0.97	0.37	18.85	29.23
89.05		27.3	365.0	0.0	93.0	840.2	263.8	0.97	0.33	17.85	27.49
91.67	4.91	27.3	288.0	173.1	212.8	485.0	556.7	0.95	0.28	19.96	30.89
93.69	4.98	27.3	340.0	178.2	128.0	416.9	477.0	0.97	0.21	19.97	30.85
95.50	4.98	27.3	424.0	188.0	177.5	331.8	536.3	0.95	0.27	22.52	35.30
97.53	4.66	27.3	295.0	182.5	262.3	402.0	616.5	0.96	0.35	18.76	29.93
99.49	4.78	27.3	320.0	183.4	134.0	740.2	488.2	0.96	0.40	21.63	34.62
101.81	4.58	27.3	348.0	184.4	163.7	776.4	518.9	0.96	0.30	16.14	25.33
103.80	5.09	27.3	395.0	178.4	195.9	310.5	545.1	0.97	0.37	18.51	30.57
105.67	4.70	27.3	311.0	263.8	141.1	355.2	575.7	0.97	0.36	19.51	31.15
107.64	4.84	27.3	284.0	177.2	161.1	229.7	509.1	0.97	0.33	22.02	36.41
109.50	5.01	27.3	360.0	170.3	139.4	240.4	480.5	0.97	0.35	22.07	36.34
111.51	5.45	27.3	313.0	216.7	168.8	248.9	556.3	0.97	0.27	16.40	26.31
113.52	5.53	27.3	324.0	164.0	171.9	217.0	506.7	0.97	0.35	18.50	30.24
115.75	5.19	27.3	322.0	185.8	165.3	276.5	521.9	0.97	0.33	20.81	33.94
117.65	5.53	27.3	350.0	192.1	155.3	302.0	518.2	0.97	0.34	17.41	27.29
119.84	5.64	27.3	327.0	166.0	200.9	389.2	537.7	0.97	0.39	19.04	30.82
121.65	5.60	27.3	325.0	170.2	184.4	346.7	525.4	0.97	0.37	16.60	25.92
123.49	5.69	27.3	378.0	184.8	151.8	338.2	507.4	0.97	0.34	16.46	25.59
125.80	5.44	27.3	357.0	220.9	184.0	280.8	575.7	0.97	0.36	14.36	22.66
127.78	5.42	27.3	300.0	193.5	170.7	465.8	535.0	0.97	0.36	16.48	26.27

Table E-10. Transfer data for Train R2 Fermentor 2 at lower reflux.

Train R2 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.72	130.6	284.0	233.3	207.0	382.9	588.3
1.68	6.27	57.3	430.0	366.7	0.0	548.8	580.5
3.50	5.79	121.1	404.0	377.1	176.4	1093.3	712.5
5.74	5.70	185.0	252.0	329.4	259.3	1033.7	683.9
7.75	5.76	187.5	307.0	223.2	231.4	544.5	547.2
9.71	5.49	149.1	312.0	284.8	187.8	421.1	601.6
11.55	6.00	149.2	256.0	248.8	227.8	489.2	607.5
13.78	6.00	136.1	295.0	230.0	177.3	576.4	551.3
15.71	6.00	45.1	354.0	237.1	100.7	351.0	572.8
17.93		220.5	332.0	310.1	258.3	514.7	656.9
19.75	6.00	172.8	316.0	224.3	322.9	463.7	654.5
21.73	5.80	155.0	353.0	261.4	226.7	625.3	613.2
23.68	5.76	166.7	312.0	308.4	229.0	644.5	648.8
25.49	6.10	156.5	350.0	335.9	191.7	391.4	651.2
27.78	6.33	149.5	341.0	361.0	173.9	653.0	665.5
29.58	6.28	161.3	406.0	112.2	119.9	85.1	349.9
31.49	5.69	122.1	404.0	386.5	121.8	521.1	666.3
33.71	5.87	186.0	378.0	375.5	228.7	829.5	698.3
35.73	4.98	167.0	373.0	379.8	184.0	808.3	676.9
37.55	4.94	182.7	320.0	355.6	221.2	657.2	673.2
39.48	5.08	165.8	352.0	306.1	194.1	789.1	614.5
41.62	5.10	165.3	347.0	351.9	185.3	627.5	652.0
43.71	5.13	173.9	374.0	342.6	195.0	761.5	642.8
45.47	5.19	155.8	364.0	390.1	153.6	691.3	668.0
47.60	5.30	195.2	338.0	355.6	216.3	582.8	658.6
49.80	5.30	166.7	349.0	334.2	186.9	665.8	633.5
51.47	5.39	144.1	348.0	335.8	153.3	197.8	625.1
53.51	5.48	159.8	334.0	351.1	176.4	678.5	647.8
55.51	5.94	171.1	333.0	306.7	213.4	895.5	629.1
57.70	5.32	172.4	392.0	330.0	191.9	1012.5	628.6
59.88	5.11	145.2	326.0	377.2	169.2	559.4	680.3
61.54	5.45	179.6	340.0	302.0	218.1	938.0	620.6
63.44	4.87	168.7	349.0	335.5	192.7	851.3	639.6
65.05	5.01	196.4	420.0	332.1	209.4	840.3	630.9
67.68	5.65	157.4	194.0	353.3	172.0	797.3	647.0
69.50	5.16	162.0	589.0	187.2	186.7	856.7	492.0
71.60	5.69	158.2	339.0	546.2	210.8	144.6	878.9

Table E-10. Continued.

Train R2 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.50	5.18	195.5	344.0	307.1	235.9	670.0	629.5
75.52	5.43	148.4	367.0	334.2	175.3	616.8	641.2
77.78	5.41	170.6	362.0	364.9	190.7	487.1	665.1
79.53	5.51	191.7	365.0	331.1	237.8	691.3	657.3
81.66	5.37	158.7	369.0	361.0	175.6	557.3	658.0
83.55	5.64	175.6	335.0	341.8	202.4	610.4	648.7
85.50	5.72	144.0	70.0	332.7	161.9	778.5	630.7
87.92	5.24	198.8	375.0	64.6	210.9	1125.2	366.8
89.05	5.21	93.0	363.0	359.6	133.4	1027.3	680.1
91.67	4.82	212.8	349.0	290.1	277.1	485.0	655.4
93.69	4.84	128.0	420.0	339.9	170.8	821.0	662.8
95.50	5.02	177.5	270.0	422.7	190.4	597.7	715.7
97.53	5.15	262.3	347.0	296.2	170.2	665.8	556.2
99.49	5.76	134.0	350.0	321.4	243.1	910.4	710.6
101.81	5.50	163.7	386.0	348.7	179.4	691.3	644.5
103.80	5.34	195.9	310.0	380.0	218.9	584.9	683.1
105.67	5.14	141.1	273.0	316.7	139.0	648.7	597.6
107.64	5.04	161.1	364.0	282.7	172.7	748.7	574.4
109.50	4.85	139.4	348.0	359.3	161.1	640.2	661.1
111.51	5.40	168.8	343.0	317.5	213.1	782.7	641.9
113.52	5.48	171.9	338.0	324.2	200.4	678.5	632.8
115.75	5.18	165.3	347.0	321.0	197.7	1006.1	633.5
117.65	5.56	155.3	380.0	339.6	180.6	595.6	644.7
119.84	5.59	200.9	359.0	329.4	253.9	780.6	662.5
121.65	5.94	184.4	395.0	311.3	238.7	355.2	645.7
123.49	5.87	151.8	356.0	378.3	170.4	680.6	677.0
125.80	6.20	184.0	337.0	354.7	211.8	833.8	662.6
127.78	5.82	162.7	327.0	305.6	222.9	699.8	618.9

Table E-11. Transfer data for Train R2 Fermentor 3 at lower reflux.

Train R2 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.75	207.0	305.0	289.5	217.9	406.3	597.0
1.68	6.08	0.0	425.0	430.5	0.0	882.7	599.1
3.50	5.71	176.4	263.0	403.7	58.7	1448.5	584.1
5.74	5.71	259.3	284.0	252.8	227.0	784.9	559.2
7.75	5.84	231.4	287.0	310.7	240.7	425.4	618.1
9.71	5.54	187.8	269.0	311.5	177.2	327.6	597.0
11.55	6.00	227.8	261.0	256.2	227.2	402.0	563.7
13.78	6.00	177.3	369.0	297.7	148.2	848.7	566.7
15.71	6.00	100.7	339.0	354.3	113.5	327.6	665.2
17.93		258.3	341.0	329.4	226.8	-608.3	634.5
19.75	6.00	322.9	329.0	316.9	276.9	408.4	673.4
21.73	5.66	226.7	358.0	355.5	296.9	514.7	729.6
23.68	5.87	229.0	333.0	355.7	225.6	546.6	659.8
25.49	6.12	191.7	331.0	350.7	177.7	319.1	634.8
27.78	6.15	173.9	343.0	343.5	160.4	544.5	628.1
29.58	5.90	119.9	337.0	406.0	62.4	1346.4	645.6
31.49	5.64	121.8	363.0	404.2	90.0	608.3	670.5
33.71	5.38	228.7	339.0	381.1	196.3	619.0	658.6
35.73	5.14	184.0	311.0	379.8	155.9	657.2	649.8
37.55	5.47	221.2	330.0	319.9	211.6	606.2	610.0
39.48	5.30	194.1	321.0	355.4	169.2	591.3	628.6
41.62	5.55	185.3	341.0	354.1	154.4	595.6	621.3
43.71	5.68	195.0	339.0	372.2	165.9	653.0	640.2
45.47	5.55	153.8	335.0	363.0	127.6	480.7	634.9
47.60	5.45	216.3	327.0	337.7	210.3	485.0	628.8
49.80	5.58	186.9	319.0	351.3	161.8	472.2	623.6
51.47	5.60	153.3	309.0	352.8	119.0	214.8	616.6
53.51	5.43	176.4	335.0	333.5	152.1	431.8	607.3
55.51	5.79	213.4	353.0	335.9	208.1	899.7	628.7
57.70	5.42	191.9	302.0	390.9	153.1	816.8	649.2
59.88	6.63	169.2	321.0	324.5	144.7	725.3	597.1
61.54	5.17	218.1	335.0	342.0	196.5	544.5	618.8
63.44	6.17	192.7	297.0	355.9	173.6	746.6	634.9
65.05	5.62	209.4	332.0	418.6	81.0	708.3	587.3
67.68	5.34	172.0	574.0	195.5	144.9	681.2	465.5
69.50	6.14	186.7	325.0	592.4	166.6	670.1	870.4
71.60	5.97	210.8	322.0	336.7	195.4	248.9	619.4

Table E-11. Continued.

Train R2 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.50	5.90	235.9	343.0	342.7	189.1	444.5	611.8
75.52	5.74	175.3	337.0	367.0	166.3	542.4	656.1
77.78	6.02	190.7	343.0	364.6	160.9	459.4	632.9
79.53	6.00	237.8	340.0	363.0	190.8	448.8	634.1
81.66	5.76	175.6	328.0	361.0	163.8	553.0	647.3
83.55	5.68	202.4	35.0	338.0	180.1	499.8	613.8
85.50	5.62	161.9	367.0	71.6	118.8	633.8	326.6
87.92	5.36	210.9	337.0	375.1	199.6	801.9	661.9
89.05	5.30	133.4	337.0	358.4	180.4	757.2	632.0
91.67	5.25	277.1	357.0	351.5	192.2	572.2	626.7
93.69	5.37	170.8	253.0	418.5	157.3	657.2	703.1
95.50	5.45	190.4	327.0	271.8	168.8	636.0	548.3
97.53	5.36	170.2	335.0	352.4	130.5	589.2	610.8
99.49	5.37	243.1	337.0	348.7	199.9	701.9	628.4
101.81	5.54	179.4	314.0	386.0	150.3	1161.3	655.0
103.80	5.87	218.9	237.0	304.1	222.9	718.9	606.2
105.67	5.81	139.0	352.0	277.5	87.3	610.4	523.9
107.64	5.54	172.7	327.0	364.0	155.3	593.4	644.7
109.50	4.15	161.1	339.0	346.1	141.6	616.8	624.7
111.51	5.60	213.1	327.0	345.0	205.8	680.6	635.8
113.52	5.75	200.4	321.0	337.3	179.2	553.0	614.2
115.75	5.61	197.7	350.3	347.1	170.0	533.9	617.5
117.65	5.89	180.6	337.0	369.2	157.2	565.8	643.9
119.84	6.06	253.9	341.0	362.4	171.5	663.6	621.2
121.65	6.04	238.7	322.0	380.0	221.7	655.1	681.1
123.49	6.25	170.4	327.0	356.8	132.1	525.4	616.6
125.80	6.09	211.8	342.0	331.8	202.1	727.4	620.2
127.78	6.04	214.9	338.0	333.5	207.3	584.9	624.0

Table E-12. Transfer data for Train R2 Fermentor 4 at lower reflux.

Train R2 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00	5.77	217.9	300.0	289.9	209.9	648.7	578.5	0.82	0.34
1.68	6.14	0.0	300.0	426.8	18.0	1135.8	593.6	0.82	0.34
3.50	5.99	58.7	300.0	265.9	18.0	63.8	419.3	0.83	0.33
5.74	5.92	227.0	300.0	287.3	117.1	389.2	485.3	0.78	0.50
7.75	6.03	226.1	300.0	291.3	237.9	251.0	601.2	0.77	0.41
9.71	5.66	177.2	300.0	270.8	185.4	202.1	575.1	0.77	0.38
11.55	6.00	227.2	300.0	265.6	237.4	806.1	584.8	0.81	0.42
13.78	6.00	148.2	300.0	371.3	66.1	412.1	587.3	0.79	0.43
15.71	6.00	113.5	300.0	342.9	67.4	1248.5	593.9	0.78	0.46
17.93	6.00	226.8	300.0	334.8	169.0	1401.7	583.2	0.76	0.50
19.75	6.00	276.9	300.0	333.5	192.9	606.2	605.7	0.81	0.45
21.73	5.65	296.9	300.0	361.3	212.6	589.2	652.9	0.80	0.48
23.68	5.78	225.6	300.0	333.1	261.1	412.6	673.5	0.78	0.34
25.49	6.34	177.7	300.0	335.2	148.4	287.1	604.0	0.80	0.37
27.78	6.33	160.4	300.0	345.6	95.1	1605.9	578.4	0.80	0.40
29.58	5.85	62.4	300.0	379.2	0.0	1403.8	606.4	0.80	0.41
31.49	5.86	90.0	300.0	365.6	17.1	553.0	590.8	0.80	0.40
33.71	5.81	196.3	300.0	345.9	146.1	1831.3	593.8	0.67	0.59
35.73	6.07	155.9	300.0	318.8	135.5	678.5	596.5	0.73	0.48
37.55	5.67	211.6	300.0	332.9	126.8	1697.3	594.2	0.75	0.43
39.48	5.86	169.2	300.0	327.6	136.9	1152.8	593.4	0.78	0.40
41.62	5.64	154.4	300.0	348.3	103.6	1423.0	595.6	0.77	0.45
43.71	5.49	165.9	300.0	341.9	122.9	1225.2	595.0	0.76	0.39
45.47	5.33	127.6	300.0	337.0	86.7	1284.7	594.2	0.77	0.36
47.60	5.27	210.3	300.0	329.5	179.5	1278.3	594.8	0.73	0.46
49.80	5.90	161.8	300.0	321.5	141.2	425.4	597.0	0.76	0.35
51.47	5.42	119.0	300.0	314.2	99.1	1246.4	592.4	0.76	0.39
53.51	6.12	152.1	300.0	338.0	109.3	1423.0	593.3	0.78	0.38
55.51	5.42	208.1	300.0	356.9	149.5	3299.0	596.4	0.76	0.44
57.70	5.52	153.1	300.0	301.6	102.8	833.8	547.4	0.76	0.45
59.88	5.26	144.7	300.0	324.9	70.3	1214.5	546.6	0.78	0.38
61.54	5.17	196.5	300.0	340.9	152.3	1967.5	594.8	0.77	0.39
63.44	5.19	173.6	300.0	302.0	169.4	1828.7	595.9	0.81	0.37
65.05	5.61	81.0	300.0	320.3	26.6	1461.1	562.0	0.81	0.28
67.68	6.06	144.9	300.0	577.3	157.2	1617.9	885.7	0.78	0.37
69.50	5.53	166.6	300.0	328.2	136.0	1718.8	595.7	0.74	0.39
71.60	5.51	195.4	300.0	320.0	169.7	1078.4	592.4	0.76	0.42

Table E-12. Continued.

Train R2 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
73.50	5.44	189.1	300.0	346.5	140.4	1631.4	595.9	0.78	0.38
75.52	5.57	166.3	300.0	340.0	123.5	674.3	595.3	0.78	0.40
77.78	5.46	160.9	300.0	341.8	117.7	1314.5	596.7	0.77	0.40
79.53	5.57	190.6	300.0	336.9	150.4	1571.9	594.8	0.77	0.35
81.66	5.68	163.8	300.0	325.9	132.4	1995.1	592.6	0.76	0.40
83.55	6.20	180.1	300.0	33.7	67.9	61.7	219.6	0.77	0.42
85.50	5.55	118.8	300.0	368.9	44.3	3964.7	592.5	0.77	0.41
87.92	5.41	199.6	300.0	338.8	154.3	3484.0	591.6	0.78	0.48
89.05	5.70	108.9	300.0	332.4	71.8	1856.9	593.4	0.77	0.45
91.67	5.16	192.2	300.0	359.0	129.0	2469.4	683.9	0.76	0.46
93.69	5.35	157.3	300.0	255.0	99.0	1333.6	494.8	0.75	0.42
95.50	5.32	168.8	300.0	326.1	141.4	1186.9	596.8	0.76	0.35
97.53	5.04	130.5	300.0	338.5	79.4	1367.7	585.5	0.76	0.40
99.49	5.07	199.9	300.0	338.2	156.7	1865.4	593.1	0.77	0.36
101.81	5.18	150.3	300.0	315.7	131.8	1682.5	595.3	0.79	0.33
103.80	5.61	222.9	300.0	229.7	183.6	1650.6	495.1	0.79	0.37
105.67	5.30	87.3	300.0	352.8	23.1	1484.6	584.7	0.76	0.42
107.64	4.88	155.3	300.0	331.5	118.7	2516.2	593.0	0.72	0.45
109.50	4.97	141.6	300.0	342.7	95.6	1848.4	594.8	0.72	0.44
111.51	5.41	205.8	300.0	333.5	168.3	2594.9	594.1	0.77	0.47
113.52	5.68	179.2	300.0	324.3	145.9	855.1	589.1	0.77	0.39
115.75	5.49	170.0	300.0	349.5	117.8	2065.3	595.4	0.76	0.42
117.65	5.77	157.2	300.0	329.4	131.8	1965.3	602.1	0.77	0.37
119.84	6.12	171.5	300.0	346.9	119.6	2084.5	593.1	0.75	0.44
121.65	5.78	221.7	300.0	313.6	202.2	1644.2	592.2	0.76	0.38
123.49	5.71	132.1	300.0	328.3	106.4	1097.5	600.7	0.79	0.30
125.80	5.75	202.1	300.0	336.9	162.6	2241.9	595.5	0.80	0.34
127.78	5.74	199.2	300.0	304.8	150.8	219.1	554.4	0.78	0.37

Table E-13. Transfer data for Train R3 Fermentor 1 at lower reflux.

Train R3 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00	5.96	27.3	235.0	60.1	172.3	340.3	401.7	0.98	0.43	12.36	16.61
1.68	6.80	27.3	376.0	185.2	74.8	382.9	430.8	0.98	0.43	12.39	16.48
3.51	6.36	27.3	51.0	214.0	184.3	433.9	569.1	0.98	0.51	11.37	15.06
5.74		27.3	342.0	0.0	80.4	364.8	251.2	0.98	0.45	11.47	15.28
7.75	5.92	27.3	123.0	143.9	222.4	629.6	537.1	0.97	0.50	17.32	27.33
9.71	5.90	27.3	255.0	34.3	118.9	353.1	322.0	0.96	0.49	17.22	27.68
11.55	6.00	27.3	304.0	116.3	176.5	385.0	463.6	0.97	0.40	12.87	21.10
13.78	6.00	27.3	253.0	202.6	129.1	402.0	502.5	0.97	0.36	19.65	28.11
15.70	6.00	27.3	257.0	134.3	146.1	391.4	451.2	0.97	0.42	19.22	28.16
18.00		27.3	309.0	109.9	173.5	516.9	452.2	0.97	0.38	24.93	37.52
19.75	6.00	27.3	202.0	148.9	180.3	285.0	500.0	0.97	0.37	19.53	29.74
21.75	5.68	27.3	250.0	87.4	150.6	559.4	399.8	0.97	0.41	21.44	32.72
23.70	5.66	27.3	242.0	123.3	146.7	606.2	438.8	0.97	0.40	20.95	31.25
25.48	5.46	27.3	296.0	117.5	151.3	850.8	439.6	0.97	0.39	22.00	33.11
27.77	5.42	27.3	341.0	157.4	164.3	938.0	492.5	0.96	0.36	20.81	31.38
29.58	5.61	27.3	341.0	185.1	176.1	642.4	532.0	0.97	0.37	19.96	30.50
31.47	5.44	27.3	374.0	191.7	162.3	123.4	524.8	0.97	0.36	18.86	28.07
33.71	5.19	27.3	388.0	211.1	190.5	416.9	572.4	0.97	0.38	18.31	27.07
35.72	4.99	27.3	331.0	230.8	185.6	557.3	587.2	0.97	0.38	17.57	26.03
37.56	4.90	27.3	296.0	164.9	94.4	495.6	429.1	0.97	0.28	17.46	25.60
39.48	5.08	27.3	302.0	207.0	214.2	621.1	592.0	0.97	0.36	16.78	24.43
41.62	5.19	27.3	273.0	163.0	170.5	655.1	504.3	0.99	0.35	17.77	25.89
43.71	4.95	27.3	336.0	109.1	192.3	699.8	471.2	0.97	0.37	19.15	27.74
45.50	4.87	27.3	336.0	190.2	168.9	610.4	529.9	0.97	0.37	18.13	26.49
47.60	5.15	27.3	370.0	193.8	171.4	274.4	535.0	0.97	0.36	17.79	26.19
49.80	5.30	27.3	97.0	201.9	195.4	629.6	567.1	0.97	0.35	18.08	26.83
51.49		27.3	356.0	4.9	118.8	410.5	214.5	0.97	0.36	21.20	30.61
53.50	5.26	27.3	300.0	200.7	184.6	721.1	556.1	0.97	0.33	20.85	30.44
55.51	5.12	27.3	357.0	147.6	180.2	797.6	498.6	0.97	0.41	17.75	25.94
57.71	5.09	27.3	216.0	203.2	182.7	763.6	555.7	0.97	0.29	20.91	31.27
59.88	5.28	27.3	338.0	78.2	165.3	342.4	413.3	0.96	0.31	17.92	26.15
61.54	4.87	27.3	316.0	177.9	181.7	493.5	530.4	0.97	0.29	19.20	29.57
63.43	4.86	27.3	295.0	181.8	162.8	599.3	515.4	0.97	0.33	19.92	30.48
65.02	5.36	27.3	300.0	163.2	141.4	549.7	474.4	0.97	0.31	18.48	28.36
67.69	5.34	27.3	396.0	173.6	183.8	496.2	527.2	0.97	0.31	19.50	30.22
69.50	5.21	27.3	217.0	238.4	183.2	534.7	592.4	0.97	0.35	19.27	29.65
71.60	5.14	27.3	376.0	162.0	181.4	159.5	514.2	0.97	0.38	16.76	26.51

Table E-13. Continued.

Train R3 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
73.50	5.34	27.3	300.0	209.3	189.0	480.7	569.1	0.97	0.39	17.66	27.16
75.51	5.29	27.3	348.0	148.2	176.4	538.1	495.4	0.97	0.40	18.33	28.77
77.78	5.18	27.3	362.1	197.8	177.1	240.4	545.7	0.97	0.32	19.12	30.13
79.48	5.34	27.3	398.0	216.7	165.0	251.0	552.5	0.97	0.33	21.00	33.14
81.68	5.41	27.3	345.0	242.0	179.3	285.0	592.1	0.97	0.32	20.06	31.71
83.54	5.60	27.3	313.0	214.6	142.1	248.9	527.5	0.97	0.36	19.23	30.18
85.49	5.59	27.3	290.0	158.6	180.5	129.7	509.9	0.97	0.33	16.92	26.25
87.90	5.67	27.3	318.0	122.5	192.7	812.5	486.0	0.97	0.41	18.52	29.87
89.79	5.31	27.3	340.0	154.0	188.7	644.5	513.5	0.97	0.38	19.15	30.23
91.67	5.27	27.3	351.0	165.1	200.3	255.2	536.2	0.97	0.39	17.27	27.17
93.69	5.51	27.3	350.0	59.4	143.1	193.6	373.3	0.97	0.42	16.94	26.45
95.49	5.49	27.3	380.0	221.7	149.9	293.5	542.4	0.97	0.39	16.64	25.33
97.53	5.22	27.3	275.0	163.1	231.7	365.8	565.6	0.97	0.40	17.70	27.81
99.50	4.98	27.3	300.0	163.1	185.1	714.7	519.0	0.97	0.26	15.97	25.13
101.80	4.60	27.3	310.0	153.9	173.5	378.6	498.2	0.97	0.37	16.59	26.40
103.75	5.03	27.3	365.0	229.6	191.1	327.6	591.5	0.97	0.39	18.64	30.20
105.66	4.98	27.3	333.0	189.4	190.1	231.8	550.3	0.97	0.33	17.11	26.97
107.64	5.01	27.3	220.0	200.7	162.1	195.7	533.6	0.97	0.36	17.41	28.11
109.49	5.13	27.3	338.0	98.6	147.6	127.6	417.0	0.97	0.37	19.19	30.41
111.52	5.60	27.3	339.0	174.8	188.7	231.8	534.3	0.97	0.35	15.31	24.13
113.52	5.61	27.3	292.0	182.4	178.1	265.9	531.3	0.97	0.34	17.53	27.96
115.74	5.43	27.3	313.0	155.0	164.7	255.2	490.5	0.97	0.38	15.90	24.22
117.65	5.73	27.3	295.0	167.5	170.7	346.7	509.0	0.97	0.36	15.58	23.57
119.79	6.17	27.3	324.0	146.6	159.9	472.2	477.3	0.97	0.39	13.68	22.39
121.60	5.82	27.3	340.0	175.9	179.5	782.7	526.2	0.97	0.41	16.86	25.15
123.48	6.20	27.3	300.0	218.8	140.9	478.6	530.5	0.98	0.40	15.91	24.66
125.75	5.70	27.3	317.0	162.7	160.4	776.4	493.9	0.97	0.39	19.64	29.79
127.85	5.60	27.3	365.0	150.9	179.9	584.9	501.6	0.97	0.39	16.21	24.66

Table E-14. Transfer data for Train R3 Fermentor 2 at lower reflux.

Train R3 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.88	172.3	291.0	239.9	213.1	210.6	577.3
1.68	6.97	74.8	444.0	376.1	0.0	265.9	581.9
3.51	6.26	154.3	407.0	50.6	197.7	100.0	362.1
5.74	5.76	80.4	174.0	343.0	135.2	502.0	595.9
7.75	5.82	222.4	321.0	126.5	263.8	431.8	471.5
9.71	5.55	118.9	366.0	255.1	187.2	448.8	619.5
11.55	6.00	176.5	292.0	305.2	223.7	214.8	650.5
13.78	6.00	129.1	317.0	256.1	165.1	440.3	590.2
15.70	6.00	146.1	376.0	257.3	205.4	308.4	614.7
18.00		173.5	282.0	304.7	244.8	361.6	672.1
19.75	6.00	180.3	294.0	203.4	255.0	480.7	576.2
21.75		150.6	308.0	253.1	189.5	423.3	630.1
23.70	5.43	146.7	332.0	244.4	210.0	512.6	603.8
25.48	5.51	151.3	360.0	296.1	181.2	461.6	624.1
27.77	5.54	164.3	327.0	343.1	180.0	457.3	656.9
29.58	5.72	176.1	391.0	340.6	181.2	425.4	643.8
31.47	5.52	162.3	420.0	374.1	178.7	231.8	688.6
33.71	5.26	190.5	342.0	391.4	218.9	351.0	717.9
35.72	5.08	185.6	335.0	336.1	192.3	380.7	640.9
37.56	5.02	94.4	322.0	296.2	134.7	336.1	633.6
39.48	5.43	214.2	322.0	306.6	225.2	427.5	615.7
41.62	5.13	170.5	373.0	278.7	216.7	553.0	623.0
43.71	4.95	192.3	360.0	333.5	232.6	542.4	670.9
45.50	5.08	168.9	382.0	366.1	187.5	453.1	682.8
47.60	5.42	171.4	100.0	369.3	183.2	453.1	678.2
49.80	5.96	195.4	370.0	100.3	193.8	665.8	395.8
51.49	5.50	118.1	336.0	359.7	125.8	378.6	664.8
53.50	5.18	184.6	372.0	300.5	219.9	323.3	633.9
55.51	5.17	180.2	341.0	361.0	208.8	595.6	687.7
57.71	5.16	182.7	356.0	216.5	207.9	529.6	538.8
59.88	5.13	165.3	350.0	334.8	184.0	476.4	650.6
61.54	4.95	181.7	304.0	317.3	209.3	623.2	643.0
63.43	4.87	162.8	335.0	299.4	168.8	556.2	603.3
65.02	5.29	141.4	355.0	302.7	129.8	546.4	588.2
67.69	5.45	183.8	378.0	395.9	188.3	550.6	697.5
69.50	5.29	183.2	391.0	319.7	237.5	569.1	672.1
71.60	5.32	181.4	348.0	373.3	215.0	236.1	705.0

Table E-14. Continued.

Train R3 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.50	5.20	189.0	268.0	298.8	237.8	553.0	645.7
75.51	5.20	176.4	376.0	347.5	193.3	419.0	662.5
77.78	5.16	177.1	395.0	360.1	191.1	431.8	672.2
79.48	5.27	165.0	355.0	396.4	156.7	397.7	686.2
81.68	5.25	179.3	343.0	341.2	186.4	368.0	646.4
83.54	5.36	142.1	365.0	316.8	158.0	601.9	630.8
85.49	5.53	180.5	365.0	290.9	252.5	723.2	661.0
87.90	6.32	192.7	388.0	316.7	238.7	601.9	660.8
89.79	5.77	188.7	348.0	337.5	236.9	561.5	683.8
91.67	5.76	200.3	347.0	351.0	228.5	146.8	677.3
93.69	5.53	143.1	400.0	346.4	142.9	399.9	644.3
95.49	5.37	149.9	310.0	376.9	173.0	487.1	698.1
97.53	5.46	231.7	327.0	275.8	194.7	765.7	548.9
99.50	5.16	185.1	330.0	299.7	215.7	699.8	628.4
101.80	5.30	173.5	356.0	310.5	191.0	680.6	626.1
103.75	6.01	191.1	355.0	352.3	188.7	508.4	648.0
105.66	5.22	190.1	247.0	337.6	190.1	444.5	635.7
107.64	5.16	162.1	390.0	217.3	188.1	331.8	541.4
109.49	4.80	147.6	374.0	337.9	178.3	553.0	666.7
111.52	5.45	188.7	307.0	341.3	221.0	336.1	671.7
113.52	5.44	178.1	346.0	291.2	188.0	285.0	599.2
115.74	5.12	164.7	355.0	312.5	192.3	238.2	638.2
117.65	5.51	181.5	375.0	375.0	187.2	450.9	672.8
119.79	6.14	159.9	347.0	327.4	177.8	487.1	644.3
121.60	6.42	179.5	350.0	331.4	192.2	438.2	642.2
123.48	6.27	140.9	348.0	299.2	177.8	601.9	634.2
125.75	5.81	160.4	417.0	313.8	191.7	855.1	643.2
127.85	5.68	171.9	449.0	368.9	203.8	557.3	698.9

Table E-15. Transfer data for Train R3 Fermentor 3 at lower reflux.

Train R3 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.88	213.1	313.0	294.5	246.1	255.2	616.2
1.68	6.19	0.0	453.0	443.9	0.0	691.3	620.7
3.51	5.78	197.7	270.0	406.7	133.0	1525.1	622.1
5.74	5.84	135.2	315.0	175.1	345.3	723.2	565.3
7.75	5.88	266.8	309.0	325.9	203.1	512.6	612.5
9.71	5.50	187.2	303.0	366.0	218.4	368.0	675.3
11.55	6.00	223.7	269.0	23.9	223.1	512.6	327.4
13.78	6.00	165.1	397.0	319.0	154.6	812.5	588.6
15.70	6.00	205.4	295.0	376.9	220.1	433.9	689.7
18.00		244.8	327.0	280.0	250.5	712.5	608.8
19.75	6.00	255.0	317.0	295.1	286.5	212.7	662.8
21.75	5.54	189.5	329.0	311.4	268.9	455.2	670.9
23.70	5.48	210.0	339.0	329.7	223.1	472.2	625.3
25.48	5.63	181.3	309.0	360.2	180.2	255.2	639.2
27.77	5.56	180.0	347.0	330.8	174.4	442.4	605.3
29.58	6.18	181.2	353.0	391.0	149.5	425.4	636.4
31.47	5.53	178.7	323.0	420.1	259.6	61.7	781.1
33.71	5.39	218.9	315.0	344.4	194.3	540.3	618.1
35.72	5.29	192.3	303.0	340.3	230.8	370.1	631.9
37.56	5.26	134.7	320.0	320.8	135.7	559.4	600.9
39.48	5.27	225.2	343.0	326.2	207.2	623.2	610.4
41.62	5.25	216.7	341.0	308.6	205.9	663.6	693.6
43.71	5.21	232.6	351.0	357.5	195.1	621.1	599.1
45.50	5.49	187.5	73.0	382.1	227.0	789.1	698.7
47.60	5.86	183.2	349.0	98.0	166.9	672.1	360.8
49.80	5.57	193.8	355.0	372.6	189.0	863.6	646.9
51.49	5.43	125.8	315.0	338.3	140.4	459.4	633.0
53.50	5.42	219.9	207.0	372.2	162.7	787.0	611.2
55.51	5.42	208.8	325.0	244.7	180.7	755.1	503.7
57.71	5.71	207.9	333.0	355.3	196.6	848.7	629.5
59.88	5.92	184.0	296.8	347.1	188.7	570.0	630.9
61.54	5.47	209.3	317.0	306.2	205.7	1508.0	589.2
63.43	5.72	168.6	349.0	340.2	170.6	920.5	622.3
65.02	5.28	129.8	341.0	355.3	105.5	961.8	610.1
67.69	5.87	188.3	405.0	376.9	210.4	990.1	678.1
69.50	5.60	237.5	325.0	393.7	211.4	1095.1	685.0
71.60	5.69	215.0	339.0	349.4	231.2	242.5	657.6

Table E-15. Continued.

Train R3 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.50	5.37	237.8	345.0	367.1	202.2	725.3	648.4
75.51	5.57	193.3	361.0	375.2	210.4	627.5	672.4
77.78	5.47	191.1	346.0	393.8	166.4	640.2	649.2
79.48	5.62	156.7	337.0	349.8	161.4	563.7	634.6
81.68	5.52	186.4	353.0	338.7	194.3	750.8	626.7
83.54	5.59	158.0	341.0	368.4	150.1	638.1	640.6
85.49	5.47	252.5	327.0	365.7	197.9	755.1	638.1
87.90	5.50	238.7	341.0	387.9	187.0	642.4	672.7
89.79	5.72	236.9	343.0	380.9	224.2	848.7	687.0
91.67	5.33	228.5	337.0	349.9	236.5	695.5	670.9
93.69	5.56	142.9	277.0	401.9	123.0	814.6	662.1
95.49	5.65	173.0	319.0	313.1	150.8	684.9	571.0
97.53	5.45	194.7	327.0	327.3	194.3	952.9	607.0
99.50	5.30	215.7	325.0	328.7	205.6	810.4	613.8
101.80	5.55	191.0	325.0	356.8	186.6	776.4	632.5
103.75	5.68	188.7	227.0	340.5	186.4	525.4	618.3
105.66	5.75	190.1	331.0	246.1	177.4	463.7	513.5
107.64	5.25	188.1	353.0	389.2	139.1	504.1	620.3
109.49	5.11	178.3	307.0	374.9	171.1	548.8	647.8
111.52	5.61	221.0	327.0	310.6	212.4	519.0	602.0
113.52	5.70	188.0	313.0	345.9	198.4	582.8	636.4
115.74	5.35	192.3	335.0	334.7	186.5	576.4	609.0
117.65	5.76	222.2	337.0	348.6	198.6	563.7	627.9
119.79	5.74	177.8	337.0	350.3	188.9	699.8	641.5
121.60	5.67	192.2	337.0	338.8	204.9	644.5	631.6
123.48	5.59	177.8	357.0	347.8	174.2	999.7	624.3
125.75	5.83	191.7	412.0	410.5	152.8	1229.4	651.7
127.85	5.69	195.8	360.0	450.0	179.0	893.3	686.3

Table E-16. Transfer data for Train R3 Fermentor 4 at lower reflux.

Train R3 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00	5.84	246.1	300.0	315.4	227.1	453.1	619.3	0.83	0.35
1.68	6.27	0.0	300.0	455.6	18.0	1046.5	616.9	0.83	0.34
3.51	6.03	133.0	300.0	272.9	18.0	848.7	441.7	0.83	0.35
5.74	5.87	245.3	300.0	319.9	178.3	742.3	580.8	0.76	0.48
7.75	6.07	203.1	300.0	314.8	215.9	393.5	625.7	0.80	0.36
9.71	5.70	218.4	300.0	305.7	205.5	540.3	592.6	0.80	0.36
11.55	6.00	223.1	300.0	272.7	238.4	1323.0	597.2	0.82	0.36
13.78	6.00	154.6	300.0	400.9	60.4	1550.6	604.8	0.80	0.39
15.70	6.00	220.1	300.0	297.8	213.5	1250.7	594.8	0.80	0.48
18.00		250.5	300.0	325.1	195.0	1250.7	599.2	0.83	0.41
19.75	6.00	286.5	300.0	321.9	227.3	1086.9	628.1	0.83	0.39
21.75	5.50	268.9	300.0	332.3	252.4	869.9	663.3	0.85	0.33
23.70	5.65	223.1	300.0	337.1	220.7	531.8	667.6	0.81	0.35
25.48	5.76	180.2	300.0	312.3	167.2	380.7	597.4	0.82	0.37
27.77	5.44	174.4	300.0	350.2	122.1	1442.1	596.0	0.80	0.34
29.58	5.55	149.5	300.0	355.9	91.0	1035.8	595.5	0.82	0.36
31.47	5.50	259.6	300.0	325.4	138.1	982.7	546.7	0.75	0.45
33.71	5.45	194.3	300.0	319.7	217.8	744.5	641.3	0.75	0.38
35.72	5.37	203.8	300.0	308.1	176.1	948.6	578.5	0.78	0.38
37.56	5.19	135.7	300.0	322.5	112.3	1446.4	595.2	0.80	0.36
39.48	5.29	207.2	300.0	349.3	153.2	1703.7	593.4	0.78	0.38
41.62	5.30	205.9	300.0	347.7	155.2	1514.4	595.1	0.77	0.39
43.71	5.72	195.1	300.0	353.1	140.7	1382.6	594.8	0.80	0.35
45.50	6.26	224.0	300.0	76.0	67.8	51.0	223.7	0.80	0.39
47.60	5.79	166.9	300.0	352.3	116.6	2037.7	598.1	0.79	0.37
49.80	5.63	189.0	300.0	358.7	121.2	1812.2	587.0	0.77	0.39
51.49	6.20	140.4	300.0	319.1	116.7	1150.7	593.5	0.82	0.36
53.50	5.70	162.7	300.0	209.5	54.0	797.6	398.9	0.80	0.37
55.51	5.82	180.7	300.0	328.7	149.6	1916.4	595.7	0.76	0.40
57.71	5.58	196.6	300.0	333.2	163.1	1235.8	595.8	0.77	0.35
59.88	5.58	188.7	300.0	316.0	134.5	399.9	857.9	0.77	0.35
61.54	5.20	205.7	300.0	322.2	180.3	1608.0	594.9	0.82	0.35
63.43	5.58	170.6	300.0	355.1	113.1	1290.0	595.7	0.81	0.38
65.02	5.79	105.5	300.0	343.6	23.1	1133.4	557.3	0.80	0.37
67.69	5.94	210.4	300.0	410.1	186.0	1107.8	681.8	0.72	0.41
69.50	5.64	211.4	300.0	328.8	179.2	1284.8	594.7	0.77	0.41
71.60	5.72	231.2	300.0	343.8	169.5	1842.0	592.7	0.80	0.43

Table E-16. Continued.

Train R3 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
73.50	5.66	202.2	300.0	348.4	165.2	1901.5	609.5	0.79	0.37
75.51	5.68	210.4	300.0	363.3	141.2	1125.2	592.2	0.78	0.42
77.78	5.71	166.4	300.0	340.6	126.8	1527.2	599.1	0.80	0.40
79.48	5.47	161.4	300.0	335.8	123.2	1544.2	595.7	0.80	0.32
81.68	5.40	194.3	300.0	355.7	134.3	1871.8	593.8	0.76	0.43
83.54	5.53	150.1	300.0	343.8	99.6	1186.9	591.4	0.80	0.32
85.49	5.31	197.9	300.0	328.0	167.9	2090.8	596.1	0.78	0.38
87.90	5.16	187.6	300.0	342.9	135.5	2071.7	588.9	0.77	0.41
89.79	5.36	224.2	300.0	338.6	175.0	1310.2	597.4	0.78	0.34
91.67	5.38	236.5	300.0	338.3	183.4	1761.2	605.2	0.82	0.35
93.69	5.35	123.0	300.0	282.5	61.8	1665.4	519.4	0.80	0.35
95.49	5.33	150.8	300.0	323.8	123.2	1533.6	594.3	0.80	0.36
97.53	5.06	194.3	300.0	326.4	152.0	2284.4	582.2	0.80	0.37
99.50	5.10	205.6	300.0	325.6	177.1	1629.3	595.2	0.81	0.40
101.80	5.09	186.6	300.0	328.2	156.9	1442.1	596.6	0.78	0.35
103.75	5.51	186.4	300.0	223.1	162.5	1044.4	497.3	0.80	0.37
105.66	5.28	177.4	300.0	334.2	145.4	1012.5	600.3	0.79	0.41
107.64	5.04	139.1	300.0	355.5	88.1	1767.5	602.6	0.71	0.41
109.49	4.92	171.1	300.0	309.2	160.1	1750.5	596.3	0.73	0.47
111.52	5.37	212.4	300.0	328.4	183.4	1693.1	597.5	0.77	0.41
113.52	5.70	198.4	300.0	315.5	176.6	1199.6	591.8	0.80	0.37
115.74	5.28	186.5	300.0	337.6	147.0	1610.1	596.2	0.79	0.40
117.65	5.59	198.6	300.0	326.5	169.8	1844.1	595.8	0.78	0.39
119.79	5.60	188.9	300.0	341.3	144.6	1784.6	595.1	0.81	0.36
121.60	5.52	204.9	300.0	332.0	166.6	1155.0	591.8	0.79	0.40
123.48	5.44	174.2	300.0	361.4	112.1	2488.6	597.4	0.79	0.38
125.75	5.79	152.8	300.0	400.3	48.9	2960.8	594.5	0.72	0.45
127.85	6.11	151.1	300.0	360.4	87.7	293.5	595.1	0.78	0.40

Table E-17. Transfer data for Train P Fermentor 1 at lower reflux.

Train P – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00	5.82	27.3	211.0	137.3	162.1	302.0	462.7	0.98	0.44	11.87	15.88
1.67	6.84	27.3	370.0	186.5	56.0	380.7	407.3	0.98	0.43	12.48	16.53
3.50	6.23	27.3	294.0	141.5	255.4	574.3	561.7	0.97	0.53	12.42	16.42
5.74	5.94	27.3	364.0	144.0	181.2	591.3	490.0	0.97	0.44	15.21	20.56
7.74	5.90	27.3	221.0	206.0	189.6	659.4	560.0	0.97	0.49	15.20	23.83
9.70	5.67	27.3	318.0	90.3	167.8	540.3	420.9	0.97	0.51	12.88	17.68
11.53	6.00	27.3	294.0	192.6	150.0	353.1	513.4	0.97	0.36	13.34	21.42
13.78	6.00	27.3	267.0	178.1	155.0	448.8	497.9	0.97	0.39	18.15	25.66
15.68	6.00	27.3	264.0	154.3	145.6	438.2	464.7	0.97	0.40	19.81	28.51
17.70	6.00	27.3	283.0	133.0	238.0	457.3	541.8	0.97	0.41	19.70	29.26
19.73	6.00	27.3	210.0	156.7	174.5	357.3	496.0	0.97	0.41	18.98	28.85
21.74	5.54	27.3	212.0	84.3	160.1	591.3	409.2	0.96	0.39	23.92	36.67
23.70	5.33	27.3	230.0	75.3	179.9	1155.0	418.0	0.96	0.42	22.34	33.22
25.46	5.41	27.3	400.0	110.0	151.6	991.2	426.4	0.97	0.39	24.04	36.17
27.75	5.28	27.3	371.0	268.0	164.0	1018.8	596.8	0.96	0.35	20.71	31.85
29.56	5.48	27.3	367.0	229.9	153.0	744.5	547.7	0.97	0.39	16.59	25.53
31.47	5.46	27.3	330.0	219.6	180.7	172.3	565.1	0.97	0.37	15.38	23.43
33.69	5.62	27.3	298.0	209.7	155.2	523.2	529.7	0.97	0.39	13.03	20.00
35.70	5.08	27.3	285.0	150.7	182.3	857.2	497.8	0.97	0.41	17.79	27.15
37.74	4.91	27.3	283.0	120.8	200.1	463.7	484.7	0.97	0.37	16.35	24.75
39.46	5.47	27.3	334.0	154.6	161.0	516.9	480.4	0.97	0.37	14.08	21.20
41.61	5.09	27.3	307.0	173.1	196.3	704.0	534.2	0.97	0.37	15.54	23.68
43.70	5.52	27.3	290.0	156.9	183.9	635.4	504.6	0.97	0.37	15.88	23.56
45.48	5.34	27.3	372.0	157.5	162.7	1044.4	485.0	0.97	0.42	17.94	27.02
47.58	5.09	27.3	394.0	212.0	193.4	614.7	569.2	0.97	0.35	17.60	26.72
49.79	5.15	27.3	219.0	255.6	171.2	723.2	590.3	0.97	0.38	14.15	21.66
51.47	5.12	27.3	98.0	95.9	156.9	567.9	417.6	0.96	0.37	15.87	23.97
53.49		27.3	294.0	0.0	135.5	767.8	300.3	0.97	0.38	16.16	24.43
55.49	5.15	27.3	275.0	141.0	185.1	521.1	490.9	0.96	0.38	16.27	24.56
57.70	5.19	27.3	323.0	134.9	172.9	567.9	471.6	0.97	0.32	20.58	31.72
59.86	5.06	27.3	310.0	187.6	167.2	516.9	518.6	0.97	0.32	19.71	30.66
61.52	4.97	27.3	282.0	157.2	184.8	650.9	506.8	0.97	0.35	18.96	29.44
63.41	4.96	27.3	289.0	140.5	176.8	564.2	482.1	0.97	0.32	17.99	27.89
64.99	5.61	27.3	315.0	145.8	130.7	575.0	440.3	0.97	0.34	17.71	27.44
67.67	5.30	27.3	356.0	187.4	184.4	576.7	535.6	0.97	0.33	18.54	28.62
69.49	5.33	27.3	333.0	187.9	199.9	591.7	552.6	0.97	0.31	17.51	26.82
71.58	5.09	27.3	423.0	170.8	194.1	391.4	529.7	0.97	0.40	17.90	27.50

Table E-17. Continued.

Train P – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
73.48	5.05	27.3	338.0	242.7	206.9	833.8	614.4	0.97	0.40	17.49	26.78
75.50	5.10	27.3	402.0	184.9	188.6	678.5	538.3	0.98	0.35	18.99	29.28
77.77	5.02	27.3	333.2	266.1	169.8	682.8	600.7	0.97	0.37	18.43	28.77
79.48	5.10	27.3	400.0	197.9	166.6	478.6	529.3	0.97	0.35	18.33	28.49
81.67	5.07	27.3	106.0	250.1	177.3	431.8	592.2	0.97	0.35	17.05	26.75
83.52	5.65	27.3	343.0	6.6	124.9	436.0	296.3	0.97	0.36	19.46	29.22
85.49	5.23	27.3	360.0	172.5	185.1	450.9	522.4	0.97	0.31	18.29	28.21
87.89	4.96	27.3	335.0	218.0	173.3	1174.1	556.1	0.97	0.37	18.80	29.38
89.72	5.08	27.3	173.0	211.1	153.3	938.0	535.2	0.97	0.40	18.06	28.71
91.64	4.94	27.3	335.0	36.5	164.4	574.3	365.7	0.96	0.39	18.31	28.50
93.63	5.04	27.3	300.0	171.8	173.2	359.5	509.8	0.97	0.40	17.01	26.63
95.48	5.34	27.3	310.0	164.5	169.1	287.1	498.4	0.96	0.38	14.61	22.90
97.53	5.07	27.3	287.0	168.5	165.6	497.7	498.9	0.97	0.39	17.51	27.39
99.49	5.09	27.3	306.0	167.8	150.2	806.1	482.8	0.97	0.39	17.73	27.76
101.79	4.86	27.3	170.0	150.2	187.3	444.5	502.3	0.96	0.39	17.20	26.98
103.68	4.81	27.3	330.0	76.6	115.9	508.4	363.3	0.96	0.39	17.38	27.20
105.65	4.93	27.3	323.0	185.7	169.7	502.0	520.2	0.96	0.39	19.75	31.69
107.63	4.67	27.3	214.0	171.1	183.4	782.7	519.3	0.97	0.38	20.76	33.15
109.48	5.08	27.3	322.0	109.4	137.8	438.2	412.0	0.97	0.39	21.47	34.09
111.50	5.26	27.3	327.0	159.8	194.4	567.9	519.0	0.97	0.37	20.21	31.90
113.51	5.40	27.3	332.0	170.0	186.9	265.9	521.7	0.97	0.34	20.41	32.37
115.72	5.09	27.3	372.0	204.9	174.3	287.1	544.0	0.97	0.36	19.35	30.34
117.64	5.44	27.3	385.0	225.1	181.5	291.4	571.4	0.97	0.32	19.70	30.91
119.79	5.40	27.3	377.0	211.3	193.6	638.1	569.7	0.97	0.39	17.37	27.10
121.53	5.22	27.3	417.0	267.2	173.3	448.8	575.3	0.97	0.39	18.84	29.39
123.47	5.32	27.3	350.0	246.1	193.4	774.2	604.3	0.97	0.40	20.09	31.55
125.69	5.24	27.3	367.0	222.8	160.1	995.4	547.7	0.96	0.32	15.49	24.01
127.76	5.29	27.3	317.0	205.5	189.7	578.5	551.0	0.97	0.37	17.44	27.82

Table E-18. Transfer data for Train P Fermentor 2 at lower reflux.

Train P – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.80	162.1	277.0	214.5	223.3	310.5	566.3
1.67	6.77	56.0	414.0	307.3	0.0	295.7	508.7
3.50	5.92	255.4	390.0	293.9	297.4	899.7	670.8
5.74	5.87	181.2	256.0	364.0	249.6	478.6	724.5
7.74	5.93	189.6	309.0	226.0	237.5	299.9	549.6
9.70	5.60	167.8	320.0	318.5	201.4	389.2	642.2
11.53	6.00	150.0	290.0	294.6	179.5	378.6	619.2
13.78	6.00	155.0	385.0	269.5	180.1	474.3	586.7
15.68	6.00	145.6	360.0	263.5	223.8	323.3	633.8
17.70	6.00	238.0	295.0	282.7	95.2	310.5	456.1
19.73	6.00	174.5	280.0	212.0	237.4	467.9	567.0
21.74	5.50	160.1	254.0	213.2	232.0	455.2	577.2
23.70	5.36	179.9	406.0	231.0	208.6	595.6	549.8
25.46	5.50	151.6	344.0	400.8	159.0	419.0	700.3
27.75	5.53	164.0	343.0	374.0	158.9	450.9	661.0
29.56	6.29	153.0	350.0	366.3	133.0	325.4	638.4
31.47	5.69	180.7	328.0	329.2	203.0	246.7	643.6
33.69	5.75	152.2	324.0	300.0	185.2	351.0	625.1
35.70	5.15	182.3	315.0	290.6	225.4	621.1	625.8
37.74	5.25	200.1	346.0	283.4	239.0	448.8	613.4
39.46	5.30	161.0	338.0	336.4	172.9	393.5	640.4
41.61	5.16	196.3	301.0	312.9	229.7	550.9	638.4
43.70	6.04	183.9	394.0	289.7	203.0	772.1	599.9
45.48	5.51	162.7	408.0	371.8	183.6	695.5	684.8
47.58	5.35	193.4	200.0	392.8	213.0	644.5	703.5
49.79	5.30	171.2	79.0	224.6	150.4	136.1	494.9
51.47	5.15	156.9	292.0	101.4	137.4	423.3	374.0
53.49	5.22	135.5	318.0	293.2	139.8	633.8	589.6
55.49	5.21	185.1	337.0	277.6	231.6	648.7	616.2
57.70	5.24	172.9	344.0	322.8	192.9	608.3	633.9
59.86	5.67	167.2	294.0	310.1	203.9	427.5	637.9
61.52	5.27	184.8	294.0	284.7	197.5	648.7	589.5
63.41	5.23	176.8	337.0	294.0	183.7	583.3	593.0
64.99	5.33	130.7	372.0	314.7	128.8	567.0	603.9
67.67	5.32	184.4	378.0	354.9	220.6	556.6	682.2
69.49	5.55	199.9	449.0	336.2	244.0	588.9	672.4
71.58	5.27	194.1	338.0	421.1	223.9	272.3	743.0

Table E-18. Continued.

Train P – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.48	5.21	206.9	392.0	338.4	207.1	491.3	630.7
75.50	5.27	188.6	330.0	402.8	181.6	493.5	687.9
77.77	5.16	169.8	379.0	336.2	168.0	467.9	626.5
79.48	5.45	166.6	95.0	396.2	145.5	419.0	667.2
81.67	5.08	177.3	344.0	107.1	172.0	502.0	393.9
83.52	5.21	124.9	385.0	346.1	116.8	574.3	630.1
85.49	5.25	185.1	350.0	360.5	215.8	753.0	683.3
87.89	5.34	173.3	160.0	338.2	182.9	969.9	639.9
89.72	5.18	153.3	358.0	168.5	143.9	319.1	457.2
91.64	5.00	164.4	319.0	336.0	186.1	348.8	649.8
93.63	5.32	173.2	320.0	302.9	191.0	419.0	612.8
95.48	5.20	169.1	280.0	309.0	186.7	504.1	618.7
97.53	5.21	165.6	325.0	291.4	150.8	770.0	568.7
99.49	5.28	150.2	242.0	305.6	170.9	808.3	618.4
101.79	5.30	187.3	312.0	172.5	178.3	655.1	455.6
103.68	5.99	115.9	340.0	324.1	114.5	608.3	614.8
105.65	6.18	169.7	234.0	327.3	192.1	597.7	641.8
107.63	5.84	183.1	330.0	213.6	216.1	665.8	538.7
109.48	5.36	3137.8	346.0	322.0	149.9	565.8	626.2
111.50	5.66	194.4	356.0	330.9	213.9	816.8	642.5
113.51	5.50	186.9	364.0	331.8	191.5	542.4	628.5
115.72	5.22	174.3	377.0	373.1	169.2	591.3	660.1
117.64	5.51	181.5	375.0	375.0	187.2	450.9	672.8
119.79	5.58	193.6	373.0	381.2	179.3	372.2	659.0
121.53	5.47	143.3	375.0	408.8	105.0	402.0	662.6
123.47	5.52	193.4	338.0	351.4	199.3	655.1	655.4
125.69	5.67	160.1	352.0	362.0	143.1	738.1	637.1
127.76	5.90	181.6	329.0	323.4	210.0	597.7	634.9

Table E-19. Transfer data for Train P Fermentor 3 at lower reflux.

Train P – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.86	223.3	307.0	280.5	262.0	331.8	627.5
1.67	6.17	0.0	459.0	413.6	0.0	563.7	609.3
3.50	5.86	297.4	237.0	389.2	174.4	1033.7	652.1
5.74	5.78	249.6	335.0	254.7	279.9	646.6	626.4
7.74	5.93	221.1	309.0	350.3	237.5	472.2	680.7
9.70	5.56	201.4	306.4	320.4	218.4	523.2	627.5
11.53	6.00	179.5	305.0	290.7	180.2	619.0	583.5
13.78	6.00	180.1	385.0	338.8	150.1	838.0	600.9
15.68	6.00	223.8	312.0	360.4	230.9	380.7	681.1
17.70	6.00	95.2	262.0	295.1	139.3	419.0	637.3
19.73	6.00	237.4	285.0	281.7	248.1	440.3	617.5
21.74	5.49	232.0	357.0	256.8	193.6	480.7	510.5
23.70	5.31	208.6	335.0	404.4	261.5	546.6	754.8
25.46	5.53	159.0	331.0	344.9	154.3	344.6	632.3
27.75	5.58	158.9	329.0	345.7	149.7	342.4	628.6
29.56	6.31	133.0	361.0	350.6	114.2	316.9	623.9
31.47	5.51	203.0	329.0	328.3	209.4	261.6	626.8
33.69	5.70	185.2	311.0	326.1	192.9	374.4	625.9
35.70	5.38	225.4	335.0	320.7	201.1	457.3	609.9
37.74	5.32	239.0	326.0	345.0	222.9	476.4	654.8
39.46	5.42	172.9	303.0	341.5	195.0	404.1	655.7
41.61	5.40	229.7	359.0	307.5	208.2	606.2	602.7
43.70	5.55	203.0	387.0	393.4	198.6	1340.0	780.1
45.48	5.44	183.6	151.0	407.8	167.7	897.6	684.0
47.58	5.39	213.0	1.0	200.5	157.7	727.4	445.1
49.79	5.23	150.4	305.0	78.4	88.1	684.9	307.2
51.47	5.62	137.4	297.0	294.3	151.2	348.8	600.2
53.49	5.63	139.8	341.0	318.7	125.0	502.0	596.0
55.49	5.50	231.6	323.0	340.4	207.9	542.4	638.1
57.70	5.77	192.9	307.0	342.2	208.6	557.3	649.0
59.86	5.82	203.9	311.0	292.8	222.0	482.8	602.4
61.52	5.66	197.5	325.0	296.5	214.7	665.8	605.8
63.41	5.54	183.7	341.0	342.0	173.4	562.1	623.8
64.99	5.90	128.8	340.0	371.7	86.8	567.0	620.8
67.67	5.96	220.6	441.0	378.1	210.4	569.4	673.3
69.49	5.65	244.0	317.0	451.7	204.2	591.0	750.0
71.58		223.9	373.0	335.2	226.4	248.9	654.8

Table E-19. Continued.

Train P – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.48	5.35	207.1	323.0	391.3	211.9	638.1	690.9
75.50	5.82	181.6	347.0	329.5	182.5	563.7	622.5
77.77	5.43	168.0	101.0	373.8	145.4	470.1	643.3
79.48	5.26	145.5	352.0	97.3	150.1	548.8	394.0
81.67	5.42	172.0	386.0	337.8	182.5	767.8	640.4
83.52	5.50	116.8	347.0	388.9	107.0	725.3	671.2
85.49	5.77	215.8	117.0	344.1	211.3	812.5	642.7
87.89	5.64	182.9	343.0	160.7	155.8	733.8	425.7
89.72	5.47	143.9	320.0	352.5	131.6	589.2	638.3
91.64	5.34	186.1	293.0	321.4	192.2	453.1	619.6
93.63	5.43	191.0	247.0	323.4	159.6	597.7	584.1
95.48	5.57	186.7	319.0	278.8	153.7	593.4	537.9
97.53	5.06	150.8	317.0	327.7	139.2	861.4	608.2
99.49	5.06	170.9	317.0	240.9	124.0	191.4	486.1
101.79	5.23	178.3	353.0	313.2	195.0	648.7	622.0
103.68	5.11	114.5	242.0	338.1	104.4	580.7	620.1
105.65	6.00	192.1	327.0	237.6	188.5	672.1	526.1
107.63	5.52	216.1	335.0	329.1	203.9	1065.6	620.7
109.48	5.33	149.9	353.0	345.7	153.9	653.0	641.8
111.50	5.72	213.9	345.0	358.2	199.0	1165.6	645.8
113.51	6.00	191.5	353.0	363.1	183.3	687.0	647.0
115.72	5.52	169.2	349.0	376.6	148.7	706.2	648.2
117.64	5.74	187.2	362.0	366.2	176.9	527.5	648.0
119.79	5.85	179.3	337.0	377.1	150.8	744.5	640.7
121.53	6.02	105.0	357.0	359.9	85.0	625.3	632.0
123.47	5.58	199.3	327.0	337.7	208.1	906.1	638.6
125.69	6.11	143.1	357.0	348.0	121.9	725.3	618.9
127.76	6.05	201.9	38.0	334.8	227.5	557.3	643.5

Table E-20. Transfer data for Train P Fermentor 4 at lower reflux.

Train P – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00	5.92	262.0	300.0	311.8	217.1	591.3	605.1	0.83	0.34
1.67	6.14	0.0	300.0	460.6	18.0	1078.4	634.2	0.83	0.33
3.50	5.93	174.4	300.0	240.2	83.6	1029.5	447.5	0.82	0.38
5.74	5.94	279.9	300.0	339.0	179.2	782.7	595.6	0.79	0.46
7.74	5.95	237.5	300.0	313.9	259.5	529.6	658.6	0.75	0.31
9.70	5.70	218.4	300.0	309.4	223.0	625.3	619.2	0.81	0.36
11.53	6.00	180.2	300.0	308.9	172.5	1384.7	599.3	0.84	0.39
13.78	6.00	150.1	300.0	388.4	57.0	1074.1	593.4	0.80	0.42
15.68	6.00	230.9	300.0	314.9	196.2	946.5	594.3	0.80	0.46
17.70	6.00	139.3	300.0	264.9	151.9	1006.1	575.6	0.85	0.44
19.73	6.00	248.1	300.0	286.7	277.0	701.9	644.5	0.85	0.41
21.74	5.47	193.6	300.0	359.9	162.5	1163.5	626.9	0.80	0.36
23.70	5.58	261.5	300.0	333.4	184.7	878.5	597.2	0.81	0.35
25.46	5.68	154.3	300.0	334.9	161.8	440.3	640.5	0.82	0.41
27.75	5.48	149.7	300.0	331.0	116.3	1118.8	595.7	0.80	0.36
29.56	6.23	114.2	300.0	364.1	67.9	1225.2	615.9	0.79	0.34
31.47	5.48	209.4	300.0	332.8	179.5	1167.7	601.0	0.74	0.40
33.69	5.45	192.9	300.0	315.9	175.7	818.9	596.8	0.75	0.42
35.70	5.23	201.1	300.0	340.1	158.8	1442.1	565.9	0.79	0.36
37.74	5.31	222.9	300.0	324.3	191.4	1329.4	595.0	0.78	0.38
39.46	5.58	195.0	300.0	308.7	187.0	869.9	598.8	0.82	0.34
41.61	6.02	208.2	300.0	365.1	135.5	733.8	590.5	0.79	0.42
43.70	5.78	198.6	300.0	388.5	88.1	421.1	574.1	0.75	0.43
45.48	5.74	167.7	300.0	153.5	88.8	3031.0	372.7	0.78	0.39
47.58		157.7	300.0	0.9	48.4	1135.8	187.7	0.65	0.46
49.79	6.21	88.1	300.0	308.3	65.1	995.4	581.3	0.77	0.35
51.47	5.58	151.2	300.0	302.0	144.8	955.0	593.7	0.75	0.44
53.49	5.35	125.0	300.0	343.3	80.5	1193.2	578.9	0.77	0.35
55.49	5.28	207.9	300.0	326.6	179.9	1420.8	596.7	0.74	0.40
57.70	5.53	208.6	300.0	309.6	199.0	1031.6	596.1	0.76	0.41
59.86	5.47	222.0	300.0	313.5	201.4	1457.0	593.9	0.78	0.37
61.52	5.19	214.7	300.0	329.7	184.6	1563.3	597.7	0.83	0.30
63.41	5.24	173.4	300.0	347.5	125.5	1368.2	597.7	0.82	0.34
64.99	5.35	86.8	300.0	343.1	13.0	1355.0	565.4	0.79	0.37
67.67	6.48	210.4	300.0	444.8	174.6	1435.9	705.1	0.76	0.68
69.49	5.83	207.2	300.0	320.3	183.2	1430.6	594.4	0.78	0.41
71.58	5.53	226.4	300.0	379.0	124.0	1505.9	585.3	0.78	0.43

Table E-20. Continued.

Train P – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
73.48	5.56	211.9	300.0	326.6	192.6	1418.7	605.4	0.78	0.40
75.50	5.80	182.5	300.0	349.4	130.7	1076.3	595.7	0.79	0.39
77.77	6.12	145.4	300.0	104.6	19.7	234.0	237.6	0.78	0.46
79.48	5.12	150.1	300.0	351.3	57.7	1673.9	557.0	0.76	0.49
81.67	5.91	182.5	300.0	389.2	88.1	2148.3	592.9	0.75	0.41
83.52	5.57	107.0	300.0	350.2	50.5	1542.1	591.8	0.77	0.36
85.49	5.53	211.3	300.0	123.7	69.1	514.7	279.6	0.77	0.41
87.89	5.21	155.8	300.0	346.0	107.7	2169.5	596.0	0.78	0.40
89.72	5.31	131.6	300.0	318.8	108.6	1257.1	593.9	0.76	0.39
91.64	5.19	192.2	300.0	292.6	198.8	1025.2	597.3	0.78	0.42
93.63	5.22	159.6	300.0	245.6	109.6	1684.6	493.7	0.77	0.35
95.48	5.16	153.7	300.0	323.2	124.2	1669.7	591.8	0.77	0.32
97.53	4.96	139.2	300.0	320.3	105.2	1995.1	584.4	0.79	0.35
99.49	5.01	124.0	300.0	321.3	98.3	1616.5	593.7	0.81	0.36
101.79	4.84	195.0	300.0	354.1	138.9	1271.9	596.1	0.76	0.38
103.68	5.52	104.4	300.0	233.9	67.7	863.6	495.5	0.75	0.42
105.65	5.07	188.5	300.0	329.5	153.7	1905.8	592.8	0.79	0.36
107.63	5.13	203.9	300.0	337.5	163.4	2235.5	595.1	0.76	0.43
109.48	5.07	153.9	300.0	354.1	96.1	2110.0	594.4	0.76	0.42
111.50	5.52	199.0	300.0	348.8	166.1	2416.3	695.0	0.76	0.48
113.51	5.75	183.3	300.0	356.0	99.5	2499.2	570.1	0.78	0.41
115.72	5.65	148.7	300.0	351.3	99.6	2799.1	600.3	0.78	0.44
117.64	6.00	176.9	300.0	348.3	128.1	2667.3	597.6	0.75	0.46
119.79	5.95	150.8	300.0	341.6	106.0	2233.4	594.9	0.77	0.45
121.53	5.66	85.0	300.0	346.2	33.7	1797.3	593.0	0.76	0.39
123.47	5.57	208.1	300.0	329.7	174.5	2227.0	594.2	0.74	0.43
125.69	5.71	121.9	300.0	353.8	61.8	2418.4	591.8	0.76	0.42
127.76	5.88	214.0	300.0	41.8	97.6	2169.0	223.5	0.76	0.43

Table E-21. Transfer data for Train R1 Fermentor 1 at higher reflux.

Train R1 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00	5.20	27.3	370.0	196.4	190.2	540.3	512.4	0.97	0.38	14.25	22.64
1.82	5.36	27.3	150.0	215.7	195.7	410.5	537.2	0.97	0.40	15.68	25.34
3.80	5.45	27.3	365.0	55.8	152.5	502.0	334.1	0.78	0.37	18.31	27.93
5.77	5.52	27.3	336.0	223.7	213.3	1284.7	562.8	0.97	0.38	16.20	26.66
7.77	5.42	27.3	287.0	156.3	243.2	1049.7	525.3	0.96	0.44	16.70	27.30
9.82	5.49	27.3	372.0	179.5	179.4	1244.3	484.7	0.97	0.37	15.39	25.18
11.85	5.51	27.3	408.0	232.4	198.8	897.6	557.0	0.98	0.29	15.59	25.59
13.80	5.44	27.3	430.0	277.5	198.4	1061.4	601.7	0.98	0.38	14.70	24.02
15.78	5.45	27.3	156.0	301.3	196.6	1208.1	623.7	0.99	0.37	15.90	26.12
17.80	5.46	27.3	361.0	81.3	144.6	868.9	351.7	0.96	0.36	16.35	26.27
19.80	5.52	27.3	332.0	238.6	195.9	544.5	560.0	0.97	0.35	17.64	28.55
21.76	5.46	27.3	310.0	198.9	202.2	306.3	526.9	0.97	0.34	16.70	26.86
23.64	5.58	27.3	379.0	180.0	156.7	316.9	507.5	0.97	0.36	16.44	25.69
25.72	5.29	27.3	404.0	250.9	243.1	1452.7	619.8	0.98	0.28	16.61	26.70
27.83	5.37	27.3	379.0	276.1	195.4	1431.5	597.3	0.98	0.37	16.75	26.81
29.73	5.41	27.3	340.0	221.3	230.0	974.2	577.1	0.97	0.44	16.18	25.64
31.83	5.48	27.3	403.0	197.7	210.3	1187.9	533.8	0.97	0.39	16.14	25.68
33.82	5.41	27.3	365.0	270.1	203.7	1080.5	599.6	0.97	0.42	16.82	27.18
35.84	5.48	27.3	350.0	259.1	172.9	1031.6	557.8	0.97	0.35	18.49	29.62
37.81	5.25	27.3	359.0	219.2	192.1	1265.6	537.1	0.97	0.38	18.56	30.10
39.80	5.26	27.3	398.0	209.8	211.2	1323.0	546.8	0.98	0.25	19.41	31.45
41.67	5.55	27.3	350.0	245.7	213.5	955.0	585.0	0.97	0.35	18.91	30.79
43.78	5.43	27.3	356.0	238.4	180.8	1242.2	545.0	0.97	0.35	19.32	31.19
45.99	5.34	27.3	365.0	247.5	177.2	1595.3	550.5	0.97	0.30	16.00	26.20
47.75	5.44	27.3	385.0	260.0	175.5	1050.7	561.3	0.97	0.35	17.52	28.59
49.89	5.43	27.3	358.0	235.3	217.4	1089.0	578.5	0.97	0.37	16.69	27.29
51.79	5.44	27.3	348.0	228.3	191.5	1250.7	545.6	0.98	0.36	16.92	27.52
53.68	5.48	27.3	343.0	221.6	198.1	986.9	545.5	0.98	0.30	17.66	28.43
55.85	5.44	27.3	368.0	214.8	199.4	1393.2	540.0	0.97	0.37	18.33	28.78
57.66	5.48	27.3	360.0	225.3	211.1	1457.0	562.2	0.98	0.36	18.18	28.87
59.84	5.56	27.3	389.0	239.8	193.3	1429.3	558.9	0.98	0.37	18.29	29.55
61.47	5.55	27.3	394.0	243.0	212.7	1278.3	580.9	0.98	0.34	17.94	28.92
63.56	5.40	27.3	370.0	264.6	197.4	1220.9	587.8	0.98	0.35	18.02	29.18
65.58	5.45	27.3	355.0	231.1	206.6	999.7	563.5	0.99	0.20	15.22	24.66
67.58	5.39	27.3	390.0	249.2	168.9	1127.3	542.9	0.97	0.23	15.82	25.55
69.91	5.57	27.3	340.0	225.6	235.9	310.5	587.3	0.98	0.39	15.13	24.13
71.92	5.53	27.3	350.0	203.9	195.4	1378.3	524.1	0.98	0.40	14.92	23.81

Table E-21. Continued.

Train R1 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
73.98	5.46	27.3	131.0	214.5	207.0	1210.3	547.3	0.98	0.41	16.16	25.95
75.80	5.49	27.3	366.0	18.4	188.2	567.9	332.4	0.96	0.39	14.98	23.01
77.73	5.48	27.3	330.0	239.6	192.1	1665.4	557.5	0.97	0.36	15.08	24.08
79.71	5.61	27.3	342.0	188.3	207.5	295.7	521.6	0.97	0.35	14.97	23.40
81.92	5.44	27.3	364.0	198.9	219.4	1465.5	544.1	0.97	0.36	14.21	22.46
83.86	5.25	27.3	336.0	233.3	202.4	316.9	561.5	0.98	0.37	15.74	25.00
85.77	5.37	27.3	365.0	201.5	205.0	935.9	532.3	0.98	0.44	15.81	24.87
87.92	5.47	27.3	355.0	213.1	225.3	753.5	564.2	0.95	0.17	16.32	25.39
89.77	5.46	27.3	376.0	233.5	191.6	867.9	550.9	0.98	0.37	16.66	26.27
91.85	5.32	27.3	350.0	251.0	193.7	718.6	570.5	0.98	0.35	16.96	26.68
93.69	5.48	27.3	397.0	239.8	197.7	689.1	563.3	0.98	0.40	17.73	28.34
95.77	5.42	27.3	370.0	259.6	208.2	852.9	593.6	0.98	0.40	16.75	26.48
97.86	5.33	27.3	344.0	225.9	207.5	1008.2	559.2	0.97	0.34	15.85	24.88
99.78	5.58	27.3	340.0	214.7	207.2	395.6	547.7	0.97	0.40	14.90	23.48
101.94	5.59	27.3	351.0	225.2	183.8	893.3	534.8	0.97	0.38	16.85	26.01
103.84	5.63	27.3	292.0	241.0	187.0	995.4	583.8	0.98	0.39	10.88	16.90
105.85	5.51	27.3	328.0	143.0	187.7	1301.7	483.5	0.97	0.42	15.93	24.89
107.79	5.55	27.3	459.0	204.0	160.7	1354.9	517.5	0.98	0.41	16.78	26.40
109.92	5.59	27.3	406.0	304.0	176.6	942.3	633.4	0.97	0.40	16.26	25.72
111.87	5.64	27.3	438.0	279.2	167.9	1301.7	599.9	0.98	0.38	15.29	25.00
113.97	5.45	27.3	420.0	309.5	170.1	1229.4	632.4	0.98	0.39	16.70	27.37
115.98	5.46	27.3	369.0	286.0	173.2	1021.0	612.0	0.98	0.38	16.64	26.90
117.77	5.53	27.3	425.0	241.4	176.3	265.9	570.5	0.97	0.37	15.98	25.87
119.71	5.68	27.3	340.0	228.7	240.0	612.6	621.5	0.98	0.38	14.52	23.74
122.02	5.65	27.3	357.0	189.6	199.4	525.4	541.8	0.97	0.40	14.17	22.84
123.83	5.77	27.3	350.0	202.0	196.3	952.9	551.1	0.97	0.35	14.48	23.03

Table E-22. Transfer data for Train R1 Fermentor 2 at higher reflux.

Train R1 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.56	190.2	112.0	371.3	161.4	533.9	640.6
1.82	5.54	195.7	375.0	143.4	162.9	567.9	408.7
3.80	6.22	152.5	347.0	370.5	126.5	406.3	642.6
5.77	6.13	213.3	386.0	331.2	226.5	706.2	642.5
7.77	6.24	243.2	320.0	287.8	308.4	570.0	674.0
9.82	6.20	179.4	402.0	364.6	156.3	560.5	639.6
11.85	5.88	198.8	392.0	406.7	186.8	450.9	692.8
13.80	5.80	198.4	132.0	426.7	158.7	519.0	685.1
15.78	5.62	196.6	340.0	156.8	170.4	755.1	428.7
17.80	5.76	144.6	330.0	364.0	114.7	415.8	632.2
19.80	5.83	195.9	310.0	330.8	192.2	365.8	625.2
21.76	5.74	202.2	374.0	308.5	200.9	278.6	605.3
23.64	5.73	156.7	397.0	382.2	150.3	174.4	673.9
25.72	5.63	243.1	356.0	400.9	215.1	610.4	693.8
27.83	5.64	195.4	307.0	378.8	191.0	333.9	672.5
29.73	5.65	230.0	370.0	338.6	182.9	576.4	605.0
31.83	5.93	210.3	323.0	406.4	188.8	591.3	683.0
33.82	5.89	203.7	321.0	360.1	159.5	499.8	614.0
35.84	6.02	172.9	360.0	348.8	139.5	584.9	613.5
37.81	5.67	192.1	395.0	359.4	188.2	555.1	653.6
39.80	5.75	211.2	328.0	389.0	204.2	529.6	680.1
41.67	5.82	213.5	315.0	349.3	181.2	536.0	615.1
43.78	5.87	180.8	340.0	354.5	140.1	593.4	611.9
45.99	5.84	177.2	363.0	368.2	145.5	525.4	634.6
47.75	5.84	175.5	360.0	381.7	153.2	572.2	657.5
49.89	5.79	217.4	336.0	355.9	217.5	567.9	654.1
51.79	5.68	191.5	317.0	351.6	168.3	506.2	626.5
53.68	5.86	198.1	339.0	343.6	166.3	542.4	609.9
55.85	5.90	199.4	342.0	363.8	172.7	633.8	635.2
57.66	6.20	211.1	360.0	361.7	181.8	444.5	635.0
59.84	5.89	193.3	379.0	387.8	169.4	550.9	662.0
61.47	6.07	212.7	354.0	389.2	197.1	493.5	671.8
63.56	5.79	197.4	326.0	374.1	171.3	521.1	646.1
65.58	5.97	206.6	387.0	347.5	182.1	474.3	621.1
67.58	5.79	168.9	334.0	391.1	156.6	557.3	675.9
69.91	5.74	235.9	346.0	339.4	213.4	189.3	631.9
71.92	5.67	195.4	84.0	351.1	206.2	712.5	659.4

Table E-22. Continued.

Train R1 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.98	5.62	207.0	349.0	136.6	154.9	197.8	382.1
75.80	5.65	188.2	340.0	365.5	173.1	326.5	648.5
77.73	5.99	192.1	340.0	329.6	199.2	842.3	635.1
79.71	6.28	207.5	367.0	346.6	196.6	440.3	633.8
81.92	6.18	219.4	316.0	365.7	221.2	735.9	665.6
83.86	5.74	202.4	355.0	334.4	181.3	195.7	611.4
85.77	5.68	205.0	335.0	366.0	190.5	553.6	649.6
87.92	5.75	225.3	360.0	359.3	195.5	481.4	632.2
89.77	5.72	191.6	372.0	372.5	179.6	491.6	658.6
91.85	5.65	193.7	374.0	347.5	196.6	430.6	648.5
93.69	5.75	197.7	347.0	400.0	170.3	208.4	670.7
95.77	5.74	208.2	340.0	365.0	190.3	431.8	645.2
97.86	5.60	207.5	302.0	344.4	199.5	529.6	634.5
99.78	5.64	207.2	328.0	337.2	169.1	217.0	597.2
101.94	5.76	183.8	336.0	353.8	156.9	410.5	625.0
103.84	5.83	187.0	300.0	287.9	191.1	672.1	590.1
105.85	5.80	180.5	418.0	329.5	147.9	487.1	595.0
107.79	5.80	160.7	393.0	457.1	110.0	463.7	704.5
109.92	5.74	176.6	400.0	402.4	159.8	457.3	683.7
111.87	5.85	167.9	390.0	435.4	128.1	463.7	693.7
113.97	5.65	170.1	380.0	417.3	138.9	485.0	684.2
115.98	5.69	173.2	375.0	374.3	147.0	527.5	646.2
117.77	5.75	176.3	351.0	423.3	128.7	310.5	673.8
119.71	5.76	240.0	314.0	342.1	227.6	576.4	647.0
122.02	5.58	199.4	317.0	354.3	179.5	516.9	632.5
123.83	6.09	196.3	367.0	339.8	169.0	619.0	610.6

Table E-23. Transfer data for Train R1 Fermentor 3 at higher reflux.

Train R1 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.43	161.4	296.0	112.9	102.7	684.9	352.3
1.82	5.81	162.9	347.0	324.2	115.5	436.0	574.9
3.80	6.43	126.5	356.0	347.9	88.5	506.2	608.0
5.77	6.66	226.5	325.0	377.3	180.4	495.6	637.8
7.77	6.42	308.4	295.0	322.8	228.1	540.3	628.4
9.82	6.01	156.3	347.0	399.1	141.0	848.7	681.9
11.85	6.12	186.8	94.0	388.0	131.1	693.4	630.4
13.80	5.75	158.7	320.0	132.7	117.2	820.6	389.3
15.78	5.93	170.4	317.0	336.8	147.8	587.1	612.3
17.80	5.92	114.7	317.0	329.0	97.9	474.3	610.3
19.80	6.17	192.2	337.0	308.4	196.5	168.0	610.8
21.76	5.83	200.9	347.0	374.5	162.4	280.8	634.1
23.64	5.90	150.3	353.0	399.4	94.3	389.2	641.5
25.72	5.74	215.1	273.0	352.1	213.7	578.5	648.8
27.83	5.79	191.0	324.0	307.1	122.0	606.2	566.2
29.73	5.85	182.9	339.0	371.1	164.0	504.1	650.3
31.83	6.10	188.8	207.0	319.7	204.2	471.1	633.2
33.82	6.55	159.5	332.0	316.0	132.7	514.7	587.3
35.84	6.06	139.5	369.0	356.2	108.3	699.8	623.1
37.81	5.79	188.2	337.0	393.7	156.1	619.0	659.7
39.80	5.91	204.2	274.0	319.2	208.7	548.8	621.8
41.67	6.24	181.2	333.0	309.9	137.6	470.1	564.4
43.78	6.22	140.1	347.0	337.4	134.4	480.7	629.8
45.99	5.93	145.5	333.0	366.0	125.1	582.8	643.7
47.75	5.94	153.2	330.0	357.8	127.8	455.2	630.5
49.89	5.94	217.5	325.0	335.2	210.7	467.9	626.5
51.79	6.13	168.3	285.0	318.3	116.7	457.3	614.8
53.68	6.58	166.3	321.0	338.6	160.8	512.6	631.2
55.85	6.55	172.7	320.0	338.7	158.1	489.2	622.2
57.66	6.13	181.8	347.0	359.2	133.1	793.4	608.6
59.84	6.38	169.4	323.0	380.5	131.8	589.2	641.0
61.47	6.43	197.1	293.0	351.1	161.8	633.8	613.9
63.56	6.26	171.3	349.0	321.1	143.0	559.4	590.9
65.58	6.21	182.1	327.0	380.6	153.8	446.7	650.4
67.58	5.98	156.6	313.0	335.6	140.8	531.8	616.9
69.91	5.98	213.4	51.0	346.1	179.8	387.1	610.6
71.92	5.68	206.2	321.0	85.0	172.4	838.0	348.3

Table E-23. Continued.

Train R1 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.98	5.89	154.9	323.0	353.6	121.6	438.2	618.4
75.80	5.89	173.1	308.0	340.4	156.1	406.3	621.5
77.73	5.97	199.2	327.0	341.9	160.8	538.1	601.6
79.71	6.67	196.6	302.0	368.4	152.1	387.1	622.0
81.92	6.25	221.2	321.0	315.7	210.1	621.1	602.7
83.86	5.71	181.3	332.0	347.8	153.5	285.0	618.1
85.77	5.96	190.5	312.0	334.5	189.7	457.8	631.8
87.92	6.18	195.5	361.0	362.6	145.8	437.8	611.0
89.77	5.98	179.6	337.0	368.6	166.4	450.4	653.5
91.85	5.77	196.6	316.0	371.2	159.3	407.8	632.0
93.69	6.08	170.3	317.0	351.3	132.2	174.4	611.3
95.77	5.98	190.3	343.0	335.3	170.1	408.4	613.2
97.86	5.81	199.5	261.0	301.4	223.4	480.7	634.5
99.78	6.25	169.1	387.0	325.6	113.5	391.4	568.1
101.94	6.03	156.9	295.0	339.3	200.5	1010.3	681.0
103.84	5.92	191.1	383.0	297.4	179.2	1701.6	583.6
105.85	5.85	140.2	355.0	413.8	106.0	801.9	677.7
107.79	5.90	110.0	373.0	388.7	66.7	604.1	643.5
109.92	5.76	159.8	357.0	395.5	118.4	755.1	652.2
111.87	5.87	128.1	337.0	386.1	101.0	816.8	657.1
113.97	5.65	138.9	303.0	348.9	130.6	955.0	638.7
115.98	5.93	147.0	305.0	379.1	103.0	565.8	633.2
117.77	5.92	128.7	335.0	350.1	84.8	467.9	604.3
119.71	5.93	227.6	289.0	315.3	239.7	616.8	631.5
122.02	6.38	179.5	337.0	316.3	179.9	461.6	629.1
123.83	6.84	169.0	327.0	356.8	111.6	408.4	597.5

Table E-24. Transfer data for Train R1 Fermentor 4 at higher reflux.

Train R1 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00	5.37	102.7	300.0	297.4	59.3	538.1	552.1	0.75	0.52
1.82	5.46	115.5	300.0	334.0	37.8	997.6	554.4	0.74	0.47
3.80	5.69	88.5	300.0	351.1	52.5	1544.2	613.2	0.90	0.47
5.77	5.78	180.4	300.0	326.2	158.9	1882.4	602.8	0.69	0.48
7.77	5.87	228.1	300.0	303.8	207.7	2626.8	591.2	0.73	0.40
9.82	6.05	141.0	300.0	340.7	108.4	1616.5	606.2	0.75	0.39
11.85	6.00	131.1	300.0	97.5	45.0	495.6	289.7	0.76	0.44
13.80	6.15	117.2	300.0	318.5	73.7	2673.6	573.1	0.77	0.44
15.78	6.13	147.8	300.0	319.2	125.9	2299.3	595.4	0.77	0.43
17.80	6.02	97.9	300.0	313.8	78.4	2315.2	592.4	0.70	0.47
19.80	6.11	196.5	300.0	339.3	157.3	2012.1	598.2	0.65	0.52
21.76	6.00	162.4	300.0	351.4	109.4	593.4	596.5	0.69	0.43
23.64	5.84	94.3	300.0	354.3	45.0	3169.2	593.8	0.68	0.46
25.72	6.01	213.7	300.0	272.2	228.1	2027.0	584.7	0.71	0.48
27.83	5.70	122.0	300.0	324.3	96.0	1214.5	596.4	0.72	0.46
29.73	5.66	164.0	300.0	341.2	122.3	2090.8	597.6	0.69	0.45
31.83	6.11	204.2	300.0	295.1	206.4	4464.6	595.4	0.73	0.43
33.82	6.49	132.7	300.0	331.7	98.2	2161.0	595.3	0.76	0.39
35.84	5.88	108.3	300.0	366.1	39.2	3556.3	595.1	0.72	0.46
37.81	5.76	156.1	300.0	337.5	115.8	3316.0	595.3	0.66	0.53
39.80	5.87	208.7	300.0	270.1	233.5	2996.9	593.0	0.73	0.44
41.67	5.94	137.6	300.0	334.6	102.1	1150.7	597.2	0.74	0.37
43.78	5.62	134.4	300.0	349.5	82.6	2563.0	595.8	0.70	0.44
45.99	5.50	125.1	300.0	336.7	82.8	2273.8	592.5	0.69	0.52
47.75	5.76	127.8	300.0	331.7	94.4	1701.6	596.4	0.69	0.45
49.89	6.21	210.7	300.0	325.7	182.3	3467.0	595.4	0.70	0.44
51.79	6.94	116.7	300.0	287.0	124.5	516.9	592.9	0.73	0.47
53.68	7.29	160.8	300.0	322.2	140.0	2790.6	599.5	0.72	0.41
55.85	6.18	158.1	300.0	314.0	136.3	2054.7	590.3	0.72	0.41
57.66	5.78	133.1	300.0	348.7	79.6	1167.7	593.3	0.70	0.45
59.84	6.00	131.8	300.0	319.8	112.4	2222.7	598.5	0.68	0.45
61.47	5.96	161.8	300.0	294.4	165.9	1427.2	596.6	0.71	0.44
63.56	5.86	143.0	300.0	355.4	86.0	2731.1	596.5	0.65	0.44
65.58	6.01	153.8	300.0	321.0	132.0	1078.4	597.3	0.71	0.42
67.58	6.03	140.8	300.0	317.6	123.9	2665.1	596.8	0.72	0.47
69.91	6.24	179.8	300.0	53.1	33.6	1975.5	208.0	0.69	0.44
71.92	5.92	172.4	300.0	325.0	146.8	2418.4	596.5	0.72	0.43

Table E-24. Continued.

Train R1 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
73.98	5.77	121.6	300.0	327.0	93.4	1201.8	596.9	0.70	0.40
75.80	5.55	156.1	300.0	308.7	147.2	1242.2	597.9	0.74	0.42
77.73	5.60	160.8	300.0	331.7	125.5	1278.3	594.5	0.71	0.38
79.71	6.49	152.1	300.0	306.2	139.2	1386.8	591.4	0.74	0.38
81.92	5.71	210.1	300.0	325.6	184.0	3703.1	597.6	0.71	0.47
83.86	6.09	153.5	300.0	333.7	115.5	151.0	593.8	0.75	0.41
85.77	5.85	189.7	300.0	316.6	173.2	1629.8	598.2	0.76	0.43
87.92	5.94	145.8	300.0	361.3	80.1	1717.7	593.7	0.73	0.43
89.77	5.85	166.4	300.0	337.5	123.8	1800.4	593.0	0.71	0.46
91.85	5.94	159.3	300.0	313.6	143.8	1324.7	596.2	0.76	0.43
93.69	5.74	132.2	300.0	318.7	99.1	1225.2	583.7	0.77	0.39
95.77	5.75	170.1	300.0	341.1	124.7	2095.1	593.8	0.70	0.47
97.86	6.96	223.4	300.0	263.7	198.0	461.6	536.4	0.74	0.44
99.78	7.84	113.5	300.0	386.9	100.0	106.4	671.5	0.71	0.41
101.94	8.23	200.5	300.0	298.4	202.3	104.2	598.3	0.74	0.43
103.84	5.94	179.2	300.0	383.0	101.1	2635.4	603.0	0.73	0.39
105.85	5.92	98.8	300.0	358.1	37.8	2556.7	595.2	0.67	0.61
107.79	5.98	66.7	300.0	367.9	0.0	3235.2	596.2	0.72	0.45
109.92	5.84	118.4	300.0	355.1	56.8	3481.9	591.6	0.61	0.59
111.87	5.94	101.0	300.0	338.2	54.2	2622.6	589.5	0.64	0.55
113.97	6.05	130.6	300.0	305.6	118.2	2811.9	591.3	0.71	0.54
115.98	6.03	103.0	300.0	308.9	92.0	1310.2	596.0	0.68	0.51
117.77	5.93	84.8	300.0	336.0	47.2	908.2	596.5	0.69	0.51
119.71	7.55	239.7	300.0	292.3	227.4	1501.7	598.5	0.65	0.56
122.02	7.82	179.9	300.0	336.4	165.4	163.8	620.0	0.72	0.39
123.83	8.94	111.6	300.0	321.7	93.3	106.4	601.5	0.73	0.40

Table E-25. Transfer data for Train R2 Fermentor 1 at higher reflux.

Train R2 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00	5.34	27.3	316.0	163.9	155.4	444.5	490.1	0.97	0.37	16.36	26.11
2.15	5.41	27.3	340.0	172.0	171.6	485.0	514.4	0.97	0.37	16.18	25.82
4.24	5.48	27.3	367.0	222.7	137.3	816.8	530.8	0.97	0.36	16.17	25.81
6.11	5.69	27.3	364.0	339.2	175.3	887.0	685.3	0.98	0.38	13.85	22.33
7.98	5.47	27.3	320.0	181.2	197.8	842.3	549.8	0.97	0.09	15.30	25.11
10.01	5.47	27.3	292.0	184.5	143.2	899.7	498.5	0.97	0.39	14.08	23.40
12.01	5.65	27.3	366.0	171.0	144.2	329.7	486.0	0.97	0.33	14.63	24.07
14.33	5.68	27.3	360.0	230.4	162.4	500.9	563.6	0.98	0.32	15.87	26.18
16.24	5.46	27.3	375.0	243.5	183.0	1189.0	597.3	0.98	0.38	13.79	22.80
18.39	5.63	27.3	335.0	219.2	178.0	918.9	568.0	0.98	0.41	14.99	24.26
20.17	5.88	27.3	316.0	201.7	161.2	272.3	533.7	0.98	0.28	17.51	28.74
22.01	5.49	27.3	375.0	192.8	140.9	691.3	504.5	0.97	0.34	15.90	25.52
24.06	5.56	27.3	382.0	243.8	156.8	1012.5	571.4	0.97	0.35	15.61	25.34
26.00	5.58	27.3	380.0	249.3	151.4	274.4	571.5	0.97	0.35	14.36	23.07
27.97	5.45	27.3	366.0	241.0	166.5	619.0	578.3	0.98	0.38	15.98	25.61
30.11	5.56	27.3	385.0	237.8	154.5	927.4	563.1	0.97	0.34	16.05	25.80
32.03	5.50	27.3	265.0	249.7	151.4	221.2	571.9	0.97	0.38	21.26	34.72
34.13	5.36	27.3	358.0	267.7	145.1	382.9	583.6	0.97	0.36	17.89	28.49
36.21	5.45	27.3	386.0	234.8	149.4	625.3	555.0	0.97	0.32	21.55	34.26
38.14	5.25	27.3	361.0	250.8	160.4	787.0	582.0	0.97	0.35	18.45	29.78
40.02	5.41	27.3	380.0	217.4	164.0	799.8	552.2	0.97	0.37	16.23	26.30
41.99	5.51	27.3	395.0	266.1	139.8	372.2	576.7	0.97	0.39	16.90	27.50
44.11	5.59	27.3	374.0	256.4	167.3	838.0	594.5	0.97	0.41	16.85	27.40
46.38	5.52	27.3	357.0	207.7	184.4	244.6	562.9	0.98	0.34	19.94	32.69
48.11	5.69	27.3	324.0	218.2	162.7	472.2	551.7	0.98	0.33	16.84	27.27
50.00	5.66	27.3	345.0	184.2	163.2	253.1	518.2	0.97	0.34	18.27	29.73
52.00	5.62	27.3	363.0	205.6	161.6	265.9	538.0	0.97	0.31	16.34	26.61
53.96	5.53	27.3	328.0	237.5	151.8	391.4	560.1	0.97	0.31	16.78	27.36
56.50	5.52	27.3	429.0	213.7	141.3	969.9	525.8	0.97	0.36	16.36	26.07
58.09	5.46	27.3	415.0	307.2	149.5	408.4	627.5	0.97	0.35	17.32	28.53
60.03	5.53	27.3	364.0	266.3	164.3	280.8	601.4	0.97	0.33	15.39	25.12
62.25	5.56	27.3	355.0	211.0	180.6	295.7	562.4	0.97	0.26	16.39	26.94
64.14	5.63	27.3	330.0	228.8	145.5	291.4	545.1	0.98	0.31	14.69	24.04
66.03	5.72	27.3	262.0	180.2	176.7	231.8	527.7	0.98	0.25	12.46	20.28
68.04	5.42	27.3	316.0	132.4	155.4	587.1	458.6	0.97	0.22	13.33	21.34
70.21	5.44	27.3	142.0	205.8	133.2	629.6	509.8	0.97	0.35	15.84	25.35
72.23	5.57	27.3	390.0	48.4	121.0	329.7	340.2	0.96	0.36	15.04	23.74

Table E-25. Continued.

Train R2 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
74.07	5.62	27.3	329.0	258.1	148.7	304.2	577.6	0.97	0.36	14.96	23.89
76.01	5.48	27.3	290.0	189.9	167.6	272.3	528.3	0.97	0.35	15.42	23.89
78.19	5.60	27.3	254.0	152.7	165.9	591.3	489.4	0.97	0.33	15.28	23.18
80.29	5.58	27.3	289.0	96.9	172.6	1016.7	440.3	0.98	0.14	16.02	24.14
82.13	5.43	27.3	365.0	216.3	95.2	1155.0	482.3	0.98	0.45	16.31	24.63
84.27	5.44	27.3	270.0	210.0	187.0	472.2	567.8	0.98	0.39	15.88	24.45
86.21	5.54	27.3	260.0	123.0	173.5	808.8	467.3	0.98	0.42	16.17	24.71
88.26	5.48	27.3	292.0	176.5	114.8	863.2	462.1	0.97	0.37	16.05	24.58
90.11	5.17	27.3	424.0	139.8	178.2	824.8	488.8	0.98	0.39	17.50	26.34
92.10	5.40	27.3	394.0	252.8	197.7	742.2	621.3	0.97	0.32	16.05	24.84
94.10	5.54	27.3	393.0	255.0	170.8	182.9	596.6	0.98	0.39	16.74	25.88
96.10	6.01	27.3	348.0	264.2	156.7	338.2	591.7	0.98	0.38	15.88	24.80
98.06	5.50	27.3	164.0	219.6	158.6	351.0	549.0	0.97	0.37	15.54	24.08
100.13	5.46	27.3	439.0	57.8	132.8	761.5	361.4	0.96	0.42	18.72	28.79
102.02	5.55	27.3	366.0	310.5	154.3	265.9	635.6	0.97	0.39	19.69	30.75
104.14	5.60	27.3	378.0	221.9	171.9	302.0	564.6	0.97	0.35	8.63	13.61
106.12	5.52	27.3	261.0	239.1	169.3	276.5	579.2	0.97	0.36	15.58	24.36
108.18	5.46	27.3	312.0	160.1	129.5	293.5	460.4	0.96	0.39	16.13	24.91
110.06	5.67	27.3	351.0	181.7	158.2	610.4	510.7	0.97	0.41	15.66	24.32
112.23	5.71	27.3	330.0	195.7	180.6	223.3	547.1	0.97	0.37	15.51	24.29
114.14	5.75	27.3	348.0	182.6	174.9	355.2	528.3	0.97	0.38	13.06	20.69
116.19	5.66	27.3	417.0	228.0	146.8	378.6	545.6	0.97	0.38	15.65	23.98
118.20	5.62	27.3	360.0	249.1	186.4	506.2	606.3	0.97	0.36	15.56	24.00
120.05	5.60	27.3	399.0	219.1	172.2	416.9	562.1	0.97	0.39	14.55	22.60
122.18	5.76	27.3	347.0	197.9	150.4	831.7	519.1	0.97	0.38	13.99	21.95
124.03	5.58	27.3	387.0	195.4	122.0	463.7	488.2	0.97	0.40	16.84	25.88

Table E-26. Transfer data for Train R2 Fermentor 2 at higher reflux.

Train R2 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.71	155.4	344.0	316.9	203.4	755.1	618.0
2.15	5.80	171.6	380.0	332.0	218.0	795.5	637.2
4.24	6.01	137.3	357.0	370.8	187.9	718.9	674.5
6.11	6.19	175.3	342.0	355.0	213.4	695.5	654.8
7.98	6.24	197.8	260.0	321.4	228.0	699.8	636.8
10.01	6.16	143.2	367.0	292.6	185.4	589.2	587.9
12.01	5.96	144.2	336.0	366.7	184.7	472.2	660.3
14.33	5.93	162.4	380.0	356.7	184.7	708.3	632.1
16.24	6.04	183.0	350.0	371.2	173.5	533.9	631.8
18.39	6.06	178.0	267.0	338.7	221.2	667.9	654.9
20.17	6.33	161.2	365.0	305.9	186.8	689.1	584.6
22.01	6.24	140.9	345.0	375.6	163.9	701.9	651.7
24.06	6.05	156.8	375.0	373.4	174.6	963.5	644.3
26.00	5.86	151.4	334.0	380.7	178.5	676.4	660.9
27.97	5.80	166.5	340.0	366.4	199.2	921.0	652.2
30.11	5.84	154.5	361.0	374.2	163.8	859.3	636.6
32.03	5.63	151.4	343.0	265.5	163.8	591.3	531.0
34.13	5.66	145.1	356.0	356.7	130.1	533.9	594.8
36.21	5.83	149.4	350.0	385.0	164.7	774.2	653.4
38.14	5.67	160.4	363.0	364.3	189.8	880.6	646.8
40.02	5.90	164.0	355.0	379.8	187.7	761.5	656.6
41.99	5.89	139.8	336.0	396.6	144.3	504.1	654.2
44.11	5.90	167.3	350.0	364.1	184.0	767.8	634.2
46.38	5.82	184.4	299.0	356.3	195.7	808.3	639.8
48.11	5.82	162.7	347.0	319.1	199.0	667.9	608.5
50.00	5.88	163.2	350.0	345.5	202.1	878.5	637.5
52.00	5.76	161.6	307.0	365.2	184.1	910.4	640.8
53.96	5.72	151.8	396.0	327.0	176.2	984.8	604.5
56.50	5.64	141.3	376.0	429.4	149.5	980.5	690.7
58.09	5.75	149.5	355.0	403.6	169.0	499.8	676.2
60.03	5.76	164.3	340.0	367.4	169.8	774.2	640.4
62.25	5.86	180.6	324.0	344.8	218.7	974.2	650.8
64.14	5.67	145.5	278.0	328.7	189.7	927.4	626.0
66.03	5.64	176.7	322.0	261.4	222.6	601.9	573.2
68.04	5.57	155.4	100.0	312.8	217.5	821.0	628.0
70.21	5.39	133.2	382.0	141.4	134.6	931.6	395.9
72.23	5.65	121.0	360.0	380.7	165.8	631.7	678.6

Table E-26. Continued.

Train R2 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.07	5.68	148.7	307.0	332.5	210.5	640.2	647.4
76.01	5.67	167.6	300.0	290.6	228.1	889.1	604.6
78.19	5.86	165.9	322.0	256.2	255.3	825.3	598.7
80.29	6.22	172.6	323.0	292.5	242.2	559.4	620.6
82.13	6.08	95.2	355.0	364.6	94.8	482.8	617.3
84.27	5.81	187.0	305.0	271.8	246.5	246.7	604.7
86.21	5.79	173.5	282.0	262.7	270.7	528.6	617.5
88.26	5.70	114.8	462.0	294.7	155.1	454.4	588.1
90.11	5.49	178.2	398.0	425.5	231.3	428.1	743.2
92.10	5.61	197.7	350.0	396.3	222.6	414.4	705.8
94.10	5.64	170.8	341.0	396.9	201.9	257.4	684.5
96.10	6.10	156.7	142.0	350.8	194.5	687.0	641.7
98.06	5.55	158.6	426.0	162.7	179.4	676.4	436.6
100.13	5.65	132.8	347.0	438.4	115.5	772.1	719.2
102.02	5.51	154.3	354.0	368.1	173.3	612.6	685.2
104.14	5.64	171.9	270.0	380.0	208.0	691.3	696.2
106.12	5.48	162.0	327.0	269.6	181.3	738.1	569.0
108.18	5.62	129.5	352.0	316.4	153.8	699.8	620.8
110.06	5.81	158.2	350.0	350.3	175.1	704.0	647.3
112.23	5.81	180.6	352.0	329.9	214.8	529.6	644.2
114.14	5.79	174.9	370.0	348.0	181.0	593.4	652.2
116.19	5.69	146.8	382.0	413.6	137.5	587.1	684.4
118.20	5.87	186.4	370.0	360.5	214.2	572.2	668.4
120.05	5.83	172.2	343.0	398.4	165.9	470.1	672.2
122.18	5.83	150.4	362.0	345.5	163.4	582.8	638.6
124.03	5.76	122.0	385.0	387.1	109.2	642.4	654.4

Table E-27. Transfer data for Train R2 Fermentor 3 at higher reflux.

Train R2 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.96	203.4	343.0	342.3	188.7	559.4	625.7
2.15	6.35	218.0	352.0	372.0	184.7	582.8	636.8
4.24	6.25	187.9	298.0	361.7	167.7	519.0	639.6
6.11	6.32	213.4	216.0	333.5	174.0	495.6	592.2
7.98	6.36	228.0	337.0	263.2	166.6	527.5	506.2
10.01	6.00	185.4	317.0	367.7	155.7	765.7	636.1
12.01	6.22	184.7	337.0	334.9	164.1	510.5	612.4
14.33	6.06	184.7	333.0	377.5	144.3	540.3	635.2
16.24	6.09	173.5	252.0	340.9	159.2	553.0	624.7
18.39	6.21	221.2	320.0	271.7	200.0	561.5	555.7
20.17	6.21	186.8	341.0	355.9	156.4	493.5	623.5
22.01	6.36	163.9	332.0	347.4	143.8	540.3	625.4
24.06	6.06	174.6	347.0	364.7	138.5	1131.6	626.7
26.00	5.10	178.5	327.0	355.6	159.1	589.2	634.3
27.97	6.37	199.2	317.0	340.4	184.0	712.5	623.3
30.11	6.08	163.8	342.0	350.9	128.4	601.9	613.6
32.03	5.92	163.8	341.0	346.9	147.7	527.5	628.9
34.13	6.25	130.1	325.0	355.8	114.0	595.6	637.8
36.21	6.30	164.7	351.0	350.4	139.5	580.7	623.3
38.14	6.05	189.8	341.0	368.3	171.3	708.3	647.9
40.02	6.29	187.7	307.0	357.5	164.4	559.4	632.3
41.99	6.32	144.3	326.0	336.3	113.1	436.0	603.2
44.11	6.30	184.0	321.0	341.6	166.6	642.4	622.3
46.38	6.11	195.7	321.0	298.9	209.1	674.3	610.4
48.11	6.31	199.0	322.0	340.9	175.9	580.7	615.9
50.00	6.21	202.1	282.0	350.5	166.5	508.4	613.0
52.00	5.99	184.1	362.0	311.7	148.9	761.5	574.6
53.96	5.81	176.2	341.0	394.7	141.3	648.7	657.9
56.50	5.92	149.5	330.0	377.0	108.7	757.2	634.3
58.09	6.05	169.0	332.0	345.9	151.8	891.2	626.8
60.03	6.16	169.8	326.0	343.7	149.9	493.5	621.9
62.25	6.26	218.7	264.0	316.0	226.7	584.9	622.1
64.14	5.95	189.7	307.0	276.9	163.8	467.9	549.1
66.03	5.86	222.6	52.0	319.0	206.3	472.2	603.9
68.04	5.54	217.5	335.0	98.6	168.4	644.5	347.6
70.21	5.81	134.6	337.0	381.8	84.9	529.6	630.2
72.23	5.93	165.8	307.0	351.3	151.1	591.3	634.7

Table E-27. Continued.

Train R2 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.07	6.55	210.5	301.0	309.7	192.3	587.1	589.6
76.01	6.71	228.1	307.0	302.2	219.1	561.5	600.0
78.19	6.85	255.3	303.0	323.2	214.6	463.7	614.2
80.29	6.76	242.2	293.0	321.9	229.6	374.4	630.1
82.13	6.83	94.8	347.0	355.2	44.9	321.2	603.4
84.27	5.92	246.5	252.0	302.8	261.5	157.4	643.6
86.21	5.93	270.7	391.0	283.7	212.7	329.2	572.1
88.26	5.68	155.1	397.0	463.5	130.8	295.5	737.3
90.11	5.82	231.3	317.0	400.0	216.8	275.8	694.6
92.10	5.78	222.6	317.0	352.0	193.3	264.5	622.1
94.10	6.20	201.9	99.0	344.2	177.7	217.0	618.1
96.10	5.84	194.5	363.0	143.1	150.4	631.7	397.1
98.06	5.71	179.4	321.0	422.6	120.7	533.9	662.0
100.13	5.93	115.5	326.0	346.4	88.3	697.7	617.3
102.02	5.93	173.3	279.0	356.6	136.6	591.3	618.0
104.14	5.78	208.0	329.0	271.9	211.6	495.6	573.6
106.12	5.78	174.2	319.0	331.2	170.8	648.7	625.9
108.18	5.94	153.8	317.0	352.7	118.3	521.1	615.3
110.06	6.27	175.1	336.0	348.8	142.6	459.4	614.4
112.23	5.92	214.6	337.0	354.5	193.7	670.0	631.5
114.14	5.92	181.0	341.0	369.9	147.1	625.3	634.1
116.19	6.15	137.5	362.0	378.0	97.4	589.2	636.0
118.20	6.21	214.2	301.0	371.7	194.2	606.2	649.8
120.05	6.02	165.9	333.0	342.4	127.1	446.7	601.8
122.18	6.23	163.4	342.0	359.3	135.0	408.4	629.0
124.03	5.81	109.2	347.0	384.4	64.2	657.2	637.5

Table E-28. Transfer data for Train R2 Fermentor 4 at higher reflux.

Train R2 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00	5.60	188.7	300.0	344.8	140.9	1399.6	595.1	0.79	0.36
2.15	5.63	184.7	300.0	346.6	133.4	1727.1	593.4	0.79	0.34
4.24	5.70	167.7	300.0	301.5	107.4	1752.6	539.3	0.75	0.39
6.11	5.87	174.0	300.0	215.4	153.0	1263.4	492.5	0.77	0.39
7.98	5.71	166.6	300.0	338.6	123.1	1586.7	593.2	0.75	0.40
10.01	5.67	155.7	300.0	318.8	134.9	1939.8	596.1	0.76	0.35
12.01	5.82	164.1	300.0	341.5	120.5	1452.7	596.0	0.75	0.40
14.33	5.86	144.3	300.0	334.4	107.3	1646.3	595.5	0.72	0.42
16.24	5.71	159.2	300.0	255.7	130.7	2278.0	525.3	0.74	0.41
18.39	5.70	200.0	300.0	324.3	171.8	1888.8	594.2	0.72	0.46
20.17	5.88	156.4	300.0	332.9	119.1	1890.9	593.7	0.74	0.41
22.01	5.66	143.8	300.0	333.6	104.1	2012.1	592.0	0.70	0.48
24.06	5.74	138.5	300.0	340.3	96.1	2495.0	596.0	0.71	0.45
26.00	5.77	159.1	300.0	330.0	127.8	2133.4	596.8	0.70	0.47
27.97	5.76	184.0	300.0	320.4	161.6	2397.1	596.1	0.73	0.44
30.11	5.91	128.4	300.0	334.0	89.1	2686.4	592.8	0.71	0.43
32.03	5.62	147.7	300.0	344.5	104.2	2033.4	599.1	0.68	0.47
34.13	5.73	114.0	300.0	328.1	82.6	2031.3	594.8	0.71	0.44
36.21	5.81	139.5	300.0	354.3	81.7	2284.4	594.6	0.65	0.48
38.14	5.60	171.3	300.0	343.7	121.4	2303.5	591.9	0.70	0.45
40.02	5.68	164.4	300.0	308.9	147.4	2141.9	590.0	0.70	0.40
41.99	5.74	113.1	300.0	329.1	82.2	1148.6	596.3	0.69	0.45
44.11	5.86	166.6	300.0	316.7	144.2	2646.0	592.4	0.71	0.43
46.38	5.81	209.1	300.0	321.9	185.4	1854.7	596.3	0.70	0.40
48.11	6.52	175.9	300.0	318.4	155.9	627.5	596.5	0.71	0.41
50.00	6.24	166.5	300.0	287.7	174.8	1776.0	594.1	0.75	0.46
52.00	5.74	148.9	300.0	364.1	74.7	3418.1	588.0	0.71	0.43
53.96	5.88	141.3	300.0	342.7	95.4	2782.1	594.9	0.73	0.38
56.50	5.74	108.7	300.0	333.5	71.6	2443.9	594.5	0.67	0.51
58.09	5.83	151.8	300.0	328.3	117.5	1157.1	592.1	0.68	0.42
60.03	5.79	149.9	300.0	328.9	119.9	1754.8	597.0	0.66	0.51
62.25	6.10	226.7	300.0	259.5	234.6	2937.4	591.2	0.75	0.48
64.14	6.09	163.8	300.0	310.3	173.8	2152.5	618.4	0.76	0.38
66.03	6.28	206.3	300.0	51.0	81.8	2000.4	224.6	0.77	0.41
68.04	6.25	168.4	300.0	335.7	129.7	1929.2	595.1	0.75	0.41
70.21	5.90	84.9	300.0	339.9	44.0	993.3	597.1	0.74	0.44
72.23	7.60	151.1	300.0	297.4	152.6	323.3	597.0	0.74	0.40

Table E-28. Continued.

Train R2 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
74.07	8.48	192.3	300.0	302.8	186.4	110.6	595.0	0.73	0.40
76.01	7.84	219.1	300.0	310.6	211.6	185.0	601.2	0.70	0.40
78.19	8.18	214.6	300.0	307.6	206.5	185.0	597.6	0.76	0.38
80.29	8.32	229.6	300.0	289.8	218.7	1174.1	587.2	0.78	0.37
82.13	8.30	44.9	300.0	347.3	2.7	157.4	603.2	0.78	0.30
84.27	7.27	261.5	300.0	253.3	261.4	53.2	599.1	0.79	0.35
86.21	5.81	212.7	300.0	392.7	161.5	392.4	639.6	0.75	0.41
88.26	5.82	130.8	300.0	400.2	31.1	444.3	598.6	0.77	0.36
90.11	5.93	216.8	300.0	320.6	192.1	261.8	594.0	0.74	0.44
92.10	5.98	193.3	300.0	319.6	170.1	287.9	594.5	0.77	0.40
94.10	6.28	177.7	300.0	103.3	48.6	346.6	272.3	0.79	0.43
96.10	6.09	150.4	300.0	367.6	80.0	3154.3	595.3	0.74	0.43
98.06	6.00	120.7	300.0	322.2	97.1	1539.9	596.7	0.76	0.41
100.13	5.78	88.3	300.0	325.3	52.1	1412.3	587.2	0.80	0.42
102.02	5.79	136.6	300.0	278.6	92.4	1501.7	532.6	0.68	0.40
104.14	5.95	211.6	300.0	332.6	178.9	3228.8	598.0	0.67	0.49
106.12	6.00	163.8	300.0	327.3	134.1	1808.0	595.7	0.71	0.46
108.18	6.12	118.3	300.0	319.9	96.5	1820.7	596.2	0.73	0.42
110.06	5.83	142.6	300.0	339.2	100.7	3243.7	595.4	0.72	0.46
112.23	6.00	193.7	300.0	339.8	154.2	3143.7	598.4	0.75	0.43
114.14	5.88	147.1	300.0	343.8	102.4	1701.6	597.2	0.72	0.47
116.19	6.00	97.4	300.0	357.1	38.2	2316.3	596.0	0.67	0.51
118.20	5.96	194.2	300.0	305.4	182.7	2307.8	592.0	0.73	0.51
120.05	5.79	127.1	300.0	336.0	93.7	1510.2	600.7	0.71	0.50
122.18	5.77	135.0	300.0	342.0	91.5	3335.1	596.6	0.73	0.47
124.03	6.04	64.2	300.0	349.5	13.7	1493.2	597.1	0.73	0.50

Table E-29. Transfer data for Train R3 Fermentor 1 at higher reflux.

Train R3 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00	5.31	27.3	422.0	196.8	185.3	636.0	552.9	0.97	0.42	18.65	28.68
2.14	5.34	27.3	420.0	257.8	185.8	748.7	614.4	0.97	0.40	17.83	28.03
4.24	5.57	27.3	403.0	234.8	199.2	882.7	604.8	0.97	0.40	18.33	29.07
6.10	5.49	27.3	377.0	254.2	172.7	767.8	597.7	0.97	0.41	18.13	28.04
7.99	5.55	27.3	305.0	163.8	227.0	633.8	561.6	0.97	0.40	15.89	25.85
10.01	5.57	27.3	367.0	163.7	161.7	744.5	496.2	0.97	0.40	16.47	26.94
12.01	5.55	27.3	430.0	228.5	162.7	472.2	562.0	0.97	0.36	17.12	28.14
14.33	5.51	27.3	394.0	233.6	219.0	823.1	623.4	0.98	0.37	16.97	27.59
16.24	5.53	27.3	386.0	233.3	181.1	733.8	585.2	0.98	0.42	16.56	26.75
18.38	5.55	27.3	412.0	228.7	185.8	765.7	585.3	0.98	0.39	16.59	26.72
20.16	5.72	27.3	405.0	268.9	169.8	453.1	609.5	0.98	0.39	14.85	23.93
22.00	5.61	27.3	340.0	271.1	146.9	591.3	588.8	0.98	0.37	16.02	25.64
24.02	5.46	27.3	392.0	196.2	169.7	1006.1	536.7	0.97	0.37	18.25	29.09
26.00	5.58	27.3	360.0	203.5	164.2	180.8	538.5	0.98	0.28	14.80	23.59
27.96	5.52	27.3	370.0	211.8	174.6	801.9	557.2	0.97	0.37	16.10	25.79
30.06	5.45	27.3	405.0	253.3	143.3	1063.5	567.4	0.97	0.36	19.12	30.07
32.02	5.49	27.3	391.0	231.7	184.3	248.9	587.1	0.98	0.31	16.47	25.85
34.12	5.38	27.3	342.0	251.4	166.8	733.8	589.0	0.97	0.38	16.95	26.88
36.20	5.41	27.3	426.0	200.2	162.5	680.6	533.5	0.97	0.37	18.02	28.42
38.14	5.23	27.3	413.0	285.4	165.9	772.1	622.1	0.97	0.38	18.34	29.09
40.01	5.39	27.3	375.0	252.6	181.1	893.3	604.5	0.97	0.37	18.25	29.17
41.99	5.47	27.3	388.0	217.2	184.2	448.8	572.2	0.97	0.40	18.60	29.61
44.06	5.44	27.3	411.0	260.8	153.6	897.6	585.2	0.98	0.40	18.32	29.39
46.32	5.53	27.3	379.0	257.1	165.8	780.6	593.7	0.97	0.35	20.11	32.99
48.10	5.61	27.3	373.0	224.6	175.1	289.3	570.5	0.97	0.33	17.08	28.26
49.99	5.59	27.3	380.0	225.9	168.0	227.6	564.7	0.97	0.34	18.70	30.56
52.00	5.60	27.3	362.0	221.7	177.5	174.4	570.0	0.97	0.31	18.54	29.96
53.95	5.46	27.3	384.0	216.7	166.9	531.8	554.4	0.97	0.36	17.73	27.98
56.50	5.40	27.3	396.0	256.2	149.8	1250.7	576.8	0.97	0.36	18.75	29.32
58.09	5.60	27.3	420.0	259.9	165.4	744.5	596.1	0.97	0.36	17.98	28.68
60.02	5.48	27.3	409.0	262.0	174.7	238.2	607.5	0.97	0.35	17.31	27.71
62.25	5.61	27.3	333.0	255.3	174.8	157.4	600.9	0.97	0.32	17.15	27.11
64.13	5.49	27.3	346.0	180.4	172.4	438.2	523.6	0.97	0.36	16.70	26.24
66.02	5.56	27.3	367.0	199.1	171.9	340.3	541.8	0.97	0.29	17.35	27.47
68.05	5.49	27.3	282.0	200.1	188.5	623.2	559.4	0.97	0.39	17.52	27.77
70.20	5.50	27.3	322.0	149.3	158.3	538.1	478.4	0.97	0.38	17.53	27.98
72.23	5.70	27.3	440.0	184.9	165.4	280.8	521.1	0.98	0.38	16.85	26.74

Table E-29. Continued.

Train R3 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
74.06	5.49	27.3	383.0	265.1	184.0	378.6	619.9	0.98	0.38	16.01	25.44
76.00	5.43	27.3	390.0	235.3	179.2	402.0	585.3	0.97	0.37	16.28	25.52
78.18	5.38	27.3	402.0	126.2	183.0	276.5	480.0	0.97	0.38	17.52	27.60
80.29	5.44	27.3	383.0	240.3	188.0	382.9	599.1	0.97	0.31	16.95	26.96
82.13	5.38	27.3	415.0	300.4	99.8	557.3	571.0	0.97	0.42	16.86	28.07
84.26	5.26	27.3	350.0	256.2	189.9	155.3	616.9	0.98	0.33	16.74	26.23
86.22	5.52	27.3	296.0	218.6	157.3	343.0	546.7	0.98	0.37	16.73	26.98
88.25	5.58	27.3	322.0	181.4	144.2	359.6	496.4	0.97	0.33	16.85	27.50
90.12	5.45	27.3	322.0	192.4	199.6	353.8	562.8	0.98	0.36	16.94	27.15
92.09	5.42	27.3	308.0	173.1	174.4	302.9	518.3	0.97	0.33	17.11	26.73
94.12	5.50	27.3	341.0	175.9	165.9	159.5	512.6	0.97	0.38	16.62	25.46
96.10	5.71	27.3	410.0	207.5	161.2	282.9	539.5	0.97	0.35	16.92	25.89
98.05	5.54	27.3	390.0	270.5	167.9	246.7	609.2	0.97	0.35	15.91	24.74
100.12	5.47	27.3	385.0	260.1	151.7	533.9	582.6	0.97	0.42	14.28	21.85
102.01	5.62	27.3	398.0	256.6	154.4	312.7	581.8	0.97	0.37	16.48	25.44
104.15	5.70	27.3	392.0	227.8	198.3	346.7	596.9	0.97	0.37	14.17	21.86
106.13	5.66	27.3	65.0	244.9	176.6	297.8	592.3	0.97	0.36	13.60	21.13
107.53		27.3	317.0	0.0	94.4	242.5	265.2	0.97	0.37	15.47	23.81
110.04	5.51	27.3	290.0	183.1	171.7	827.4	525.6	0.97	0.41	16.78	25.25
112.23	5.65	27.3	406.0	148.1	168.3	155.3	487.2	0.97	0.39	17.61	26.63
114.17	5.88	27.3	386.0	233.2	185.9	255.2	590.2	1.00	0.44	15.48	23.93
116.19	5.63	27.3	342.0	250.1	163.3	325.4	584.2	0.97	0.36	15.48	23.89
118.22	5.79	27.3	392.0	183.0	179.0	389.2	532.8	0.97	0.38	15.81	24.38
120.05	5.62	27.3	386.0	245.2	177.3	357.3	593.3	0.97	0.40	13.28	20.34
122.17	5.56	27.3	397.0	244.2	168.6	363.7	583.6	0.97	0.38	15.65	23.95
124.01	5.57	27.3	390.0	197.9	157.0	423.3	525.7	0.97	0.40	8.09	13.43

Table E-30. Transfer data for Train R3 Fermentor 2 at higher reflux.

Train R3 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.43	185.3	392.0	422.8	201.1	514.7	736.7
2.14	5.44	185.8	390.0	411.4	164.3	576.4	688.0
4.24	5.72	199.2	553.0	406.8	178.2	491.3	683.9
6.10	5.92	172.7	400.0	368.1	154.9	655.1	648.4
7.99	5.97	227.0	330.0	299.7	254.7	497.7	625.5
10.01	5.68	161.7	417.0	368.5	176.0	621.1	680.9
12.01	5.74	162.7	384.0	428.5	149.1	193.6	713.0
14.33	5.75	219.0	380.0	388.5	214.2	555.1	681.8
16.24	5.76	181.1	390.0	387.4	165.4	527.5	669.8
18.38	5.87	185.8	378.0	413.1	165.7	512.6	691.1
20.16	5.89	169.8	351.0	393.6	153.4	525.4	675.3
22.00	5.86	146.9	360.0	341.0	145.8	438.2	638.0
24.02	5.70	169.7	365.0	380.4	149.3	1097.5	658.1
26.00	5.63	164.2	395.0	361.2	162.3	304.2	657.4
27.96	5.68	174.6	380.0	370.5	199.0	612.6	693.0
30.06	5.70	143.3	392.0	394.6	125.7	650.9	675.1
32.02	5.57	184.3	347.0	393.5	173.4	391.4	680.7
34.12	5.54	166.8	396.0	342.2	168.9	684.9	642.4
36.20	5.68	162.5	398.0	425.6	131.6	529.6	692.8
38.14	5.48	165.9	359.0	416.9	144.3	555.1	693.4
40.01	5.62	181.1	350.0	376.2	159.8	610.4	653.0
41.99	5.65	184.2	360.0	388.8	146.0	446.7	648.7
44.06	5.70	153.6	360.0	403.1	112.5	678.5	660.1
46.32	5.55	165.8	356.0	381.0	138.4	625.3	651.7
48.10	5.66	175.1	383.0	365.2	163.4	540.3	651.6
49.99	5.69	168.0	355.0	378.1	163.3	182.9	671.5
52.00	5.61	177.5	372.0	363.7	163.2	348.8	647.5
53.95	5.55	166.9	380.0	382.9	154.0	546.6	668.1
56.50	5.57	149.8	390.0	396.0	128.7	770.0	673.0
58.09	5.63	165.4	407.0	412.0	145.4	584.9	690.1
60.02	5.55	174.7	341.0	411.9	169.1	170.2	704.4
62.25	5.61	174.8	360.0	324.3	189.7	259.5	637.3
64.13	5.54	172.4	366.0	343.6	181.0	465.8	650.3
66.02	5.55	171.9	319.0	363.2	173.7	663.6	663.1
68.05	5.79	188.5	335.0	280.4	222.9	665.8	612.9
70.20	5.63	158.3	430.0	322.3	165.5	614.7	627.6
72.23	5.61	165.4	400.0	423.0	173.7	633.8	729.4

Table E-30. Continued.

Train R3 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.06	5.54	184.0	399.0	386.2	184.5	712.5	684.8
76.00	5.47	179.2	390.0	392.9	189.1	729.6	700.9
78.18	5.55	183.0	388.0	388.6	164.4	744.5	668.1
80.29	5.58	188.0	353.0	381.6	189.0	555.1	680.7
82.13	5.49	99.8	400.0	416.6	33.3	506.2	648.2
84.26	5.34	189.9	315.0	350.9	242.8	380.7	701.9
86.22	5.46	157.3	364.0	297.2	170.5	546.6	608.8
88.25	5.63	144.2	362.0	366.9	145.0	497.2	665.8
90.12	5.44	199.6	332.0	322.7	238.9	482.7	660.1
92.09	5.54	174.4	328.0	309.5	195.4	476.8	628.6
94.12	5.71	165.9	425.0	343.7	153.2	289.3	629.1
96.10	5.71	161.2	387.0	411.9	174.5	521.1	723.3
98.05	5.47	167.9	374.0	386.5	172.4	619.0	689.1
100.12	5.45	151.7	398.0	384.6	137.2	444.5	668.2
102.01	5.55	154.4	395.0	400.3	147.3	157.4	691.3
104.15	5.58	198.3	76.0	393.7	200.2	338.2	693.7
106.13	5.57	169.1	339.0	72.3	173.2	306.3	375.0
107.53	5.54	94.4	317.0	331.0	100.6	463.7	635.3
110.04	5.65	171.7	394.0	289.8	209.3	874.2	625.5
112.23	5.77	168.3	394.0	407.7	153.7	455.2	691.2
114.17	5.73	185.9	330.0	385.9	195.2	429.7	693.3
116.19	5.74	163.3	412.0	339.1	152.0	382.9	625.9
118.22	5.77	179.0	370.0	393.0	185.7	421.1	697.8
120.05	5.61	177.3	351.0	386.1	166.6	278.6	673.5
122.17	5.64	168.6	362.0	392.5	187.9	427.5	709.9
124.01	5.67	157.0	421.0	384.6	130.3	461.6	657.9

Table E-31. Transfer data for Train R3 Fermentor 3 at higher reflux.

Train R3 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.55	201.1	341.0	391.7	197.3	906.1	666.0
2.14	5.71	164.3	333.0	386.8	186.0	950.8	661.6
4.24	6.01	178.2	333.0	356.9	183.0	650.9	623.1
6.10	6.06	154.9	347.0	381.7	150.6	674.3	630.5
7.99	5.94	254.7	322.0	326.8	227.1	1135.8	631.4
10.01	6.07	176.0	362.0	419.9	196.9	844.4	693.9
12.01	5.96	149.1	347.0	385.0	172.3	678.5	661.3
14.33	5.97	214.2	331.0	374.2	190.2	751.9	643.8
16.24	5.93	165.4	352.0	392.6	180.4	787.0	660.7
18.38	6.05	165.7	312.0	381.7	174.1	1099.7	646.2
20.16	6.30	153.4	332.0	341.3	171.6	648.7	612.6
22.00	6.01	145.8	327.0	359.5	145.8	789.1	612.6
24.02	5.89	149.3	358.0	360.1	158.6	1135.8	622.5
26.00	5.93	162.2	352.0	395.3	158.3	784.9	644.5
27.96	6.06	199.0	329.0	380.4	191.4	944.4	650.5
30.06	5.90	125.7	373.0	381.1	140.9	906.1	649.4
32.02	5.69	173.4	252.0	350.7	152.1	455.2	592.7
34.12	5.77	168.9	355.0	395.3	175.3	1042.2	654.8
36.20	5.93	131.6	335.0	397.1	131.5	701.9	650.1
38.14	5.63	144.3	323.0	364.1	153.9	897.6	626.8
40.01	5.79	159.8	327.0	350.6	170.5	701.9	614.4
41.99	5.79	146.0	328.0	366.1	150.0	695.5	623.2
44.06	5.90	112.5	354.0	353.6	125.6	904.0	619.8
46.32	5.69	138.4	337.0	357.2	172.5	935.9	644.4
48.10	5.90	163.4	313.0	373.9	169.7	699.8	633.3
49.99	5.94	163.3	342.0	356.3	157.5	931.6	603.6
52.00	5.72	163.2	337.0	374.0	167.7	842.3	631.6
53.95	5.73	154.0	345.0	378.9	158.1	804.0	636.1
56.50	5.73	128.7	346.0	390.6	125.7	878.5	640.7
58.09	5.76	145.4	328.0	395.6	139.5	636.0	642.8
60.02	5.72	169.1	322.0	344.2	160.4	723.2	602.2
62.25	5.81	189.7	327.0	351.0	202.7	859.3	633.9
64.13	5.83	181.0	325.0	366.7	180.5	480.7	625.0
66.02	5.92	173.7	299.0	317.8	229.6	512.6	626.8
68.05	6.34	222.9	347.0	330.2	187.0	493.5	593.3
70.20	5.99	165.5	347.0	430.7	167.1	619.0	685.4
72.23	5.89	173.7	357.0	390.4	173.4	750.8	643.2

Table E-31. Continued.

Train R3 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.06	5.74	184.5	343.0	402.8	164.0	716.8	642.4
76.00	5.63	189.1	347.0	389.9	181.4	912.5	648.4
78.18	5.68	164.4	325.0	388.4	182.5	759.3	659.6
80.29	5.95	189.0	345.0	355.7	183.5	681.7	620.0
82.13	5.92	33.3	347.0	402.3	33.1	665.8	655.2
84.26	5.94	242.8	327.0	313.5	201.7	610.4	599.4
86.22	6.04	170.5	313.0	366.2	245.4	679.3	694.2
88.25	6.14	145.0	337.0	367.5	137.4	659.3	613.0
90.12	5.80	238.9	284.0	332.9	221.4	653.7	631.3
92.09	5.81	195.4	373.0	328.9	238.3	650.7	643.3
94.12	5.82	153.2	357.0	428.5	164.4	240.4	692.8
96.10	5.86	174.5	333.0	391.6	185.9	587.1	656.1
98.05	5.70	172.4	337.0	370.2	181.2	648.7	632.1
100.12	5.71	137.2	364.0	396.1	74.0	831.7	631.0
102.01	5.78	147.3	373.0	397.6	117.8	695.5	666.2
104.15	5.75	200.2	331.0	76.1	136.8	255.2	292.8
106.13	5.68	166.1	307.0	345.7	170.8	678.5	630.5
107.53	5.73	100.6	342.0	330.8	90.9	880.6	601.2
110.04	6.17	209.3	355.0	393.5	166.3	676.4	640.1
112.23	6.13	153.7	285.0	394.4	138.7	636.0	659.5
114.17	5.94	195.2	355.0	330.1	168.8	553.0	583.8
116.19	5.92	152.0	357.0	405.7	99.6	661.5	651.4
118.22	5.91	185.7	301.0	371.7	192.9	727.4	659.0
120.05	5.83	166.6	331.0	350.6	138.5	619.0	602.6
122.17	5.87	187.9	357.0	362.7	162.0	521.1	616.9
124.01	5.80	130.3	365.0	420.3	81.6	525.4	651.7

Table E-32. Transfer data for Train R3 Fermentor 4 at higher reflux.

Train R3 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00	5.80	197.3	300.0	344.0	152.0	2239.7	596.8	0.74	0.47
2.14	5.66	186.0	300.0	329.4	153.8	1682.5	595.3	0.77	0.41
4.24	5.81	183.0	300.0	338.9	142.6	1374.0	596.6	0.73	0.43
6.10	5.83	150.6	300.0	340.0	105.7	1399.6	593.2	0.75	0.40
7.99	5.75	227.1	300.0	324.9	190.1	2248.2	593.3	0.74	0.34
10.01	5.75	196.9	300.0	368.3	134.2	1803.7	603.7	0.79	0.36
12.01	5.96	172.3	300.0	350.4	120.3	1635.7	596.5	0.72	0.46
14.33	5.85	190.2	300.0	327.6	160.3	1892.0	595.8	0.74	0.46
16.24	5.75	180.7	300.0	354.8	123.4	1827.1	595.6	0.72	0.45
18.38	5.73	174.1	300.0	315.7	158.8	2022.8	598.5	0.75	0.41
20.16	5.98	171.6	300.0	322.1	147.1	1646.3	595.7	0.77	0.41
22.00	5.83	145.8	300.0	329.5	113.1	1548.5	594.9	0.77	0.39
24.02	5.75	158.6	300.0	351.7	104.0	2626.8	595.2	0.72	0.39
26.00	5.83	158.3	300.0	357.6	97.4	1995.1	630.8	0.68	0.45
27.96	5.94	191.4	300.0	311.6	157.7	1688.8	576.0	0.67	0.52
30.06	5.88	140.9	300.0	367.3	71.9	2303.5	596.4	0.69	0.46
32.02	7.09	152.1	300.0	352.6	97.6	2046.2	596.2	0.64	0.54
34.12	6.08	175.3	300.0	356.8	116.9	1884.5	596.5	0.65	0.45
36.20	6.07	131.5	300.0	337.2	92.1	2420.5	595.9	0.70	0.44
38.14	5.72	153.9	300.0	327.6	121.0	3120.3	592.8	0.69	0.49
40.01	6.01	170.5	300.0	330.5	133.1	2452.4	591.2	0.68	0.46
41.99	5.88	150.0	300.0	331.2	116.5	1656.9	595.8	0.70	0.45
44.06	5.95	125.6	300.0	350.9	72.2	2618.3	595.6	0.69	0.44
46.32	5.98	172.5	300.0	340.0	127.9	2688.5	593.5	0.67	0.53
48.10	6.18	169.7	300.0	310.1	156.4	1627.2	594.9	0.74	0.44
49.99	5.97	157.5	300.0	344.1	110.8	2831.0	595.5	0.68	0.46
52.00	5.80	167.7	300.0	339.2	119.5	1759.0	589.1	0.70	0.44
53.95	5.90	158.1	300.0	347.2	104.9	2516.2	592.1	0.69	0.47
56.50	5.69	125.7	300.0	349.0	71.1	3739.3	592.5	0.70	0.46
58.09	6.05	139.5	300.0	322.7	117.4	1410.2	598.7	0.72	0.46
60.02	5.82	160.4	300.0	325.3	130.8	759.3	593.8	0.66	0.52
62.25	6.09	202.7	300.0	318.1	180.5	2399.3	594.0	0.69	0.44
64.13	5.83	180.5	300.0	327.8	151.8	687.0	597.2	0.72	0.40
66.02	5.81	229.6	300.0	297.4	219.1	1165.6	596.4	0.70	0.46
68.05	5.85	187.0	300.0	346.9	158.2	933.8	616.2	0.77	0.37
70.20	5.92	167.1	300.0	349.6	113.7	2369.5	594.3	0.78	0.36
72.23	5.80	173.4	300.0	350.1	122.7	3398.9	597.5	0.72	0.46

Table E-32. Continued.

Train R3 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
74.06	5.85	164.0	300.0	344.9	115.5	2726.8	594.5	0.74	0.43
76.00	5.77	181.4	300.0	353.2	128.6	3109.7	598.5	0.70	0.48
78.18	6.15	182.5	300.0	330.9	151.4	2220.6	596.9	0.73	0.45
80.29	6.04	183.5	300.0	347.8	129.7	465.8	592.1	0.71	0.43
82.13	5.77	33.1	300.0	350.0	0.0	1561.2	590.8	0.72	0.45
84.26	5.51	201.7	300.0	329.5	149.9	1312.4	575.8	0.76	0.40
86.22	5.98	245.4	300.0	316.8	201.1	1390.0	595.2	0.77	0.42
88.25	7.02	137.4	300.0	339.7	124.0	1182.3	624.4	0.75	0.36
90.12	7.07	221.4	300.0	286.7	236.6	1361.5	600.0	0.76	0.40
92.09	5.91	238.3	300.0	376.7	139.0	1311.5	594.2	0.74	0.42
94.12	5.92	164.4	300.0	361.1	122.1	644.5	616.9	0.75	0.39
96.10	6.10	185.9	300.0	338.6	145.7	2592.8	596.5	0.74	0.48
98.05	5.87	181.2	300.0	336.5	141.7	2735.3	595.1	0.75	0.41
100.12	5.96	74.0	300.0	365.3	7.3	2548.1	596.7	0.75	0.42
102.01	5.94	117.8	300.0	375.3	39.7	3367.0	595.3	0.75	0.42
104.15	5.93	136.8	300.0	335.4	101.5	3256.4	598.2	0.70	0.46
106.13	5.82	163.8	300.0	313.9	148.0	2831.0	596.2	0.72	0.53
107.53	5.95	90.9	300.0	345.4	45.2	1731.4	597.8	0.78	0.31
110.04	6.17	166.3	300.0	357.6	107.3	2078.1	596.7	0.73	0.44
112.23	6.10	138.7	300.0	290.1	98.2	2414.1	547.7	0.75	0.48
114.17	6.20	168.8	300.0	357.7	110.6	1582.5	597.6	0.71	0.49
116.19	5.91	99.6	300.0	350.6	47.3	3575.5	596.4	0.74	0.41
118.22	5.90	192.9	300.0	305.2	181.8	3507.4	592.2	0.73	0.54
120.05	6.01	138.5	300.0	330.4	112.5	2020.7	602.5	0.74	0.48
122.17	5.93	162.0	300.0	356.0	105.2	2584.3	597.3	0.74	0.41
124.01	5.77	81.6	300.0	366.6	15.1	1739.9	598.2	0.74	0.45

Table E-33. Transfer data for Train P Fermentor 1 at higher reflux.

Train P – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00	5.23	27.3	316.0	168.0	185.8	457.3	509.6	0.97	0.38	16.84	27.15
2.14	5.26	27.3	78.0	169.1	185.3	1246.4	510.2	0.97	0.36	16.86	27.00
3.51		27.3	371.0		121.3	799.8	277.1	0.97	0.36	17.59	27.82
6.10	5.62	27.3	355.0	220.6	192.3	570.0	568.7	0.97	0.38	16.63	26.39
8.01	5.51	27.3	310.0	167.2	219.5	929.5	542.5	0.97	0.10	15.29	24.63
10.01	5.64	27.3	347.0	166.7	179.4	955.0	501.9	0.97	0.40	15.91	26.17
12.01	5.65	27.3	408.0	211.0	176.0	461.6	542.8	0.97	0.37	17.49	28.38
14.34	5.58	27.3	360.0	248.7	197.9	1012.5	602.4	0.98	0.36	17.30	28.31
16.25	5.59	27.3	355.0	222.6	173.1	957.2	551.5	0.98	0.40	17.35	28.12
18.37	5.59	27.3	377.0	210.4	186.8	961.4	553.0	0.98	0.33	16.88	27.33
20.09	5.48	27.3	419.0	260.0	143.4	910.4	574.2	0.97	0.37	16.60	26.98
22.01	5.44	27.3	360.0	278.4	183.2	974.2	617.4	0.97	0.35	16.79	27.08
24.03	5.42	27.3	173.0	242.6	155.3	1097.5	553.7	0.97	0.36	16.37	26.40
26.00	5.36	27.3	146.0	65.1	146.0	380.7	366.9	0.97	0.36	16.63	26.01
27.96	5.39	27.3	382.0	38.1	151.3	1018.8	345.2	0.95	0.39	16.77	26.99
30.08	5.45	27.3	370.0	241.7	181.8	848.7	579.3	0.97	0.38	18.31	29.39
32.02	5.40	27.3	369.0	224.1	182.7	214.8	562.6	0.97	0.24	17.94	28.52
34.15	5.36	27.3	356.0	255.1	156.1	887.0	567.0	0.97	0.01	19.38	30.90
36.21	5.46	27.3	122.0	247.7	149.4	840.2	552.9	0.97	0.37	18.18	29.24
38.13	5.38	27.3	357.0	24.7	139.6	676.4	320.1	0.96	0.40	21.08	33.88
40.01	5.40	27.3	310.0	207.6	177.9	827.4	541.3	0.97	0.37	18.87	30.46
41.99	5.48	27.3	257.0	177.9	172.4	433.9	506.1	0.96	0.38	18.96	30.40
44.08	5.45	27.3	151.0	144.2	153.7	887.0	453.7	0.99	0.40	18.87	30.24
46.27	5.48	27.3	365.0	52.2	126.0	461.6	334.0	0.96	0.35	22.81	35.92
48.10	5.61	27.3	70.0	202.2	187.3	240.4	545.3	0.97	0.34	18.58	29.55
49.51		27.3	355.0	0.0	113.4	370.1	269.2	0.97	0.37	15.17	24.08
52.00	5.36	27.3	302.0	214.6	177.9	610.4	548.3	0.97	0.33	17.59	27.50
53.95	5.43	27.3	334.0	179.0	163.7	353.1	498.5	0.96	0.35	18.66	29.61
56.50	5.44	27.3	329.0	203.0	162.7	961.4	521.5	0.97	0.32	18.61	29.48
58.13	5.53	27.3	381.0	232.9	138.2	514.7	526.9	0.97	0.35	19.04	30.90
60.01	5.57	27.3	287.0	209.4	202.9	223.3	567.9	0.97	0.34	17.94	28.52
62.24	5.47	27.3	333.0	230.1	199.6	742.3	585.5	0.97	0.32	17.95	28.62
64.13	5.45	27.3	366.0	200.8	167.6	546.6	524.2	0.97	0.35	18.30	29.11
65.96	5.54	27.3	364.0	238.9	168.3	376.5	563.0	0.98	0.22	18.44	30.05
68.05	5.41	27.3	313.0	220.3	182.0	801.9	558.1	0.97	0.43	18.25	29.57
70.20	5.42	27.3	358.0	190.4	162.1	623.2	508.3	0.97	0.36	16.48	26.64
72.22	5.45	27.3	380.0	220.8	181.2	395.6	557.8	0.97	0.37	20.78	33.02

Table E-33. Continued.

Train P – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
74.06	5.36	27.3	381.0	247.1	170.9	986.9	573.8	0.97	0.37	16.81	27.06
75.99	5.32	27.3	420.0	247.6	175.4	955.0	578.8	0.97	0.38	21.11	34.09
78.19	5.40	27.3	394.0	250.4	209.5	812.5	615.7	0.98	0.36	18.65	30.07
80.30	5.50	27.3	361.0	272.3	160.2	691.3	588.3	0.98	0.33	17.99	29.41
82.13	5.39	27.3	280.0	142.3	255.5	861.4	553.6	0.97	0.43	16.50	26.92
84.25	5.34	27.3	360.0	143.3	178.5	248.9	477.6	0.97	0.32	18.64	30.10
86.23	5.45	27.3	336.0	199.6	200.5	0.0	558.9	0.97	0.37	17.19	27.55
88.27	5.48	27.3	382.0	217.1	169.3	0.0	542.2	0.97	0.32	17.40	27.77
90.13	5.23	27.3	348.0	220.1	201.5	0.0	577.4	0.97	0.38	15.90	25.03
92.10	5.46	27.3	356.0	205.0	183.7	0.0	544.5	0.97	0.33	15.43	24.09
94.11	5.50	27.3	329.0	210.8	189.0	221.2	555.6	0.97	0.36	15.36	24.11
96.12	6.04	27.3	372.0	194.6	178.6	246.7	529.0	0.97	0.35	9.17	14.10
97.99	5.39	27.3	398.0	236.2	173.4	429.7	565.4	0.97	0.35	14.71	22.83
100.12	5.38	27.3	315.0	252.6	169.4	889.1	592.8	0.97	0.41	14.51	22.71
102.01	5.34	27.3	455.0	232.0	189.7	584.9	592.5	0.97	0.41	14.18	22.22
104.15	5.48	27.3	350.0	289.2	216.5	427.5	670.5	0.98	0.33	13.00	20.71
106.14	5.67	27.3	333.0	202.3	184.5	472.2	551.6	0.97	0.37	14.37	22.52
108.17	5.58	27.3	337.0	185.2	181.3	993.3	531.3	0.97	0.43	16.14	25.09
110.04	5.54	27.3	351.0	196.8	170.8	993.3	532.4	0.98	0.43	15.64	24.71
112.24	5.60	27.3	386.0	212.0	170.5	204.2	547.3	0.97	0.40	8.74	14.36
114.17	5.73	27.3	405.0	238.8	182.7	1137.9	592.3	0.97	0.41	12.15	19.30
116.19	5.62	27.3	347.0	254.4	180.3	793.4	599.5	0.97	0.39	15.35	23.97
118.22	5.75	27.3	382.0	191.3	180.9	663.6	537.0	0.97	0.37	15.18	23.56
120.04	5.58	27.3	360.0	221.8	200.0	312.7	586.6	0.98	0.41	15.38	23.96
122.16	5.51	27.3	342.0	217.2	174.8	502.0	556.8	0.97	0.39	15.38	23.77
124.01	5.35	27.3	445.0	224.0	147.7	795.5	536.5	0.97	0.39	17.79	27.71

Table E-34. Transfer data for Train P Fermentor 2 at higher reflux.

Train P – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.49	185.8	90.0	314.5	208.5	610.4	620.3
2.14	5.40	185.3	370.0	77.3	210.6	2069.6	385.7
3.51	6.01	121.3	351.0	374.3	123.1	550.9	659.2
6.10	5.82	192.3	369.0	346.3	214.3	597.7	651.4
8.01	6.02	219.5	330.0	305.0	271.8	738.1	656.1
10.01	6.10	179.4	382.0	349.0	186.5	680.6	639.2
12.01	6.07	176.0	340.0	406.3	186.7	487.1	700.1
14.34	6.36	197.9	328.0	356.1	196.1	623.2	637.4
16.25	6.49	173.1	365.0	355.5	168.9	597.7	617.3
18.37	5.93	186.8	361.0	379.6	169.8	708.3	645.7
20.09	5.92	143.4	375.0	405.3	114.8	601.9	659.8
22.01	5.76	183.2	145.0	362.8	198.6	531.8	661.3
24.03	5.71	155.3	114.0	167.5	144.4	406.3	439.7
26.00	5.50	146.0	376.0	147.3	124.6	291.4	409.0
27.96	5.72	151.3	326.0	382.2	161.4	725.3	675.4
30.08	5.85	181.8	369.0	362.4	158.5	897.6	622.2
32.02	5.71	182.7	325.0	372.6	181.6	476.4	654.6
34.15	5.85	156.1	86.0	355.6	137.4	816.8	620.0
36.21	5.64	149.4	348.0	121.4	127.8	610.4	382.9
38.13	5.69	139.6	325.0	359.4	143.3	397.7	646.2
40.01	5.62	177.9	240.0	310.3	200.2	825.3	615.7
41.99	5.65	172.4	117.0	257.6	163.8	408.4	532.1
44.08	5.61	153.7	350.0	149.9	139.1	778.5	418.4
46.27	5.57	126.0	77.0	367.7	101.4	695.5	628.1
48.10	5.68	187.3	358.0	68.5	197.6	276.5	361.9
49.51	5.57	113.4	335.0	356.8	123.4	838.0	649.9
52.00	5.45	177.9	337.0	303.1	214.8	997.6	623.1
53.95	5.65	163.7	338.0	334.9	179.7	580.7	634.0
56.50	6.03	162.7	356.0	329.5	184.6	984.8	634.5
58.13	5.78	138.2	410.0	373.8	117.9	606.2	636.6
60.01	5.68	202.9	329.0	389.3	214.8	491.3	692.7
62.24	5.73	199.6	350.0	325.0	224.3	835.9	632.8
64.13	5.72	167.6	344.0	365.9	158.6	406.3	640.0
65.96	5.66	168.3	327.0	360.7	164.4	529.6	639.9
68.05	5.69	182.0	342.0	310.6	206.7	825.3	618.4
70.20	5.54	162.1	366.0	358.5	156.2	578.5	635.7
72.22	5.61	181.2	360.0	378.0	182.6	633.8	662.5

Table E-34. Continued.

Train P – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.06	5.57	170.9	389.0	383.3	159.0	874.2	654.5
75.99	5.60	175.4	380.0	417.4	163.7	689.1	688.8
78.19	5.80	209.5	340.0	396.1	207.4	597.7	679.8
80.30	5.82	160.2	319.0	363.0	148.1	519.0	634.0
82.13	5.69	255.5	295.0	278.3	244.5	742.3	609.2
84.25	5.52	178.5	330.0	362.7	184.0	436.0	651.3
86.23	5.48	200.5	360.0	337.0	205.8	573.8	625.4
88.27	5.54	169.3	367.0	382.8	165.2	567.8	661.8
90.13	5.41	201.5	350.0	349.1	231.7	580.0	662.4
92.10	5.58	183.7	316.0	356.6	191.2	539.4	647.2
94.11	5.62	189.0	357.0	334.1	188.4	340.3	616.6
96.12	5.66	178.6	372.0	372.3	179.9	527.5	656.7
97.99	5.52	173.4	303.0	394.6	162.5	680.6	666.8
100.12	5.61	169.4	430.0	314.4	150.0	704.0	593.1
102.01	5.78	189.7	348.0	455.7	177.9	470.1	742.0
104.15	5.64	216.5	336.0	352.6	224.9	474.3	654.1
106.14	5.75	177.4	329.0	341.2	179.3	565.8	635.2
108.17	5.71	181.3	317.0	339.1	176.7	608.3	626.6
110.04	5.77	170.8	372.0	350.6	141.7	480.7	613.6
112.24	5.77	170.5	374.0	387.6	159.3	293.5	668.5
114.17	5.77	182.7	334.0	404.4	158.8	397.7	672.6
116.19	5.80	180.3	377.0	344.7	172.3	536.0	628.8
118.22	5.83	180.9	364.0	382.4	165.0	565.8	658.6
120.04	5.73	200.0	333.0	359.5	214.0	336.1	665.6
122.16	5.64	174.8	407.0	341.5	170.2	646.6	629.0
124.01	5.64	147.7	391.0	443.8	111.2	576.4	699.4

Table E-35. Transfer data for Train P Fermentor 3 at higher reflux.

Train P – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.52	208.5	329.0	90.2	162.0	625.3	338.0
2.14	6.05	210.6	327.0	361.6	189.2	678.5	637.3
3.51	6.17	123.1	334.0	355.9	112.6	495.6	628.5
6.10	5.95	214.3	363.0	358.3	186.2	584.9	631.1
8.01	5.83	271.8	342.0	326.5	252.2	555.1	667.0
10.01	5.86	186.5	332.0	388.6	203.3	657.2	688.5
12.01	5.94	186.7	323.0	341.0	192.7	625.3	630.1
14.34	5.93	196.1	343.0	323.2	210.8	682.8	621.0
16.25	6.07	168.9	347.0	367.3	152.8	1125.2	634.3
18.37	6.05	169.8	337.0	365.1	161.4	1369.8	639.8
20.09	6.01	114.8	111.0	364.9	95.4	1008.2	628.6
22.01	5.82	198.6	67.0	145.6	164.2	804.0	398.0
24.03	5.74	144.4	357.0	111.2	113.4	829.5	363.3
26.00	6.01	124.6	325.0	377.6	108.3	525.4	644.4
27.96	6.36	161.4	339.0	325.5	174.3	667.9	621.5
30.08	6.10	158.5	342.0	359.6	150.4	431.8	634.6
32.02	5.87	181.6	47.0	328.5	200.4	553.0	630.4
34.15	5.76	137.4	331.0	86.3	106.0	821.0	338.0
36.21	6.16	127.8	321.0	347.8	125.7	682.8	628.8
38.13	5.77	143.3	215.0	327.3	148.8	644.5	615.9
40.01	5.82	200.2	89.0	239.3	185.0	591.3	510.8
41.99	5.69	163.8	321.0	118.7	147.1	508.4	385.1
44.08	5.90	139.1	37.0	344.1	127.4	725.3	615.5
46.27	5.45	101.4	346.0	80.1	58.6	857.2	320.4
48.10	6.03	197.6	332.0	352.8	187.9	536.0	626.2
49.51	5.86	123.4	322.0	333.2	130.5	942.3	623.4
52.00	5.94	214.8	317.0	341.2	186.5	550.9	614.6
53.95	5.77	179.7	305.0	338.8	191.0	531.8	633.2
56.50	5.85	184.6	345.0	335.9	164.1	1055.0	598.5
58.13	5.86	117.9	352.0	401.6	80.2	935.9	647.0
60.01	6.01	214.8	321.0	332.7	196.0	844.4	630.8
62.24	6.25	224.3	317.0	335.0	221.0	514.7	644.4
64.13	5.86	158.6	310.0	342.8	166.7	455.2	634.0
65.96	6.08	164.4	339.0	323.8	163.8	912.5	606.3
68.05	5.81	206.7	345.0	336.9	208.1	629.6	630.9
70.20	5.76	156.2	333.0	364.4	157.7	653.0	649.0
72.22	5.88	182.6	367.0	357.2	171.0	689.1	628.7

Table E-35. Continued.

Train P – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.52	208.5	329.0	90.2	162.0	625.3	338.0
74.06	5.72	159.0	351.0	391.1	140.9	806.1	656.1
75.99	6.12	163.7	327.0	382.4	151.5	687.0	653.3
78.19	6.00	207.4	297.0	339.8	197.0	599.8	621.3
80.30	5.93	148.1	333.0	317.0	144.7	601.9	596.7
82.13	5.81	244.5	272.0	294.5	234.8	663.6	627.1
84.25	5.71	184.0	342.0	331.0	197.1	431.8	627.2
86.23	5.83	205.8	335.0	361.9	189.7	574.3	637.4
88.27	5.73	165.2	332.0	368.7	152.2	567.9	638.8
90.13	5.72	231.7	269.0	350.1	189.0	559.4	626.5
92.10	5.71	191.2	327.0	316.5	194.0	533.3	602.4
94.11	5.84	188.4	347.0	361.3	172.0	199.9	628.0
96.12	5.80	179.9	74.0	373.6	171.1	495.6	647.9
97.99	5.81	162.5	385.0	295.9	129.4	472.2	545.9
100.12	6.02	150.0	347.0	425.1	103.0	691.3	676.2
102.01	6.08	177.9	325.0	350.1	153.0	723.2	623.3
104.15	6.16	224.9	331.0	337.1	212.5	601.9	635.5
106.14	5.81	172.3	297.0	337.5	193.8	563.7	651.1
108.17	5.88	176.7	327.0	317.3	96.3	578.5	529.0
110.04	5.87	141.7	362.0	371.7	158.8	567.9	680.9
112.24	5.97	159.3	319.0	374.2	150.5	425.4	657.5
114.17	5.99	158.8	355.0	334.4	151.7	423.3	619.4
116.19	5.92	172.3	362.0	372.4	159.4	580.7	651.6
118.22	5.92	165.0	291.0	365.9	154.4	687.0	647.4
120.04	5.82	214.0	364.0	332.7	174.6	584.9	593.0
122.16	5.83	170.2	337.0	404.3	141.2	644.5	667.4
124.01	5.74	111.2	335.0	389.9	68.3	661.5	639.1

Table E-36. Transfer data for Train P Fermentor 4 at higher reflux.

Train P – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00	5.63	162.0	300.0	332.0	134.1	2152.9	612.2	0.79	0.34
2.14	5.63	189.2	300.0	323.4	164.2	1329.4	596.5	0.75	0.37
3.51	5.76	112.6	300.0	335.3	74.6	1635.7	595.4	0.75	0.46
6.10	5.67	186.2	300.0	355.2	130.1	1893.0	597.2	0.75	0.39
8.01	5.63	252.2	300.0	339.4	174.6	1691.0	592.2	0.62	0.24
10.01	5.79	203.3	300.0	335.6	199.1	750.8	629.5	0.78	0.34
12.01	5.71	192.7	300.0	327.1	164.6	1403.8	597.1	0.76	0.39
14.34	5.74	210.8	300.0	341.9	166.7	2154.7	595.9	0.75	0.42
16.25	5.76	152.8	300.0	347.2	104.9	1565.5	597.4	0.89	0.84
18.37	5.83	161.4	300.0	339.5	100.8	542.4	577.0	0.73	0.51
20.09	6.10	95.4	300.0	109.7	45.0	857.2	308.5	0.78	0.50
22.01	6.08	164.2	300.0	68.7	41.2	1279.9	243.8	0.78	0.53
24.03	5.73	113.4	300.0	349.5	62.3	2114.2	596.5	0.68	0.44
26.00	5.84	108.3	300.0	327.7	77.8	1578.2	595.3	0.68	0.45
27.96	5.75	174.3	300.0	340.9	131.4	2316.3	596.1	0.65	0.47
30.08	5.71	150.4	300.0	333.8	113.6	2424.8	595.1	0.68	0.44
32.02	5.67	200.4	300.0	49.8	67.5	538.1	215.0	0.71	0.44
34.15	5.90	106.0	300.0	333.5	86.8	867.8	597.4	0.70	0.42
36.21	5.98	125.7	300.0	323.3	83.8	2439.7	579.5	0.68	0.47
38.13	5.62	148.8	300.0	217.6	104.0	1452.7	452.9	0.69	0.50
40.01	6.36	185.0	300.0	91.7	38.9	1401.7	243.7	0.69	0.45
41.99	5.78	147.1	300.0	324.2	118.9	2063.2	594.1	0.72	0.46
44.08	5.93	127.4	300.0	42.3	0.0	302.0	185.7	0.70	0.46
46.27	6.02	58.6	300.0	345.8	0.0	1959.0	563.8	0.70	0.47
48.10	6.06	187.9	300.0	329.0	134.6	2278.0	573.8	0.63	0.51
49.51	5.78	130.5	300.0	325.4	104.4	1654.8	597.4	0.70	0.41
52.00	5.85	186.5	300.0	320.7	158.1	1595.3	590.4	0.71	0.42
53.95	6.24	191.0	300.0	308.1	181.8	1578.2	597.0	0.74	0.41
56.50	5.72	164.1	300.0	348.3	109.7	3658.4	592.0	0.73	0.46
58.13	6.00	80.2	300.0	344.0	35.4	1384.7	597.3	0.70	0.44
60.01	5.98	196.0	300.0	324.6	168.9	1786.7	595.6	0.69	0.47
62.24	6.08	221.0	300.0	309.8	207.0	1172.0	594.7	0.72	0.52
64.13	7.07	166.7	300.0	312.7	154.3	444.5	598.4	0.75	0.38
65.96	6.00	163.8	300.0	335.9	123.5	2709.8	593.7	0.75	0.42
68.05	6.04	208.1	300.0	345.1	161.3	2697.0	596.4	0.73	0.51
70.20	5.95	157.9	300.0	337.7	118.2	1976.0	596.3	0.77	0.38
72.22	5.74	171.0	300.0	364.5	103.0	3171.4	594.6	0.74	0.44

Table E-36. Continued.

Train P – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
74.06	5.81	140.9	300.0	354.6	81.7	2012.1	593.5	0.72	0.38
75.99	5.71	151.5	300.0	328.2	123.5	2050.4	598.3	0.73	0.41
78.19	5.99	197.0	300.0	300.7	194.7	2290.8	596.5	0.73	0.47
80.30	6.03	144.7	300.0	335.5	89.8	1635.7	578.7	0.72	0.39
82.13	6.01	234.8	300.0	273.9	236.9	2435.4	592.3	0.80	0.44
84.25	5.88	197.1	300.0	347.1	165.5	289.3	613.6	0.81	0.40
86.23	5.86	189.7	300.0	338.8	140.4	1662.8	587.6	0.75	0.46
88.27	5.88	152.2	300.0	333.0	91.3	1505.8	570.2	0.72	0.45
90.13	6.02	189.0	300.0	274.1	162.3	1473.3	545.5	0.73	0.52
92.10	5.81	194.0	300.0	331.5	150.8	1232.8	586.4	0.75	0.46
94.11	5.93	172.0	300.0	352.5	110.7	1280.5	589.3	0.73	0.43
96.12	6.33	171.1	300.0	74.6	32.7	1373.1	234.3	0.73	0.46
97.99	5.86	129.4	300.0	382.4	45.7	1886.6	596.8	0.73	0.47
100.12	5.90	103.0	300.0	343.5	57.4	2441.8	596.0	0.66	0.50
102.01	5.84	153.0	300.0	326.6	75.2	2352.5	546.9	0.69	0.50
104.15	5.94	212.5	300.0	335.1	176.4	3099.0	597.1	0.64	0.55
106.14	6.13	186.7	300.0	303.6	178.8	1993.0	593.8	0.74	0.47
108.17	6.12	96.3	300.0	327.0	66.9	2484.3	595.7	0.76	0.42
110.04	6.05	158.8	300.0	364.6	92.1	2822.5	596.0	0.70	0.49
112.24	6.09	150.5	300.0	324.2	123.8	2435.4	595.6	0.73	0.45
114.17	6.02	151.7	300.0	357.9	88.2	1435.7	592.5	0.70	0.48
116.19	5.87	159.4	300.0	360.1	100.8	3626.5	599.6	0.71	0.49
118.22	6.11	154.4	300.0	295.3	152.8	2763.0	591.8	0.76	0.52
120.04	5.92	174.6	300.0	366.5	109.0	2497.1	599.0	0.73	0.46
122.16	5.82	141.2	300.0	343.3	93.4	3507.4	593.6	0.72	0.47
124.01	6.45	68.3	300.0	337.3	30.9	1027.3	598.0	0.72	0.43

**SUPPLEMENTAL F. DATA FOR RESIDUAL BIOMASS RECYCLE IN
COUNTERCURRENT MIXED-ACID FERMENTATION: COMPARISON OF THREE
CARBON-NITROGEN RATIOS AT DIFFERENT RECYCLE POINTS**

Table F-1. Transfer data for Train C Fermentor 1 at low C-N ratio.

Train C – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00	5.59	27.3	368.0	193.4	182.4	961.4	546.6	0.98	0.37	15.68	25.05
1.83	6.16	27.3	360.0	250.8	144.2	465.8	565.8	0.98	0.33	13.61	21.42
3.86	5.78	27.3	347.0	199.4	191.7	778.5	561.9	0.98	0.41	13.79	21.24
6.04	5.79	27.3	422.0	170.4	195.1	846.5	536.3	0.98	0.34	14.98	23.03
8.11	6.00	27.3	390.0	302.6	147.6	640.2	621.0	0.98	0.31	16.29	24.88
9.97	5.95	27.3	415.0	281.5	131.1	967.8	583.4	0.98	0.35	18.40	28.01
11.85	6.25	27.3	387.0	231.0	207.3	929.5	609.1	0.98	0.38	15.46	23.94
14.05	6.15	27.3	390.0	296.3	113.5	1248.5	580.6	0.98	0.28	11.63	17.90
15.82	6.05	27.3	410.0	220.8	183.3	916.7	574.9	0.98	0.36	18.59	28.01
18.06	6.47	27.3	347.0	231.3	192.6	725.3	594.7	0.99	0.37	15.89	24.30
20.00	7.01	27.3	288.0	174.7	181.7	565.8	527.2	0.99	0.30	16.67	23.72
22.18	7.29	27.3	298.0	113.2	177.7	735.9	461.7	0.99	0.27	16.11	24.31
24.17	7.68	27.3	259.0	156.1	166.4	299.9	493.3	0.99	0.36	15.72	23.70
25.98	7.73	27.3	260.0	151.6	131.0	248.9	453.4	0.99	0.36	15.77	23.66
28.10	7.54	27.3	225.0	109.2	166.7	268.0	446.7	0.99	0.38	14.94	18.82
30.07	7.85	27.3	190.0	66.8	177.0	348.8	414.6	0.99	0.34	16.67	20.19
31.91	7.99	27.3	203.0	94.1	122.2	255.2	387.1	0.99	0.37	13.33	16.36
33.64	8.50	27.3	190.0	62.9	159.5	321.2	393.2	0.99	0.37	12.69	15.40
36.08	8.09	27.3	188.0	35.8	182.7	499.8	389.3	0.99	0.39	12.14	14.57
37.95	8.21	27.3	201.0	52.5	162.8	231.8	386.1	0.99	0.37	10.51	12.72
39.85	8.13	27.3	230.0	64.6	165.4	171.2	400.8	0.99	0.34	10.26	12.19
41.67	8.14	27.3	234.0	115.8	141.2	240.4	427.8	0.89	0.04	10.00	11.81
43.96	8.12	27.3	198.0	75.7	184.6	185.0	431.1	0.99	0.27	9.05	10.62
45.68	8.15	27.3	206.0	54.0	162.2	380.7	387.0	0.99	0.38	10.81	12.54
47.95	7.85	27.3	204.0	90.0	138.2	282.9	399.0	0.99	0.35	11.44	13.14
49.95	8.00	27.3	210.0	67.9	159.1	331.8	397.8	0.99	0.35	11.95	13.60
51.91	8.09	27.3	202.0	109.2	123.5	307.4	403.5	0.99	0.40	7.73	8.68
53.86	7.81	27.3	218.0	79.4	148.8	319.6	399.0	0.99	0.40	11.73	13.15
55.71	7.85	27.3	175.0	112.6	123.3	313.5	406.7	0.99	0.37	12.35	13.78
57.84	7.54	27.3	212.0	59.2	142.5	316.5	372.5	0.99	0.40	14.08	15.67
59.91	7.75	27.3	201.0	81.9	155.5	416.9	408.2	0.99	0.61	9.96	10.98
62.10	7.87	27.3	180.0	77.0	150.3	255.2	398.1	0.99	0.41	11.13	12.33

Table F-1. Continued.

Train C – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
63.92	8.11	27.3	180.0	34.8	165.7	336.1	371.3	0.99	0.44	11.94	13.29
66.06	7.73	27.3	211.0	48.9	158.9	136.1	378.6	0.99	0.43	14.07	15.65
67.97	7.40	27.3	200.0	88.0	138.1	368.0	396.9	0.99	0.29	12.75	14.20
69.86	7.48	27.3	205.0	106.5	121.7	197.8	399.0	0.99	0.11	8.62	9.43
71.87	7.55	27.3	222.0	72.4	157.9	440.3	401.1	1.00	0.20	14.00	15.56
73.87	7.51	27.3	185.0	121.4	119.6	402.0	411.8	0.99	0.38	12.32	13.62
75.93	7.61	27.3	166.0	54.3	154.2	319.1	379.3	0.99	0.29	14.44	16.14
77.85	7.18	27.3	180.0	62.2	126.2	478.6	359.2	0.99	0.44	12.35	13.69
79.78	7.48	27.3	201.0	77.4	129.7	423.3	377.9	0.99	0.36	9.93	11.14
81.89	7.58	27.3	192.0	94.8	130.0	491.3	395.6	0.99	0.41	12.26	13.65
83.93	7.26	27.3	159.0	55.0	161.9	289.3	387.7	0.99	0.29	10.16	11.43
85.86	7.58	27.3	112.0	98.1	138.3	265.9	407.2	0.99	0.36	10.75	12.10

Table F-2. Transfer data for Train C Fermentor 2 at low C-N ratio.

Train C – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	6.06	182.4	322.0	368.7	176.8	470.1	661.2
1.83	6.96	144.2	332.0	361.2	103.8	323.3	618.9
3.86	5.88	191.7	430.0	341.4	185.4	529.6	633.2
6.04	6.53	195.1	362.0	422.3	195.5	582.8	720.8
8.11	6.00	147.6	386.0	385.2	124.7	372.2	660.4
9.97	6.38	131.5	415.0	414.7	96.9	555.1	678.2
11.85	6.42	207.3	325.0	385.3	232.5	608.3	708.6
14.05	6.65	113.5	400.0	379.6	50.9	678.5	615.1
15.82	6.71	183.3	350.0	395.9	173.1	242.5	683.8
18.06	7.73	192.6	292.0	334.2	198.5	234.0	638.2
20.00	8.02	181.7	310.0	283.8	173.2	210.6	573.4
22.18	8.37	177.7	270.0	294.9	187.9	229.0	603.2
24.17	8.59	166.4	289.0	256.8	196.5	138.3	585.0
25.98	8.59	131.0	270.0	250.0	165.2	110.6	582.3
28.10	8.54	166.7	250.0	214.6	211.2	102.1	557.2
30.07	8.61	177.0	256.0	188.6	236.2	204.2	545.9
31.91	8.66	122.2	269.0	198.5	178.5	223.3	552.9
33.64	9.00	159.5	250.0	187.5	219.8	161.7	545.9
36.08	8.76	182.7	278.0	186.7	247.4	125.5	549.5
37.95	8.78	162.8	297.0	204.4	237.9	89.3	577.6
39.85	8.69	165.4	286.0	231.0	232.2	104.2	595.9
41.67	8.73	141.2	268.0	230.7	196.2	102.1	583.8
43.96	8.69	184.6	270.0	193.4	257.8	106.4	564.7
45.68	8.71	162.2	265.0	204.5	218.0	117.0	558.4
47.95	8.55	138.2	258.0	200.6	195.0	111.7	555.5
49.95	8.75	159.1	265.0	205.4	208.1	114.3	552.5
51.91	8.69	123.5	277.0	203.6	180.1	113.0	558.3
53.86	8.68	148.8	256.0	210.0	214.0	113.7	573.3
55.71	8.47	123.3	275.0	174.8	195.3	113.3	544.9
57.84	8.45	142.5	285.0	211.1	202.6	113.5	569.3
59.91	8.69	155.5	243.0	203.7	235.1	4.3	581.4
62.10	8.30	150.3	254.0	173.1	216.4	119.1	537.3
63.92	8.35	165.7	275.0	181.5	231.8	193.6	545.7
66.06	8.35	158.9	269.0	207.9	225.4	210.6	572.5
67.97	8.23	138.1	255.0	200.7	191.3	217.0	552.0
69.86	8.14	121.7	280.0	202.8	173.5	197.8	552.7
71.87	8.44	157.9	272.0	214.8	224.3	172.3	579.3

Table F-2. Continued.

Train C – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.87	8.29	119.6	233.0	183.8	202.5	214.8	564.8
75.93	8.47	154.2	254.0	161.0	221.8	168.0	526.7
77.85	8.02	126.2	265.0	179.8	196.8	180.8	548.5
79.78	8.43	129.7	271.0	201.9	192.6	165.9	562.9
81.89	8.41	130.0	250.0	190.4	204.4	212.7	562.9
83.93	8.12	161.9	230.0	157.6	254.1	191.4	547.9
85.86	8.64	138.1	212.0	147.6		8.5	294.4

Table F-3. Transfer data for Train C Fermentor 3 at low C-N ratio.

Train C – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	6.74	176.8	289.0	322.5	201.9	540.3	645.7
1.83	6.62	103.8	363.0	332.4	55.4	1231.5	582.1
3.86	5.94	185.4	369.0	426.0	124.6	1425.1	663.3
6.04	6.23	195.5	321.0	364.1	192.9	1176.2	659.6
8.11	6.50	124.7	383.0	380.2	63.4	914.6	617.0
9.97	6.19	96.9	327.0	415.2	56.7	1431.5	673.1
11.85	7.26	232.5	329.0	317.6	222.3	629.6	618.9
14.05	8.29	50.9	362.0	386.5	1.9	142.5	635.6
15.82	9.03	173.1	297.0	340.4	176.1	108.5	641.5
18.06	8.57	198.5	327.0	277.8	208.3	110.6	585.7
20.00	8.74	173.2	295.0	307.5	174.8	148.9	607.2
22.18	8.91	187.9	305.0	265.8	190.5	122.7	566.5
24.17	8.90	196.5	303.0	287.6	203.4	138.3	593.1
25.98	8.97	165.2	297.0	259.8	204.5	110.6	597.2
28.10	8.95	211.2	297.0	246.6	245.2	17.0	578.7
30.07	8.92	236.2	303.0	254.5	251.9	136.1	581.7
31.91	8.98	178.5	298.0	262.9	229.6	95.7	612.1
33.64	9.50	219.8	307.0	249.0	254.7	136.1	582.0
36.08	8.98	247.4	315.0	278.9	250.6	89.3	604.4
37.95	9.00	237.9	299.0	300.9	261.0	57.4	636.3
39.85	8.93	232.2	305.0	288.1	248.7	44.7	611.2
41.67	8.97	196.2	287.0	264.5	246.6	48.9	613.0
43.96	8.96	257.8	291.0	265.3	242.1	112.7	583.4
45.68	8.96	218.0	290.0	260.1	273.0	97.8	613.2
47.95	8.81	195.0	299.0	254.3	223.7	105.3	581.1
49.95	8.99	208.1	312.0	260.2	241.0	101.6	591.2
51.91	9.11	180.1	292.0	278.2	207.7	103.4	603.9
53.86	8.95	214.0	298.0	245.4	260.0	102.5	589.5
55.71	8.88	195.3	322.0	271.2	211.2	103.0	585.2
57.84	8.82	202.6	285.0	282.3	233.5	102.7	611.3
59.91	8.82	235.1	281.0	243.3	260.9	78.7	579.6
62.10	8.88	216.4	317.0	247.3	259.2	61.7	588.2
63.92	8.50	231.8	297.0	273.9	254.8	295.7	604.0
66.06	8.82	225.4	307.0	263.2	260.9	144.6	601.2
67.97	8.63	191.3	312.0	254.3	236.2	136.1	597.3
69.86	8.54	173.5	307.0	281.3	203.8	93.6	609.7
71.87	8.87	224.3	295.0	266.8	262.3	83.0	604.6

Table F-3. Continued.

Train C – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.87	8.73	202.5	293.0	233.0	256.7	127.6	585.3
75.93	8.95	221.8	310.0	250.3	261.8	57.4	588.4
77.85	8.49	196.8	297.0	264.0	235.9	119.1	601.2
79.78	8.82	192.6	305.0	268.0	223.5	97.8	597.0
81.89	8.80	204.4	299.0	248.9	251.8	25.5	594.4
83.93	8.74	254.1	284.0	228.4	289.3	72.3	594.8
85.86	8.83		285.0	250.4	0.0	6.4	529.0

Table F-4. Transfer data for Train C Fermentor 4 at low C-N ratio.

Train C – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00	8.73	201.9	300.0	292.8	179.6	178.7	570.5	0.75	0.42
1.83	6.34	55.4	300.0	368.0	0.0	436.0	596.3	0.74	0.40
3.86	5.72	124.6	300.0	365.9	45.8	2867.2	585.2	0.72	0.46
6.04	5.95	192.9	300.0	324.2	167.6	2499.2	597.0	0.69	0.62
8.11	6.50	63.4	300.0	380.7	0.0	2012.1	598.6	0.72	0.47
9.97	7.90	56.7	300.0	325.7	18.7	655.1	585.8	0.72	0.45
11.85	8.97	222.3	300.0	328.6	194.7	97.8	600.7	0.68	0.53
14.05	8.20	1.9	300.0	349.6	0.0	136.1	602.7	0.71	0.48
15.82	9.12	176.1	300.0	290.9	145.1	1131.6	558.0	0.74	0.44
18.06	9.10	208.3	300.0	311.7	199.7	57.4	601.2	0.74	0.45
20.00	8.96	174.8	300.0	292.7	185.8	108.5	601.8	0.78	0.39
22.18	9.17	190.5	300.0	299.5	192.5	432.5	599.6	0.78	0.40
24.17	9.15	203.4	300.0	301.2	199.6	106.4	595.5	0.81	0.37
25.98	9.04	204.5	300.0	285.2	222.6	97.8	601.4	0.84	0.39
28.10	9.09	245.2	300.0	284.9	236.9	34.0	599.6	0.86	0.36
30.07	9.11	251.9	300.0	303.9	248.0	53.2	628.4	0.85	0.38
31.91	9.16	229.6	300.0	289.5	274.7	78.7	632.7	0.83	0.38
33.64	9.50	254.7	300.0	306.2	229.6	117.0	625.1	0.83	0.39
36.08	9.14	250.6	300.0	316.8	252.8	95.7	645.4	0.85	0.36
37.95	9.19	261.0	300.0	301.6	252.1	106.4	629.5	0.84	0.35
39.85	9.04	248.7	300.0	309.3	282.0	65.9	640.7	0.85	0.35
41.67	9.18	246.6	300.0	287.4	260.3	57.4	624.9	0.85	0.35
43.96	9.12	242.1	300.0	288.7	262.5	104.2	628.3	0.85	0.39
45.68	9.17	273.0	300.0	287.3	253.3	1140.1	617.7	0.86	0.35
47.95	8.98	223.7	300.0	295.4	280.0	622.1	652.2	0.87	0.37
49.95	9.18	241.0	300.0	308.8	216.1	881.1	602.2	0.84	0.38
51.91	9.12	207.7	300.0	294.7	234.5	751.6	620.2	0.84	0.34
53.86	9.11	260.0	300.0	289.6	236.4	816.4	602.8	0.84	0.39
55.71	9.06	211.2	300.0	316.9	234.9	784.0	638.7	0.83	0.81
57.84	9.05	233.5	300.0	286.1	235.6	800.2	600.3	0.82	0.41
59.91	8.97	260.9	300.0	281.8	254.2	85.1	613.1	0.85	0.34
62.10	9.01	259.2	300.0	308.9	255.9	74.4	641.6	0.84	0.33
63.92	8.74	254.8	300.0	297.0	265.1	106.4	638.9	0.85	0.33
66.06	9.06	260.9	300.0	303.7	252.4	114.9	636.3	0.85	0.33
67.97	8.91	236.2	300.0	314.2	248.8	108.5	639.5	0.86	0.33
69.86	8.68	203.8	300.0	309.2	210.7	46.8	614.2	0.83	0.37
71.87	9.12	262.3	300.0	288.1	235.3	106.4	600.6	0.86	0.31

Table F-4. Continued.

Train C – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
73.87	8.99	256.7	300.0	293.9	272.5	125.5	642.5	0.85	0.35
75.93	9.23	261.8	300.0	305.9	249.2	123.4	633.0	0.86	0.34
77.85	8.72	235.9	300.0	301.4	264.1	129.7	642.2	0.84	0.33
79.78	9.10	223.5	300.0	300.6	236.5	83.0	615.8	0.85	0.31
81.89	9.08	251.8	300.0	299.6	228.2	106.4	603.7	0.85	0.37
83.93	8.98	289.3	300.0	285.3	267.9	78.7	629.7	0.87	0.33
85.86	9.14		300.0	312.8	0.0	17.0	603.7	0.87	0.30

Table F-5. Transfer data for Train R1 Fermentor 1 at low C-N ratio.

Train R1 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00	5.49	27.3	378.0	212.5	172.7	1157.1	538.0	0.98	0.37	13.45	21.04
1.85	6.15	27.3	352.0	233.5	190.1	240.4	576.4	0.98	0.32	12.55	20.24
3.86	5.54	27.3	317.0	210.1	190.6	461.6	553.6	0.98	0.38	13.50	20.15
6.03	5.70	27.3	324.0	158.8	195.6	1055.0	507.2	0.98	0.27	12.56	18.94
8.09	6.00	27.3	372.0	195.6	175.0	397.7	523.4	0.98	0.33	13.60	19.53
9.95	6.09	27.3	349.0	216.8	197.6	699.8	567.2	0.98	0.33	15.28	21.89
11.99	6.59	27.3	343.0	176.2	215.2	663.6	544.2	0.99	0.39	14.28	20.38
14.04	6.75	27.3	295.0	189.2	195.0	642.4	537.0	0.99	0.33	12.27	16.92
16.03	7.14	27.3	145.0	121.5	149.3	550.9	423.6	0.99	0.40	10.50	13.97
18.09	8.33	27.3	37.0	312.9	192.1	146.8	657.8	0.99	0.44	9.92	12.80
20.01		27.3	258.0	0.0	80.8	414.8	233.6	0.99	0.27	13.70	16.62
22.13	7.48	27.3	230.0	80.6	214.0	370.8	447.4	0.99	0.37	13.29	16.36
24.12	7.53	27.3	285.0	91.0	180.0	438.2	425.7	0.99	0.37	16.74	19.89
25.97	7.51	27.3	285.0	170.2	155.7	393.5	478.7	0.99	0.37	14.85	17.43
28.10	7.11	27.3	220.0	122.0	186.4	599.8	461.2	0.99	0.42	12.07	13.96
30.07	7.66	27.3	250.0	44.8	107.6	433.9	305.2	0.99	0.35	13.78	16.20
31.93	7.79	27.3	237.0	134.3	162.6	234.0	449.7	0.99	0.39	12.78	14.78
33.63	7.50	27.3	235.0	101.3	170.1	391.4	424.2	0.99	0.41	13.36	15.37
36.07	7.85	27.3	224.0	110.2	171.1	333.9	434.1	0.99	0.37	12.69	14.44
37.95	7.86	27.3	229.0	80.4	189.5	282.9	422.7	0.99	0.39	11.53	13.14
39.86	7.83	27.3	234.0	104.5	169.7	280.8	427.0	0.99	0.43	11.01	12.43
41.66	8.04	27.3	188.0	116.3	161.9	240.4	431.0	0.99	0.42	10.49	11.76
43.96	7.89	27.3	200.0	49.2	184.4	348.8	386.4	0.99	0.29	11.25	12.58
45.67	7.95	27.3	207.0	75.4	60.7	291.4	388.9	0.99	0.39	9.75	10.79
47.94	7.27	27.3	222.0	104.3	241.4	320.1	498.5	0.99	0.45	12.66	14.02
49.94	7.78	27.3	235.0	104.8	158.5	305.8	416.1	0.99	0.41	10.38	11.37
51.90	7.64	27.3	227.0	148.6	129.7	312.9	431.1	0.99	0.40	12.42	13.65
53.86	7.52	27.3	204.0	119.1	150.4	309.3	422.3	0.99	0.44	8.56	9.27
55.72	7.64	27.3	215.0	100.4	139.3	311.1	392.5	0.99	0.42	14.27	15.64
57.83	7.34	27.3	210.0	131.3	129.5	310.2	413.6	0.99	0.40	12.25	13.41
59.90	7.51	27.3	215.0	87.9	165.7	414.8	406.4	0.99	0.40	12.91	14.13
62.05	7.42	27.3	222.0	121.7	119.9	399.9	394.4	0.99	0.41	11.22	12.30
63.91	8.05	27.3	175.0	110.5	150.1	93.6	413.4	0.99	0.41	13.13	14.40
66.01	7.54	27.3	215.0	65.2	154.2	480.7	372.2	0.99	0.43	14.80	16.28
67.96	7.60	27.3	195.0	83.8	163.8	442.4	400.4	0.99	0.33	11.31	12.46
69.84	7.31	27.3	240.0	70.1	170.7	448.8	393.6	0.99	0.66	10.17	11.16
71.86	7.60	27.3	206.0	119.7	167.7	274.4	440.2	0.99	0.24	12.97	14.11

Table F-5. Continued.

Train R1 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
73.87	7.23	27.3	185.0	69.8	193.8	399.9	416.4	0.99	0.41	12.31	13.50
75.92	7.89	27.3	194.0	42.3	159.8	280.8	354.9	0.99	0.39	13.21	14.51
77.83	7.48	27.3	195.0	50.0	184.2	397.7	387.0	0.99	0.41	12.16	13.32
79.77	7.64	27.3	203.0	95.5	142.9	406.3	391.2	0.99	0.37	10.89	11.96
81.88	7.27	27.3	48.0	100.2	147.4	459.4	400.4	0.99	0.39	11.11	12.28
83.85	6.76	27.3	210.0	0.0	94.1	227.6	246.9	0.99	0.39	11.84	13.02
85.18	7.84	27.3	126.2	88.4	103.6	431.8	344.8	0.99	0.38	16.19	18.26

Table F-6. Transfer data for Train R1 Fermentor 2 at low C-N ratio.

Train R1 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	6.00	172.7	342.0	378.8	148.5	531.8	652.7
1.85	6.64	190.1	308.0	353.3	177.3	289.3	638.6
3.86	6.04	190.6	347.0	310.8	191.1	470.1	609.4
6.03	6.21	195.6	352.0	325.4	205.4	663.6	633.3
8.09	7.00	175.0	368.0	369.2	159.4	395.6	651.7
9.95	7.61	197.6	367.0	348.9	210.4	257.4	659.8
11.99	7.95	215.2	289.0	338.6	237.5	204.2	659.0
14.04	7.63	195.0	340.0	278.7	201.7	212.7	583.5
16.03	7.18	149.3	320.0	137.0	169.4	251.0	455.7
18.09	6.77	192.1	287.0	37.4	175.3	410.5	318.7
20.01	8.28	80.8	280.0	249.8	104.1	187.2	571.2
22.13	8.19	214.0	314.0	226.6	262.8	282.9	573.5
24.12	8.32	180.0	307.0	279.6	210.2	174.4	607.9
25.97	8.33	155.7	260.0	274.2	184.8	136.1	601.4
28.10	7.84	186.4	275.0	208.6	238.5	302.0	558.8
30.07	8.23	107.6	274.0	251.1	126.1	238.2	567.7
31.93	8.02	162.6	303.0	231.3	204.2	225.5	571.0
33.63	8.50	170.1	280.0	232.2	227.4	225.5	587.6
36.07	8.35	171.1	282.0	224.1	226.7	208.4	577.8
37.95	8.39	189.5	297.0	230.9	241.0	146.8	580.5
39.86	8.55	169.7	240.0	234.4	232.4	140.4	595.2
41.66	8.43	161.9	274.0	184.9	217.0	134.0	538.1
43.96	8.52	184.4	295.0	196.4	259.8	93.6	569.9
45.67	8.52	60.7	276.0	205.3	137.1	157.4	579.8
47.94	8.42	241.4	297.0	218.5	271.0	125.5	566.6
49.94	8.43	158.5	300.0	233.1	237.2	141.4	609.9
51.90	8.27	129.7	287.0	228.2	198.4	133.5	595.0
53.86	8.29	150.4	291.0	196.2	220.1	137.5	564.0
55.72	8.11	139.3	275.0	215.5	203.1	135.5	577.4
57.83	8.04	129.5	292.0	208.3	195.3	136.5	572.2
59.90	8.09	165.7	277.0	217.9	236.6	263.7	586.9
62.05	8.20	119.9	264.0	216.1	178.2	178.7	572.5
63.91	7.83	150.1	285.0	174.7	225.6	238.2	548.3
66.01	8.18	154.2	289.0	210.1	226.0	217.0	580.0
67.96	8.12	163.8	290.0	195.1	243.8	227.6	573.2
69.84	8.10	170.7	260.0	241.8	224.5	136.1	593.7
71.86	8.39	167.7	263.0	196.8	230.9	159.5	558.1

Table F-6. Continued.

Train R1 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.87	8.10	193.8	267.0	182.7	266.1	251.0	553.1
75.92	8.48	159.8	264.0	188.8	232.4	131.9	559.5
77.83	8.04	184.2	270.0	192.5	249.5	202.1	555.9
79.77	8.45	142.9	79.0	204.7	209.2	170.2	569.1
81.88	7.75	147.4	264.0	47.2	179.6	402.0	377.5
83.85	7.98	94.1	220.0	209.2	163.2	453.1	576.4
85.18	8.00	103.6	276.0	126.2	124.7	110.6	445.4

Table F-7. Transfer data for Train R1 Fermentor 3 at low C-N ratio.

Train R1 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	6.94	148.5	291.0	342.5	125.9	333.9	618.0
1.85	7.38	177.3	315.0	309.9	157.7	348.8	588.4
3.86	6.12	191.1	337.0	339.0	169.7	833.8	615.7
6.03	7.28	205.6	299.0	354.3	180.3	408.4	627.3
8.09	9.00	159.4	345.0	364.4	98.5	87.2	601.6
9.95	8.26	210.4	289.0	365.3	189.2	117.0	642.2
11.99	7.94	237.5	293.0	285.5	218.9	208.4	580.9
14.04	7.50	201.7	332.0	329.1	176.5	248.9	602.0
16.03	7.67	169.4	307.0	314.9	170.2	402.0	613.8
18.09	7.20	175.3	357.0	276.7	198.3	376.5	597.8
20.01	8.58	104.1	313.0	276.8	168.3	176.5	639.1
22.13	8.73	262.8	309.0	310.4	217.4	318.3	605.7
24.12	8.71	210.2	297.0	304.8	250.9	119.1	643.6
25.97	8.91	184.8	287.0	251.5	224.4	83.0	589.2
28.10	8.72	238.5	287.0	261.5	196.4	80.8	571.5
30.07	8.52	126.1	295.0	273.6	181.6	208.4	627.2
31.93	8.91	204.2	291.0	294.7	208.0	95.7	596.6
33.63	8.50	227.4	302.0	277.8	220.0	146.8	574.3
36.07	8.87	226.7	295.0	280.8	245.9	131.9	602.2
37.95	8.89	241.0	285.0	298.2	241.6	165.9	616.1
39.86	8.68	232.4	299.0	239.9	288.1	21.3	603.7
41.66	8.88	217.0	315.0	270.6	253.1	70.2	604.8
43.96	8.79	259.8	303.0	287.9	248.0	93.6	613.4
45.67	8.87	137.1	294.0	272.4	195.6	101.0	629.0
47.94	8.84	271.0	292.0	291.9	217.7	97.3	585.8
49.94	8.93	237.2	307.0	296.5	260.4	99.2	633.2
51.90	9.01	198.4	317.0	268.7	248.1	98.2	616.5
53.86	8.66	220.1	307.0	280.4	254.6	98.7	613.0
55.72	8.58	203.1	307.0	273.0	225.1	98.5	593.1
57.83	8.53	195.3	322.0	288.9	208.6	98.6	600.3
59.90	8.78	236.6	285.0	277.4	260.6	114.9	615.0
62.05	8.60	178.2	325.0	250.3	227.0	106.4	597.2
63.91	8.62	225.6	297.0	284.5	254.0	187.2	615.3
66.01	8.70	226.0	318.0	283.2	239.2	159.5	599.2
67.96	8.63	243.8	297.0	291.2	243.0	125.5	610.1
69.84	8.58	224.5	277.0	259.8	270.2	93.6	606.7
71.86	8.81	230.9	311.0	255.1	247.3	144.6	578.7

Table F-7. Continued.

Train R1 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.87	8.69	266.1	287.0	265.4	271.4	93.6	613.0
75.92	8.77	232.4	310.0	258.4	293.0	76.6	627.4
77.83	8.40	249.5	47.0	270.2	273.0	104.2	620.4
79.77	8.56	209.2	330.0	81.9	204.4	174.4	375.2
81.88	8.85	179.6	257.0	260.3	224.8	100.0	603.6
83.85	8.61	163.2	275.0	216.4	199.5	95.7	552.7
85.18	8.67	124.7	290.0	273.4	182.0	8.5	628.8

Table F-8. Transfer data for Train R1 Fermentor 4 at low C-N ratio.

Train R1 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00	8.59	125.9	300.0	295.0	133.0	153.1	600.2	0.77	0.40
1.85	7.25	157.7	300.0	318.7	139.1	346.7	597.2	0.76	0.36
3.86	8.10	169.7	300.0	332.2	143.8	476.4	604.4	0.74	0.44
6.03	9.08	180.3	300.0	302.7	180.3	125.5	600.8	0.76	0.40
8.09	9.00	98.5	300.0	343.9	55.8	68.1	601.2	0.72	0.41
9.95	7.79	189.2	300.0	287.1	209.3	325.4	605.3	0.72	0.45
11.99	7.31	218.9	300.0	290.7	231.2	304.2	601.1	0.79	0.38
14.04	6.77	176.5	300.0	321.0	157.8	368.0	600.4	0.78	0.40
16.03	9.03	170.2	300.0	306.1	166.7	212.7	600.7	0.78	0.40
18.09	9.07	198.3	300.0	344.1	158.2	114.9	602.1	0.78	0.42
20.01	8.48	168.3	300.0	311.8	161.0	204.2	602.6	0.82	0.38
22.13	8.99	217.4	300.0	308.7	210.5	177.3	599.9	0.83	0.37
24.12	9.02	250.9	300.0	292.7	234.7	93.6	604.5	0.81	0.37
25.97	9.12	224.4	300.0	283.8	270.7	72.3	631.5	0.80	0.39
28.10	9.16	196.4	300.0	276.9	219.9	36.2	598.5	0.83	0.40
30.07	9.09	181.6	300.0	301.2	189.8	110.6	607.5	0.85	0.36
31.93	9.13	208.0	300.0	280.8	230.8	117.0	601.7	0.81	0.41
33.63	9.00	220.0	300.0	300.0	221.0	117.0	599.1	0.80	0.38
36.07	9.10	245.9	300.0	297.5	229.8	34.0	603.9	0.82	0.35
37.95	8.99	241.6	300.0	288.9	240.5	97.8	607.3	0.84	0.35
39.86	9.10	288.1	300.0	302.2	244.9	42.5	623.9	0.82	0.41
41.66	8.94	253.1	300.0	314.7	269.6	93.6	664.3	0.83	0.38
43.96	9.10	248.0	300.0	300.1	261.2	95.7	638.6	0.85	0.37
45.67	9.15	195.6	300.0	289.8	230.2	329.7	622.5	0.87	0.37
47.94	9.03	217.7	300.0	289.2	229.5	212.7	599.1	0.86	0.39
49.94	9.23	260.4	300.0	306.2	224.9	271.2	609.7	0.83	0.38
51.90	9.09	248.1	300.0	318.5	245.2	241.9	642.3	0.83	0.37
53.86	8.98	254.6	300.0	298.1	252.6	256.6	630.2	0.84	0.26
55.72	9.08	225.1	300.0	308.8	250.7	249.3	637.5	0.84	0.32
57.83	8.98	208.6	300.0	319.8	222.1	252.9	631.4	0.82	0.37
59.90	8.94	260.6	300.0	287.4	239.3	114.9	603.6	0.83	0.35
62.05	9.03	227.0	300.0	318.2	242.9	74.4	638.9	0.82	0.36
63.91	8.76	254.0	300.0	299.6	231.2	108.5	608.1	0.83	0.35
66.01	8.94	239.2	300.0	315.3	238.0	72.3	635.4	0.83	0.35
67.96	8.88	243.0	300.0	298.9	242.0	110.6	618.6	0.83	0.34
69.84	8.74	270.2	300.0	280.8	266.1	110.6	624.2	0.83	0.35
71.86	9.08	247.3	300.0	308.9	268.2	104.2	650.7	0.84	0.30

Table F-8. Continued.

Train R1 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
73.87	8.97	271.4	300.0	287.6	263.8	102.1	628.1	0.85	0.36
75.92	9.12	293.0	300.0	315.9	330.7	93.6	651.7	0.84	0.28
77.83	8.72	273.0	300.0	50.6	246.2	157.4	374.0	0.80	0.34
79.77	9.06	204.4	300.0	327.0	233.7	106.4	654.4	0.85	0.32
81.88	9.00	224.8	300.0	257.2	265.7	100.0	600.0	0.85	0.35
83.85	9.06	199.5	300.0	278.3	226.4	63.8	605.2	0.86	0.36
85.18	9.00	182.0	300.0	286.6	197.6	29.8	600.3	0.87	0.36

Table F-9. Transfer data for Train R2 Fermentor 1 at low C-N ratio.

Train R2 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00	6.35	27.3	360.0	242.5	172.5	391.4	585.8	0.98	0.39	14.61	22.91
2.14	5.51	27.3	385.0	237.1	163.9	616.8	571.8	0.97	0.32	14.44	22.40
4.09	5.60	27.3	387.0	257.0	152.6	735.9	580.4	0.97	0.41	14.54	22.46
6.34	5.53	27.3	366.0	237.4	172.8	825.3	581.0	0.97	0.39	17.77	27.92
8.23	5.64	27.3	360.0	229.1	158.3	670.0	558.2	0.97	0.36	15.97	25.21
10.05	5.77	27.3	352.0	107.1	141.4	357.3	419.3	0.97	0.31	15.77	25.10
12.05	6.13	27.3	305.0	225.2	149.9	527.5	545.9	0.98	0.32	16.49	25.78
14.26	6.25	27.3	318.0	180.8	145.9	952.9	497.5	0.98	0.33	16.00	24.69
16.27	4.85	27.3	335.0	176.8	173.8	480.7	521.4	0.99	0.63	15.85	23.50
18.06	7.37	27.3	277.0	201.0	158.2	253.1	530.0	0.99	0.25	13.72	20.00
20.10	7.61	27.3	223.0	124.0	176.1	342.4	470.9	0.99	0.39	13.85	19.02
22.30	7.61	27.3	225.0	105.6	150.5	297.8	426.9	0.99	0.35	13.20	17.74
24.20	7.61	27.3	232.0	121.4	126.6	331.8	418.8	0.99	0.37	11.77	15.58
25.98	7.69	27.3	270.0	92.7	159.9	246.7	423.4	0.99	0.41	14.73	18.28
28.43	7.56	27.3	178.0	115.7	173.1	504.1	459.6	0.99	0.39	12.18	15.04
30.23	7.66	27.3	184.0	74.0	128.6	365.8	373.4	0.99	0.33	13.68	16.27
32.13	7.54	27.3	117.0	53.5	152.5	419.0	376.8	0.99	0.43	13.73	16.37
33.93	7.72	27.3	222.0	48.0	188.4	567.9	407.2	0.99	0.45	14.03	16.53
36.10	7.71	27.3	222.0	98.1	149.0	1089.0	417.9	0.99	0.45	13.49	15.78
38.01	7.79	27.3	212.0	88.2	160.4	316.9	419.4	0.99	0.43	12.62	14.75
39.93	7.74	27.3	246.0	63.7	171.3	406.3	405.8	0.99	0.46	12.28	14.18
42.30	7.53	27.3	216.0	128.6	145.5	391.4	444.9	0.99	0.45	12.21	13.96
44.19	7.82	27.3	240.0	90.6	151.1	248.9	412.5	0.99	0.31	12.13	13.87
46.22	7.87	27.3	205.0	103.8	157.1	1308.1	431.7	0.99	0.41	12.14	13.53
48.18	7.64	27.3	200.0	121.3	107.9	778.5	400.0	0.99	0.38	12.19	13.53
49.97	7.30	27.3	250.0	86.3	133.1	404.1	390.2	0.99	0.37	11.29	12.61
52.11	7.66	27.3	225.0	144.3	124.7	591.3	439.5	0.99	0.33	11.98	13.27
54.17	7.68	27.3	190.0	71.6	175.1	497.7	417.5	0.99	0.43	13.82	15.30
55.99	7.21	27.3	200.0	79.3	132.2	544.5	382.3	0.99	0.40	14.03	15.63
57.92	7.11	27.3	190.0	111.2	116.6	521.1	398.6	0.99	0.44	14.53	16.36
60.22	7.57	27.3	187.0	84.8	132.6	391.4	388.2	0.99	0.40	14.00	15.68
62.05	7.70	27.3	195.0	51.7	154.6	206.3	377.1	0.99	0.36	15.16	16.97
63.98	7.15	27.3	195.0	92.6	125.4	476.4	388.8	0.99	0.42	13.15	14.72
66.14	7.60	27.3	207.0	75.9	142.7	553.0	389.4	0.99	0.24	13.69	15.45
68.27	7.53	27.3	180.0	74.4	151.4	414.8	396.6	0.99	0.41	14.02	15.87
69.98	7.08	27.3	191.0	58.3	146.2	470.1	375.3	0.99	0.43	12.44	14.23
71.99	7.19	27.3	223.0	87.3	126.7	419.0	384.8	0.99	0.41	15.50	17.69

Table F-9. Continued.

Train R2 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
74.17	7.35	27.3	193.0	105.7	143.8	416.9	420.3	0.99	0.42	13.16	14.93
75.93	7.19	27.3	176.0	100.1	112.4	506.2	383.3	0.99	0.36	14.10	15.97
77.97	7.10	27.3	198.0	57.4	144.5	553.0	372.7	0.99	0.37	12.97	14.75
80.00	7.24	27.3	192.0	113.9	108.9	431.8	393.6	0.99	0.36	14.21	16.12
82.15	7.99	27.3	176.0	99.6	117.4	533.9	387.8	0.99	0.36	11.51	13.02
83.99	7.84	27.3	215.0	62.3	134.6	557.3	367.7	0.99	0.36	11.96	13.51
86.20	7.61	27.3	150.0	106.0	69.2	68.1	346.0	0.99	0.33	11.44	12.82

Table F-10. Transfer data for Train R2 Fermentor 2 at low C-N ratio.

Train R2 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	6.22	172.5	376.0	355.6	195.3	246.7	658.5
2.14	5.77	163.9	360.0	383.7	151.2	778.5	669.1
4.09	5.78	152.6	337.0	386.0	157.4	704.0	670.9
6.34	6.16	172.8	366.0	359.0	165.3	661.5	631.6
8.23	5.93	158.3	350.0	359.8	172.4	499.8	654.0
10.05	7.25	141.4	337.0	350.7	153.3	353.1	642.7
12.05	7.21	149.9	335.0	301.3	202.5	399.9	634.0
14.26	7.84	145.9	347.0	306.5	191.0	272.3	631.7
16.27	8.05	173.8	306.0	331.8	175.5	182.9	613.6
18.06	8.39	158.2	292.0	276.8	203.3	104.2	602.0
20.10	8.65	176.1	251.0	222.1	262.2	165.9	588.3
22.30	8.42	150.5	280.0	220.7	198.7	135.1	549.0
24.20	8.39	126.6	307.0	232.2	188.4	146.8	574.1
25.98	8.62	159.9	240.0	260.4	218.5	112.7	599.1
28.43	8.30	173.1	228.0	174.9	248.8	282.9	530.7
30.23	8.49	128.6	252.0	179.1	187.3	123.4	517.9
32.13	8.26	152.5	287.0	214.9	200.8	219.1	543.3
33.93	8.49	188.4	266.0	221.1	266.4	225.5	579.2
36.10	8.52	149.0	285.0	221.9	209.2	153.1	562.2
38.01	8.67	160.4	283.0	215.1	229.0	97.8	581.8
39.93	8.42	171.3	273.0	244.5	239.0	72.3	592.3
42.30	8.22	145.5	304.0	213.6	205.1	159.5	553.3
44.19	8.57	151.1	285.0	239.7	230.5	114.9	599.2
46.22	8.69	157.1	239.0	204.4	247.6	123.4	575.0
48.18	8.34	107.9	320.0	193.4	167.6	119.1	533.2
49.97	8.39	133.1	250.0	241.5	221.1	189.3	609.6
52.11	8.56	124.7	273.0	222.7	168.1	154.2	546.2
54.17	8.26	175.1	264.0	187.5	260.3	171.8	552.8
55.99	7.99	132.2	250.0	200.3	228.3	163.0	576.5
57.92	8.07	116.6	260.0	189.4	191.9	167.4	544.8
60.22	8.34	132.6	265.0	185.2	210.2	8.5	560.9
62.05	8.28	154.6	255.0	191.3	258.8	234.0	575.6
63.98	8.19	125.4	277.0	192.6	202.6	178.7	549.9
66.14	8.33	142.7	247.0	206.5	227.1	229.7	571.0
68.27	8.29	151.4	270.0	178.7	228.0	182.9	535.4
69.98	8.07	146.2	264.0	188.5	239.2	206.3	561.6
71.99	8.24	126.7	265.0	221.7	180.4	153.1	555.5

Table F-10. Continued.

Train R2 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.17	8.26	143.8	247.0	189.0	233.7	191.4	559.0
75.93	8.01	112.4	251.0	174.0	198.4	299.9	540.1
77.97	8.11	144.5	250.0	195.3	210.9	172.3	541.8
80.00	7.87	108.9	232.0	192.8	184.3	138.3	548.3
82.15	8.27	117.4	277.0	172.7	196.9	248.9	532.3
83.99	8.06	134.6	265.0	214.7	208.9	253.1	569.1
86.20	8.41	69.2	206.0	184.6	63.3	453.1	458.8

Table F-11. Transfer data for Train R2 Fermentor 3 at low C-N ratio.

Train R2 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	6.62	195.3	341.0	371.3	169.4	684.9	643.5
2.14	5.77	151.2	312.0	357.4	129.9	674.3	634.2
4.09	6.31	157.4	347.0	337.1	128.7	678.5	606.5
6.34	6.09	165.3	341.0	358.2	148.7	565.8	639.7
8.23	6.14	172.4	317.0	345.6	160.1	474.3	631.4
10.05	7.96	153.3	312.0	339.6	127.7	234.0	612.1
12.05	8.57	202.5	317.0	333.4	176.3	157.4	605.3
14.26	8.55	191.0	305.0	333.9	173.0	155.3	614.0
16.27	8.52	175.5	289.0	304.6	163.8	131.9	591.0
18.06	8.91	203.3	292.0	293.5	195.2	46.8	583.5
20.10	8.89	262.2	267.0	251.3	260.3	131.9	588.1
22.30	8.66	198.7	322.0	275.6	228.5	89.3	603.5
24.20	8.67	188.4	257.0	304.7	198.4	112.7	612.8
25.98	8.85	218.5	257.0	232.7	235.5	125.5	549.7
28.43	8.84	248.8	267.0	220.5	250.5	146.8	548.3
30.23	8.79	187.3	283.0	245.9	230.7	83.0	587.4
32.13	8.55	200.8	307.0	284.6	189.8	131.9	571.7
33.93	8.73	266.4	281.0	264.8	256.9	1533.6	599.3
36.10	8.85	209.2	310.0	283.1	251.3	223.3	623.3
38.01	8.97	229.0	287.0	283.6	243.6	89.3	605.9
39.93	8.78	239.0	301.0	270.7	237.3	45.7	584.6
42.30	8.69	205.1	305.0	301.2	222.6	76.6	616.8
44.19	8.90	230.5	272.0	281.9	242.2	68.1	600.6
46.22	8.87	247.6	307.0	238.1	256.0	85.1	569.7
48.18	8.78	167.6	287.0	314.5	182.0	76.6	627.0
49.97	8.78	221.1	267.0	246.9	258.5	97.8	582.4
52.11	8.97	168.1	315.0	260.0	171.1	87.2	561.1
54.17	8.74	260.3	285.0	261.5	264.9	92.5	603.0
55.99	8.35	228.3	297.0	248.4	266.0	89.9	590.3
57.92	8.61	191.9	302.0	262.6	225.9	91.2	594.7
60.22	8.76	210.2	272.0	261.1	248.8	114.9	597.8
62.05	8.72	258.8	307.0	252.0	233.3	125.5	562.5
63.98	8.67	202.6	287.0	274.8	266.8	117.0	637.1
66.14	8.71	227.1	281.0	247.5	254.5	242.5	578.9
68.27	8.68	228.0	297.0	264.8	232.4	80.8	574.1
69.98	8.55	239.2	298.0	259.5	259.3	121.2	596.6
71.99	8.51	180.4	277.0	262.4	223.2	106.4	603.3

Table F-11. Continued.

Train R2 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.17	8.69	233.7	280.0	244.1	250.7	106.4	571.9
75.93	8.61	198.4	283.0	249.5	232.0	125.5	581.2
77.97	8.40	210.9	277.0	248.1	244.7	27.7	580.0
80.00	8.41	184.3	292.0	236.7	224.6	55.3	575.1
82.15	8.74	196.9	297.0	270.6	216.7	114.9	588.2
83.99	8.42	208.9	277.0	264.8	234.5	140.4	588.5
86.20	8.78	63.3	255.0	227.5	22.0	151.0	484.3

Table F-12. Transfer data for Train R2 Fermentor 4 at low C-N ratio.

Train R2 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00	6.42	169.4	300.0	339.5	105.7	2856.6	573.9	0.68	0.52
2.14	6.04	129.9	300.0	311.6	116.3	2426.9	596.1	0.70	0.49
4.09	5.73	128.7	300.0	345.3	78.8	2339.7	593.5	0.70	0.49
6.34	5.87	148.7	300.0	338.0	106.0	2112.1	593.4	0.68	0.49
8.23	8.58	160.1	300.0	316.7	143.8	353.1	598.5	0.73	0.44
10.05	9.07	127.7	300.0	310.3	120.5	89.3	601.2	0.74	0.41
12.05	8.88	176.3	300.0	319.7	160.1	95.7	601.6	0.73	0.40
14.26	8.78	173.0	300.0	295.8	179.2	119.1	600.1	0.75	0.42
16.27	8.70	163.8	300.0	288.6	163.5	97.8	586.4	0.76	0.42
18.06	9.14	195.2	300.0	292.6	205.8	48.9	601.3	0.79	0.42
20.10	9.12	260.3	300.0	268.6	238.6	102.1	585.1	0.79	0.40
22.30	8.81	228.5	300.0	319.2	250.9	75.5	647.2	0.80	0.37
24.20	8.90	198.4	300.0	254.1	227.6	108.5	581.4	0.83	0.35
25.98	9.00	235.5	300.0	251.3	271.6	91.5	601.4	0.85	0.36
28.43	9.09	250.5	300.0	266.2	272.8	97.8	615.3	0.84	0.40
30.23	8.95	230.7	300.0	277.1	276.0	76.6	630.4	0.84	0.36
32.13	8.45	189.8	300.0	306.1	195.7	91.5	610.1	0.82	0.37
33.93	8.96	256.9	300.0	283.2	242.3	129.7	601.8	0.83	0.39
36.10	9.07	251.3	300.0	310.8	248.4	121.2	635.7	0.83	0.38
38.01	9.26	243.6	300.0	283.7	267.1	91.5	630.7	0.84	0.35
39.93	9.00	237.3	300.0	301.7	244.5	31.9	622.9	0.83	0.41
42.30	9.04	222.6	300.0	307.1	235.4	93.6	618.0	0.84	0.38
44.19	9.09	242.2	300.0	269.9	255.7	93.6	601.1	0.85	0.37
46.22	8.93	256.0	300.0	306.7	266.1	110.6	614.9	0.85	0.36
48.18	8.95	182.0	300.0	288.3	231.1	102.1	635.5	0.84	0.37
49.97	9.06	258.5	300.0	266.3	255.2	85.1	605.0	0.85	0.36
52.11	9.18	171.1	300.0	308.2	205.0	93.6	640.2	0.84	0.34
54.17	9.00	264.9	300.0	285.3	238.0	89.3	600.4	0.85	0.35
55.99	8.78	266.0	300.0	288.5	262.9	91.5	625.1	0.83	0.34
57.92	8.76	225.9	300.0	303.3	273.1	90.4	653.4	0.83	0.36
60.22	9.05	248.8	300.0	267.5	259.9	17.0	605.9	0.85	0.36
62.05	8.99	233.3	300.0	304.8	242.9	114.9	623.3	0.82	0.42
63.98	8.73	266.8	300.0	284.4	249.6	97.8	611.6	0.85	0.35
66.14	8.93	254.5	300.0	280.4	290.3	74.4	646.9	0.84	0.28
68.27	9.04	232.4	300.0	295.6	254.1	91.5	624.0	0.85	0.30
69.98	8.22	259.3	300.0	277.4	262.3	110.6	619.4	0.86	0.35
71.99	8.85	223.2	300.0	277.6	271.6	108.5	627.7	0.86	0.36

Table F-12. Continued.

Train R2 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
74.17	9.00	250.7	300.0	275.0	249.8	44.7	603.3	0.84	0.36
75.93	8.88	232.0	300.0	284.9	268.8	117.0	630.5	0.86	0.30
77.97	8.71	244.7	300.0	279.5	252.6	108.5	610.1	0.86	0.36
80.00	8.71	224.6	300.0	292.7	256.5	6.4	626.0	0.84	0.34
82.15	9.06	216.7	300.0	293.7	228.7	102.1	603.8	0.94	0.34
83.99	8.71	234.5	300.0	276.8	249.8	125.5	603.4	0.85	0.35
86.20	9.09	22.0	300.0	281.6	0.0	125.5	525.5	0.86	0.27

Table F-13. Transfer data for Train R3 Fermentor 1 at low C-N ratio.

Train R3 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00	6.10	27.3	420.0	249.0	165.7	287.1	585.5	0.97	0.41	15.20	23.35
2.13	5.57	27.3	375.0	267.5	173.6	474.3	611.9	0.97	0.31	15.16	23.42
4.08	5.65	27.3	292.0	224.0	177.2	399.9	572.0	0.97	0.41	14.61	22.55
6.33	5.64	27.3	330.0	147.1	171.4	440.3	489.3	0.97	0.39	4.57	7.18
8.22	5.98	27.3	340.0	170.9	177.1	493.5	518.8	0.98	0.34	8.86	14.05
10.04	6.38	27.3	327.0	205.2	159.9	561.5	535.9	0.99	0.30	6.04	9.72
12.03	6.73	27.3	270.0	203.4	149.9	359.5	524.1	0.99	0.42	8.75	14.38
14.25	6.59	27.3	256.0	130.2	166.6	361.6	467.6	0.99	0.36	10.31	16.44
15.50	6.43	27.3	270.0	92.4	185.3	565.8	448.5	0.98	0.38	14.84	20.42
18.05	6.93	27.3	242.0	176.7	116.8	497.7	464.3	0.99	0.29	13.17	17.82
20.09	6.94	27.3	240.0	111.6	153.4	436.0	435.8	0.99	0.35	13.77	18.23
22.30	7.48	27.3	250.0	96.5	165.6	466.9	432.9	0.99	0.30	13.27	17.24
24.20	7.87	27.3	232.0	138.8	132.2	572.2	441.8	0.99	0.38	12.48	15.77
25.92	7.29	27.3	305.0	98.2	154.4	508.4	423.4	0.99	0.37	11.44	14.32
28.42	6.97	27.3	242.0	134.6	184.1	1123.1	489.5	0.99	0.38	14.32	16.82
30.23	6.98	27.3	218.0	111.6	151.2	776.4	433.6	0.99	0.36	15.40	18.12
32.12	7.02	27.3	292.0	87.4	150.2	706.2	408.4	0.99	0.44	17.41	20.21
33.92	7.41	27.3	288.0	135.1	176.9	644.5	482.8	0.99	0.40	14.55	16.91
36.08	7.43	27.3	303.0	149.9	163.8	576.4	484.5	0.99	0.38	14.17	16.34
38.00	7.54	27.3	282.0	149.0	179.6	329.7	499.4	0.99	0.41	12.36	14.16
39.92	7.66	27.3	289.0	132.2	169.8	314.8	472.8	0.99	0.43	11.51	13.05
42.29	7.51	27.3	210.0	151.7	163.7	276.5	486.2	0.99	0.39	11.82	13.35
44.19	7.70	27.3	298.0	78.0	157.3	336.1	406.2	0.98	0.30	12.46	14.23
46.22	7.87	27.3	247.0	152.4	163.2	244.6	486.4	0.99	0.41	11.65	12.96
48.16	7.58	27.3	215.0	135.9	133.9	290.3	440.6	0.99	0.39	9.26	10.18
49.96	7.45	27.3	235.0	89.2	151.1	325.4	411.1	0.99	0.37	8.37	9.17
52.10	7.64	27.3	217.0	80.6	173.9	307.9	425.3	0.99	0.40	9.07	9.94
54.17	7.70	27.3	208.0	46.1	196.3	316.7	413.2	0.99	0.43	12.95	14.35
55.98	7.07	27.3	217.0	62.8	169.8	312.3	403.4	0.99	0.44	15.88	17.61
57.91	7.16	27.3	235.0	118.2	123.1	314.5	412.1	0.99	0.35	15.55	17.13
60.16	7.53	27.3	241.0	79.6	177.5	427.5	427.9	0.99	0.43	16.16	17.87
62.03	7.65	27.3	185.0	80.5	181.8	333.9	433.1	0.99	0.38	10.32	11.47
63.97	7.45	27.3	205.0	35.3	174.5	444.5	380.6	0.99	0.45	10.16	11.48
66.14	7.67	27.3	263.0	69.4	130.4	161.7	370.6	0.99	0.24	10.70	11.93
68.25	7.64	27.3	200.0	137.1	142.3	299.9	450.2	0.99	0.42	13.18	14.69
69.96	7.15	27.3	220.0	76.7	124.3	399.9	371.8	0.99	0.39	10.72	11.95
71.98	7.26	27.3	189.0	109.1	138.1	310.5	418.0	0.99	0.34	9.17	10.13

Table F-13. Continued.

Train R3 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
74.13	7.54	27.3	201.0	49.6	165.5	450.9	385.9	0.99	0.36	13.33	14.85
75.91	7.28	27.3	194.0	72.5	146.5	376.5	389.8	0.99	0.40	13.43	14.90
77.96	7.02	27.3	195.0	62.3	154.6	363.7	387.7	0.99	0.38	13.86	15.48
79.98	7.49	27.3	162.0	116.5	108.0	370.1	395.3	0.99	0.35	10.84	12.13
82.14	7.57	27.3	96.0	52.3	138.9	540.3	362.0	0.99	0.39	12.34	13.86
83.97	7.22	27.3	205.0	9.3	71.0	480.7	251.1	0.99	0.39	11.97	13.71
85.50	7.32	27.3	164.0	76.6	151.7	474.3	399.1	0.99	0.38	12.39	14.05

Table F-14. Transfer data for Train R3 Fermentor 2 at low C-N ratio.

Train R3 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	6.13	165.7	380.0	413.6	172.7	389.2	718.7
2.13	5.73	173.6	310.0	373.1	175.4	491.3	673.0
4.08	5.73	177.2	362.0	293.3	187.6	348.8	601.8
6.33	6.71	171.4	366.0	324.3	204.2	453.1	655.2
8.22	7.38	177.1	320.0	338.8	199.4	225.5	659.2
10.04	7.77	159.9	287.0	328.7	147.7	210.6	614.6
12.03	7.07	149.9	310.0	268.7	173.8	272.3	590.7
14.25	7.20	166.6	327.0	250.8	222.0	314.8	604.3
15.50	7.90	185.3	270.0	266.2	233.4	170.2	612.4
18.05	7.88	116.8	297.0	240.6	143.8	206.3	565.7
20.09	8.42	153.4	292.0	232.1	216.6	157.4	593.4
22.30	8.04	165.6	255.0	243.2	201.2	181.9	576.9
24.20	8.19	132.2	327.0	228.0	155.5	136.1	549.4
25.92	8.53	154.4	290.0	294.7	180.3	131.9	618.7
28.42	8.20	184.1	220.0	236.3	231.0	308.4	581.3
30.23	7.56	151.2	292.0	211.2	150.8	414.8	508.9
32.12	7.64	150.2	322.0	289.4	139.5	333.9	576.8
33.92	8.17	176.9	319.0	287.5	203.7	261.6	612.4
36.08	8.42	163.8	376.0	301.5	180.1	191.4	615.9
38.00	8.49	179.6	309.0	280.2	223.2	102.1	621.9
39.92	8.36	169.8	224.0	286.5	186.8	22.3	601.6
42.29	8.17	163.7	348.0	206.6	180.5	140.4	521.1
44.19	8.57	157.3	294.0	292.7	208.0	112.7	641.5
46.22	8.57	163.2	245.0	246.2	202.6	121.2	583.7
48.16	8.33	133.9	290.0	212.8	163.8	117.0	540.8
49.96	8.31	151.1	275.0	227.9	211.3	134.0	586.2
52.10	8.45	173.9	253.0	218.2	228.4	125.5	570.8
54.17	8.35	196.3	284.0	205.9	238.6	129.7	546.3
55.98	8.28	169.8	272.0	213.9	236.5	127.6	578.7
57.91	8.17	123.1	315.0	231.0	160.4	128.7	566.4
60.16	8.44	177.5	247.0	238.7	252.3	63.8	611.6
62.03	8.47	181.8	270.0	182.7	241.6	155.3	540.6
63.97	8.31	174.7	303.0	202.6	239.1	108.5	565.3
66.14	8.56	130.4	269.0	262.3	168.4	117.0	598.4
68.25	8.31	142.3	290.0	194.8	203.0	176.5	553.6
69.96	8.25	124.3	242.0	221.9	185.6	153.1	581.3
71.98	8.21	138.1	280.0	186.6	188.4	123.4	535.0

Table F-14. Continued.

Train R3 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.13	8.33	165.5	260.0	194.0	247.6	144.6	574.2
75.91	8.20	146.5	258.0	193.2	207.0	174.4	551.8
77.96	8.08	154.6	230.0	193.7	216.7	53.2	553.9
79.98	7.95	108.0	182.0	166.3	169.6	91.5	526.0
82.14	8.27	138.9	280.0	93.7	204.3	246.7	457.2
83.97	7.95	71.0	245.0	206.1	174.0	223.3	607.2
85.50	8.19	151.7	244.0	162.7	228.0	214.8	537.1

Table F-15. Transfer data for Train R3 Fermentor 3 at low C-N ratio.

Train R3 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	6.63	172.7	285.0	376.5	173.4	531.8	657.3
2.13	5.96	175.4	327.0	305.0	168.8	536.0	578.5
4.08	7.56	187.6	322.0	360.8	171.7	306.3	625.0
6.33	8.38	204.2	303.0	361.9	170.9	646.6	615.4
8.22	8.58	199.4	282.0	318.0	195.5	83.0	594.1
10.04	6.88	147.7	312.0	295.3	151.7	414.8	579.4
12.03	7.00	173.8	323.0	307.4	190.8	406.3	604.5
14.25	8.59	222.0	323.0	313.5	226.1	157.4	616.0
15.50	8.61	233.4	295.0	267.0	241.6	12.8	585.3
18.05	8.84	143.8	312.0	297.8	187.6	48.9	621.7
20.09	8.93	216.6	257.0	285.5	238.2	83.0	605.8
22.30	8.47	201.2	325.0	251.1	236.7	65.9	566.7
24.20	8.75	155.5	307.0	324.0	168.9	93.6	617.5
25.92	8.85	180.3	282.0	278.9	214.8	76.6	593.5
28.42	8.85	231.0	287.0	211.4	246.9	31.9	534.4
30.23	8.80	150.8	313.0	279.3	198.0	53.2	606.6
32.12	8.66	139.5	332.0	318.1	141.3	129.7	600.0
33.92	8.79	203.7	309.0	317.0	218.7	110.6	612.5
36.08	8.81	180.1	326.0	323.8	179.1	93.6	602.9
38.00	8.87	223.2	292.0	309.5	232.0	70.2	622.1
39.92	8.82	186.8	324.0	220.6	222.6	44.7	536.5
42.29	8.79	180.5	307.0	343.5	177.3	31.9	620.4
44.19	8.92	208.0	267.0	289.9	240.7	76.6	605.8
46.22	8.89	202.6	299.0	244.2	237.0	61.7	558.7
48.16	8.77	163.8	307.0	288.5	188.2	69.1	593.0
49.96	8.77	211.3	267.0	272.1	249.0	76.6	599.1
52.10	8.93	228.4	317.0	252.1	241.8	72.8	570.5
54.17	8.79	238.6	284.0	280.9	280.4	74.7	637.3
55.98	8.47	236.5	308.0	269.4	262.9	73.8	611.0
57.91	8.58	160.4	299.0	313.7	205.8	74.2	638.9
60.16	8.84	252.3	279.0	245.6	269.6	25.5	594.8
62.03	8.82	241.6	327.0	268.0	276.9	89.3	621.0
63.97	8.72	239.1	283.0	300.8	281.0	108.5	658.3
66.14	8.86	168.4	309.0	269.0	233.5	85.1	614.2
68.25	8.89	203.0	294.0	282.9	231.6	93.6	591.6
69.96	8.55	185.6	289.0	240.2	247.1	40.4	581.8
71.98	8.67	188.4	306.0	276.1	215.9	70.2	583.7

Table F-15. Continued.

Train R3 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.13	8.78	247.6	297.0	257.0	269.9	87.2	603.0
75.91	8.61	207.0	290.0	255.6	301.0	102.1	630.0
77.96	8.57	216.7	302.0	227.5	263.8	55.3	569.3
79.98	8.38	169.6	302.0	185.7	219.6	78.7	515.8
82.14	8.75	204.3	284.0	271.1	248.4	78.7	596.1
83.97	8.49	174.0	287.0	243.6	224.1	87.2	573.8
85.50	8.69	228.0	280.0	240.6	288.8	106.4	581.5

Table F-16. Transfer data for Train R3 Fermentor 4 at low C-N ratio.

Train R3 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00	6.44	173.4	300.0	283.4	188.3	2069.6	596.4	0.72	0.49
2.13	8.86	168.8	300.0	329.8	143.6	336.1	602.7	0.69	0.51
4.08	9.04	171.7	300.0	320.9	154.9	121.2	602.2	0.71	0.48
6.33	9.01	170.9	300.0	300.1	175.0	138.3	602.3	0.76	0.38
8.22	5.11	195.5	300.0	286.5	212.1	142.5	601.2	0.77	0.38
10.04	7.67	151.7	300.0	310.8	144.0	257.4	601.2	0.79	0.37
12.03	8.18	190.8	300.0	320.5	173.7	202.1	601.5	0.79	0.40
14.25	8.94	226.1	300.0	312.5	210.8	131.9	601.8	0.82	0.38
15.50	9.01	241.6	300.0	297.3	232.1	59.6	606.2	0.82	0.41
18.05	9.07	187.6	300.0	311.1	200.2	17.0	623.7	0.82	0.39
20.09	9.16	238.2	300.0	255.5	262.7	74.4	596.1	0.84	0.39
22.30	8.80	236.7	300.0	319.9	219.7	45.7	617.4	0.82	0.39
24.20	8.71	168.9	300.0	306.3	180.7	102.1	616.2	0.82	0.37
25.92	8.99	214.8	300.0	282.5	234.9	70.2	600.7	0.85	0.33
28.42	9.17	246.9	300.0	284.4	239.4	80.8	601.2	0.83	0.39
30.23	9.11	198.0	300.0	305.7	220.9	63.8	626.7	0.82	0.35
32.12	8.83	141.3	300.0	331.0	114.6	91.5	602.4	0.80	0.41
33.92	9.09	218.7	300.0	310.3	210.5	140.4	600.6	0.77	0.42
36.08	9.13	179.1	300.0	325.6	156.5	48.9	601.1	0.76	0.40
38.00	9.18	232.0	300.0	292.4	227.4	97.8	601.9	0.78	0.41
39.92	9.02	222.6	300.0	324.9	210.5	121.2	614.3	0.81	0.37
42.29	9.07	177.3	300.0	309.2	176.5	53.2	607.0	0.82	0.37
44.19	9.13	240.7	300.0	264.8	240.8	46.8	581.6	0.82	0.41
46.22	9.12	237.0	300.0	298.4	239.9	87.2	614.3	0.82	0.39
48.16	8.96	188.2	300.0	305.0	200.7	67.0	615.6	0.83	0.36
49.96	9.06	249.0	300.0	267.2	209.1	2.1	597.1	0.85	0.34
52.10	9.19	241.8	300.0	317.5	275.3	34.6	671.2	0.83	0.34
54.17	8.96	280.4	300.0	282.7	260.9	18.3	620.5	0.84	0.35
55.98	8.74	262.9	300.0	308.5	271.2	26.5	659.1	0.85	0.33
57.91	8.77	205.8	300.0	299.7	250.2	22.4	642.2	0.84	0.36
60.16	9.08	269.6	300.0	275.1	245.5	4.3	600.0	0.84	0.38
62.03	9.04	276.9	300.0	326.2	248.1	91.5	651.8	0.84	0.33
63.97	8.95	281.0	300.0	284.4	292.6	89.3	656.8	0.86	0.34
66.14	8.96	233.5	300.0	306.5	281.8	95.7	664.2	0.85	0.34
68.25	9.08	231.6	300.0	288.9	241.0	78.7	607.3	0.85	0.36
69.96	8.90	247.1	300.0	289.8	246.0	89.3	616.5	0.86	0.36
71.98	8.82	215.9	300.0	307.6	240.3	104.2	630.1	0.85	0.35

Table F-16. Continued.

Train R3 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
74.13	9.06	269.9	300.0	291.3	230.9	8.5	599.3	0.85	0.33
75.91	8.83	301.0	300.0	291.5	280.9	93.6	650.0	0.85	0.34
77.96	8.69	263.8	300.0	305.0	293.3	87.2	677.9	0.83	0.34
79.98	8.66	219.6	300.0	304.3	264.0	8.5	646.8	0.84	0.36
82.14	9.01	248.4	300.0	277.1	245.5	93.6	600.1	0.85	0.33
83.97	8.72	224.1	300.0	292.0	259.9	93.6	628.7	0.83	0.41
85.50	8.98	228.0	300.0	278.6	249.5	95.7	598.2	0.84	0.37

Table F-17. Transfer data for Train P Fermentor 1 at low C-N ratio.

Train P – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00	6.07	27.3	418.0	313.4	163.1	225.5	641.3	0.97	0.39	16.86	26.59
2.19	5.44	27.3	340.0	279.1	164.1	565.8	608.0	0.97	0.35	14.44	22.63
4.14	5.46	27.3	337.0	207.1	164.7	595.6	536.6	0.97	0.38	14.93	23.39
6.40	5.43	27.3	424.0	214.8	148.3	601.9	527.9	0.97	0.36	15.11	23.73
8.29	4.96	27.3	360.0	270.5	180.0	674.3	615.3	0.98	0.28	15.69	25.30
10.10	5.58	27.3	402.0	235.0	154.6	450.9	554.4	0.97	0.23	15.02	24.35
12.09	5.54	27.3	270.0	267.5	167.0	465.8	599.3	0.97	0.32	14.86	24.62
14.32	5.71	27.3	386.0	139.7	158.1	457.3	462.6	0.97	0.30	15.13	24.59
15.55	5.62	27.3	340.0	214.7	191.3	465.8	570.8	0.98	0.34	14.32	23.52
18.11	6.14	27.3	342.0	192.4	177.4	255.2	534.6	0.97	0.24	14.95	24.26
20.09	6.07	27.3	389.0	221.5	148.1	331.8	534.4	0.97	0.27	16.41	25.95
22.36	6.75	27.3	380.0	230.4	190.2	293.5	585.4	0.98	0.21	15.67	23.61
24.27	7.23	27.3	317.0	279.8	132.5	380.7	577.1	0.99	0.36	14.90	21.90
25.96	7.36	27.3	280.0	215.7	130.1	302.0	510.6	0.99	0.32	14.20	19.97
28.49	7.73	27.3	274.0	132.1	175.3	378.6	472.2	0.99	0.39	14.57	19.67
30.30	7.71	27.3	216.0	73.1	193.3	361.6	431.2	0.99	0.48	16.65	20.87
32.18	7.66	27.3	217.0	89.8	151.9	391.4	406.5	0.99	0.44	14.46	18.16
33.99	8.00	27.3	226.0	77.4	167.6	357.3	409.8	0.99	0.39	12.59	15.72
36.15	7.97	27.3	258.0	96.9	161.4	427.5	423.1	0.99	0.39	12.66	15.50
38.07	8.11	27.3	202.0	83.7	207.6	163.8	456.1	0.99	0.43	10.73	13.14
39.98	8.01	27.3	210.0	76.3	154.7	185.0	395.8	0.97	0.61	10.38	12.50
42.36	7.87	27.3	218.0	50.5	190.5	193.6	405.8	0.99	0.40	11.10	13.13
44.26	8.02	27.3	242.0	86.9	163.1	234.0	414.8	0.99	0.29	10.38	12.32
46.29	8.06	27.3	251.0	88.0	178.7	170.2	431.5	0.99	0.41	8.02	9.27
48.23	7.76	27.3	225.0	101.6	181.7	202.1	448.1	0.99	0.46	7.15	8.20
50.03	7.89	27.3	180.0	66.1	190.1	121.2	421.0	0.99	0.39	8.05	9.10
52.17	8.20	27.3	199.0	42.4	175.5	161.7	382.7	0.99	0.43	8.15	9.19
54.24	7.92	27.3	192.0	44.9	184.9	141.4	394.6	0.99	0.41	4.07	4.47
56.04	7.55	27.3	213.0	63.4	159.3	151.5	387.5	0.99	0.36	7.93	8.87
57.98	8.29	27.3	213.0	77.3	168.0	146.5	410.1	0.99	0.41	7.54	8.40
60.19	7.64	27.3	233.0	84.1	161.3	248.9	410.2	0.99	0.40	10.50	11.73
62.09	7.62	27.3	220.0	96.3	164.4	406.3	425.5	0.99	0.42	11.90	13.31
64.06	7.25	27.3	202.0	117.9	133.6	325.4	416.3	0.99	0.39	9.49	10.59
66.20	7.64	27.3	245.0	104.5	133.1	314.8	402.4	0.99	0.29	13.38	14.79
68.34	7.44	27.3	230.0	89.8	177.0	342.4	431.6	0.99	0.43	12.79	14.11
70.03	7.22	27.3	209.0	100.5	160.9	336.1	426.2	0.99	0.37	14.05	15.48
72.05	7.15	27.3	269.0	95.0	145.5	376.5	405.3	0.99	0.39	11.54	12.74

Table F-17. Continued.

Train P – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
74.15	7.68	27.3	155.0	126.1	176.2	36.2	467.1	0.99	0.17	10.60	11.47
75.97	7.97	27.3	138.0	47.3	134.2	357.3	346.3	0.99	0.36	8.83	9.67
78.03	7.02	27.3	195.0	15.1	154.6	331.8	334.5	0.99	0.44	9.04	10.09
80.05	7.59	27.3	187.0	77.5	149.3	327.6	391.6	0.99	0.36	8.73	9.67
82.21	7.57	27.3	202.0	45.3	151.9	399.9	362.0	0.99	0.36	10.89	12.21
84.04	7.17	27.3	205.0	110.0	119.9	438.2	394.7	0.99	0.37	10.05	11.15
85.55	7.46	27.3	208.0	87.7	144.3	376.5	396.8	0.99	0.36	11.27	12.63

Table F-18. Transfer data for Train P Fermentor 2 at low C-N ratio.

Train P – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	6.11	163.1	350.0	410.3	148.5	336.1	687.8
2.19	5.64	164.1	310.0	338.6	176.1	755.1	642.7
4.14	5.57	164.7	402.0	334.5	142.1	701.9	604.0
6.40	6.20	148.3	360.0	418.0	134.6	825.3	696.4
8.29	4.90	180.0	365.0	360.5	180.1	529.6	652.7
10.10	6.24	154.6	247.0	402.8	120.2	474.3	660.5
12.09	6.03	167.0	360.0	265.6	149.3	619.0	540.0
14.32	6.12	158.1	354.0	375.3	146.0	591.3	655.3
15.55	6.02	191.3	340.0	337.4	199.6	636.0	637.8
18.11	6.64	177.4	397.0	340.6	180.2	576.4	635.5
20.09	7.37	148.1	370.0	388.9	155.6	238.2	688.5
22.36	7.27	190.2	315.0	377.6	189.7	407.3	669.2
24.27	7.78	132.5	297.0	315.4	131.0	159.5	606.0
25.96	8.45	130.1	300.0	275.1	147.8	123.4	590.9
28.49	8.40	175.3	254.0	231.7	240.2	259.5	594.7
30.30	8.54	193.3	260.0	209.1	249.3	68.1	557.2
32.18	8.29	151.9	287.0	217.1	191.4	108.5	548.7
33.99	8.62	167.6	309.0	224.0	232.9	146.8	581.4
36.15	8.74	161.4	280.0	256.8	217.8	142.5	605.3
38.07	8.68	207.6	262.0	204.0	285.9	91.5	574.4
39.98	8.57	154.7	292.0	206.0	209.1	37.2	552.5
42.36	8.57	190.5	304.0	215.2	275.4	57.4	592.2
44.26	8.59	163.1	310.0	237.6	234.2	68.1	600.8
46.29	8.66	178.7	283.0	252.7	235.2	85.1	601.3
48.23	8.55	181.7	255.0	223.3	244.1	76.6	577.8
50.03	8.45	190.1	267.0	178.3	270.3	97.8	550.6
52.17	8.71	175.5	265.0	201.1	234.3	87.2	552.0
54.24	8.60	184.9	296.0	188.9	262.5	92.5	558.6
56.04	8.39	159.3	270.0	212.8	245.9	89.9	591.5
57.98	8.38	168.0	278.0	211.0	229.9	91.2	565.0
60.19	8.42	161.3	292.0	231.8	209.8	40.4	572.4
62.09	8.46	164.4	275.0	217.9	239.7	172.3	585.3
64.06	8.25	133.6	280.0	204.1	204.8	176.5	567.4
66.20	8.46	133.1	277.0	242.2	172.6	136.1	573.8
68.34	8.24	177.0	270.0	223.3	226.6	206.3	565.0
70.03	8.06	160.9	258.0	207.8	225.5	140.4	564.5
72.05	7.93	145.5	210.0	267.0	204.5	87.2	618.1

Table F-18. Continued.

Train P – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.15	7.70	176.2	281.0	151.4	249.2	159.5	516.5
75.97	8.03	134.2	273.0	136.1	199.3	170.2	493.3
78.03	7.91	154.6	243.0	194.3	235.5	174.4	567.3
80.05	7.84	149.3	277.0	167.0	232.6	72.3	542.4
82.21	8.21	151.9	274.0	197.1	240.2	165.9	577.5
84.04	7.93	119.9	280.0	202.8	191.0	157.4	566.0
85.55	8.25	144.3	270.0	205.6	216.4	221.2	569.8

Table F-19. Transfer data for Train P Fermentor 3 at low C-N ratio.

Train P – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	6.51	148.5	292.0	344.8	142.4	799.8	630.8
2.19	5.69	176.1	372.0	308.0	160.2	738.1	584.2
4.14	6.25	142.1	342.0	402.1	114.5	833.8	666.6
6.40	6.16	134.6	359.0	356.0	123.7	687.0	637.2
8.29	5.03	180.1	232.0	363.9	179.9	470.1	655.8
10.10	6.34	120.2	327.0	246.6	107.1	499.8	525.6
12.09	6.21	149.3	337.0	357.6	121.1	591.3	621.5
14.32	6.23	146.0	332.0	341.1	142.6	957.2	629.8
15.55	6.37	199.6	361.0	337.9	186.8	1078.4	617.2
18.11	7.70	180.2	332.0	395.3	148.6	231.8	655.8
20.09	8.41	155.6	305.0	368.4	121.2	91.5	626.1
22.36	8.04	189.7	297.0	308.5	186.9	161.7	597.8
24.27	8.44	131.0	307.0	296.4	132.6	93.6	590.1
25.96	8.92	147.8	297.0	290.5	163.8	95.7	598.6
28.49	8.93	240.2	297.0	252.8	248.4	129.7	587.4
30.30	8.96	249.3	299.0	254.1	281.4	74.4	621.2
32.18	8.53	191.4	332.0	286.8	242.7	97.8	630.2
33.99	8.92	232.9	295.0	306.6	230.1	104.2	622.8
36.15	8.95	217.8	299.0	277.3	255.7	223.3	618.8
38.07	9.04	285.9	297.0	260.7	260.5	80.8	606.7
39.98	8.83	209.1	315.0	289.6	290.7	8.5	665.4
42.36	8.86	275.4	309.0	301.8	227.7	21.3	614.4
44.26	8.82	234.2	320.0	309.3	279.4	38.3	673.4
46.29	8.96	235.2	285.0	281.1	269.4	87.2	635.0
48.23	8.73	244.1	302.0	253.6	268.3	62.7	607.4
50.03	8.80	270.3	290.0	261.1	286.9	61.7	633.2
52.17	9.00	234.3	323.0	264.5	295.5	62.2	648.2
54.24	8.88	262.5	307.0	293.5	266.6	61.9	645.3
56.04	8.63	245.9	300.0	267.5	303.5	62.1	656.3
57.98	8.59	229.9	303.0	274.7	270.7	62.0	632.6
60.19	8.82	209.8	323.0	284.2	259.8	29.8	626.3
62.09	8.88	239.7	297.0	269.1	253.3	70.2	609.9
64.06	8.68	204.8	312.0	275.5	268.3	123.4	631.1
66.20	8.84	172.6	317.0	277.8	209.2	74.4	606.5
68.34	8.81	226.6	312.0	263.8	250.7	129.7	600.8
70.03	8.57	225.5	301.0	256.0	278.7	14.9	622.9
72.05	8.51	204.5	309.0	201.1	263.9	72.3	552.6

Table F-19. Continued.

Train P – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.15	8.61	249.2	317.0	279.0	265.8	95.7	631.3
75.97	8.62	199.3	289.0	271.9	285.1	134.0	649.8
78.03	8.49	235.5	308.0	241.4	255.0	102.1	584.9
80.05	8.31	232.6	302.0	281.6	268.0	4.3	636.6
82.21	8.68	240.2	322.0	267.7	275.2	80.8	628.6
84.04	8.41	191.0	307.0	277.4	269.6	108.5	648.1
85.55	8.69	216.4	314.0	268.8	255.3	129.7	599.8

Table F-20. Transfer data for Train P Fermentor 4 at low C-N ratio.

Train P – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00	6.45	142.4	300.0	290.4	77.3	2161.0	523.4	0.71	0.53
2.19	6.36	160.2	300.0	372.0	87.9	2856.6	597.8	0.64	0.55
4.14	5.84	114.5	300.0	342.7	72.1	2369.5	598.4	0.70	0.44
6.40	5.92	123.7	300.0	360.7	52.5	1089.0	587.6	0.66	0.46
8.29	5.04	179.9	300.0	232.2	165.9	1729.3	516.3	0.75	0.40
10.10	5.84	107.1	300.0	327.7	80.4	1371.9	599.1	0.74	0.39
12.09	5.95	121.1	300.0	335.9	85.3	1899.4	598.2	0.70	0.51
14.32	6.53	142.6	300.0	323.8	112.1	4096.6	591.4	0.75	0.52
15.55	7.92	186.8	300.0	360.9	127.5	676.4	600.0	0.66	0.55
18.11	8.80	148.6	300.0	331.3	120.7	97.8	601.5	0.69	0.48
20.09	8.80	121.2	300.0	306.4	117.6	80.8	600.9	0.72	0.43
22.36	8.50	186.9	300.0	295.9	192.0	89.3	599.1	0.80	0.36
24.27	8.89	132.6	300.0	302.9	137.1	102.1	605.5	0.73	0.43
25.96	9.11	163.8	300.0	291.2	175.7	89.3	601.2	0.74	0.43
28.49	9.22	248.4	300.0	293.2	232.0	102.1	601.1	0.80	0.41
30.30	9.00	281.4	300.0	292.2	257.3	97.8	625.9	0.82	0.32
32.18	8.62	242.7	300.0	328.3	256.6	85.1	662.1	0.80	0.36
33.99	9.05	230.1	300.0	296.5	250.1	127.6	622.9	0.80	0.40
36.15	9.18	255.7	300.0	300.5	233.0	112.7	610.8	0.83	0.39
38.07	9.23	260.5	300.0	292.6	265.1	97.8	636.3	0.83	0.43
39.98	9.06	290.7	300.0	315.2	245.8	6.4	638.3	0.85	0.38
42.36	9.08	227.7	300.0	309.9	288.6	65.9	674.1	0.84	0.36
44.26	9.09	279.4	300.0	317.2	214.1	76.6	607.1	0.84	0.37
46.29	9.08	269.4	300.0	284.4	294.4	108.5	654.5	0.86	0.35
48.23	8.99	268.3	300.0	301.3	270.0	92.5	647.9	0.84	0.35
50.03	8.94	286.9	300.0	290.6	279.2	70.2	648.2	0.85	0.36
52.17	9.20	295.5	300.0	321.8	269.2	81.4	667.9	0.84	0.36
54.24	9.08	266.6	300.0	306.7	292.2	75.8	675.4	0.87	0.22
56.04	8.84	303.5	300.0	299.2	265.1	78.6	644.8	0.87	0.33
57.98	8.76	270.7	300.0	305.8	299.0	77.2	683.2	0.86	0.35
60.19	9.05	259.8	300.0	315.0	298.2	8.5	651.5	0.85	0.37
62.09	9.15	253.3	300.0	300.5	253.8	93.6	632.8	0.85	0.31
64.06	8.88	268.3	300.0	313.3	240.6	85.1	634.3	0.86	0.39
66.20	8.99	209.2	300.0	316.4	248.0	91.5	653.3	0.85	0.35
68.34	9.10	250.7	300.0	307.0	209.3	70.2	594.1	0.84	0.34
70.03	8.86	278.7	300.0	302.6	257.9	106.4	641.2	0.85	0.36
72.05	8.80	263.9	300.0	310.6	267.5	87.2	660.2	0.85	0.31

Table F-20. Continued.

Train P – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
74.15	8.98	265.8	300.0	311.1	220.2	119.1	608.1	0.85	0.31
75.97	8.95	285.1	300.0	289.6	276.2	80.8	644.6	0.86	0.26
78.03	8.73	255.0	300.0	309.5	275.4	55.3	663.5	0.85	0.32
80.05	8.63	268.0	300.0	306.0	252.7	10.6	635.6	0.84	0.39
82.21	8.94	275.2	300.0	318.5	251.3	70.2	648.1	0.85	0.34
84.04	8.65	269.6	300.0	311.1	268.8	78.7	656.2	0.83	0.37
85.55	8.92	255.3	300.0	310.1	290.6	89.3	643.5	0.84	0.37

Table F-21. Transfer data for Train C Fermentor 1 at high C-N ratio.

Train C – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
1.00	5.98										
2.00						278.6					
3.00											
4.00	5.95					163.8					
5.00											
6.00	6.00										
7.65	6.10	27.3	225.0	226.0	164.1	136.1	562.8		0.67		
9.82	6.08	27.3	201.0	113.4	136.8	423.3	421.0	0.92	0.85	15.02	19.60
11.80	5.81	27.3	175.0	82.4	139.8	470.1	393.0	0.99	0.88	18.77	24.75
14.48	5.55	27.3	150.0	62.2	135.4	419.0	368.4	0.97	0.48	21.91	29.70
16.71	5.59	27.3	171.0	37.1	135.9	472.2	343.8	0.97	0.47	24.42	33.35
18.71	5.73	27.3	196.0	53.8	141.5	476.4	366.1	0.96	0.67	25.95	35.71
21.48	5.59	27.3	152.0	89.0	130.8	544.5	390.6	0.96	0.49	24.51	33.71
23.78	5.54	27.3	151.0	33.4	143.1	470.1	347.3	0.96	0.50	24.84	34.48
25.91	5.97	27.3	140.0	39.2	137.1	470.1	347.1	0.96	0.46	26.53	36.76
28.56	5.97	27.3	166.0	53.4	114.2	446.7	338.4	0.96	0.46	27.46	38.50
30.81	5.63	27.3	143.0	52.3	144.4	402.0	367.5	0.90	0.20	27.66	38.20
32.84	5.72	27.3	168.0	23.8	146.5	425.4	341.1	0.95	0.46	26.64	36.65
35.56	5.65	27.3	187.0	53.0	139.7	582.8	363.5	0.96	0.42	26.94	38.03
37.87	5.59	27.3	164.0	54.9	157.8	427.5	383.5	0.96	0.49	24.01	33.19
39.80	5.62	27.3	165.0	45.8	144.0	265.9	360.6	0.95	0.49	25.11	34.19
42.53	5.78	27.3	158.0	80.6	112.9	461.6	364.3	0.96	0.49	27.24	38.13
44.79	5.79	27.3	292.0	148.5	37.0	355.2	356.3	0.96	0.47	24.97	35.27
46.84	5.57	27.3	190.0	109.2	211.5	310.5	491.5	0.96	0.44	23.48	33.34
49.60	6.01	27.3	163.0	66.5	146.7	399.9	384.0	0.96	0.48	18.79	27.23
51.89	6.08	27.3	100.0	47.7	144.7	399.9	363.2	0.96	0.46	20.71	29.79
53.66	5.45	27.3	138.0	9.4	119.2	321.2	299.4	0.96	0.47	19.91	27.81
56.50	5.36	27.3	131.0	35.9	129.7	342.4	336.4	0.95	0.54	22.76	31.64
58.58	5.40	27.3	148.0	19.1	141.9	346.7	331.8	0.95	1.41	21.13	29.96
60.50	5.65	27.3	158.0	16.3	160.3	351.0	347.4	0.95	1.07	19.51	27.35
62.53	6.00	27.3	139.0	46.2	139.9	399.9	356.9	0.96	0.85	21.91	31.07
64.50	5.85	27.3	204.0	38.8	128.6	380.7	338.2	0.96	1.06	23.25	32.75
66.59	5.50	27.3	204.0	70.0	164.2	408.4	405.0	0.96	0.50	20.09	28.42
68.59	5.50	27.3	210.0	116.0	113.7	285.0	400.5	0.96	0.48	19.75	28.06
70.48	5.62	27.3	198.0	78.2	157.5	419.0	406.5	0.96	0.40	16.82	23.57
72.46	5.75	27.3	237.0	68.7	155.0	410.5	394.5	0.96	0.60	17.93	24.61

Table F-21. Continued.

Train C – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
74.69	6.00	27.3	211.0	99.5	162.6	378.6	432.9	0.97	0.94	17.79	24.38
76.51	6.50	27.3	218.0	86.3	151.9	340.3	409.0	0.97	0.10	17.12	23.71
78.53	6.09	27.3	213.0	137.0	108.9	344.6	416.7	0.97	0.38	16.64	22.96
80.55	5.95	27.3	211.0	81.6	158.1	323.3	410.5	0.97	0.36	13.82	19.14
82.53	5.99	27.3	221.0	86.0	150.1	357.3	406.9	0.97	0.45	14.91	20.48
84.51	5.98	27.3	206.0	90.9	156.5	333.9	418.2	0.97	0.40	13.99	19.19
86.53	5.97	27.3	224.0	106.4	123.8	312.7	401.0	0.97	0.48	14.11	18.96
88.46	5.85	27.3	205.0	104.0	147.7	359.5	422.5	0.97	0.66	12.29	16.28
90.48	6.50	27.3	230.0	101.3	132.0	353.1	404.1	0.98	0.47	12.21	16.15
92.53	6.13	27.3	209.0	82.0	173.9	331.8	426.7	0.97	0.43	13.39	17.76
94.52	6.51	27.3	226.0	94.3	141.1	319.1	406.2	0.97	0.51	10.65	14.17
96.53	6.27	27.3	224.0	104.3	148.9	331.8	424.0	0.98	0.50	13.97	18.47
98.52	6.34	27.3	236.0	98.4	150.7	297.8	419.9	0.97	0.50	11.25	14.85
100.52	6.07	27.3	198.0	87.4	173.2	355.2	431.4	0.98	0.53	11.76	15.52
102.53	5.93	27.3	230.0	72.6	152.9	353.1	396.3	0.98	0.51	12.46	16.36
104.49	6.02	27.3	200.0	105.8	151.2	340.3	427.8	0.98	0.46	13.07	17.27
106.59	6.26	27.3	220.0	68.1	78.7	325.4	317.6	0.98	0.50	12.36	16.30
108.51	6.91	27.3	361.0	30.1	51.3	231.8	252.2	0.98	0.41	12.18	16.06
110.58	6.24	27.3	205.0	203.8	89.4	189.3	464.0	0.98	0.50	10.69	14.12
112.68	6.22	27.3	295.0	65.6	166.6	344.6	403.0	0.98	0.44	10.45	13.70
114.77	6.06	27.3	255.0	173.0	148.1	293.5	491.8	0.98	0.36	9.88	13.11
116.70	6.10	27.3	268.0	117.7	163.0	336.1	451.5	0.98	0.33	9.46	12.59
118.51	6.22	27.3	258.0	159.1	129.6	251.0	459.5	0.99	0.41	10.22	13.55
120.73	6.22	27.3	212.0	128.0	62.5	234.0	361.3	0.98	0.41	8.31	10.99
122.53	6.58	27.3	227.0	72.7	49.9	223.3	293.4	0.98	0.37	9.53	12.61
124.52	6.26	27.3	225.0	67.4	94.4	223.3	323.6	0.98	0.36	9.75	12.86
126.66	5.99	27.3	280.0	83.4	168.5	291.4	422.7	0.98	0.41	10.27	13.59
128.81	5.85	27.3	272.0	145.3	161.1	263.7	477.2	0.98	0.43	10.21	13.54
130.79	6.06	27.3	254.0	110.0	187.7	265.9	468.5	0.98	0.46	9.19	12.22
132.72	6.00	27.3	296.0	161.2	113.7	276.5	445.7	0.98	0.51	10.06	13.41
134.56	6.20	27.3	235.0	186.3	43.5	206.3	400.6	0.98	0.51	10.04	13.33
136.42	5.92	27.3	230.0	75.5	186.3	414.8	432.6	0.98	0.51	11.93	16.03
138.52	6.22	27.3	238.0	90.9	164.7	265.9	426.4	0.99	0.48	11.06	14.73
140.77	6.38	27.3	259.0	113.9	57.5	180.8	342.2	0.98	0.34	10.60	14.03
142.78	5.92	27.3	263.0	119.1	166.9	342.4	456.8	0.98	0.49	11.93	15.93
144.91	5.96	27.3	240.0	113.0	177.5	355.2	460.3	0.98	0.49	11.51	15.39
146.64	6.07	27.3	261.0	147.1	120.1	308.4	438.0	0.98	0.41	11.54	15.50

Table F-21. Continued.

Train C – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
148.64	6.50	27.3	234.0	138.6	56.2	282.9	365.6	0.98	0.48	13.23	17.64
150.64	6.11	27.3	232.0	106.8	61.9	244.6	339.5	0.98	0.48	10.17	13.46
152.56	6.04	27.3	239.0	99.7	60.3	176.5	430.8	0.98	0.43	10.78	14.38
154.66	6.07	27.3	255.0	140.9	225.0	278.6	536.7	0.98	0.38	12.30	16.41
156.72	6.01	27.3	236.0	139.0	138.3	357.3	448.1	0.98	0.44	8.93	11.93

Table F-22. Transfer data for Train C Fermentor 2 at high C-N ratio.

Train C – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00							
1.00	6.05						
2.00						265.9	
3.00							
4.00	5.97					176.5	
5.00							
6.00	5.96						
7.65	6.02	164.1	218.0	225.7	200.0	127.6	558.3
9.82	6.00	136.8	192.0	202.6	148.9	268.0	512.8
11.80	5.91	139.8	169.0	174.2	155.7	270.1	488.2
14.48	5.54	135.4	206.0	149.5	150.0	217.0	462.2
16.71	5.44	135.9	216.0	174.5	161.2	206.3	497.9
18.71	5.68	141.5	178.0	195.9	155.6	248.9	508.1
21.48	5.56	130.8	188.0	152.4	152.6	263.7	472.3
23.78	5.46	143.1	162.0	154.2	175.7	259.5	484.9
25.91	5.75	137.1	195.0	142.9	153.6	244.6	457.5
28.56	5.73	114.2	192.0	169.3	138.1	255.2	491.3
30.81	5.60	144.4	197.0	148.9	185.9	242.5	488.5
32.84	5.65	146.5	216.0	167.5	176.1	278.6	495.2
35.56	5.65	139.7	210.0	187.0	165.8	308.4	511.2
37.87	5.49	157.8	201.0	167.0	197.0	206.3	504.3
39.80	5.48	144.0	191.0	167.6	175.9	299.9	497.6
42.53	5.60	112.9	201.0	160.6	144.0	261.6	489.8
44.79	5.57	37.0	332.0	295.8	0.0	255.2	494.3
46.84	5.54	211.5	101.0	187.9	292.2	229.7	566.6
49.60	5.80	146.7	126.0	166.0	177.4	253.1	494.8
51.89	5.76	144.7	179.0	104.6	170.0	255.2	428.0
53.66	5.39	119.2	154.0	140.0	158.9	165.9	477.8
56.50	5.32	129.7	192.0	132.9	151.1	261.6	452.4
58.58	5.35	141.9	196.0	153.3	178.5	199.9	488.0
60.50	5.82	160.3	179.0	159.3	194.9	210.6	492.0
62.53	5.59	139.9	253.0	141.6	174.0	225.5	473.8
64.50	5.35	128.6	252.0	210.5	170.3	212.7	550.3
66.59	5.55	164.2	255.0	203.6	211.9	219.1	549.4
68.59	5.32	113.7	246.0	209.9	157.0	108.5	551.3
70.48	5.42	157.5	285.0	197.2	206.1	282.9	543.9
72.46	5.70	155.0	258.0	238.4	199.9	257.4	581.4

Table F-22. Continued.

Train C – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.69	5.69	162.6	262.0	212.3	207.0	340.3	554.8
76.51	6.00	151.9	258.0	217.3	195.7	229.7	559.2
78.53	5.95	108.9	280.0	216.3	149.6	217.0	555.1
80.55	5.90	158.1	265.0	209.9	226.7	165.9	576.6
82.53	5.82	150.1	266.0	220.6	193.7	204.2	562.3
84.51	5.94	156.5	278.0	204.7	216.6	210.6	562.9
86.53	5.98	123.8	259.0	223.7	173.9	182.9	571.9
88.46	5.89	147.7	276.0	208.9	197.0	206.3	556.3
90.48	6.50	132.0	259.0	229.6	176.4	234.0	572.1
92.53	6.05	173.9	275.0	212.2	219.8	210.6	556.2
94.52	6.32	141.1	266.0	226.6	188.1	206.3	571.7
96.53	6.35	148.9	274.0	224.1	190.1	204.2	563.4
98.52	6.22	130.7	258.0	235.8	189.1	168.0	572.3
100.52	5.92	173.2	278.0	202.1	227.9	259.5	554.9
102.53	5.83	152.9	254.0	230.3	199.7	231.8	575.2
104.49	5.82	151.2	288.0	199.5	205.4	217.0	551.8
106.59	6.09	78.7	260.0	224.8	63.9	217.0	508.1
108.51	6.02	51.3	293.0	361.5	144.2	138.3	752.5
110.58	6.17	89.4	325.0	204.7	100.8	221.2	514.2
112.68	6.09	166.6	295.0	294.7	196.9	204.2	623.1
114.77	6.06	148.1	307.0	258.4	184.1	199.9	592.5
116.70	6.02	163.0	309.0	262.6	204.7	193.6	602.4
118.51	6.07	129.6	297.0	258.7	173.4	225.5	600.6
120.73	5.99	62.5	310.0	215.6	145.7	185.0	596.9
122.53	5.92	49.9	310.0	228.0	64.8	208.4	541.0
124.52	6.14	94.4	317.0	225.0	100.6	174.4	529.2
126.66	5.85	168.5	314.0	279.2	204.9	206.3	613.7
128.81	5.75	161.1	283.0	274.6	198.6	199.9	612.1
130.79	5.94	187.7	337.0	250.6	220.7	199.9	581.7
132.72	5.80	113.7	317.0	296.8	148.5	204.2	629.7
134.56	5.98	43.5	269.0	283.2	112.9	174.4	650.4
136.42	5.83	186.3	284.0	229.7	225.1	302.0	566.6
138.52	5.88	164.7	223.0	242.3	205.6	204.2	581.3
140.77	5.96	57.5	338.0	259.2	159.6	180.8	659.4
142.78	5.78	166.9	299.0	265.8	208.5	206.3	605.5
144.91	5.91	177.5	287.0	242.2	234.8	204.2	596.6
146.64	5.93	120.1	322.0	261.2	146.4	121.2	585.6

Table F-22. Continued.

Train C – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
148.64	6.04	56.2	310.0	238.2	130.7	197.8	610.8
150.64	5.92	61.9	280.0	232.4	67.3	189.3	535.9
152.56	5.92	60.3	262.0	239.4	100.4	146.8	577.6
154.66	5.93	225.0	338.0	255.4	227.5	206.3	558.7
156.72	5.90	138.3	296.1	236.1	233.5	231.8	629.4

Table F-23. Transfer data for Train C Fermentor 3 at high C-N ratio.

Train C – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00							
1.00	6.03						
2.00						251.0	
3.00							
4.00	5.95					157.4	
5.00							
6.00	5.95						
7.65	6.00	200.0	219.0	218.6	228.0	140.4	543.3
9.82	5.97	148.9	151.0	195.1	167.3	219.1	511.6
11.80	5.89	155.7	182.0	168.2	134.7	402.0	445.3
14.48	5.49	150.0	205.0	205.2	119.1	399.9	474.3
16.71	5.36	161.2	185.0	218.5	143.7	270.1	499.1
18.71	5.68	155.6	186.0	177.5	160.4	217.0	480.4
21.48	5.57	152.6	176.0	188.1	147.0	214.8	480.6
23.78	5.48	175.7	222.0	165.2	182.8	204.2	470.4
25.91	5.71	153.6	209.0	197.0	176.6	195.7	518.1
28.56	5.67	138.1	226.0	194.5	149.5	234.0	503.9
30.81	5.62	185.9	222.0	202.3	209.1	206.3	523.6
32.84	5.73	176.1	222.0	214.9	183.3	253.1	520.2
35.56	5.64	165.8	217.0	208.5	174.5	248.9	515.3
37.87	5.57	197.0	215.0	204.0	204.9	191.4	510.0
39.80	5.57	175.9	220.0	193.7	191.9	193.6	507.8
42.53	5.52	144.0	213.0	203.6	159.0	210.6	516.7
44.79	5.55	0.0	332.0	335.2	0.0	208.4	511.0
46.84	5.56	292.2	106.0	199.2	229.7	285.0	508.0
49.60	5.70	177.4	219.0	126.9	227.0	253.1	474.5
51.89	5.75	170.0	184.0	183.8	199.1	221.2	511.0
53.66	5.43	158.9	204.0	155.5	185.9	185.0	480.6
56.50	5.35	151.1	228.0	191.0	163.1	225.5	501.1
58.58	5.35	178.5	214.0	198.9	204.0	274.4	522.5
60.50	5.39	194.9	297.0	178.1	226.8	274.4	511.1
62.53	5.52	174.0	283.0	254.0	216.2	272.3	594.3
64.50	5.26	170.3	293.0	254.8	197.4	214.8	580.0
66.59	5.60	211.9	293.0	254.8	247.6	238.2	588.6
68.59	5.46	157.0	304.0	247.1	203.2	74.4	591.4
70.48	5.63	206.1	297.0	284.9	224.3	270.1	601.2
72.46	5.74	199.9	289.0	260.6	235.0	276.5	593.8

Table F-23. Continued.

Train C – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.69	5.77	207.0	287.0	262.2	234.1	321.2	587.4
76.51	6.00	195.7	299.0	257.4	223.0	221.2	582.8
78.53	5.93	149.6	297.0	282.3	164.9	231.8	595.7
80.55	5.98	226.7	287.0	266.1	247.7	231.8	593.5
82.53	5.95	193.7	318.0	265.1	222.1	234.0	591.6
84.51	5.96	216.6	296.0	278.2	255.4	210.6	615.1
86.53	5.99	173.9	306.0	258.7	209.2	206.3	592.1
88.46	5.96	197.0	291.0	278.8	225.7	142.5	605.6
90.48	6.50	176.4	301.0	258.5	206.7	238.2	586.9
92.53	6.20	219.8	296.0	277.5	242.2	223.3	598.0
94.52	6.47	188.1	309.0	265.5	217.7	227.6	593.2
96.53	6.40	190.1	287.0	274.6	223.9	204.2	606.5
98.52	6.38	189.1	306.0	258.0	217.6	208.4	584.6
100.52	5.98	227.9	283.0	280.7	245.9	248.9	602.4
102.53	5.98	199.7	311.0	254.0	231.4	236.1	583.8
104.49	5.90	205.4	304.0	288.2	266.5	221.2	607.4
106.59	6.12	63.9	303.0	263.1	27.4	204.2	524.7
108.51	6.09	144.2	310.0	293.9	212.6	174.4	660.4
110.58	6.02	100.8	320.0	324.6	178.5	151.0	700.4
112.68	6.19	196.9	302.0	295.1	221.9	202.1	618.2
114.77	6.07	184.1	309.0	309.4	174.6	217.0	598.0
116.70	6.07	204.7	331.0	306.1	204.7	272.3	604.2
118.51	6.09	173.4	314.0	297.6	204.6	280.8	626.9
120.73	5.95	145.7	313.0	313.6	188.3	404.1	654.3
122.53	5.85	64.8	310.0	310.4	146.9	191.4	690.6
124.52	6.05	100.5	317.0	316.3	107.9	274.4	621.8
126.66	5.89	204.9	285.0	314.6	205.0	187.2	612.8
128.81	5.82	198.6	313.0	286.0	197.7	333.9	583.2
130.79	5.91	220.7	170.1	336.0	186.6	236.1	600.0
132.72	5.88	148.5	287.0	317.7	136.7	257.4	604.0
134.56	5.89	112.6	266.0	272.2	161.3	195.7	619.0
136.42	5.68	225.1	340.0	283.7	203.9	718.9	562.8
138.52	5.88	205.6	335.0	326.8	219.1	238.2	638.4
140.77	5.95	159.6	299.0	337.5	225.3	165.9	701.3
142.78	5.86	208.5	313.0	301.9	204.1	265.9	595.6
144.91	5.99	234.8	275.0	288.5	247.2	212.7	610.9
146.64	5.69	146.4	491.0	322.4	144.4	165.9	585.5

Table F-23. Continued.

Train C – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
148.64	5.78	130.7	290.0	314.0	160.7	214.8	642.1
150.64	5.77	67.3	291.0	279.8	151.1	197.8	661.7
152.56	5.86	100.4	289.0	261.5	0.0	236.1	419.2
154.66	5.77	227.5	315.0	338.4	300.4	338.2	714.2
156.72	5.92	233.5	218.5	296.0	237.3	310.5	612.0

Table F-24. Transfer data for Train C Fermentor 4 at high C-N ratio.

Train C – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00									
1.00	6.07								
2.00						189.3			
3.00									
4.00	6.04					176.5			
5.00									
6.00	5.94								
7.65	6.04	228.0	160.0	223.1	246.5	155.3	546.4	0.79	0.41
9.82	6.19	167.3	160.0	153.3	173.7	114.9	457.8	0.79	0.36
11.80	5.92	134.7	160.0	183.3	109.0	627.5	455.7	0.92	0.99
14.48	5.49	119.1	160.0	206.7	68.9	682.8	454.6	0.75	0.40
16.71	5.54	143.7	160.0	187.6	111.6	382.9	453.6	0.72	0.41
18.71	5.85	160.4	160.0	188.9	127.6	368.0	454.2	0.79	0.51
21.48	5.67	147.0	220.0	178.5	124.6	472.2	454.2	0.75	0.38
23.78	5.66	182.8	220.0	225.0	173.3	631.7	513.6	0.77	0.34
25.91	5.78	176.6	220.0	212.4	180.8	438.2	514.7	0.81	0.33
28.56	5.75	149.5	220.0	231.2	135.1	612.6	514.9	0.80	0.33
30.81	5.68	209.1	220.0	227.1	198.9	429.7	515.0	0.79	0.34
32.84	5.81	183.3	220.0	222.2	178.8	333.9	515.8	0.83	0.32
35.56	5.75	174.5	220.0	216.6	175.0	474.3	515.2	0.82	0.31
37.87	5.68	204.9	220.0	216.3	204.4	312.7	513.9	0.82	0.32
39.80	5.66	191.9	220.0	224.1	185.4	310.5	515.7	0.80	0.35
42.53	5.59	159.0	220.0	216.9	157.8	463.7	513.8	0.82	0.31
44.79	5.63	0.0	220.0	334.9	0.0	423.3	514.5	0.82	0.32
46.84	5.80	229.7	220.0	107.5	213.2	393.5	398.2	0.82	0.34
49.60	5.90	227.0	220.0	221.7	225.2	421.1	523.9	0.81	0.35
51.89	5.80	199.1	220.0	187.0	236.1	168.0	522.1	0.79	0.30
53.66	5.41	185.9	220.0	207.9	196.9	248.9	517.0	0.83	0.39
56.50	5.26	163.2	220.0	229.7	150.4	642.4	515.1	0.82	0.43
58.58	5.41	204.0	300.0	217.9	204.9	310.5	516.9	0.82	0.57
60.50	5.54	226.8	300.0	299.4	219.4	395.6	595.1	0.81	0.52
62.53	5.81	216.2	300.0	286.4	232.4	259.5	600.7	0.83	0.50
64.50	6.45	197.4	300.0	295.4	200.2	399.9	596.3	0.85	0.44
66.59	5.65	247.6	300.0	297.1	226.0	380.7	599.2	0.84	0.49
68.59	5.56	203.2	300.0	308.3	218.7	204.2	621.9	0.83	0.49
70.48	5.79	224.3	300.0	300.4	220.9	325.4	595.1	0.83	0.61
72.46	5.87	235.0	300.0	293.0	225.7	440.3	595.3	0.84	0.52

Table F-24. Continued.

Train C – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
74.69	5.66	234.1	300.0	290.3	242.4	531.8	609.5	0.84	0.51
76.51	6.00	225.0	300.0	301.7	230.2	353.1	607.0	0.83	0.49
78.53	6.11	164.9	300.0	300.0	166.4	382.9	599.6	0.84	0.33
80.55	6.08	247.7	300.0	289.3	226.5	380.7	596.7	0.86	0.35
82.53	5.97	222.1	300.0	320.7	229.4	370.1	626.1	0.82	0.40
84.51	6.01	255.4	300.0	299.2	219.8	357.3	597.5	0.84	0.35
86.53	5.98	209.2	300.0	308.4	233.8	299.9	631.1	0.85	0.35
88.46	6.08	225.7	300.0	293.4	227.5	304.2	593.2	0.86	0.37
90.48	6.00	206.7	300.0	303.9	205.9	361.6	601.2	0.84	0.39
92.53	6.11	242.2	300.0	299.0	225.6	340.3	596.9	0.85	0.55
94.52	6.46	217.7	300.0	311.6	225.2	310.5	617.2	0.84	0.55
96.53	6.44	223.9	300.0	290.0	228.9	325.4	596.2	0.84	0.36
98.52	6.41	217.6	300.0	309.0	207.4	316.9	596.9	0.83	0.56
100.52	6.08	245.9	300.0	284.3	234.8	325.4	595.4	0.85	0.37
102.53	5.97	231.4	300.0	313.9	229.5	402.0	619.6	0.83	0.36
104.49	6.08	226.5	300.0	306.9	223.2	355.2	606.0	0.82	0.47
106.59	6.15	27.4	300.0	306.0	34.1	353.1	522.6	0.84	0.35
108.51	6.15	212.6	300.0	313.7	235.9	299.9	635.1	0.84	0.36
110.58	6.16	178.5	300.0	323.3	222.3	240.4	665.2	0.82	0.36
112.68	6.18	221.9	300.0	304.9	215.3	363.7	596.9	0.84	0.31
114.77	6.18	174.6	300.0	311.6	162.7	314.8	597.8	0.85	0.32
116.70	6.08	204.7	300.0	329.4	172.8	440.3	595.6	0.82	0.36
118.51	6.08	204.6	300.0	317.9	181.8	472.2	593.2	0.84	0.33
120.73	5.96	188.3	300.0	316.5	197.6	308.4	623.9	0.83	0.34
122.53	5.94	146.9	300.0	313.4	174.9	338.2	639.5	0.83	0.34
124.52	6.12	107.4	300.0	319.4	171.4	234.0	681.0	0.81	0.32
126.66	5.97	205.0	300.0	288.3	214.9	378.6	596.3	0.83	0.33
128.81	5.75	197.7	300.0	315.6	180.2	563.7	596.2	0.83	0.38
130.79	5.96	186.6	300.0	311.3	173.1	446.7	595.9	0.82	0.38
132.72	5.84	136.7	300.0	291.2	141.7	538.1	594.3	0.82	0.39
134.56	5.97	161.3	300.0	269.3	180.4	459.4	586.5	0.83	0.33
136.42	5.71	203.9	300.0	342.6	157.2	859.3	594.0	0.83	0.34
138.52	6.02	219.1	300.0	338.4	177.5	314.8	594.9	0.81	0.29
140.77	6.08	225.3	300.0	302.3	232.8	257.4	612.4	0.82	0.36
142.78	5.96	204.1	300.0	316.2	192.5	287.1	602.7	0.82	0.35
144.91	6.03	247.2	300.0	278.9	242.9	421.1	597.6	0.83	0.35
146.64	5.96	144.4	300.0	494.6	111.2	351.0	792.5	0.83	0.35

Table F-24. Continued.

Train C – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
148.64	5.95	160.7	300.0	293.5	132.6	331.8	563.5	0.82	0.37
150.64	5.82	151.1	300.0	294.2	183.3	474.3	624.5	0.82	0.36
152.56	5.88	0.0	300.0	291.9	0.0	510.5	429.0	0.82	0.36
154.66	6.02	300.4	300.0	317.7	209.0	342.4	604.9	0.83	0.36
156.72	5.89	237.3	300.0	315.6	280.0	457.3	672.3	0.82	0.36

Table F-25. Transfer data for Train R1 Fermentor 1 at high C-N ratio.

Train R1 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
1.00	6.15					280.8					
2.00						231.8					
3.00						236.1					
4.00	6.18					140.4					
5.00						159.5					
6.00	6.15					140.4					
7.72	6.02	27.3	210.0	222.0	175.6	148.9	552.3	0.98	0.60		
9.87	5.96	27.3	227.0	93.5	161.9	478.6	408.2	0.97	0.49	17.03	21.82
11.84	5.94	27.3	176.0	99.3	169.3	614.7	421.4	0.99	0.94	18.21	23.88
14.53	5.58	27.3	248.0	65.6	152.6	597.7	371.0	0.96	0.50	25.28	33.30
16.75	5.42	27.3	196.0	99.7	144.0	506.2	432.5	0.96	0.46	23.96	32.39
18.74	5.61	27.3	186.0	103.6	171.5	567.9	427.9	0.97	0.60	28.10	38.20
21.53	5.61	27.3	174.0	76.0	139.4	546.6	386.2	0.96	0.50	23.33	32.10
23.00	5.62	27.3	147.0	61.8	174.4	457.3	389.0	0.95	0.48	27.32	37.57
25.95	5.88	27.3	136.0	38.4	154.0	476.4	345.2	0.95	0.47	27.86	38.26
28.68	5.89	27.3	173.0	25.2	154.6	584.9	332.6	0.95	0.48	29.66	40.80
30.84	5.72	27.3	161.0	56.1	160.7	385.0	369.6	0.92	0.25	28.11	38.62
32.87	5.71	27.3	182.0	37.4	163.6	421.1	353.8	0.95	0.48	27.41	37.79
35.61	5.68	27.3	155.0	62.1	162.9	453.1	377.8	0.95	0.43	28.70	39.63
37.90	5.66	27.3	183.0	74.8	125.4	374.4	353.0	0.95	0.49	26.32	36.48
39.83	5.81	27.3	253.0	99.3	110.8	380.7	362.9	0.96	0.49	27.57	38.20
42.56	5.54	27.3	215.0	124.6	174.1	414.8	451.4	0.96	0.43	26.36	36.51
44.82	5.75	27.3	207.0	194.7	60.3	312.7	407.9	0.96	0.48	22.55	31.39
46.00	5.62	27.3	170.0	37.9	198.0	355.2	388.7	0.96	0.47	22.92	32.12
49.64	6.00	27.3	146.0	42.9	170.4	348.8	366.1	0.96	0.42	18.85	26.45
51.93	5.90	27.3	86.0	23.0	159.6	397.7	335.4	0.96	0.48	21.65	30.23
53.00		27.3	121.0	0.0	133.9	372.2	286.7	0.96	0.46	22.47	31.34
56.53	5.53	27.3	129.0	19.1	148.7	378.6	320.6	0.96	0.46	22.98	32.05
58.62	5.58	27.3	164.0	22.9	151.5	404.1	327.2	0.95	0.46	21.77	30.44
60.55	5.66	27.3	136.0	48.4	161.6	378.6	362.8	0.96	0.46	18.99	26.66
62.57	5.95	27.3	148.0	18.6	163.9	378.6	335.3	0.96	0.46	17.43	24.27
64.55	5.67	27.3	205.0	53.3	141.9	376.5	348.0	0.93	0.46	21.40	29.49
66.66	5.56	27.3	197.0	71.4	180.5	438.2	404.7	0.96	0.46	19.86	27.42
68.63	5.46	27.3	197.0	98.8	141.6	248.9	393.2	0.96	0.46	18.63	25.82
70.51	5.64	27.3	198.0	66.0	177.2	459.4	396.0	0.96	0.46	17.64	24.25
72.50	6.05	27.3	232.0	99.3	142.4	555.1	394.5	0.97	0.46	17.94	24.53

Table F-25. Continued.

Train R1 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
74.84	5.88	27.3	200.0	138.5	137.0	372.2	428.3	0.94	0.46	17.13	23.38
76.55	6.50	27.3	202.0	83.4	160.2	338.2	396.4	0.97	0.46	14.31	19.49
78.60	6.06	27.3	207.0	75.1	173.0	338.2	400.9	0.97	0.37	14.88	19.99
80.57	5.91	27.3	232.0	58.6	175.1	340.3	404.5	0.97	0.37	12.85	17.32
82.56	6.07	27.3	223.0	133.3	159.3	289.3	445.4	0.97	0.46	13.09	17.64
84.54	5.86	27.3	208.0	84.8	182.7	331.8	420.3	0.97	0.43	12.28	16.48
86.57	5.98	27.3	230.0	57.4	193.9	331.8	404.1	0.97	0.51	14.60	19.46
88.48	5.92	27.3	223.0	110.8	167.8	304.2	431.4	0.97	0.43	9.19	12.17
90.51	6.50	27.3	230.0	124.8	125.4	306.3	421.0	0.98	0.46	13.42	17.94
92.55	6.18	27.3	230.0	142.8	132.1	276.5	445.7	0.98	0.46	11.28	15.07
94.55	6.39	27.3	228.0	87.3	205.3	319.1	445.4	0.97	0.46	10.23	13.60
96.56	6.28	27.3	202.0	99.9	172.6	323.3	425.3	0.98	0.51	9.98	13.27
98.54	6.28	27.3	210.0	113.7	133.6	310.5	400.1	0.95	0.46	12.62	16.77
100.59	6.01	27.3	218.0	101.7	152.6	297.8	407.1	0.98	0.50	12.10	16.07
102.55	5.92	27.3	225.0	126.3	136.4	357.3	415.5	0.98	0.51	11.80	15.64
104.52	5.99	27.3	208.0	73.3	195.2	372.2	421.3	0.97	0.49	10.74	14.19
106.63	6.33	27.3	198.0	65.3	111.3	310.5	329.4	0.97	0.49	11.19	14.81
108.54	6.58	27.3	230.0	43.6	111.8	178.7	308.2	0.99	0.49	9.96	13.11
110.60	6.29	27.3	247.0	65.5	134.1	236.1	352.4	0.98	0.47	10.95	14.45
112.71	6.19	27.3	340.0	98.9	193.8	312.7	445.5	0.98	0.41	10.41	13.68
114.82	6.03	27.3	263.0	173.5	211.5	295.7	537.8	0.98	0.34	11.03	14.58
116.74	6.08	27.3	263.0	133.7	172.5	453.1	459.0	0.98	0.36	11.37	14.99
118.58	6.18	27.3	277.0	136.3	167.7	280.8	456.8	0.99	0.41	10.91	14.47
120.76	6.18	27.3	263.0	150.5	96.7	257.4	400.0	0.99	0.40	10.21	13.54
122.55	6.13	27.3	216.0	89.3	143.0	248.9	385.1	0.98	0.37	10.39	13.77
124.59	6.32	27.3	269.0	109.5	75.5	219.1	337.8	0.98	0.41	9.64	12.71
126.68	5.91	27.3	264.0	111.8	201.7	293.5	466.3	0.98	0.39	9.97	13.22
128.84	5.87	27.3	211.0	159.3	150.2	289.3	462.3	0.98	0.46	10.28	13.67
130.74	6.11	27.3	222.0	58.9	177.9	270.1	407.6	0.98	0.53	11.39	15.21
132.74	6.02	27.3	262.0	112.8	150.6	340.3	434.2	0.98	0.52	10.19	13.54
134.59	6.18	27.3	207.0	131.5	100.8	259.5	385.1	0.98	0.50	10.58	14.10
136.45	5.99	27.3	294.0	110.0	143.0	351.0	405.8	0.98	0.51	11.69	15.67
138.54	6.12	27.3	234.0	130.4	207.8	229.7	491.0	0.99	0.50	10.51	14.02
140.74	6.31	27.3	293.0	64.2	138.3	185.0	355.3	0.98	0.35	9.89	13.09
142.80	5.84	27.3	266.0	151.3	186.4	351.0	490.5	0.98	0.43	10.63	14.15
144.95	6.17	27.3	192.0	117.7	192.3	125.5	461.8	0.98	0.42	8.50	11.30
146.65	6.17	27.3	260.0	60.1	77.3	304.2	390.2	0.98	0.53	11.31	15.02

Table F-25. Continued.

Train R1 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
148.66	6.06	27.3	268.0	96.2	132.4	304.2	381.4	0.98	0.48	14.35	19.10
150.68	6.07	27.3	321.0	94.5	140.7	257.4	388.0	0.98	0.52	11.37	15.05
152.60	6.05	27.3	273.0	224.7	140.8	208.4	518.3	0.98	0.42	12.83	17.09
154.73		27.3	238.0	130.4	192.5	285.0	475.7	0.98	0.47	11.59	15.36
156.75	6.09	27.3	225.1	126.3	152.0	323.3	431.3	0.98	0.48	9.36	12.36
158.73	5.83	27.3	196.0	103.9	162.5	314.8	419.2	0.98	0.47	11.80	5.73
160.48	5.94	27.3	230.0	76.3	172.0	312.7	401.1	0.98	0.47	10.36	13.69

Table F-26. Transfer data for Train R1 Fermentor 2 at high C-N ratio.

Train R1 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00							
1.00	6.12					365.8	
2.00						231.8	
3.00						229.7	
4.00	6.22					148.9	
5.00						157.4	
6.00	6.12					246.7	
7.72	5.77	175.6	214.0	207.1	210.9	295.7	539.1
9.87	6.01	161.9	197.0	229.2	144.5	548.8	509.9
11.84	5.87	169.3	252.0	176.1	186.9	376.5	491.8
14.53	5.56	152.6	228.0	237.6	163.5	338.2	546.6
16.75	5.37	144.0	201.0	199.8	167.5	293.5	521.4
18.74	5.65	171.5	210.0	186.4	183.0	276.5	496.0
21.53	5.54	139.4	182.0	174.0	172.9	221.2	505.6
23.00	5.58	174.4	157.0	151.6	205.1	297.8	479.4
25.95	5.73	154.0	202.0	136.7	172.2	312.7	453.0
28.68	5.65	154.6	205.0	176.5	180.0	357.3	500.0
30.84	5.57	160.7	214.0	166.4	200.0	236.1	503.8
32.87	5.69	163.6	183.0	181.6	195.7	261.6	511.8
35.61	5.62	162.9	220.0	156.2	185.0	312.7	478.3
37.90	5.51	125.4	314.0	186.3	159.3	251.0	518.3
39.83	5.54	110.8	261.0	255.1	168.6	193.6	611.0
42.56	5.53	174.1	107.0	217.2	219.9	212.7	561.1
44.82	5.57	60.3	302.0	210.5	0.0	225.5	405.9
46.00	5.57	198.0	186.0	168.4	290.6	199.9	529.1
49.64	5.80	170.4	111.0	147.9	204.7	251.0	480.3
51.93	5.89	159.6	157.0	90.5	180.6	280.8	409.6
53.00	5.39	133.9	167.0	123.7	168.7	251.0	456.6
56.53	5.30	148.7	217.0	129.2	186.7	248.9	465.3
58.62	5.38	151.5	178.0	168.5	199.4	165.9	514.5
60.55	5.35	161.6	181.0	138.3	203.3	193.6	478.1
62.57	5.59	163.9	274.0	150.4	192.6	248.9	477.2
64.55	5.75	141.9	259.0	210.6	203.7	170.2	570.5
66.66	5.61	180.5	250.0	196.4	242.1	206.3	556.1
68.63	5.37	141.6	253.0	199.0	192.0	78.7	547.5
70.51	5.59	177.2	286.0	197.0	233.9	287.1	551.8
72.50	5.93	142.4	257.0	234.5	192.3	365.8	582.5

Table F-26. Continued.

Train R1 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.84	5.69	137.0	276.0	199.4	193.5	199.9	554.1
76.55	6.00	160.2	255.0	202.8	230.5	238.2	571.2
78.60	5.89	173.0	288.0	209.5	218.6	229.7	553.2
80.57	5.85	175.1	253.0	230.6	231.2	202.1	584.8
82.56	5.73	159.3	268.0	222.6	188.6	182.9	550.0
84.54	5.96	182.7	293.0	207.1	244.0	221.2	566.5
86.57	5.91	193.9	268.0	232.5	252.8	206.3	589.5
88.48	5.91	167.8	285.0	226.1	209.5	217.0	565.9
90.51	6.50	125.4	283.0	228.9	176.2	202.1	581.6
92.55	5.98	132.1	292.0	233.1	184.6	155.3	583.7
94.55	6.30	205.3	268.0	227.3	270.9	214.8	591.0
96.56	6.30	172.6	269.0	201.8	239.5	191.4	566.8
98.54	6.29	133.6	288.0	209.6	194.4	159.5	568.5
100.59	5.90	152.6	284.0	220.4	219.9	206.3	585.8
102.55	5.92	136.4	263.0	224.6	194.3	219.1	580.6
104.52	5.88	195.2	259.0	207.7	250.2	240.4	560.8
106.63	6.07	111.3	262.0	201.3	90.4	191.4	478.5
108.54	6.07	118.8	297.0	231.6	187.0	176.5	604.9
110.60	6.07	134.1	372.0	246.9	151.5	185.0	562.4
112.71	6.02	193.8	304.0	340.2	227.9	187.2	672.7
114.82	5.98	211.5	276.0	265.7	249.5	210.6	601.5
116.74	6.01	172.5	340.0	261.2	186.0	206.3	572.8
118.58	6.02	167.7	326.0	277.2	222.8	163.8	630.4
120.76	5.96	96.7	301.0	266.7	178.6	195.7	646.7
122.55	5.88	143.0	284.0	216.2	176.7	144.6	548.0
124.59	6.06	75.5	309.0	268.6	90.1	214.8	581.3
126.68	5.88	201.7	266.0	263.7	247.3	197.8	607.4
128.84	5.73	150.2	286.0	213.8	203.0	251.0	564.7
130.74	5.88	177.9	314.0	319.6	241.6	195.7	681.4
132.74	5.89	150.6	276.0	262.8	192.6	176.5	602.9
134.59	5.94	100.8	331.0	210.9	191.9	185.0	600.1
136.45	5.83	143.0	310.0	293.6	183.9	274.4	632.6
138.54	5.96	207.8	324.0	237.8	279.1	161.7	607.2
140.74	5.94	138.3	293.0	293.4	234.1	161.7	687.3
142.80	5.83	186.4	236.0	268.9	210.1	231.8	590.7
144.95	6.05	192.3	285.0	193.0	234.2	95.7	532.0
146.65	6.06	77.3	309.0	260.5	102.1	134.0	583.4

Table F-26. Continued.

Train R1 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
148.66	6.29	132.4	363.0	271.9	202.5	193.6	640.1
150.68	5.85	140.7	305.0	321.1	170.8	12.8	649.3
152.60	5.94	140.8	292.0	273.3	171.9	159.5	602.5
154.73	5.98	192.5	282.0	237.6	242.7	161.7	585.9
156.75	6.01	152.2	276.0	225.2	201.4	206.3	572.5
158.73	5.79	162.5	273.0	202.6	227.1	195.7	565.3
160.48	5.78	172.0	215.0	229.9	207.4	238.2	563.4

Table F-27. Transfer data for Train R1 Fermentor 3 at high C-N ratio.

Train R1 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00							
1.00	6.12					440.3	
2.00						219.1	
3.00						231.8	
4.00	6.18					138.3	
5.00						161.7	
6.00	6.17					165.9	
7.72	6.22	210.9	189.0	211.9	269.9	255.2	567.6
9.87	5.88	144.5	209.0	194.5	129.6	495.6	477.7
11.84	5.96	186.9	203.0	251.5	141.7	395.6	504.4
14.53	5.54	163.5	173.0	227.5	134.0	397.7	496.1
16.75	5.41	167.5	197.0	203.6	104.9	274.4	439.1
18.74	5.69	183.0	170.0	210.1	167.2	234.0	492.4
21.53	5.55	172.9	167.0	182.7	157.8	268.0	465.7
23.00	5.61	205.1	207.0	159.6	211.4	236.1	463.0
25.95	5.78	172.2	214.0	204.1	169.6	221.2	499.6
28.68	5.77	180.0	229.0	207.3	184.6	202.1	510.0
30.84	5.61	200.0	194.0	219.1	210.4	182.9	527.6
32.87	5.74	195.7	234.0	182.8	206.3	204.2	491.5
35.61	5.55	185.0	216.0	219.5	195.8	219.1	528.4
37.90	5.69	159.3	330.0	318.3	46.5	217.0	503.6
39.83	5.63	168.6	102.0	263.3	232.9	174.4	627.6
42.56	5.68	219.9	201.0	108.4	216.2	195.7	402.8
44.82	5.66	0.0	326.0	305.3	0.0	134.0	492.1
46.00	5.65	290.6	101.0	183.4	251.9	157.4	512.6
49.64	5.76	204.7	200.0	111.9	261.8	244.6	467.1
51.93	5.81	180.6	186.0	161.9	218.5	212.7	497.9
53.00	5.44	168.7	219.0	168.2	187.1	144.6	484.7
56.53	5.45	186.7	215.0	216.8	183.6	157.4	511.8
58.62	5.41	199.4	206.0	183.7	226.6	155.3	509.0
60.55	5.43	203.3	287.0	180.8	226.2	187.2	501.8
62.57	5.65	192.6	294.0	274.3	205.3	170.2	585.1
64.55	5.65	203.7	275.0	262.1	233.0	157.4	589.5
66.66	5.68	242.1	277.0	249.4	246.5	187.2	571.9
68.63	5.47	192.0	297.0	254.0	234.6	80.8	594.7
70.51	5.63	233.9	289.0	285.3	232.5	244.6	594.0
72.50	5.79	192.3	284.0	260.0	234.2	234.0	600.0

Table F-27. Continued.

Train R1 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.84	5.56	193.5	286.0	274.2	199.3	378.6	578.1
76.55	6.00	230.5	302.0	254.1	254.2	246.7	579.9
78.60	6.05	218.6	307.0	290.6	238.3	219.1	608.4
80.57	5.99	231.2	285.0	252.8	274.0	217.0	604.8
82.56	5.99	188.6	304.0	268.1	215.8	163.8	593.4
84.54	5.75	244.0	305.0	293.0	231.0	302.0	601.2
86.57	5.99	252.9	292.0	268.0	275.0	221.2	622.9
88.48	5.92	209.5	309.0	287.9	248.6	65.9	625.1
90.51	6.50	176.2	294.0	282.3	201.2	180.8	605.4
92.55	6.23	184.6	295.0	294.9	183.6	185.0	592.0
94.55	6.47	270.9	284.0	268.0	248.8	206.3	593.0
96.56	6.45	239.5	295.0	269.1	284.2	189.3	630.6
98.54	6.35	194.4	307.0	287.9	220.8	159.5	612.4
100.59	5.98	219.9	287.0	286.5	239.1	212.7	603.8
102.55	6.00	194.3	293.0	263.0	214.5	163.8	583.3
104.52	5.87	250.2	289.0	258.6	256.4	114.9	591.2
106.63	6.13	90.4	311.0	265.1	64.6	157.4	537.4
108.54	6.06	187.0	387.0	297.2	254.9	136.1	663.2
110.60	5.96	151.5	323.0	372.1	241.4	138.3	760.7
112.71	6.10	227.9	273.0	303.9	240.0	136.1	621.0
114.82	6.07	249.2	317.0	279.2	222.8	176.5	578.0
116.74	6.07	186.0	317.0	333.9	194.1	165.9	640.1
118.58	6.10	222.8	298.0	326.8	207.3	185.0	609.4
120.76	6.02	178.6	276.0	304.7	226.3	142.5	650.5
122.55	5.87	176.7	303.0	284.8	249.1	138.3	655.3
124.59	6.06	90.1	278.0	309.1	117.4	131.9	634.5
126.68	5.92	247.3	293.0	266.0	231.9	204.2	574.6
128.84	5.88	203.0	311.0	288.5	234.2	168.0	617.8
130.74	5.95	241.6	310.2	307.4	221.3	189.3	607.7
132.74	5.96	192.6	335.0	277.0	238.1	159.5	620.6
134.59	5.97	191.9	296.0	334.3	235.0	153.1	675.5
136.45	5.90	183.9	310.0	309.8	169.3	340.3	593.3
138.54	6.00	279.1	313.0	328.4	259.5	199.9	606.9
140.74	6.02	234.1	245.0	292.5	313.3	142.5	682.6
142.80	5.88	210.1	321.0	238.6	226.2	195.7	552.8
144.95	6.08	243.2	293.0	283.9	261.0	83.0	616.4
146.65	6.02	102.1	372.0	310.2	91.8	155.3	598.0

Table F-27. Continued.

Train R1 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
148.66	6.26	202.5	313.0	366.7	230.0	182.9	692.3
150.68	5.84	170.8	304.0	305.1	248.4	159.5	680.8
152.60	5.93	171.9	286.0	291.5	184.4	163.8	602.1
154.73	6.04	242.7	306.0	282.2	225.9	223.3	585.6
156.75	6.04	201.4	290.1	272.4	243.8	176.5	612.9
158.73	5.77	227.1	308.0	269.1	243.2	140.4	587.1
160.48	6.03	207.4	320.0	214.6	202.8	838.0	508.1

Table F-28. Transfer data for Train R1 Fermentor 4 at high C-N ratio.

Train R1 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00									
1.00	6.11								
2.00									
3.00									
4.00	6.12								
5.00									
6.00	6.09								
7.72	6.14	269.9	160.0	190.6	298.9	208.4	561.2	0.80	0.50
9.87	5.94	129.6	160.0	212.0	122.2	857.2	502.7	0.79	0.37
11.84	6.02	141.7	160.0	204.3	94.2	465.8	454.9	0.90	1.00
14.53	5.58	134.0	160.0	176.3	111.3	546.6	451.7	0.75	0.39
16.75	5.53	104.9	160.0	203.2	86.7	382.9	483.1	0.73	0.38
18.74	5.86	167.2	160.0	171.7	152.5	393.5	455.1	0.80	0.53
21.53	5.68	157.8	220.0	169.2	143.9	397.7	453.4	0.74	0.39
23.00	5.77	211.4	220.0	208.6	220.5	474.3	514.8	0.77	0.37
25.95	5.89	169.6	220.0	217.0	170.4	359.5	515.9	0.80	0.34
28.68	5.81	184.6	220.0	233.8	167.8	540.3	515.1	0.78	0.36
30.84	5.74	210.4	220.0	198.3	229.4	344.6	515.4	0.80	0.34
32.87	5.83	206.3	220.0	234.2	188.4	380.7	514.4	0.79	0.33
35.61	5.80	195.8	220.0	215.6	198.1	467.9	516.0	0.81	0.33
37.90	5.79	46.5	220.0	334.4	0.0	319.1	516.6	0.80	0.34
39.83	5.78	232.9	220.0	106.2	260.8	368.0	446.9	0.78	0.32
42.56	5.74	216.2	220.0	202.4	245.9	314.8	530.2	0.82	0.32
44.82	5.72	0.0	220.0	328.0	0.0	289.3	516.3	0.80	0.33
46.00	5.88	251.9	220.0	102.2	224.5	427.5	408.3	0.81	0.37
49.64	5.87	261.8	220.0	204.7	241.3	504.1	526.1	0.82	0.34
51.93	5.86	218.5	220.0	192.3	288.1	187.2	560.0	0.78	0.32
53.00	5.62	187.1	220.0	220.5	185.4	151.0	516.9	0.82	0.48
56.53	5.58	183.6	220.0	216.0	185.6	268.0	516.1	0.82	0.46
58.62	5.56	226.6	300.0	209.2	229.7	448.8	516.4	0.83	0.39
60.55	5.56	226.2	300.0	291.0	233.9	168.0	603.1	0.82	0.48
62.57	5.84	205.3	300.0	296.6	213.2	206.3	602.6	0.81	0.49
64.55	6.49	233.0	300.0	277.5	241.4	385.0	596.5	0.83	0.52
66.66	5.65	246.5	300.0	279.4	254.2	336.1	611.0	0.82	0.58
68.63	5.53	234.6	300.0	299.9	246.0	119.1	623.0	0.84	0.46
70.51	5.98	232.5	300.0	293.2	240.7	242.5	610.4	0.83	0.46
72.50	5.91	234.2	300.0	286.4	245.0	561.5	608.3	0.85	0.57

Table F-28. Continued.

Train R1 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
74.84	5.76	199.3	300.0	286.8	224.2	657.2	609.8	0.85	0.58
76.55	6.00	254.2	300.0	304.5	215.3	312.7	597.7	0.84	0.49
78.60	6.03	238.3	300.0	310.3	236.5	312.7	626.1	0.83	0.36
80.57	5.99	274.0	300.0	287.7	252.3	299.9	616.8	0.84	0.33
82.56	5.98	215.8	300.0	306.7	261.3	272.3	650.3	0.85	0.33
84.54	6.15	231.0	300.0	307.3	207.3	302.0	597.9	0.83	0.36
86.57	5.98	275.0	300.0	294.9	240.2	80.8	612.1	0.85	0.35
88.48	6.05	248.6	300.0	312.0	262.5	265.9	652.2	0.84	0.38
90.51	6.00	201.2	300.0	296.5	231.7	306.3	625.1	0.84	0.34
92.55	5.99	183.6	300.0	297.5	182.0	333.9	594.0	0.86	0.58
94.55	6.57	248.8	300.0	286.5	234.9	308.4	598.2	0.84	0.55
96.56	6.36	284.2	300.0	298.3	248.3	329.7	625.6	0.84	0.39
98.54	6.43	220.8	300.0	309.7	275.5	272.3	662.5	0.83	0.58
100.59	6.16	239.1	300.0	289.7	229.6	304.2	597.0	0.85	0.49
102.55	6.14	216.5	300.0	297.0	236.7	238.2	615.2	0.85	0.37
104.52	6.17	256.4	300.0	292.1	227.4	261.6	597.1	0.85	0.46
106.63	6.30	64.6	300.0	314.0	7.6	253.1	555.1	0.85	0.46
108.54	6.03	254.9	300.0	390.7	445.8	199.9	879.7	0.81	0.30
110.60	6.12	241.4	300.0	325.7	262.2	217.0	664.8	0.82	0.34
112.71	6.23	240.0	300.0	276.3	262.8	259.5	617.7	0.84	0.32
114.82	6.16	222.8	300.0	320.1	221.3	280.8	618.4	0.83	0.36
116.74	6.15	194.1	300.0	316.4	178.1	287.1	598.5	0.81	0.43
118.58	6.22	207.3	300.0	301.5	203.4	263.7	595.7	0.83	0.30
120.76	6.14	226.3	300.0	279.3	233.6	263.7	584.7	0.85	0.30
122.55	6.04	249.1	300.0	306.8	290.7	240.4	646.5	0.83	0.39
124.59	6.14	117.4	300.0	280.5	209.5	248.9	670.7	0.83	0.32
126.68	6.00	231.9	300.0	296.8	223.2	329.7	597.7	0.85	0.34
128.84	5.95	234.2	300.0	313.9	218.5	319.1	609.3	0.83	0.37
130.74	6.12	221.3	300.0	308.0	225.1	274.4	609.8	0.85	0.39
132.74	6.00	238.1	300.0	338.4	200.9	312.7	599.3	0.83	0.37
134.59	6.12	235.0	300.0	299.7	265.3	253.1	643.0	0.83	0.33
136.45	5.93	169.3	300.0	313.4	162.8	459.4	605.0	0.84	0.35
138.54	6.22	259.5	300.0	316.5	241.6	238.2	596.7	0.85	0.33
140.74	6.10	313.3	300.0	247.7	254.3	259.5	580.0	0.84	0.34
142.80	5.90	226.2	300.0	324.5	287.4	291.4	691.8	0.85	0.36
144.95	6.24	261.0	300.0	295.4	235.0	136.1	602.6	0.85	0.33
146.65	6.04	91.8	300.0	375.4	50.4	282.9	632.1	0.80	0.32

Table F-28. Continued.

Train R1 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
148.66	5.58	230.0	300.0	317.2	202.7	363.7	588.0	0.84	0.36
150.68	5.88	248.4	300.0	307.1	238.7	470.1	623.6	0.85	0.34
152.60	6.10	184.4	300.0	289.4	221.5	227.6	624.6	0.83	0.34
154.73	6.02	225.9	300.0	309.0	214.3	304.2	602.0	0.83	0.35
156.75	6.02	243.8	300.0	288.0	228.8	395.6	595.6	0.83	0.38
158.73	6.04	243.2	300.0	305.1	238.3	178.7	622.4	0.84	0.33
160.48	6.10	202.8	300.0	320.3	202.8	217.0	618.4	0.84	0.33

Table F-29. Transfer data for Train R2 Fermentor 1 at high C-N ratio.

Train R2 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
1.00	6.20					291.4					
2.00						219.1					
3.00						223.3					
4.00	6.16					157.4					
5.00						136.1					
6.00	6.22					136.1					
7.72	6.42	27.3	210.0	220.5	158.9	93.6	552.1	0.98	0.43		
9.72	6.12	27.3	193.0	103.9	132.4	440.3	406.1	0.98	0.43	14.81	18.83
11.88	5.97	27.3	136.0	72.5	148.6	619.0	390.9	0.99	0.43	19.97	25.85
14.57	5.65	27.3	220.0	19.5	143.8	548.8	333.1	0.96	0.52	26.30	34.20
16.92	5.49	27.3	213.0	104.2	147.7	574.3	421.7	0.96	0.48	31.10	41.22
18.82	5.70	27.3	196.0	87.5	151.3	544.5	408.6	0.97	0.46	25.04	33.47
21.66	5.55	27.3	168.0	72.6	150.6	163.8	393.0	0.96	0.48	27.47	37.15
23.88	5.60	27.3	155.0	6.6	130.4	431.8	306.8	0.95	0.50	26.98	36.54
25.04	5.91	27.3	140.0	49.6	134.3	399.9	353.7	0.95	0.49	27.94	37.57
28.75	5.98	27.3	170.0	38.4	132.1	385.0	340.3	0.95	0.50	29.42	39.52
30.88	5.80	27.3	153.0	44.2	154.6	425.4	368.6	0.91	0.24	27.28	37.02
32.00	5.80	27.3	184.0	38.2	142.6	467.9	350.6	0.95	0.47	15.65	26.04
35.78	5.95	27.3	188.0	73.5	140.7	372.2	384.0	0.95	0.46	26.12	35.15
37.00	5.73	27.3	287.0	181.0	33.5	436.0	384.3	0.96	0.47	25.11	34.06
39.88	5.71	27.3	180.0	106.0	207.3	448.8	483.1	0.96	0.51	25.97	34.81
42.00	5.76	27.3	146.0	72.7	134.2	450.9	376.7	0.96	0.48	24.27	32.46
44.86	5.74	27.3	191.0	139.5	333.0	306.3	342.6	0.96	0.50	23.69	31.50
46.95	6.01	27.3	188.0	22.6	198.6	404.1	391.0	0.96	0.51	24.45	32.54
49.70	6.01	27.3	138.0	50.0	168.8	412.6	388.6	0.96	0.51	16.74	22.48
51.92	6.18	27.3	75.0	43.1	122.6	374.4	335.5	0.96	0.50	20.41	27.49
53.71		27.3	126.0	0.0	105.9	376.5	275.7	0.96	0.50	21.91	29.29
56.76	5.78	27.3	124.0	8.1	147.2	419.0	325.1	0.96	0.50	25.14	34.23
58.80	5.84	27.3	127.0	17.0	134.1	404.1	320.9	0.93	0.50	21.73	29.21
60.64	5.88	27.3	146.0	15.3	141.3	453.1	326.4	0.95	0.50	20.45	27.76
62.90	5.97	27.3	136.0	32.0	143.3	391.4	345.1	0.96	0.50	24.30	32.84
64.79	6.44	27.3	197.0	34.7	131.9	395.6	336.4	0.96	0.78	23.04	31.02
66.73	6.45	27.3	220.0	84.3	140.3	416.9	394.4	0.96	0.54	21.07	28.26
68.76	5.58	27.3	212.0	86.7	158.6	476.4	415.1	0.96	0.69	19.10	25.49
70.72	5.82	27.3	232.0	81.1	159.4	363.7	410.3	0.96	0.66	17.41	23.30
72.71	5.89	27.3	237.0	100.2	158.7	338.2	428.7	0.98	0.64	20.98	28.18

Table F-29. Continued.

Train R2 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
74.84	6.00	27.3	218.0	113.9	150.1	391.4	433.8	0.97	0.66	17.84	23.83
76.76	6.00	27.3	218.0	90.4	154.5	370.1	414.7	0.97	0.49	17.24	23.08
78.72	6.01	27.3	234.0	66.9	88.6	319.1	326.3	0.97	0.63	15.94	21.00
80.75	6.50	27.3	206.0	128.6	213.2	365.8	511.6	0.97	0.37	14.41	19.25
82.93	6.50	27.3	207.0	73.8	162.8	353.1	406.4	0.97	0.45	13.79	18.35
84.78	6.00	27.3	174.0	82.4	154.9	293.5	407.1	0.97	0.41	13.20	17.50
86.77	6.50	27.3	214.0	60.4	144.4	189.3	374.6	0.97	0.48	13.72	17.66
88.56	6.03	27.3	182.0	77.5	171.6	314.8	418.9	0.97	0.44	14.80	19.13
90.90	5.87	27.3	202.0	75.9	137.6	280.8	383.3	0.97	0.53	15.99	20.82
92.79	6.00	27.3	137.0	106.2	118.6	342.4	394.6	0.97	0.39	14.07	18.38
94.79	6.50	27.3	198.0	3.4	160.6	323.3	333.8	0.97	0.45	15.49	20.00
96.63	6.50	27.3	204.0	80.9	145.6	314.8	396.3	0.97	0.49	13.24	17.17
98.81	6.50	27.3	230.0	70.2	164.2	344.6	404.2	0.87	0.46	12.41	16.24
100.85	6.50	27.3	269.0	93.9	165.8	316.9	429.5	0.88	0.46	12.20	15.97
102.77	6.50	27.3	234.0	103.6	143.1	274.4	416.5	0.98	0.36	12.76	16.53
104.87	6.50	27.3	206.0	93.9	171.0	274.4	434.7	0.98	0.44	11.43	14.92
106.64	6.14	27.3	209.0	64.4	170.2	278.6	405.4	0.98	0.52	11.99	15.61
108.70	6.12	27.3	226.0	91.9	145.9	291.4	407.6	0.98	0.52	12.39	16.22
110.55	6.11	27.3	230.0	89.4	162.4	191.4	422.6	0.98	0.50	12.44	16.27
112.83	6.11	27.3	289.0	134.7	140.2	329.7	444.7	0.98	0.49	12.51	16.48
114.69	6.14	27.3	235.0	109.2	171.1	331.8	451.1	0.98	0.49	12.17	16.05
116.78	6.13	27.3	246.0	136.4	128.1	304.2	434.3	0.98	0.50	11.65	15.44
118.52	6.19	27.3	246.0	117.0	156.5	197.8	444.3	0.98	0.36	11.93	15.81
120.63	6.08	27.3	249.0	107.4	165.5	297.8	443.7	0.98	0.35	10.51	13.94
122.47	6.08	27.3	238.0	112.3	164.3	304.2	446.4	0.98	0.37	11.16	14.87
124.62	5.94	27.3	251.0	90.1	172.5	302.0	433.4	0.98	0.43	11.03	14.66
126.84	6.20	27.3	264.0	113.9	70.9	274.4	354.6	0.98	0.38	9.92	13.28
128.65	5.82	27.3	260.0	112.5	178.1	257.4	461.4	0.98	0.46	10.36	13.77
130.76	6.04	27.3	230.0	147.7	141.2	321.2	458.7	0.98	0.51	11.70	15.54
132.52	6.13	27.3	252.0	96.7	162.0	304.2	429.5	0.98	0.52	11.65	15.50
134.50	5.99	27.3	229.0	148.9	129.9	282.9	449.6	0.98	0.51	11.32	15.10
136.50	6.13	27.3	252.0	106.2	55.3	282.9	332.3	0.98	0.38	9.88	13.16
138.86	6.49	27.3	236.0	143.3	44.9	151.0	358.0	0.98	0.37	12.17	16.16
140.90	5.98	27.3	242.0	84.6	179.7	342.4	434.1	0.98	0.46	10.79	14.27
142.52	5.80	27.3	220.0	101.9	167.5	312.7	440.2	0.98	0.44	10.47	13.90
144.54	5.67	27.3	242.0	102.1	142.6	314.8	415.5	0.98	0.47	12.41	16.54
146.49	6.00	27.3	249.0	110.7	160.1	333.9	441.6	0.98	0.42	12.09	16.13

Table F-29. Continued.

Train R2 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
148.56	5.79	27.3	199.0	97.6	178.3	370.1	446.7	0.98	0.50	11.59	15.40
150.50	6.06	27.3	256.0	83.3	143.4	265.9	397.5	0.98	0.49	12.85	17.07
152.51	6.11	27.3	269.0	130.6	58.4	234.0	359.8	0.98	0.42	14.08	18.72
154.80	6.24	27.3	220.0	146.3	59.3	304.2	375.4	0.98	0.37	14.85	19.79
156.70	6.14	27.3	269.0	72.0	169.5	353.1	412.3	0.98	0.44	11.07	14.79
158.57	5.70	27.3	232.0	137.8	156.1	263.7	464.7	0.98	0.43	12.89	17.16
160.48	5.67	27.3	240.0	134.2	123.3	359.5	428.3	0.98	0.43	11.40	15.23

Table F-30. Transfer data for Train R2 Fermentor 2 at high C-N ratio.

Train R2 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00							
1.00	6.10					393.5	
2.00						261.6	
3.00						204.2	
4.00	6.14					155.3	
5.00						117.0	
6.00	6.12					129.7	
7.72	6.25	158.9	204.0	210.0	209.3	157.4	557.1
9.72	5.81	132.4	159.0	197.4	172.8	482.8	516.9
11.88	5.90	148.6	242.0	136.0	182.5	397.7	449.0
14.57	5.49	143.8	220.0	216.2	176.8	370.1	528.6
16.92	5.40	147.7	229.0	215.4	172.7	276.5	519.5
18.82	5.58	151.3	190.0	198.4	198.1	268.0	524.3
21.66	5.46	150.6	170.0	168.9	189.0	272.3	486.4
23.88	5.45	130.4	163.0	159.9	156.8	178.7	465.4
25.04	5.68	134.3	208.0	142.5	171.0	236.1	458.3
28.75	5.70	132.1	188.0	171.3	188.5	244.6	506.8
30.88	5.62	154.6	213.0	156.0	185.6	229.7	484.1
32.00	5.58	142.6	200.0	186.2	187.8	576.4	528.5
35.78	5.77	140.7	184.0	188.9	191.2	259.5	518.5
37.00	5.56	33.5	319.0	290.1	0.0	229.7	478.2
39.88	5.67	207.3	192.0	180.2	284.6	202.1	540.4
42.00	5.58	134.2	102.0	148.0	197.2	274.4	490.1
44.86	5.62	33.3	326.0	197.7	0.0	134.0	397.2
46.95	5.81	198.6	168.0	191.0	291.0	2969.3	562.5
49.70	5.86	168.8	92.0	138.3	218.9	255.2	467.5
51.92	5.83	122.6	173.0	80.6	151.1	227.6	389.2
53.71	5.80	105.9	170.0	129.1	169.3	180.8	471.6
56.76	5.36	147.2	178.0	124.6	211.9	314.8	468.4
58.80	5.46	134.1	177.0	132.2	197.4	3245.8	474.6
60.64	5.49	141.3	180.0	147.4	192.3	236.1	477.5
62.90	5.74	143.3	248.0	138.5	204.5	212.7	478.8
64.79	6.29	131.9	265.0	200.9	200.0	208.4	548.1
66.73	5.75	140.3	270.0	217.0	206.0	217.0	561.8
68.76	5.66	158.6	276.0	213.2	239.0	223.3	572.7
70.72	5.71	159.4	294.0	231.1	223.1	278.6	573.9
72.71	5.77	158.7	267.0	239.2	226.8	240.4	586.4

Table F-30. Continued.

Train R2 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.84	6.00	150.1	274.0	217.4	212.5	308.4	558.9
76.76	6.00	154.5	300.0	219.3	223.7	253.1	567.6
78.72	5.82	88.6	260.0	230.5	174.0	140.4	596.0
80.75	6.00	213.2	270.0	208.0	260.6	212.7	543.8
82.93	6.00	162.8	225.0	210.4	252.3	240.4	579.0
84.78	6.00	154.9	278.0	176.9	225.3	125.5	526.4
86.77	6.00	144.4	274.0	215.9	224.8	214.8	575.4
88.56	6.12	171.6	270.0	183.1	223.6	234.0	514.2
90.90	5.72	137.6	222.0	202.7	228.3	255.2	572.5
92.79	6.00	188.6	285.0	140.5	210.9	276.5	511.9
94.79	6.50	160.6	275.0	199.5	262.8	229.7	580.8
96.63	6.00	145.6	298.0	206.8	232.3	93.6	572.6
98.81	6.50	164.2	280.0	232.7	250.1	185.0	597.7
100.85	6.50	165.8	305.0	223.7	240.8	185.0	577.8
102.77	6.50	143.1	280.0	273.2	227.6	174.4	637.1
104.87	6.50	171.0	283.0	207.9	262.0	197.8	578.0
106.64	5.92	170.2	284.0	211.9	259.3	185.0	581.1
108.70	5.98	145.9	302.0	228.8	219.2	238.2	583.2
110.55	6.01	162.4	318.0	229.7	251.8	221.2	599.2
112.83	6.02	140.2	301.0	254.0	209.2	270.1	602.2
114.69	6.04	171.1	315.0	238.6	255.2	210.6	602.8
116.78	6.00	128.1	308.0	247.3	212.5	302.0	610.8
118.52	6.01	156.5	316.0	245.8	235.7	204.2	605.1
120.63	5.99	165.5	293.0	251.8	247.1	217.0	613.5
122.47	6.02	164.3	312.0	238.9	235.6	257.4	589.3
124.62	5.83	172.5	306.0	254.2	244.8	234.0	606.6
126.84	5.68	70.9	293.0	264.7	203.4	251.0	676.3
128.65	5.69	178.1	275.0	263.2	224.5	240.4	589.7
130.76	5.92	141.2	305.0	231.6	230.5	287.1	545.7
132.52	5.99	162.0	278.0	251.9	231.8	227.6	601.8
134.50	5.87	129.9	311.0	232.4	192.4	251.0	575.0
136.50	5.82	55.3	321.0	252.5	160.7	253.1	638.0
138.86	6.15	44.9	285.0	236.3	105.3	172.3	575.8
140.90	5.93	179.7	262.0	244.6	236.9	255.2	580.9
142.52	5.69	167.5	285.0	217.4	227.4	240.4	557.4
144.54	5.62	142.6	294.0	243.0	199.2	342.4	579.7
146.49	5.90	160.1	262.0	249.1	226.3	263.7	595.4

Table F-30. Continued.

Train R2 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
148.56	5.73	178.3	303.0	202.7	254.9	314.8	559.4
150.50	5.82	143.4	322.0	259.7	208.4	191.4	604.8
152.51	5.82	58.4	312.0	269.4	170.6	231.8	661.7
154.80	6.07	59.3	294.0	221.6	127.2	157.4	568.6
156.70		169.5	280.2	271.7	202.8	306.3	585.1
158.57	5.71	156.1	264.0	230.8	221.0	180.8	575.8
160.48	5.75	123.3	290.0	240.8	176.1	348.8	573.7

Table F-31. Transfer data for Train R2 Fermentor 3 at high C-N ratio.

Train R2 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00							
1.00	6.22					485.0	
2.00						287.1	
3.00						248.9	
4.00	6.12					180.8	
5.00						174.4	
6.00	5.99					295.7	
7.72	6.12	209.3	165.0	203.8	268.1	272.3	559.3
9.72	5.83	172.8	225.0	163.9	173.5	453.1	461.7
11.88	5.81	182.5	199.0	242.5	163.2	378.6	520.3
14.57	5.54	176.8	195.0	222.1	152.9	336.1	495.3
16.92	5.44	172.7	195.0	231.1	136.8	227.6	492.3
18.82	5.67	198.1	163.0	189.7	164.6	202.1	453.3
21.66	5.62	189.0	163.0	169.7	178.5	574.3	456.3
23.88	5.58	156.8	225.0	164.9	152.8	140.4	458.0
25.04	5.75	171.0	211.0	209.7	183.1	178.7	518.9
28.75	5.72	188.5	231.0	189.7	209.6	185.0	507.9
30.88	5.65	185.6	229.0	215.4	21.4	165.9	528.3
32.00	5.72	187.8	206.0	202.0	213.0	136.1	524.3
35.78	5.90	191.2	213.0	185.7	211.5	478.6	503.1
37.00	5.65	0.0	331.0	321.8	0.0	157.4	506.8
39.88	5.83	284.6	83.0	189.9	248.7	189.3	514.5
42.00	5.56	157.2	215.0	101.7	242.3	259.5	443.9
44.86	5.67	0.0	315.0	332.2	0.0	174.4	509.7
46.95	5.99	291.0	71.0	169.7	249.5	142.5	495.3
49.70	5.82	218.9	211.0	92.4	268.2	238.2	438.8
51.92	5.87	151.1	187.0	177.7	185.8	240.4	509.5
53.71	5.93	169.3	195.0	171.6	183.2	161.7	482.8
56.76	5.45	211.9	205.0	178.2	230.0	265.9	493.4
58.80	5.41	197.4	201.0	182.7	217.5	234.0	499.9
60.64	5.53	192.3	291.0	182.6	211.1	- 653.0	498.5
62.90	5.73	204.5	295.0	250.8	245.4	212.7	588.8
64.79	6.32	200.0	291.0	269.7	229.7	276.5	596.5
66.73	5.78	206.0	207.0	273.9	223.5	282.9	588.5
68.76	5.69	239.0	305.0	276.3	250.2	285.0	602.6
70.72	5.80	223.1	295.0	291.9	245.4	246.7	613.5
72.71	5.86	226.8	293.0	266.2	249.7	214.8	591.9

Table F-31. Continued.

Train R2 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.84	6.00	212.5	313.0	270.9	234.9	261.6	590.4
76.76	6.00	223.7	300.0	298.5	230.9	189.3	605.1
78.72	5.93	174.0	295.0	258.7	220.8	131.9	603.6
80.75	6.00	260.6	211.0	271.7	234.3	170.2	582.0
82.93	6.00	252.3	305.0	229.3	243.7	151.0	549.0
84.78	6.00	225.3	293.0	277.7	281.1	165.9	634.5
86.77	6.00	224.8	303.0	274.1	243.7	163.8	594.0
88.56	6.16	223.6	272.0	271.9	257.2	146.8	603.3
90.90	6.12	218.3	295.0	222.0	253.8	202.1	550.0
92.79	6.00	210.9	312.0	286.9	225.2	238.2	598.3
94.79	6.50	262.8	312.0	277.5	253.6	144.6	606.8
96.63	6.00	232.3	299.0	300.6	273.3	163.8	649.8
98.81	6.50	250.1	305.0	279.5	250.6	182.9	606.0
100.85	6.50	240.8	299.0	308.4	245.4	161.7	629.9
102.77	6.50	227.6	295.0	280.7	258.0	155.3	614.9
104.87	6.50	262.0	314.0	283.9	239.2	195.7	599.6
106.64	5.94	259.3	297.0	286.7	287.0	172.3	650.7
108.70	5.97	219.2	337.0	302.2	250.2	214.8	630.3
110.55	5.97	251.8	313.0	317.1	238.9	193.6	633.6
112.83	6.06	209.2	304.0	306.3	247.2	246.7	641.4
114.69	6.03	255.2	315.0	317.7	205.6	193.6	601.2
116.78	5.99	212.9	319.0	308.3	254.7	219.1	647.6
118.52	5.98	235.7	315.0	316.1	221.2	189.3	614.6
120.63	6.02	247.1	293.0	295.6	252.3	217.0	627.5
122.47	6.02	235.6	306.0	311.4	232.4	253.1	619.4
124.62	5.81	244.8	295.0	309.6	254.6	176.5	617.5
126.84	5.86	203.4	292.0	293.6	249.6	265.9	636.9
128.65	5.71	224.5	310.0	278.7	233.8	219.1	589.3
130.76	5.89	203.5	292.0	306.9	209.8	314.8	610.3
132.52	5.96	231.8	315.0	277.8	233.5	219.1	589.0
134.50	5.90	192.4	315.0	315.3	202.1	212.7	623.1
136.50	5.80	160.7	300.0	322.1	188.4	227.6	647.9
138.86	6.15	105.3	284.0	285.0	201.9	125.5	678.7
140.90	5.85	236.9	275.0	262.3	241.2	470.1	579.6
142.52	5.68	227.4	307.0	284.7	221.8	519.0	586.3
144.54	5.64	199.2	277.0	293.8	216.0	202.1	608.7
146.49	5.84	226.3	308.0	262.0	230.9	287.1	569.8

Table F-31. Continued.

Train R2 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
148.56	5.74	254.9	310.0	306.1	227.3	285.0	610.2
150.50	5.77	208.4	301.0	325.7	220.9	208.4	636.3
152.51	5.82	170.6	302.0	312.7	196.2	195.7	636.4
154.80	5.98	127.2	287.0	295.5	220.0	238.2	685.4
156.70	6.16	202.8	288.3	283.2	198.8	221.2	577.3
158.57	5.70	221.0	294.0	264.5	227.0	202.1	568.6
160.48	6.04	176.1	299.0	290.1	183.6	287.1	595.7

Table F-32. Transfer data for Train R2 Fermentor 4 at high C-N ratio.

Train R2 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00									
1.00	6.11					536.0			
2.00						297.8			
3.00						165.9			
4.00	6.14					174.4			
5.00						127.6			
6.00	6.09					221.2			
7.72	6.23	268.1	160.0	168.8	291.0	214.8	539.1	0.81	0.42
9.72	5.61	173.5	160.0	228.9	146.0	714.7	498.5	0.77	0.36
11.88	5.90	163.2	160.0	201.6	118.2	414.8	454.0	0.73	0.39
14.57	5.63	152.9	160.0	199.0	112.4	395.6	455.6	0.73	0.43
16.92	5.59	136.8	160.0	196.1	97.0	348.8	453.4	0.72	0.40
18.82	5.80	164.6	160.0	165.4	192.7	323.3	490.6	0.75	0.40
21.66	5.60	178.5	220.0	164.2	171.5	325.4	454.3	0.76	0.38
23.88	5.72	152.8	220.0	225.0	147.8	274.4	517.1	0.76	0.36
25.04	5.84	183.1	220.0	214.4	188.2	527.5	516.6	0.79	0.35
28.75	5.81	209.6	220.0	234.4	200.5	559.4	516.6	0.80	0.35
30.88	5.98	201.4	220.0	231.0	180.8	236.1	507.6	0.79	0.32
32.00	5.78	213.0	220.0	208.6	222.3	344.6	515.0	0.82	0.32
35.78	6.07	211.5	220.0	218.5	211.1	423.3	515.2	0.81	0.34
37.00	5.84	0.0	220.0	332.0	0.0	182.9	507.3	0.80	0.33
39.88	6.05	248.7	220.0	86.6	238.3	497.7	395.3	0.82	0.36
42.00	5.76	242.3	220.0	218.3	248.0	448.8	543.6	0.81	0.32
44.86	5.83	0.0	220.0	320.0	0.0	110.6	533.4	0.81	0.34
46.95	6.22	249.5	220.0	75.3	237.5	210.6	388.9	0.78	0.28
49.70	5.96	268.2	220.0	215.8	252.6	382.9	545.0	0.80	0.33
51.92	6.00	185.8	220.0	191.3	262.8	159.5	565.4	0.80	0.30
53.71	5.91	183.2	220.0	200.0	207.2	257.4	521.1	0.82	0.40
56.76	5.40	230.0	220.0	206.4	230.6	593.4	514.5	0.81	0.44
58.80	5.63	217.5	300.0	203.9	242.5	144.6	526.0	0.81	0.44
60.64	5.75	211.1	300.0	294.1	216.3	219.1	596.4	0.82	0.45
62.90	5.88	245.4	300.0	301.8	217.4	372.2	595.7	0.82	0.41
64.79	6.36	229.7	300.0	296.5	246.5	389.2	620.2	0.83	0.42
66.73	5.94	223.5	300.0	308.7	220.3	399.9	605.7	0.82	0.48
68.76	5.89	250.2	300.0	301.9	219.3	363.7	597.5	0.82	0.49
70.72	5.91	245.4	300.0	296.0	253.2	359.5	625.8	0.82	0.45
72.71	5.95	249.7	300.0	292.1	252.7	306.3	621.5	0.82	0.45

Table F-32. Continued.

Train R2 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
74.84	6.00	234.9	300.0	310.4	237.4	319.1	624.1	0.82	0.46
76.76	6.00	230.9	300.0	302.2	231.7	244.6	610.9	0.82	0.47
78.72	6.06	220.8	300.0	291.3	238.1	227.6	606.7	0.82	0.38
80.75	6.00	234.3	300.0	214.7	237.5	523.2	528.8	0.86	0.31
82.93	6.00	243.7	300.0	308.9	224.7	240.4	610.1	0.84	0.33
84.78	6.00	281.1	300.0	295.7	247.1	231.8	619.3	0.84	0.36
86.77	6.00	243.7	300.0	306.4	272.9	272.3	656.2	0.84	0.31
88.56	6.12	257.2	300.0	272.6	269.9	246.7	617.5	0.84	0.33
90.90	6.07	253.8	300.0	299.4	237.7	295.7	612.1	0.85	0.35
92.79	6.00	225.2	300.0	312.5	241.3	285.0	630.4	0.84	0.31
94.79	6.50	253.6	300.0	315.5	243.6	312.7	602.6	0.84	0.39
96.63	6.50	273.3	300.0	300.4	251.0	253.1	627.7	0.84	0.39
98.81	6.00	250.6	300.0	307.8	266.2	246.7	650.3	0.83	0.57
100.85	6.00	245.4	300.0	302.7	247.0	238.2	626.2	0.84	0.40
102.77	6.00	258.0	300.0	300.2	243.7	214.8	621.1	0.84	0.30
104.87	6.50	239.2	300.0	316.9	240.7	282.9	634.8	0.84	0.74
106.64	6.00	287.0	300.0	299.3	234.6	342.4	615.9	0.85	0.36
108.70	5.99	250.2	300.0	339.3	250.5	308.4	666.6	0.84	0.37
110.55	6.09	238.9	300.0	315.6	232.2	302.0	626.5	0.83	0.36
112.83	6.11	247.2	300.0	307.6	232.1	416.9	616.7	0.84	0.35
114.69	6.09	205.6	300.0	317.5	214.6	261.6	624.6	0.84	0.44
116.78	6.11	254.7	300.0	322.4	198.4	357.3	597.3	0.84	0.38
118.52	6.09	221.2	300.0	317.8	235.1	274.4	629.8	0.84	0.37
120.63	6.10	252.3	300.0	295.3	221.4	378.6	597.1	0.83	0.38
122.47	6.04	232.4	300.0	309.4	242.3	438.2	628.5	0.84	0.33
124.62	5.80	254.6	300.0	298.1	266.5	459.4	608.1	0.84	0.36
126.84	6.01	249.6	300.0	296.9	234.4	476.4	608.4	0.84	0.36
128.65	5.69	233.8	300.0	313.6	234.2	425.4	626.3	0.84	0.35
130.76	5.92	209.8	300.0	295.8	228.9	572.2	612.0	0.86	0.33
132.52	5.99	233.5	300.0	317.8	200.5	429.7	596.0	0.86	0.40
134.50	5.85	202.1	300.0	319.3	194.9	470.1	610.2	0.84	0.36
136.50	5.86	188.4	300.0	304.5	192.0	438.2	606.2	0.83	0.36
138.86	6.42	201.9	300.0	286.1	246.7	87.2	627.9	0.83	0.36
140.90	5.92	241.2	300.0	279.4	240.0	625.3	595.8	0.84	0.34
142.52	5.74	221.8	300.0	308.9	225.4	414.8	614.6	0.84	0.37
144.54	5.58	216.0	300.0	280.0	238.1	180.8	600.2	0.84	0.38
146.49	5.91	230.9	300.0	310.7	205.9	429.7	595.9	0.84	0.31

Table F-32. Continued.

Train R2 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
148.56	5.70	227.3	300.0	313.4	219.8	561.5	606.4	0.83	0.34
150.50	5.85	220.9	300.0	305.0	221.7	393.5	603.9	0.83	0.37
152.51	5.86	196.2	300.0	305.7	204.1	414.8	611.7	0.81	0.34
154.80	6.14	220.0	300.0	289.5	259.0	370.1	625.6	0.82	0.35
156.70	6.30	198.8	300.0	291.3	199.2	246.7	589.8	0.82	0.32
158.57	5.65	227.0	300.0	297.1	221.4	495.6	599.4	0.83	0.33
160.48	6.23	183.6	300.0	302.9	179.6	448.8	597.0	0.82	0.34

Table F-33. Transfer data for Train R3 Fermentor 1 at high C-N ratio.

Train R3 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
1.00	6.24					459.4					
2.00						253.1					
3.00						199.9					
4.00	6.14					161.7					
5.00						151.0					
6.00	6.13					168.0					
7.69	6.03	27.3	208.0	196.0	186.5	165.9	555.2	0.98	0.55		
9.83	6.00	27.3	199.0	87.6	146.2	565.8	404.4	0.98	0.44	15.89	20.44
11.90	6.02	27.3	213.0	98.6	129.6	576.4	398.0	0.99	0.83	18.84	24.70
14.60	5.54	27.3	238.0	75.5	165.0	619.0	410.3	0.96	0.48	26.05	34.16
16.98	5.40	27.3	227.0	113.4	151.3	553.0	434.5	0.96	0.47	24.46	32.37
18.85	5.60	27.3	150.0	106.0	147.2	574.3	423.0	0.97	0.55	25.39	34.12
21.68	5.56	27.3	146.0	45.4	131.1	610.4	346.3	0.95	0.51	27.18	37.01
23.92	5.67	27.3	159.0	30.7	142.1	476.4	342.6	0.95	0.51	28.69	39.14
25.07	5.79	27.3	130.0	45.2	143.0	446.7	358.0	0.96	0.50	28.25	38.27
28.79	5.84	27.3	192.0	9.1	151.2	429.7	330.1	0.96	0.51	30.54	40.88
30.91	5.65	27.3	155.0	65.9	156.0	412.6	391.7	0.93	0.33	27.11	36.62
32.06	5.79	27.3	182.0	37.3	145.3	344.6	352.4	0.95	0.48	28.04	37.74
35.81	6.02	27.3	164.0	79.2	130.9	325.4	379.9	0.95	0.47	25.24	34.11
37.01	5.85	27.3	291.0	149.8	39.3	253.1	358.9	0.95	0.49	26.81	36.06
39.91	5.82	27.3	194.0	118.7	200.7	402.0	489.2	0.96	0.50	24.34	32.63
42.00	5.82	27.3	192.0	87.0	134.9	357.3	391.7	0.96	0.50	24.02	32.39
44.88	5.74	27.3	223.0	177.4	41.2	359.5	388.4	0.96	0.51	23.02	30.87
46.98	5.86	27.3	182.0	57.2	197.3	378.6	424.3	0.96	0.50	23.32	31.23
49.73	6.04	27.3	140.0	54.6	159.3	372.2	383.7	0.96	0.47	15.62	21.19
51.94	6.01	27.3	71.0	25.6	145.2	321.2	340.6	0.96	0.46	19.57	26.24
53.75		27.3	164.0	0.0	99.8	370.1	269.6	0.96	0.49	21.11	28.38
56.76	5.75	27.3	130.0	64.1	130.2	44.7	364.1	0.96	0.48	23.56	31.71
58.74	5.86	27.3	133.0	36.6	120.5	331.8	326.9	0.96	0.48	24.34	32.89
60.67	5.91	27.3	112.0	19.6	143.1	351.0	332.1	0.95	0.48	22.44	30.17
62.95	5.96	27.3	130.0	10.8	130.4	427.5	311.0	0.96	0.48	21.75	29.16
64.83	6.51	27.3	181.0	17.8	143.3	340.3	330.9	0.96	0.48	21.22	28.26
66.77	5.93	27.3	188.0	49.2	161.4	351.0	380.4	0.96	0.48	19.29	25.63
68.79	5.63	27.3	238.0	57.9	157.3	393.5	385.0	0.96	0.48	20.31	26.70
70.76	5.76	27.3	188.0	90.7	174.8	355.2	435.3	0.96	0.48	18.26	24.13
72.75	6.11	27.3	233.0	56.3	158.0	419.0	384.1	0.96	0.48	19.71	26.04

Table F-33. Continued.

Train R3 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
74.88	6.00	27.3	270.0	73.6	199.6	444.5	443.0	0.96	0.48	19.18	25.38
76.81	6.00	27.3	206.0	113.5	180.1	344.6	463.4	0.96	0.48	15.48	20.49
78.76	5.90	27.3	245.0	61.1	171.0	314.8	402.9	0.96	0.46	17.21	22.66
80.80	6.50	27.3	218.0	146.6	118.0	265.9	434.4	0.97	0.36	14.18	18.77
82.96	6.00	27.3	185.0	88.4	160.9	323.3	419.1	0.97	0.44	15.41	20.34
84.84	6.50	27.3	198.0	52.3	164.6	663.6	386.7	0.97	0.38	14.52	18.87
86.81	6.50	27.3	197.0	58.5	171.1	308.4	399.4	0.97	0.47	15.43	19.97
88.61	6.20	27.3	210.0	45.4	178.0	304.2	393.2	0.97	0.42	14.80	19.01
90.55	5.93	27.3	212.0	132.3	104.2	276.5	406.3	0.97	0.51	14.72	19.07
92.83	6.50	27.3	235.0	116.6	117.4	355.2	403.8	0.97	0.45	12.71	16.80
94.82	6.50	27.3	214.0	127.8	136.4	310.5	434.0	0.97	0.45	15.34	20.03
96.66	6.50	27.3	180.0	59.1	184.8	210.6	413.7	0.98	0.51	11.68	15.11
98.85	6.50	27.3	196.0	40.4	169.6	278.6	379.8	0.97	0.47	12.44	16.16
100.89	6.50	27.3	211.0	62.6	162.8	246.7	395.2	0.96	0.48	13.97	17.97
102.80	6.50	27.3	232.0	81.6	160.0	257.4	411.4	0.98	0.31	12.20	15.75
104.91	6.50	27.3	230.0	85.3	177.1	255.2	432.2	0.97	0.44	12.74	16.53
106.67	6.09	27.3	223.0	81.1	176.8	261.6	428.7	0.98	0.51	10.57	13.72
108.74	6.13	27.3	210.0	122.8	128.1	246.7	420.7	0.98	0.50	12.52	16.38
110.58	6.19	27.3	230.0	63.5	173.0	182.9	407.3	0.98	0.49	12.89	16.77
112.60	6.22	27.3	237.0	122.5	137.1	280.8	429.4	0.98	0.50	12.11	15.92
114.72	6.19	27.3	209.0	84.8	182.3	293.5	437.9	0.98	0.49	10.81	14.19
116.82	6.16	27.3	206.0	82.1	156.1	297.8	408.0	0.98	0.50	12.19	16.12
118.55	6.18	27.3	224.0	56.0	176.7	282.9	403.5	0.98	0.35	11.52	15.19
120.65	6.18	27.3	125.0	119.0	133.7	272.3	423.5	0.98	0.35	11.44	15.08
122.51	6.37	27.3	226.0	19.9	134.3	246.7	324.0	0.98	0.44	13.29	17.63
124.56	5.99	27.3	197.0	68.7	184.4	234.0	423.9	0.98	0.39	11.77	15.58
126.87	6.34	27.3	254.0	33.7	97.7	210.6	301.2	0.98	0.41	12.26	16.16
128.69	5.91	27.3	298.0	106.8	175.2	251.0	452.8	0.98	0.55	12.25	16.24
130.79	5.99	27.3	222.0	162.5	163.6	238.2	495.9	0.98	0.51	11.64	15.42
132.55	6.19	27.3	220.0	85.1	165.5	278.6	421.4	0.98	0.53	11.54	15.34
134.52	6.01	27.3	257.0	74.1	174.0	246.7	418.9	0.98	0.53	10.93	14.53
136.52	6.07	27.3	268.0	126.7	63.4	231.8	360.9	0.98	0.41	10.41	13.80
138.89	6.52	27.3	250.0	156.0	48.8	125.5	374.6	0.98	0.35	10.41	13.84
140.93	6.02	27.3	283.0	109.8	168.3	333.9	447.9	0.98	0.41	11.78	15.74
142.55	5.92	27.3	216.0	135.6	174.6	248.9	481.3	0.98	0.48	9.21	12.27
144.57	5.82	27.3	216.0	75.9	165.2	297.8	411.9	0.98	0.47	11.92	15.90
146.51	6.05	27.3	257.0	98.6	145.9	202.1	415.3	0.98	0.43	11.13	14.83

Table F-33. Continued.

Train R3 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
148.63	5.90	27.3	245.0	102.5	181.5	357.3	454.8	0.98	0.44	15.37	20.40
150.52	5.99	27.3	224.0	129.9	144.4	259.5	445.1	0.98	0.44	12.27	16.41
152.53	6.22	27.3	215.0	90.6	66.6	189.3	328.0	0.98	0.41	14.15	18.80
154.85	6.37	27.3	270.0	98.2	52.1	221.2	320.1	0.98	0.44	14.50	19.20
156.74	6.25	27.3	248.1	287.0	174.0	295.7	631.8	0.98	0.43	10.41	13.87
158.60	5.79	27.3	230.0	109.4	164.4	221.2	444.6	0.98	0.44	11.00	14.60
160.51	5.60	27.3	200.0	89.0	166.0	302.0	425.8	0.98	0.43	10.22	13.67

Table F-34. Transfer data for Train R3 Fermentor 2 at high C-N ratio.

Train R3 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00							
1.00	6.18					438.2	
2.00						236.1	
3.00						199.9	
4.00	5.99					144.6	
5.00						165.9	
6.00	6.04					134.0	
7.69	5.97	186.5	180.0	206.5	135.7	121.2	552.4
9.83	5.65	146.2	255.0	204.7	218.4	414.8	574.0
11.90	5.80	129.6	259.0	215.1	164.9	342.4	547.5
14.60	5.42	165.0	230.0	240.0	183.8	425.4	555.9
16.98	5.38	151.3	183.0	231.0	150.3	265.9	527.1
18.85	5.67	147.2	176.0	149.8	179.0	187.2	478.7
21.68	5.52	131.1	182.0	145.4	159.3	204.2	470.7
23.92	5.45	142.1	159.0	164.4	158.9	206.3	478.3
25.07	5.67	143.0	236.0	131.9	168.1	234.0	454.1
28.79	5.65	151.2	194.0	195.1	191.1	214.8	535.0
30.91	5.57	156.0	217.0	158.0	195.6	193.6	494.7
32.06	5.64	145.3	196.0	183.5	177.0	195.7	512.3
35.81	5.93	130.9	194.0	166.8	161.7	157.4	494.7
37.01	5.61	39.3	353.0	295.1	0.0	159.5	491.9
39.91	5.74	200.7	247.0	194.2	299.1	187.2	589.7
42.00	5.59	134.9	130.0	194.6	186.5	212.7	543.6
44.88	5.61	41.2	323.0	229.9	0.0	168.0	427.2
46.98	5.59	197.3	188.0	184.2	279.2	191.4	563.2
49.73	5.87	159.3	88.0	143.2	205.8	280.8	486.8
51.94	5.94	145.2	197.0	75.9	158.7	187.2	386.5
53.75	5.80	99.8	166.0	167.2	130.1	240.4	494.6
56.76	5.43	130.2	184.0	131.1	165.3	295.7	463.3
58.74	5.48	120.5	159.0	137.7	165.5	212.7	479.8
60.67	5.57	143.1	198.0	113.9	188.6	231.8	456.5
62.95	5.73	130.4	242.0	133.7	196.1	221.2	496.5
64.83	6.25	143.3	235.0	186.4	200.0	46.8	540.2
66.77	5.81	161.4	290.0	187.9	209.8	185.0	533.4
68.79	5.68	157.3	256.0	237.6	209.9	234.0	587.3
70.76	5.77	174.8	290.0	188.3	242.4	272.3	553.0
72.75	5.84	158.0	323.0	236.1	209.6	219.1	584.8

Table F-34. Continued.

Train R3 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.88	6.00	199.6	292.0	267.5	252.2	185.0	617.2
76.81	6.00	180.1	312.0	205.6	162.0	240.4	584.6
78.76	5.93	171.0	280.0	241.4	243.0	134.0	611.5
80.80	6.00	118.0	254.0	220.0	173.0	197.8	572.1
82.96	6.00	160.9	263.0	189.8	226.8	176.5	552.8
84.84	6.00	164.6	252.0	201.7	230.8	182.9	565.0
86.81	6.00	171.1	296.0	200.8	224.4	138.3	551.2
88.61	5.91	178.0	278.0	211.3	260.9	148.9	591.3
90.55	6.00	104.2	314.0	213.1	162.9	214.8	568.9
92.83	6.00	117.4	291.0	238.8	187.4	189.3	608.8
94.82	6.50	136.4	252.0	216.5	212.1	144.6	589.3
96.66	6.00	184.8	253.0	181.8	255.7	138.3	549.8
98.85	6.50	169.6	290.0	197.9	225.9	163.8	551.3
100.89	6.50	162.8	283.0	216.9	236.6	170.2	587.8
102.80	6.50	160.0	300.0	234.6	208.1	144.6	579.8
104.91	6.50	177.1	284.0	232.1	244.5	123.4	596.6
106.67	5.88	176.8	265.0	226.1	235.6	168.0	583.0
108.74	5.94	128.1	299.0	210.3	183.9	134.0	563.2
110.58	6.01	173.0	287.0	230.2	240.6	148.9	595.9
112.60	6.05	137.1	276.0	242.2	183.3	151.0	585.5
114.72	6.05	182.3	264.0	212.2	247.4	191.4	575.4
116.82	6.02	156.1	280.0	207.4	213.9	213.3	562.4
118.55	6.01	176.7	320.0	224.4	232.8	140.4	578.6
120.65	6.12	133.7	289.0	128.8	184.0	169.0	477.2
122.51	6.01	134.3	254.0	227.2	197.0	206.3	587.0
124.56	5.81	184.4	304.0	200.0	237.6	168.0	551.3
126.87	5.83	97.7	228.0	255.7	203.7	193.6	658.8
128.69	5.67	175.2	263.0	301.4	202.3	144.6	626.6
130.79	5.96		275.0	223.8	204.5	170.2	561.8
132.55	6.02	165.5	280.0	220.8	219.3	144.6	572.7
134.52	5.92	174.0	314.0	261.6	192.0	174.4	577.7
136.52	5.81	63.4	340.0	269.0	150.7	159.5	654.4
138.89	6.12	18.8	307.0	250.7	73.9	83.0	572.9
140.93	5.97	168.3	277.0	285.3	191.0	217.0	605.1
142.55	5.77	174.6	248.0	214.0	235.7	182.9	573.2
144.57	5.74	165.2	289.0	216.1	184.2	246.7	543.2
146.51	5.88	145.9	305.0	257.1	177.2	187.2	586.5

Table F-34. Continued.

Train R3 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
148.63	5.77	181.5	279.0	249.1	237.6	265.9	603.3
150.52	5.82	147.7	282.0	227.8	196.4	225.5	577.9
152.53	5.91	60.6	371.0	215.6	148.7	195.7	595.8
154.85	6.04	52.1	279.0	270.4	93.0	221.2	608.4
156.74	6.15	174.0	297.3	251.1	193.2	159.5	568.5
158.60	5.72	164.4	254.0	230.2	222.3	189.3	586.2
160.51	6.14	166.0	278.0	201.8	218.5	221.2	552.4

Table F-35. Transfer data for Train R3 Fermentor 3 at high C-N ratio.

Train R3 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00							
1.00	6.23					406.3	
2.00						287.1	
3.00						189.3	
4.00	6.07					129.7	
5.00						191.4	
6.00	5.92					393.5	
7.69	5.86	135.7	221.0	177.8	201.0	287.1	539.8
9.83	5.65	218.4	213.0	258.8	126.0	504.1	445.5
11.90	5.77	164.9	193.0	259.6	220.4	380.7	594.2
14.60	5.49	183.8	177.0	230.2	184.2	295.7	490.6
16.98	5.38	150.3	151.0	185.5	122.8	229.7	482.1
18.85	5.56	179.0	179.0	176.4	189.3	212.7	465.8
21.68	5.46	159.3	169.0	180.6	173.0	214.8	473.4
23.92	5.53	158.9	243.0	160.0	184.6	159.5	464.8
25.07	5.70	168.1	221.0	238.9	188.8	191.4	538.7
28.79	5.74	191.1	219.0	196.5	234.9	140.4	519.4
30.91	5.70	195.6	227.0	218.7	215.1	114.9	517.3
32.06	5.73	177.0	201.0	197.4	204.4	100.0	521.9
35.81	6.01	161.7	235.0	197.7	203.4	123.4	518.5
37.01	5.64	0.0	349.0	357.0	0.0	168.0	530.0
39.91	5.81	299.1	127.0	245.9	199.4	242.5	520.7
42.00	5.61	186.8	205.0	131.8	292.1	212.7	516.2
44.88	5.69	0.0	337.0	330.0	0.0	104.2	500.9
46.98	5.76	279.2	77.0	189.4	244.8	214.8	510.1
49.73	5.78	205.8	241.0	89.0	270.5	206.3	450.9
51.94	5.89	158.7	191.0	201.2	235.6	165.9	557.2
53.75	5.99	130.1	217.0	167.3	172.8	155.3	489.1
56.76	5.47	165.3	195.0	183.5	219.7	202.1	517.0
58.74	5.47	165.5	227.0	163.0	213.2	180.8	489.8
60.67	5.49	188.6	307.0	199.3	235.8	151.0	525.6
62.95	5.72	196.1	267.0	242.6	278.9	189.3	604.5
64.83	6.34	200.0	327.0	238.5	249.2	197.8	566.8
66.77	5.80	209.8	291.0	290.5	261.7	199.9	627.9
68.79	5.71	209.9	315.0	257.2	262.6	217.0	595.0
70.76	5.83	242.4	309.0	288.1	248.6	197.8	612.5
72.75	5.85	209.6	317.0	324.9	241.8	274.4	642.0

Table F-35. Continued.

Train R3 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.88	5.50	252.2	305.0	286.2	251.1	272.3	612.7
76.81	6.00	262.0	302.0	314.6	256.5	197.8	646.2
78.76	5.86	243.0	270.0	279.8	337.8	140.4	656.7
80.80	6.00	173.0	291.0	254.6	249.3	206.3	610.0
82.96	6.00	226.8	291.0	267.6	246.3	187.2	589.3
84.84	6.00	230.8	321.0	254.7	283.0	131.9	612.8
86.81	6.00	224.4	293.0	297.7	272.2	178.7	645.6
88.61	6.04	260.9	308.0	278.5	255.2	178.7	609.0
90.55	6.05	162.9	308.0	315.3	224.4	165.9	655.9
92.83	6.00	187.4	289.0	292.2	214.4	210.6	598.3
94.82	6.50	212.1	294.0	253.2	255.3	121.2	584.1
96.66	6.00	255.7	322.0	255.4	268.2	159.5	599.3
98.85	6.00	225.9	323.0	290.0	306.1	148.9	671.4
100.89	6.50	236.6	301.0	288.0	279.8	161.7	643.9
102.80	6.50	208.1	307.0	299.9	254.9	155.3	631.1
104.91	6.50	244.5	277.0	285.9	248.0	244.6	609.4
106.67	5.91	235.6	315.0	268.1	270.6	140.4	614.9
108.74	5.90	183.9	302.0	298.9	249.5	134.0	643.6
110.58	5.98	240.6	304.0	286.9	234.4	134.0	598.3
112.60	6.04	183.3	297.0	279.4	245.9	170.2	621.1
114.72	6.02	247.4	305.0	267.2	249.7	178.7	593.8
116.82	6.02	213.9	327.0	280.1	290.3	263.7	646.0
118.55	5.96	232.8	329.0	320.8	238.1	195.7	635.6
120.65	5.99	184.0	281.0	291.5	267.7	251.0	655.3
122.51	6.03	197.0	330.0	254.3	258.1	223.3	594.5
124.56	5.76	237.6	341.0	307.7	259.0	248.9	627.2
126.87	5.82	203.7	305.0	230.7	304.1	208.4	610.2
128.69	5.71	202.3	309.0	266.2	258.1	134.0	602.1
130.79	5.94	204.5	305.0	276.8	253.7	231.8	606.4
132.55	6.03	219.3	305.0	279.8	244.8	172.3	604.6
134.52	5.89	192.0	367.0	317.9	214.5	204.2	620.5
136.52	5.80	150.7	322.0	340.0	231.5	204.2	700.9
138.89	6.09	73.9	294.0	307.4	213.5	104.2	726.1
140.93	5.96	191.0	269.0	277.1	222.9	363.7	588.1
142.55	5.66	235.7	299.0	247.5	231.9	285.0	565.3
144.57	5.67	194.2	315.0	289.0	266.4	225.5	641.3
146.51	5.88	177.2	303.0	305.4	203.4	276.5	611.7

Table F-35. Continued.

Train R3 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
148.63	5.74	237.6	295.0	282.8	241.4	344.6	601.2
150.52	5.79	196.4	365.0	285.5	258.8	255.2	628.0
152.53	5.79	148.7	308.0	371.3	228.8	208.4	731.5
154.85	6.01	93.0	309.0	279.4	240.5	221.2	706.0
156.74	6.23	193.2	277.0	293.6	220.3	168.0	600.8
158.60	5.77	222.8	283.0	253.9	238.3	246.7	571.7
160.51	5.86	218.5	303.0	279.5	243.2	208.4	599.0

Table F-36. Transfer data for Train R3 Fermentor 4 at high C-N ratio.

Train R3 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00									
1.00	6.19					423.3			
2.00						304.2			
3.00						246.7			
4.00	6.20					131.9			
5.00						187.2			
6.00	6.09					276.5			
7.69	6.11	201.0	160.0	224.9	240.2	391.4	564.1	0.78	0.53
9.83	5.78	126.0	160.0	217.0	67.0	646.6	455.1	0.80	0.37
11.90	5.90	220.4	160.0	197.9	180.2	427.5	454.8	0.90	0.45
14.60	5.66	184.2	160.0	181.0	161.2	291.4	455.1	0.74	0.40
16.98	5.59	122.8	160.0	153.5	128.9	306.3	456.7	0.77	0.39
18.85	6.04	189.3	160.0	181.2	316.6	455.2	455.6	0.80	0.43
21.68	5.55	173.0	220.0	171.9	157.8	321.2	453.8	0.77	0.35
23.92	5.57	184.6	220.0	244.8	164.1	323.3	521.4	0.77	0.35
25.07	5.73	188.8	220.0	226.2	179.2	425.4	513.8	0.81	0.35
28.79	5.78	234.9	220.0	225.1	214.1	421.1	515.8	0.80	0.33
30.91	5.87	215.1	220.0	228.6	219.1	125.5	529.7	0.80	0.33
32.06	5.83	204.4	220.0	206.6	217.6	123.4	516.9	0.81	0.33
35.81	5.92	203.4	220.0	239.9	181.5	421.1	515.1	0.81	0.33
37.01	5.75	0.0	220.0	351.0	0.0	387.1	511.7	0.81	0.33
39.91	6.15	199.4	220.0	129.2	153.0	319.1	379.9	0.79	0.35
42.00	5.80	292.1	220.0	211.1	234.4	312.7	521.9	0.79	0.28
44.88	5.85	0.0	220.0	342.6	0.0	238.2	528.1	0.80	0.32
46.98	5.86	244.8	220.0	81.8	200.3	376.5	360.3	0.78	0.37
49.73	5.96	270.5	220.0	246.2	219.2	406.3	542.2	0.80	0.35
51.94	6.01	235.6	220.0	196.3	290.7	36.2	562.4	0.78	0.34
53.75	6.00	172.8	220.0	222.7	182.7	131.9	529.7	0.82	0.42
56.76	5.50	219.7	220.0	196.2	241.8	514.7	515.4	0.82	0.41
58.74	5.57	213.2	300.0	231.2	201.6	338.2	516.7	0.83	0.48
60.67	5.74	235.8	300.0	310.8	209.6	276.5	596.1	0.80	0.47
62.95	5.99	278.9	300.0	272.3	262.7	253.1	610.9	0.84	0.43
64.83	6.36	249.2	300.0	333.7	244.0	316.9	653.8	0.81	0.46
66.77	5.96	261.7	300.0	295.3	252.6	272.3	623.5	0.84	0.43
68.79	5.78	262.6	300.0	312.7	248.5	293.5	637.0	0.83	0.57
70.76	5.96	248.6	300.0	310.2	250.8	346.7	636.9	0.83	0.45
72.75	6.00	241.8	300.0	314.8	230.8	306.3	621.4	0.82	0.47

Table F-36. Continued.

Train R3 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
74.88	6.50	251.1	300.0	304.5	265.1	370.1	615.6	0.83	0.62
76.81	6.00	256.5	300.0	305.1	245.0	265.9	626.5	0.85	0.55
78.76	5.99	337.8	300.0	267.0	357.2	193.6	624.2	0.83	0.35
80.80	6.00	249.3	300.0	294.8	294.7	274.4	665.4	0.84	0.32
82.96	6.00	246.3	300.0	295.6	253.6	238.2	625.2	0.85	0.36
84.84	6.00	283.0	300.0	323.8	221.4	199.9	620.9	0.85	0.38
86.81	6.00	272.2	300.0	298.0	283.0	282.9	656.8	0.86	0.36
88.61	6.15	252.2	300.0	308.7	261.9	202.1	645.3	0.81	0.36
90.55	6.07	226.6	300.0	307.3	261.5	240.4	643.5	0.84	0.34
92.83	6.00	214.4	300.0	290.4	232.5	304.2	605.6	0.85	0.35
94.82	6.50	255.3	300.0	296.7	256.4	172.3	594.9	0.85	0.39
96.66	6.00	268.2	300.0	324.3	276.9	221.2	630.1	0.85	0.42
98.85	6.00	306.1	300.0	328.5	239.1	344.6	643.5	0.84	0.53
100.89	6.50	279.8	300.0	304.3	302.0	231.8	682.2	0.85	0.40
102.80	6.00	254.9	300.0	310.8	267.7	168.0	654.7	0.85	0.35
104.91	6.00	248.0	300.0	280.3	274.7	185.0	630.5	0.85	0.54
106.67	5.96	270.6	300.0	317.5	227.9	259.5	623.7	0.83	0.38
108.74	6.01	249.5	300.0	304.8	254.4	263.7	646.8	0.84	0.36
110.58	6.00	234.4	300.0	307.0	251.8	282.9	636.8	0.84	0.39
112.60	6.10	245.9	300.0	300.8	233.6	440.3	610.8	0.86	0.36
114.72	6.04	249.7	300.0	307.6	236.3	348.8	621.3	0.84	0.37
116.82	6.01	290.3	300.0	331.4	218.6	408.4	625.7	0.84	0.37
118.55	5.96	238.1	300.0	331.7	256.4	289.3	664.9	0.85	0.47
120.65	6.03	267.7	300.0	283.4	252.9	363.7	613.7	0.85	0.37
122.51	6.01	258.1	300.0	333.3	216.8	404.1	626.1	0.85	0.44
124.56	5.80	259.0	300.0	344.8	248.4	348.8	632.3	0.84	0.34
126.87	5.94	304.1	300.0	307.7	235.8	495.6	619.5	0.85	0.35
128.69	5.69	258.1	300.0	312.0	290.2	342.4	679.2	0.85	0.36
130.79	6.09	253.7	300.0	310.7	247.8	255.2	634.3	0.85	0.37
132.55	5.97	244.8	300.0	307.8	243.7	427.5	628.2	0.87	0.34
134.52	5.91	214.5	300.0	371.9	164.8	408.4	620.3	0.85	0.36
136.52	5.86	231.5	300.0	325.8	208.8	410.5	601.2	0.85	0.34
138.89	6.14	213.5	300.0	294.4	282.5	104.2	660.5	0.85	0.34
140.93	5.89	222.9	300.0	273.7	245.3	644.5	595.2	0.84	0.35
142.55	5.90	231.9	300.0	301.6	211.2	170.2	596.7	0.85	0.37
144.57	5.67	266.4	300.0	316.9	260.4	453.1	609.0	0.84	0.37
146.51	5.95	203.4	300.0	306.8	241.1	342.4	642.6	0.84	0.26

Table F-36. Continued.

Train R3 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
148.63	5.77	241.4	300.0	298.5	220.1	529.6	596.8	0.83	0.39
150.52	5.78	258.8	300.0	386.8	208.9	472.2	634.5	0.85	0.34
152.53	5.85	228.8	300.0	311.9	260.7	393.5	641.9	0.82	0.36
154.85	6.07	240.5	300.0	311.9	271.9	419.0	659.4	0.82	0.34
156.74	6.33	220.3	300.0	279.6	252.4	248.9	609.8	0.83	0.34
158.60	5.79	238.3	300.0	285.6	225.7	419.0	594.3	0.84	0.35
160.51	6.27	243.2	300.0	306.2	230.6	291.4	613.8	0.83	0.35

Table F-37. Transfer data for Train P Fermentor 1 at high C-N ratio.

Train P – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
1.00	6.04					470.1	0.0				
2.00						268.0	0.0				
3.00		27.3				255.2	0.0	0.98	0.95		
4.00	6.04	27.3				134.0	0.0	0.98	0.42		
5.00		27.3				140.4	0.0	0.98	0.69		
6.00	6.06	27.3				131.9	0.0	0.98	0.69		
7.75	5.77	27.3	224.0	227.5	173.2	108.5	566.6	0.98	0.60		
9.87	5.75	27.3	235.0	95.6	155.9	402.0	415.3	0.98	0.42	15.07	19.38
11.95	5.93	27.3	172.0	105.1	164.7	480.7	433.6	0.99	0.99	18.70	23.94
14.64	5.72	27.3	188.0	51.1	156.0	450.9	370.9	0.97	0.49	18.09	23.34
16.00	5.59	27.3	147.0	63.0	158.1	431.8	384.9	0.96	0.50	26.75	34.79
18.89	5.86	27.3	156.0	33.3	144.1	436.0	342.2	0.98	0.60	24.08	31.47
21.71	5.76	27.3	148.0	25.4	164.6	478.6	353.8	0.95	0.53	27.17	35.63
23.00	5.70	27.3	97.0	33.4	149.8	431.8	347.0	0.95	0.50	26.23	34.72
25.11		27.3	130.0	1.6	129.8	463.7	295.2	0.85	0.49	26.65	35.52
28.83	5.90	27.3	150.0	129.0	152.6	331.8	445.4	0.94	0.52	32.25	43.41
30.94	5.86	27.3	145.0	20.5	164.3	436.0	348.7	0.95	0.50	27.02	36.46
32.08	5.90	27.3	168.0	15.0	164.8	363.7	343.6	0.95	0.44	27.55	37.08
35.84	6.02	27.3	160.0	44.9	157.9	425.4	366.6	0.95	0.42	24.55	33.32
37.04	5.71	27.3	301.0	159.7	34.5	368.0	358.0	0.95	0.51	27.81	37.44
39.93	5.74	27.3	177.0	134.5	193.0	502.0	492.3	0.96	0.47	26.06	35.33
42.00	5.93	27.3	140.0	38.8	174.6	285.0	377.2	0.96	0.51	23.73	32.21
44.90	5.80	27.3	215.0	136.3	36.7	285.0	336.8	0.96	0.51	24.12	32.73
47.00	5.82	27.3	214.0	52.8	193.8	310.5	410.4	0.96	0.48	23.80	32.31
49.76	5.99	27.3	140.0	75.7	174.2	412.6	413.7	0.94	0.64	21.82	30.03
51.97	6.00	27.3	69.0	29.6	145.3	372.2	338.7	0.96	0.45	22.10	30.48
53.78		27.3	144.0	0.0	105.1	365.8	268.9	0.95	0.52	23.61	32.18
56.88	5.71	27.3	112.0	9.3	70.7	391.4	344.1	0.95	0.52	23.18	32.01
58.77	5.66	27.3	97.0	54.5	191.9	351.0	410.2	0.96	0.52	22.05	30.57
60.70		27.3	114.0	0.0	145.6	395.6	309.4	0.95	0.53	22.76	31.26
62.97		27.3	132.0	0.0	145.8	380.7	309.6	0.96	0.51	22.59	31.09
64.85	6.47	27.3	181.0	16.5	151.4	442.4	331.7	0.96	0.52	20.94	27.93
66.81	5.92	27.3	204.0	30.9	185.6	238.2	380.3	0.96	0.52	20.77	27.79
68.82	5.56	27.3	210.0	107.2	130.4	312.7	401.4	0.96	0.52	19.85	26.33
70.85	5.74	27.3	136.0	71.7	173.2	146.8	408.7	0.96	0.52	18.87	24.87
72.79	5.84	27.3	219.0	92.4	176.5	348.8	432.7	0.96	0.52	18.65	24.60

Table F-37. Continued.

Train P – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
74.92	6.00	27.3	218.0	92.1	159.0	363.7	414.9	0.96	0.52	18.88	25.07
76.85	6.00	27.3	212.0	84.8	166.1	282.9	414.7	0.97	0.52	16.98	22.49
78.78	5.94	27.3	225.0	53.7	191.6	257.4	410.1	0.97	0.32	17.42	23.03
80.83	6.00	27.3	232.0	136.3	113.6	248.9	413.7	0.97	0.36	15.13	20.01
82.98	6.50	27.3	197.0	90.5	178.8	87.2	433.1	0.97	0.46	14.43	19.00
84.84	6.50	27.3	222.0	52.3	182.2	278.6	398.3	0.98	-0.11	14.03	18.48
86.85	6.50	27.3	219.0	86.2	173.5	227.6	423.5	0.97	0.48	14.18	18.40
88.66	6.09	27.3	252.0	86.1	168.0	223.3	417.9	0.97	0.44	14.78	19.10
90.56	5.94	27.3	244.0	151.0	129.4	293.5	444.2	0.98	0.50	14.97	19.47
92.86	6.50	27.3	211.0	125.2	147.2	227.6	436.2	0.98	0.35	12.20	15.91
94.85	6.50	27.3	206.0	61.1	185.2	302.0	410.1	0.98	0.33	13.77	18.13
96.69	6.50	27.3	212.0	82.5	158.2	261.6	404.5	0.98	0.52	13.31	17.35
98.88	6.50	27.3	204.0	89.3	158.5	272.3	411.6	0.98	0.43	12.25	15.90
100.08	6.50	27.3	189.0	71.5	167.2	259.5	402.5	0.98	0.52	13.38	17.40
102.83	6.45	27.3	230.0	44.2	178.8	259.5	386.8	0.97	0.33	11.79	15.29
104.95	6.50	27.3	234.0	94.2	170.4	255.2	428.4	0.98	0.43	12.40	16.08
106.70	6.08	27.3	223.0	94.4	173.7	238.2	432.9	0.98	0.51	11.73	15.20
108.76	6.11	27.3	218.0	99.7	157.7	246.7	421.2	0.98	0.51	12.33	16.13
110.60	6.15	27.3	202.0	89.5	161.3	285.0	415.6	0.98	0.50	11.29	14.75
112.89	6.20	27.3	217.0	73.9	163.7	276.5	401.4	0.98	0.51	12.53	16.38
114.74	6.20	27.3	213.0	101.7	150.7	351.0	417.2	0.98	0.49	11.22	14.81
116.85	6.14	27.3	218.0	86.1	161.2	297.8	411.1	0.98	0.50	12.43	16.44
118.57	6.15	27.3	256.0	86.6	165.5	293.5	416.9	0.98	0.37	11.92	15.62
120.67	6.11	27.3	227.0	98.4	197.5	255.2	460.7	0.98	0.47	10.02	13.20
122.54	6.13	27.3	212.0	81.5	153.5	297.8	426.1	0.98	0.47	12.44	16.57
124.58	5.92	27.3	228.0	92.7	179.9	342.4	437.4	0.98	0.40	13.16	17.50
126.90	6.19	27.3	242.0	98.2	76.2	204.2	338.2	0.98	0.38	12.82	17.03
128.72	5.92	27.3	258.0	102.1	175.2	231.8	442.1	0.98	0.49	12.31	16.35
130.83	5.98	27.3	228.0	97.6	195.1	891.2	456.5	0.98	0.54	12.41	16.45
132.56	6.22	27.3	314.0	82.1	179.6	272.3	426.5	0.98	0.53	11.13	14.69
134.54	6.08	27.3	294.0	75.8	171.0	280.8	411.6	0.98	0.52	11.70	15.51
136.53	6.05	27.3	318.0	152.1	86.4	257.4	403.3	0.98	0.39	10.59	14.00
138.92	6.33	27.3	214.0	166.5	101.2	80.8	431.5	0.98	0.39	11.76	15.57
140.97	6.07	27.3	212.0	80.9	167.8	259.5	412.5	0.98	0.48	11.98	15.91
142.58	5.94	27.3	261.0	94.8	150.5	217.0	410.1	0.98	0.49	11.60	15.36
144.60	5.79	27.3	226.0	101.1	193.2	231.8	459.1	0.98	0.51	12.27	16.34
146.53	6.05	27.3	246.0	116.2	143.2	310.5	496.2	0.98	0.31	11.88	15.78

Table F-37. Continued.

Train P – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
148.67	5.90	27.3	256.0	117.7	160.7	276.5	443.2	0.98	0.50	11.68	15.49
150.54	5.95	27.3	233.0	126.2	162.8	272.3	453.8	0.98	0.50	11.72	15.54
152.54	6.16	27.3	239.0	100.4	78.9	236.1	344.1	0.98	0.48	10.46	13.85
154.89	6.25	27.3	258.0	66.2	119.8	244.6	349.8	0.97	0.42	11.60	15.39
156.78	6.24	27.3	267.0	139.8	145.4	234.0	450.0	0.98	0.44	11.60	15.40
158.63	5.80	27.3	246.0	133.2	166.4	238.2	464.4	0.98	0.40	11.60	15.40
160.53	5.50	27.3	264.0	124.9	151.9	372.2	448.8	0.98	0.45	11.39	15.18

Table F-38. Transfer data for Train P Fermentor 2 at high C-N ratio.

Train P – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00							
1.00	6.06					480.7	0.0
2.00						240.4	0.0
3.00			248.0		228.7	195.7	0.0
4.00	6.09					125.5	0.0
5.00						136.1	0.0
6.00	6.08					125.5	0.0
7.75	6.14	173.2	248.0	221.8	228.7	119.1	568.0
9.87	5.80	155.9	193.0	238.3	170.2	187.2	543.7
11.95	5.94	164.3	192.0	174.2	189.0	180.8	489.6
14.64	5.54	156.0	176.0	188.8	166.6	214.8	490.5
16.00	5.55	158.1	179.0	150.5	191.7	148.9	475.2
18.89	5.65	144.1	159.0	156.2	158.8	185.0	463.0
21.71	5.59	164.6	132.0	148.4	181.5	297.8	456.4
23.00	5.58	149.8	147.0	100.7	185.3	234.0	427.3
25.11	5.76	129.8	188.0	132.1	149.4	272.3	442.8
28.83	5.71	152.6	190.0	152.7	196.5	195.7	488.0
30.94	5.63	164.3	199.0	149.1	211.6	223.3	487.5
32.08	5.73	199.5	225.0	185.0	239.0	193.6	515.6
35.84	5.96	157.9	200.0	162.4	186.5	217.0	482.1
37.04	5.67	34.5	321.0	305.4	0.0	153.1	493.0
39.93	5.56	193.0	194.0	178.8	265.6	208.4	543.5
42.00	5.68	174.6	112.0	142.0	234.2	287.1	492.7
44.90	5.69	36.7	375.0	221.2	0.0	174.4	407.7
47.00	5.61	193.8	198.0	214.8	286.7	185.0	598.8
49.76	5.90	174.2	80.0	141.2	240.4	246.7	498.3
51.97	5.96	145.3	173.0	73.7	160.7	165.9	380.2
53.78	5.93	105.1	156.0	146.9	139.3	161.7	472.2
56.88	5.41	170.7	178.0	113.2	220.4	450.9	454.0
58.77	5.48	191.9	167.0	100.5	156.8	134.0	356.5
60.70	5.49	145.6	192.0	116.1	205.5	182.9	467.1
62.97	5.72	145.8	244.0	135.0	205.0	221.2	491.3
64.85	6.33	151.4	253.0	186.7	224.2	176.5	550.6
66.81	5.73	185.6	260.0	203.8	241.9	221.2	551.2
68.82	5.69	130.4	300.0	210.2	185.1	197.8	556.0
70.85	5.71	173.2	278.0	236.3	243.5	214.8	597.7
72.79	5.80	176.5	259.0	221.5	233.5	255.2	569.6

Table F-38. Continued.

Train P – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.92	6.00	159.0	267.0	217.2	206.8	161.7	556.1
76.85	6.00	166.1	274.0	212.9	223.0	187.2	560.9
78.78	5.97	191.6	290.0	221.7	249.7	119.1	571.9
80.83	6.00	113.6	260.0	234.9	165.1	153.1	577.5
82.98	6.00	178.8	283.0	202.1	245.9	121.2	560.3
84.84	6.00	182.2	274.0	221.0	251.7	155.3	581.5
86.85	6.00	173.5	297.0	224.7	231.8	148.9	574.1
88.66	6.01	168.0	288.0	252.2	219.9	142.5	595.2
90.56	5.93	129.4	270.0	242.8	178.4	227.6	582.9
92.86	6.00	147.2	272.0	214.6	204.5	157.4	563.0
94.85	6.50	185.2	270.0	207.5	255.8	142.5	569.2
96.69	6.00	158.2	262.0	213.1	223.1	131.9	569.1
98.88	6.50	158.5	246.0	205.1	223.6	153.1	561.3
100.08	6.50	167.2	276.0	193.5	226.6	165.9	544.0
102.83	6.50	178.8	287.0	230.8	231.6	125.5	574.7
104.95	6.50	170.4	276.0	235.9	228.8	178.7	585.4
106.70	5.89	173.7	269.0	225.5	229.7	202.1	573.6
108.76	5.93	157.7	269.0	218.2	217.1	123.4	568.7
110.60	5.98	161.3	277.0	202.5	233.6	159.5	566.9
112.89	6.00	163.7	262.0	220.8	227.8	144.6	576.0
114.74	6.02	150.7	275.0	215.6	207.2	231.8	564.2
116.85	6.00	161.2	305.0	219.0	222.3	291.4	571.2
118.57	6.00	165.5	287.0	256.8	219.8	195.7	603.2
120.67	6.01	197.5	249.0	230.9	253.6	165.9	579.1
122.54	6.00	153.5	278.0	213.2	197.0	255.2	547.8
124.58	5.76	179.9	285.0	231.1	232.8	227.6	576.1
126.90	5.82	76.2	298.0	244.2	177.4	172.3	636.5
128.72	5.68	175.2	294.0	261.6	218.4	180.8	596.9
130.83	6.02	195.1	261.0	229.3	266.4	131.9	591.7
132.56	6.03	179.6	300.0	213.7	233.4	193.6	559.6
134.54	5.93	171.0	366.0	298.0	177.5	180.8	596.6
136.53	5.82	86.4	288.0	319.0	182.1	193.6	706.8
138.92	6.18	101.2	240.0	214.7	142.1	114.9	546.7
140.97	5.93	167.8	315.0	212.9	201.8	180.8	538.0
142.58	5.77	150.5	276.0	260.9	210.1	163.8	612.6
144.60	5.73	193.2	278.0	225.9	245.9	193.6	570.7
146.53	5.89	143.2	319.0	245.7	183.7	246.7	578.3

Table F-38. Continued.

Train P – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
148.67	5.78	160.7	282.0	258.9	226.8	208.4	617.1
150.54	5.79	152.8	275.0	237.0	213.1	244.6	579.4
152.54	5.88	78.9	341.0	239.1	156.6	217.0	608.9
154.89	6.03	119.8	286.0	258.5	160.7	142.5	590.5
156.78	6.12	145.4	292.0	269.8	160.9	151.0	577.4
158.63	5.72	116.4	282.0	245.5	168.4	155.3	589.3
160.53	6.19	159.1	268.0	264.3	226.7	253.1	624.0

Table F-39. Transfer data for Train P Fermentor 3 at high C-N ratio.

Train P – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00							
1.00	6.07					353.1	0.0
2.00	6.23					234.0	0.0
3.00	6.01	228.7	215.0	246.0	231.9	191.4	564.2
4.00	6.23					161.7	0.0
5.00						176.5	0.0
6.00	6.02					402.0	0.0
7.75	6.01	228.7	215.0	246.0	231.9	342.4	564.2
9.87	5.73	170.2	187.0	198.7	213.1	125.5	532.7
11.95	5.90	189.0	169.0	193.2	186.9	225.5	482.2
14.64	5.57	166.6	179.0	178.7	162.4	208.4	465.6
16.00	5.48	191.7	175.0	183.4	188.5	193.6	471.3
18.89	5.73	158.8	155.0	158.9	176.2	144.6	468.4
21.71	5.65	181.5	159.0	130.9	208.2	195.7	448.0
23.00	5.54	185.3	215.0	149.0	200.3	206.3	455.1
25.11	5.78	149.4	211.0	190.2	176.8	159.5	508.7
28.83	5.75	196.5	237.0	191.6	220.9	157.4	507.1
30.94	5.67	211.6	215.0	202.1	246.8	353.1	533.6
32.08	5.73	199.5	225.0	185.1	239.0	108.5	515.7
35.84	5.87	186.5	211.0	201.6	219.9	148.9	526.2
37.04	5.71	0.0	343.0	323.4	0.0	129.7	507.2
39.93	5.68	265.6	107.0	196.2	242.4	323.3	525.3
42.00	5.61	234.2	253.0	112.0	268.1	257.4	464.8
44.90	5.64	0.0	339.0	380.0	0.0	157.4	576.3
47.00	5.74	286.7	41.0	200.5	253.3	119.1	538.8
49.76	5.80	240.4	205.0	82.9	251.7	253.1	419.2
51.97	5.89	160.7	177.0	178.7	228.8	159.5	537.9
53.78	6.03	139.3	205.0	157.9	164.6	138.3	474.3
56.88	5.45	220.4	197.0	176.9	241.6	151.0	504.2
58.77	5.43	156.8	197.0	172.8	199.1	174.4	506.2
60.70	5.56	205.5	291.0	194.7	216.0	153.1	496.3
62.97	5.71	205.0	301.0	247.0	256.3	214.8	589.4
64.85	6.34	224.2	283.0	257.9	256.5	182.9	599.7
66.81	5.79	241.9	311.0	259.2	156.1	148.9	600.2
68.82	5.65	185.1	295.0	299.4	240.1	202.1	645.5
70.85	5.84	243.5	271.0	273.3	234.7	212.7	592.9
72.79	5.86	233.5	295.0	259.6	255.9	242.5	600.6

Table F-39. Continued.

Train P – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.92	6.00	206.8	305.0	263.3	266.3	316.9	614.9
76.85	6.00	223.0	320.0	273.6	241.3	140.4	599.7
78.78	5.86	249.7	295.0	287.5	255.7	193.6	626.7
80.83	6.00	165.1	305.0	261.4	238.6	110.6	626.0
82.98	6.00	245.9	299.0	289.3	231.0	161.7	605.1
84.84	6.00	251.7	307.0	276.8	274.5	146.8	636.6
86.85	6.00	231.8	302.0	298.7	269.4	136.1	653.2
88.66	6.06	219.9	304.0	288.0	253.5	110.6	625.0
90.56	6.08	178.4	288.0	220.3	231.3	172.3	564.3
92.86	6.00	204.5	312.0	273.8	216.8	161.7	577.2
94.85	6.50	255.8	299.0	271.6	249.7	110.6	606.8
96.69	6.00	223.1	285.0	264.1	296.6	95.7	645.5
98.88	6.50	223.6	309.0	246.0	267.1	157.4	598.7
100.08	6.50	226.6	312.0	281.3	256.5	155.3	622.9
102.83	6.50	231.6	309.0	288.1	256.3	125.5	630.0
104.95	6.50	228.8	309.0	277.7	271.1	155.3	633.4
106.70	5.89	229.7	301.0	272.2	268.3	168.0	628.6
108.76	5.90	217.1	297.0	268.4	272.1	125.5	625.4
110.60	6.01	233.6	300.0	276.9	242.8	199.9	605.6
112.89	6.01	227.8	297.0	266.6	273.1	172.3	624.6
114.74	6.01	207.2	313.0	277.9	250.7	193.6	614.7
116.85	6.00	222.3	292.0	306.2	220.2	244.6	611.0
118.57	6.01	219.8	289.0	287.0	232.2	161.7	606.8
120.67	6.02	253.6	282.0	252.8	264.0	238.2	602.2
122.54	6.04	197.0	307.0	280.1	253.3	312.7	627.5
124.58	5.77	232.8	308.0	288.1	255.8	223.3	603.2
126.90	5.83	177.4	328.0	299.4	254.9	191.4	668.0
128.72	5.70	218.4	295.0	297.6	240.7	199.9	625.0
130.83	5.92	266.4	302.0	261.8	259.1	253.1	606.1
132.56	5.99	233.4	318.0	299.3	275.1	136.1	660.9
134.54	5.89	177.5	322.0	369.8	158.0	197.8	642.4
136.53	5.88	182.1	246.0	289.4	236.4	208.4	635.8
138.92	6.09	142.1	307.0	240.8	259.8	110.6	649.6
140.97	5.92	201.8	294.0	317.8	197.3	410.5	604.4
142.58	5.76	210.1	292.0	276.4	222.8	174.4	590.0
144.60	5.72	245.9	325.0	277.6	244.1	227.6	603.3
146.53	5.86	183.7	314.0	319.0	230.2	234.0	657.6

Table F-39. Continued.

Train P – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
148.67	5.79	226.8	287.0	285.5	235.2	255.2	611.3
150.54	5.82	213.1	336.0	278.1	253.6	251.0	610.7
152.54	5.82	156.6	322.0	341.0	216.0	227.6	692.5
154.89	5.95	160.7	305.0	286.2	288.9	197.8	705.5
156.78	6.31	160.9	297.0	294.9	159.9	231.8	586.0
158.63	5.75	168.4	277.0	282.1	197.2	255.2	603.0
160.53	5.92	226.7	307.0	267.8	225.1	338.2	579.7

Table F-40. Transfer data for Train P Fermentor 4 at high C-N ratio.

Train P – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00									
1.00	6.03					425.4	0.0		
2.00	5.96					238.2	0.0		
3.00	6.05	231.9	160.0	215.8	266.2	195.7	558.4	0.80	0.53
4.00	5.96		160.0			153.1	0.0	0.78	0.53
5.00			160.0			144.6	0.0	0.79	0.53
6.00	5.99		160.0			134.0	0.0	0.79	0.53
7.75	6.05	231.9	160.0	215.8	266.2	110.6	558.4	0.80	0.42
9.87	5.84	213.0	160.0	191.5	187.9	712.5	463.4	0.78	0.30
11.95	5.94	186.9	160.0	171.9	171.6	761.5	453.7	0.92	1.00
14.64	5.65	162.4	160.0	182.1	138.5	427.5	455.3	0.76	0.42
16.00	5.66	188.5	160.0	177.1	171.3	312.7	457.0	0.76	0.40
18.89	5.81	176.2	160.0	156.2	177.7	176.5	455.8	0.80	0.51
21.71	5.61	208.2	220.0	160.2	206.4	561.5	455.5	0.81	0.36
23.00	5.68	200.3	220.0	216.2	205.7	325.4	518.7	0.81	0.35
25.11	5.79	176.8	220.0	214.1	182.1	457.3	516.5	0.81	0.34
28.83	5.80	220.9	220.0	242.4	197.3	278.6	515.9	0.80	0.35
30.94	5.90	246.8	220.0	216.8	223.4	131.9	515.6	0.81	0.36
32.08	5.87	239.0	220.0	230.5	235.1	136.1	541.8	0.81	0.34
35.84	6.13	219.9	220.0	215.3	241.2	289.3	533.7	0.82	0.33
37.04	5.82	0.0	220.0	346.2	0.0	229.7	513.7	0.81	0.34
39.93	5.77	242.4	220.0	110.6	197.1	578.5	385.7	0.82	0.34
42.00	5.71	268.1	220.0	258.0	203.4	365.8	537.3	0.80	0.36
44.90	5.84	0.0	220.0	346.1	0.0	106.4	559.2	0.81	0.34
47.00	5.94	253.3	220.0	45.5	274.9	361.6	389.1	0.79	0.35
49.76	5.98	251.7	220.0	209.6	263.6	323.3	548.9	0.80	0.36
51.97	6.09	228.8	220.0	181.7	297.9	123.4	547.8	0.79	0.33
53.78	6.07	164.6	220.0	210.8	179.6	206.3	522.8	0.82	0.44
56.88	5.49	241.6	220.0	198.3	243.8	372.2	511.6	0.83	0.43
58.77	5.60	199.1	300.0	202.1	232.3	336.1	532.4	0.83	0.50
60.70	5.68	216.0	300.0	295.4	219.8	355.2	596.3	0.82	0.45
62.97	5.92	256.3	300.0	306.8	214.3	293.5	596.7	0.83	0.44
64.85	6.43	256.5	300.0	287.3	267.6	282.9	630.7	0.83	0.40
66.81	5.95	256.1	300.0	316.0	275.1	295.7	632.1	0.82	0.44
68.82	5.80	240.1	300.0	299.5	256.6	263.7	631.8	0.83	0.52
70.85	5.94	234.7	300.0	271.2	267.0	319.1	615.0	0.84	0.48
72.79	5.94	255.9	300.0	296.2	237.7	412.6	610.0	0.84	0.58

Table F-40. Continued.

Train P – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
74.92	6.50	266.3	300.0	302.1	251.8	338.2	630.0	0.84	0.58
76.85	6.00	241.3	300.0	319.5	247.6	208.4	643.4	0.82	0.46
78.78	6.09	255.7	300.0	291.2	248.2	199.9	613.6	0.84	0.34
80.83	6.00	238.6	300.0	310.4	249.7	274.4	635.9	0.85	0.31
82.98	6.00	231.0	300.0	305.1	234.4	217.0	614.9	0.84	0.37
84.84	6.00	274.5	300.0	313.5	215.5	234.0	604.8	0.84	0.34
86.85	6.00	269.4	300.0	307.0	267.1	212.7	649.8	0.86	0.36
88.66	6.16	253.5	300.0	305.2	266.4	172.3	645.8	0.83	0.34
90.56	5.84	231.3	300.0	286.8	268.9	248.9	629.9	0.83	0.37
92.86	6.00	216.8	300.0	312.4	215.3	240.4	608.0	0.85	0.30
94.85	6.50	249.7	300.0	302.5	212.5	151.0	590.4	0.83	0.41
96.69	6.50	296.6	300.0	288.0	241.0	191.4	624.1	0.86	0.37
98.88	6.00	267.1	300.0	313.0	285.2	178.7	673.6	0.84	0.52
100.08	6.00	256.5	300.0	315.8	284.7	291.4	641.1	0.84	0.38
102.83	6.00	256.3	300.0	314.0	240.2	219.1	630.7	0.84	0.35
104.95	6.00	271.1	300.0	312.2	244.2	278.6	632.4	0.83	0.57
106.70	6.01	268.3	300.0	304.6	262.0	272.3	647.5	0.83	0.37
108.76	6.00	272.1	300.0	300.3	270.8	280.8	646.9	0.85	0.37
110.60	5.99	242.8	300.0	303.0	268.0	255.2	648.3	0.87	0.37
112.89	6.07	273.1	300.0	301.0	242.0	467.9	619.2	0.86	0.35
114.74	6.02	250.7	300.0	315.9	253.8	327.6	648.0	0.85	0.41
116.85	6.05	220.2	300.0	296.4	255.3	470.1	628.6	0.85	0.38
118.57	6.03	232.2	300.0	292.4	226.8	382.9	596.0	0.86	0.35
120.67	6.07	264.0	300.0	285.4	246.0	391.4	608.8	0.85	0.35
122.54	5.98	253.3	300.0	309.7	255.7	444.5	641.5	0.84	0.34
124.58	5.80	255.8	300.0	312.0	274.5	416.9	628.8	0.85	0.42
126.90	5.90	254.9	300.0	332.2	197.6	463.7	605.3	0.85	0.41
128.72	5.76	240.7	300.0	298.6	247.5	387.1	627.8	0.85	0.43
130.83	6.09	259.1	300.0	306.9	239.6	372.2	622.2	0.85	0.36
132.56	6.00	275.1	300.0	321.3	235.0	353.1	633.7	0.85	0.38
134.54	6.01	158.0	300.0	325.9	186.1	251.0	654.1	0.85	0.35
136.53	5.89	236.4	300.0	249.8	251.9	234.0	563.4	0.84	0.33
138.92	6.39	259.8	300.0	311.0	256.0	93.6	641.2	0.86	0.42
140.97	5.94	197.3	300.0	298.1	235.7	365.8	633.6	0.85	0.43
142.58	5.81	222.8	300.0	295.1	223.8	333.9	595.5	0.85	0.34
144.60	5.68	244.1	300.0	327.5	191.7	444.5	595.4	0.85	0.35
146.53	5.92	230.2	300.0	316.7	220.8	478.6	614.7	0.84	0.35

Table F-40. Continued.

Train P – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
148.67	5.85	235.2	300.0	290.5	240.1	387.1	607.7	0.83	0.39
150.54	5.85	253.6	300.0	339.5	226.9	476.4	610.9	0.82	0.38
152.54	5.88	216.0	300.0	325.6	214.6	436.0	622.3	0.81	0.36
154.89	6.02	288.9	300.0	308.6	256.6	427.5	641.6	0.82	0.35
156.78	6.35	159.9	300.0	300.2	220.0	231.8	558.4	0.82	0.31
158.63	5.85	197.2	300.0	280.2	214.6	410.5	595.7	0.85	0.33
160.53	6.36	225.1	300.0	310.7	198.7	433.9	590.3	0.83	0.35

**SUPPLEMENTAL G. DATA FOR RESIDUAL BIOMASS RECYCLE IN
COUNTERCURRENT MIXED-ACID FERMENTATION: DECOUPLING CARBON-
NITROGEN RATIO AND PH**

Table G-1. Transfer data for Train C Fermentor 1 at low C-N ratio and near-neutral pH.

Train C – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00		27.3	172.0	0.0	136.8	453.1	307.6	0.99	0.36	11.78	13.15
2.59	7.74	27.3	180.6	30.2	164.8	395.6	365.8	0.99	0.36	17.09	19.54
4.00								0.99	0.36	12.04	13.51
6.00								0.99	0.36	12.00	13.49
8.51	7.39	27.3	191.0	63.5	138.5	663.6	372.8	0.98	0.28	16.61	19.19
10.69	6.87	27.3	236.0	75.8	137.5	506.2	384.1	0.98	0.34	16.37	19.60
12.58	6.58	27.3	253.0	153.8	110.8	316.9	435.4	0.99	0.35	14.67	17.67
14.59	6.57	27.3	188.0	98.2	179.2	412.6	448.2	0.98	0.47	14.39	17.40
16.57	6.36	27.3	240.0	51.8	160.3	272.3	382.9	0.98	0.31	13.57	16.26
18.64	6.83	27.3	232.0	153.4	110.8	548.8	435.0	0.99	0.29	12.16	15.16
20.00								0.98	0.30	13.98	16.54
22.50	6.50	27.3	210.0	112.3	164.8	89.3	447.9	0.98	0.44	14.22	16.91
24.73	6.51	27.3	298.0	72.8	162.6	440.3	406.2	0.98	0.34	14.26	17.73
26.58	7.06	27.3	255.0	147.9	175.5	142.5	494.2	0.98	0.29	13.09	15.98
28.59	6.43	27.3	244.0	116.1	164.1	189.3	451.0	0.77	0.21	12.82	15.77
30.70	6.32	27.3	246.0	105.0	164.5	346.7	440.3	0.97	0.24	12.56	15.44
32.62	6.42	27.3	226.0	93.4	173.6	485.0	437.8	0.98	0.26	12.43	15.34
34.64	6.35	27.3	239.0	104.6	147.0	399.9	422.4	0.98	0.42	11.94	14.82
36.65	6.58	27.3	261.0	126.4	139.9	372.2	437.1	0.98	0.27	8.69	10.95
38.15	6.26	27.3	223.0	123.8	166.4	210.6	461.0	0.98	0.26	10.38	12.84
40.60	6.44	27.3	217.0	60.7	188.0	419.0	419.5	0.97	0.38	10.36	12.84
42.61	6.26	27.3	132.0	100.7	143.1	372.2	414.6	0.97	0.29	12.03	14.82
44.59	6.57	27.3	210.0	18.7	140.1	316.9	329.6	0.97	0.28	12.38	15.28
46.67	6.18	27.3	214.0	102.8	126.8	389.2	400.4	0.97	0.29	13.14	16.19
48.75	6.41	27.3	231.0	102.4	140.7	319.1	413.9	0.98	0.34	13.11	16.14
50.68	6.45	27.3	220.0	132.1	121.3	238.2	424.2	0.98	0.31	10.17	12.48
52.61	6.52	27.3	210.0	108.0	134.8	406.3	413.6	0.97	0.25	10.40	12.80
54.67	6.46	27.3	229.0	100.2	134.5	448.8	405.5	0.97	0.23	12.98	16.06
56.70	6.16	27.3	256.0	94.9	161.6	548.8	427.3	0.98	0.23	11.36	14.18
58.59	6.43	27.3	220.0	130.7	120.5	399.9	422.0	0.98	0.25	14.96	18.59
60.58	6.02	27.3	228.0	100.2	142.6	516.9	413.6	0.98	0.31	16.13	20.16
62.66	6.04	27.3	271.0	101.2	153.1	482.8	425.1	0.97	0.38	12.72	15.69

Table G-1. Continued.

Train C – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
64.69	5.81	27.3	302.0	134.5	160.4	378.6	465.7	0.97	0.32	15.09	18.25
66.60	5.91	27.3	372.0	208.1	121.8	314.8	500.7	0.97	0.30	14.04	16.95
68.76	5.78	27.3	390.0	229.9	168.0	357.3	568.7	0.96	0.30	14.64	17.57
70.78	5.67	27.3	374.0	224.5	189.1	357.3	584.4	0.96	0.32	13.54	16.35
72.95	5.58	27.3	368.0	221.3	146.3	368.0	538.4	0.96	0.35	13.71	16.68
74.53	6.03	27.3	316.0	238.0	158.9	504.1	567.7	0.96	0.24	17.17	21.22
76.54	6.02	27.3	303.0	163.0	149.6	536.0	508.4	0.96	0.26	17.66	21.73
78.22	6.06	27.3	306.0	191.8	163.2	502.0	525.8	0.97	0.27	18.09	22.59
80.63	5.98	27.3	308.0	167.7	163.4	472.2	501.9	0.98	0.36	17.85	22.28
82.50	5.93	27.3	305.0	177.6	154.0	406.3	502.4	0.97	0.28	17.35	21.49
84.40	5.89	27.3	284.0	173.0	157.4	355.2	501.2	0.97	0.30	15.04	18.61
86.49	6.18	27.3	296.0	152.9	156.6	374.4	480.3	0.97	0.23	15.16	18.77
88.49	6.31	27.3	256.0	147.3	170.2	368.0	488.3	0.98	0.28	12.22	15.19
90.55	6.26	27.3	237.0	96.8	185.3	408.4	452.9	0.97	0.22	13.65	16.92
92.55	6.30	27.3	228.0	100.9	160.3	387.1	432.0	0.98	0.27	13.58	16.73
94.48	6.27	27.3	248.0	125.9	125.8	378.6	422.8	0.97	0.25	14.16	17.40
96.39	6.35	27.3	265.0	130.6	139.9	327.6	441.3	0.98	0.36	14.31	17.70
98.43	6.41	27.3	240.0	128.0	156.7	419.0	455.5	0.98	0.33	13.75	17.00

Table G-2. Transfer data for Train C Fermentor 2 at low C-N ratio and near-neutral pH.

Train C – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	8.10	136.8	272.0	169.2	221.0	253.1	551.5
2.59	8.55	164.8	240.0	173.4	258.1	100.0	564.8
4.00							
6.00							
8.51	7.21	138.5	307.0	187.0	184.2	470.1	530.8
10.69	7.10	137.5	310.0	236.1	204.9	463.7	601.6
12.58	6.94	110.8	233.0	254.4	168.4	348.8	610.1
14.59	6.63	179.2	312.0	185.7	224.3	429.7	528.9
16.57	7.59	160.3	286.0	236.5	233.9	229.7	608.2
18.64	6.71	110.8	256.0	229.9	140.9	325.4	558.1
20.00							
22.50	6.79	164.8	372.0	209.7	209.4	129.7	552.4
24.73	6.62	162.6	312.0	298.0	235.9	374.4	669.4
26.58	7.05	175.5	285.0	256.1	225.2	319.1	603.9
28.59	7.34	164.1	298.0	241.4	206.1	259.5	581.5
30.70	7.32	164.5	276.0	242.0	219.5	182.9	595.1
32.62	7.25	173.6	290.0	223.1	222.1	295.7	569.7
34.64	7.03	147.0	303.0	241.1	197.3	261.6	589.5
36.65	7.22	139.9	290.0	260.8	180.9	227.6	599.9
38.15	7.10	166.4	258.0	222.0	236.7	246.7	590.4
40.60	7.25	188.0	169.0	219.9	257.6	242.5	553.4
42.61	7.05	143.1	262.0	131.8	144.0	340.3	430.8
44.59	6.68	140.1	270.0	207.6	190.2	285.0	555.8
46.67	6.62	126.8	286.0	213.4	169.3	329.7	554.0
48.75	7.06	140.7	287.0	230.4	190.2	174.4	578.0
50.68	6.74	121.3	281.0	214.9	205.4	327.6	580.0
52.61	6.89	134.8	274.0	208.1	198.5	382.9	569.9
54.67	6.72	134.5	306.0	232.1	172.0	357.3	567.7
56.70	6.48	161.6	291.0	255.7	211.5	523.2	603.7
58.59	6.15	120.5	281.0	217.3	192.2	955.0	587.1
60.58	5.97	142.6	332.0	227.7	193.0	1023.1	576.2
62.66	6.00	153.1	331.0	270.7	212.2	595.6	627.9
64.69	5.94	160.4	378.0	302.5	187.3	408.4	627.5
66.60	5.75	121.8	414.0	371.5	127.1	329.7	674.9
68.76	5.64	168.0	391.0	391.0	190.0	289.3	711.1
70.78	5.58	189.1	364.0	369.9	201.6	291.4	680.5
72.95	6.76	146.3	340.0	365.0	140.0	557.3	656.8

Table G-2. Continued.

Train C – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.53	7.01	158.9	342.0	313.5	180.4	374.4	633.1
76.54	6.80	149.6	301.0	303.2	187.4	478.6	639.1
78.22	6.90	163.2	324.0	305.3	155.5	376.5	595.7
80.63	6.51	163.4	340.0	306.4	179.0	538.1	620.1
82.50	6.42	154.0	303.0	305.1	186.9	282.9	636.1
84.40	6.77	157.4	316.0	282.7	173.4	327.6	596.8
86.49	6.89	156.6	308.0	290.3	178.0	278.6	609.8
88.49	6.84	170.2	284.0	255.7	213.1	340.3	596.7
90.55	6.81	185.3	265.0	236.7	228.3	346.7	577.9
92.55	6.78	160.3	276.0	224.9	197.5	306.3	560.2
94.48	6.85	125.8	318.0	243.4	152.8	299.9	568.5
96.39	6.94	139.9	275.0	265.4	188.7	333.9	612.3
98.43	6.71	156.7	294.0	235.1	186.5	376.5	563.0

Table G-3. Transfer data for Train C Fermentor 3 at low C-N ratio and near-neutral pH.

Train C – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	8.81	221.0	291.0	270.5	218.6	59.6	566.2
2.59	8.93	258.1	313.6	228.0	279.7	46.8	582.9
4.00							
6.00							
8.51	7.68	184.2	327.0	303.9	227.9	265.9	645.7
10.69	6.98	204.9	258.0	310.8	215.6	525.4	619.6
12.58	6.67	168.4	321.0	234.8	195.2	474.3	559.7
14.59	7.67	224.3	299.0	309.3	214.6	459.4	601.6
16.57	6.75	233.9	254.5	279.2	250.5	297.8	607.7
18.64	7.92	140.9	361.0	252.3	155.8	208.4	565.3
20.00							
22.50	7.37	209.4	335.0	371.0	192.8	134.0	652.5
24.73	7.24	235.9	303.0	312.1	244.0	363.7	631.6
26.58	7.13	225.2	317.0	286.3	258.7	248.9	619.8
28.59	7.55	206.1	321.0	295.6	232.9	204.2	620.5
30.70	7.17	219.5	302.0	276.5	269.7	278.6	624.8
32.62	7.20	222.1	333.0	288.3	241.9	331.8	606.2
34.64	7.16	197.3	315.0	303.9	234.6	268.0	639.3
36.65	7.25	180.9	301.0	287.3	204.1	272.3	614.5
38.15	7.19	236.7	202.0	257.1	263.9	297.8	597.4
40.60	7.53	257.6	303.0	170.2	272.5	212.7	517.9
42.61	6.62	144.0	295.0	259.2	227.3	495.6	640.6
44.59	6.87	190.2	322.0	263.3	225.2	385.0	596.4
46.67	7.07	169.3	314.0	283.3	196.3	242.5	608.4
48.75	8.09	190.2	322.0	285.3	214.1	144.6	607.3
50.68	7.09	205.4	307.0	278.4	238.5	374.4	609.6
52.61	6.95	198.5	290.0	271.7	234.0	450.9	605.3
54.67	7.03	172.0	309.0	307.5	200.6	427.5	634.2
56.70	7.15	211.5	308.0	289.7	229.9	363.7	606.2
58.59	6.91	192.2	304.0	279.4	218.5	495.6	603.8
60.58	6.30	193.0	328.0	332.1	167.7	1237.9	604.9
62.66	6.38	212.2	335.0	332.8	205.6	1057.1	624.3
64.69	6.08	187.3	379.0	377.7	140.6	821.0	629.1
66.60	5.78	127.1	369.0	413.5	90.4	408.4	674.9
68.76	5.65	190.0	349.0	389.9	167.9	393.5	665.9
70.78	7.10	201.6	314.0	359.5	185.8	580.7	641.8
72.95	7.10	140.0	321.0	338.1	115.5	425.4	611.7

Table G-3. Continued.

Train C – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.53	7.14	180.4	303.0	341.3	166.1	353.1	625.1
76.54	6.95	187.4	309.0	301.3	194.5	472.2	606.5
78.22	7.03	155.5	323.0	323.7	144.4	202.1	610.7
80.63	6.35	179.0	311.0	337.9	172.7	391.4	629.7
82.50	6.96	186.9	301.0	302.5	199.8	376.5	613.5
84.40	6.90	173.4	309.0	312.0	166.9	276.5	603.6
86.49	7.15	178.0	297.0	300.8	190.3	319.1	611.2
88.49	7.26	213.1	295.0	282.0	230.0	280.8	597.0
90.55	6.89	228.3	295.0	265.4	253.6	523.2	595.7
92.55	6.96	197.5	337.0	272.0	229.8	357.3	602.4
94.48	7.17	152.8	299.0	314.8	159.9	240.4	620.0
96.39	7.09	188.7	303.0	273.6	214.7	348.8	597.7
98.43	7.29	186.5	294.0	288.5	197.5	299.9	597.6

Table G-4. Transfer data for Train C Fermentor 4 at low C-N ratio and near-neutral pH.

Train C – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00	9.12	218.6	300.0	290.1	223.9	63.8	593.5	0.87	0.32
2.59	9.08	279.7	300.0	306.3	218.1	63.8	601.0	0.87	0.31
4.00								0.86	0.31
6.00								0.87	0.32
8.51	9.06	227.9	300.0	318.2	262.7	85.1	658.9	0.84	0.35
10.69	7.02	215.6	300.0	261.3	244.1	348.8	587.9	0.83	0.34
12.58	6.63	195.2	300.0	320.7	179.2	457.3	602.8	0.83	0.33
14.59	7.68	214.6	300.0	298.1	224.2	178.7	613.3	0.83	0.36
16.57	7.82	250.5	300.0	254.5	271.8	157.4	603.9	0.86	0.25
18.64	6.67	155.8	300.0	358.6	129.5	297.8	630.4	0.79	0.39
20.00								0.82	0.34
22.50	8.87	192.8	300.0	330.7	164.3	68.1	600.3	0.81	0.34
24.73	8.98	244.0	300.0	306.0	215.8	178.7	599.5	0.81	0.32
26.58	8.30	258.7	300.0	319.5	225.3	236.1	622.8	0.83	0.28
28.59	8.22	232.9	300.0	322.2	234.6	138.3	639.1	0.82	0.35
30.70	8.86	269.7	300.0	306.7	232.4	117.0	616.7	0.84	0.31
32.62	8.84	241.9	300.0	333.1	240.3	144.6	646.5	0.84	0.31
34.64	8.76	234.6	300.0	315.8	226.4	108.5	619.5	0.85	0.30
36.65	8.81	204.1	300.0	299.8	230.7	100.0	624.2	0.85	0.35
38.15	8.93	263.9	300.0	202.7	217.5	87.2	499.7	0.85	0.33
40.60	8.75	272.5	300.0	304.8	261.8	127.6	643.9	0.85	0.31
42.61	8.69	227.3	300.0	297.6	283.3	44.7	651.7	0.83	0.36
44.59	6.51	225.2	300.0	320.1	210.8	299.9	609.3	0.83	0.32
46.67	7.46	196.3	300.0	313.4	184.2	295.7	599.4	0.84	0.32
48.75	8.79	214.1	300.0	323.2	190.9	180.8	598.1	0.84	0.31
50.68	8.87	238.5	300.0	304.2	215.6	110.6	597.3	0.84	0.36
52.61	7.50	234.0	300.0	291.8	244.1	440.3	614.8	0.85	0.33
54.67	8.79	200.6	300.0	305.3	164.9	157.4	567.7	0.83	0.31
56.70	8.87	229.9	300.0	303.7	220.4	180.8	601.0	0.81	0.33
58.59	8.81	218.5	300.0	306.4	223.0	140.4	609.0	0.83	0.27
60.58	8.71	167.7	300.0	324.2	144.7	148.9	599.3	0.82	0.32
62.66	6.57	205.6	300.0	336.4	166.7	1155.0	595.6	0.82	0.38
64.69	5.85	140.6	300.0	382.1	58.5	1457.0	598.1	0.79	0.34
66.60	5.65	90.4	300.0	372.0	18.9	1342.1	598.6	0.74	0.36
68.76	7.51	167.9	300.0	347.8	122.0	680.6	600.0	0.69	0.46
70.78	8.82	185.8	300.0	311.8	173.0	131.9	597.1	0.76	0.38
72.95	8.50	115.5	300.0	324.8	91.8	159.5	599.2	0.77	0.31

Table G-4. Continued.

Train C – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
74.53	9.00	166.1	300.0	304.5	164.1	129.7	600.6	0.77	0.32
76.54	8.97	194.5	300.0	309.7	187.1	38.3	600.4	0.79	0.32
78.22	7.62	144.4	300.0	325.0	122.1	178.7	600.8	0.80	0.30
80.63	8.87	172.7	300.0	312.9	160.3	134.0	598.6	0.79	0.32
82.50	8.84	199.8	300.0	301.2	200.8	104.2	600.4	0.81	0.32
84.40	8.80	166.9	300.0	309.1	161.1	159.5	601.4	0.82	0.30
86.49	8.93	190.3	300.0	295.9	196.8	104.2	600.5	0.82	0.29
88.49	9.04	230.0	300.0	294.4	234.6	601.9	599.6	0.83	0.31
90.55	8.85	253.6	300.0	293.9	236.4	163.8	608.5	0.83	0.32
92.55	7.19	229.8	300.0	326.6	228.3	395.6	632.8	0.84	0.30
94.48	8.71	159.9	300.0	296.6	175.0	185.0	609.8	0.84	0.30
96.39	9.03	214.7	300.0	301.1	215.8	72.3	600.3	0.85	0.30
98.43	8.43	197.5	300.0	288.7	205.8	85.1	595.1	0.86	0.31

Table G-5. Transfer data for Train R2 Fermentor 1 at low C-N ratio and near-neutral pH.

Train R2 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00	7.42	27.3	151.0	49.9	121.5	482.8	342.2	0.99	0.33	13.30	15.04
2.27	7.46	27.3	146.0	43.0	138.5	423.3	352.3	0.99	0.33	16.56	18.95
3.64								0.99	0.33	13.39	15.17
5.64								0.99	0.33	13.88	15.76
8.17	6.89	27.3	205.0	36.7	131.2	493.5	338.7	0.99	0.43	17.49	20.31
10.35	6.64	27.3	260.0	89.0	140.2	538.1	400.0	0.98	0.31	16.23	19.37
12.24	6.43	27.3	251.0	152.9	133.4	46.8	457.1	0.98	0.36	15.06	17.96
14.27	6.49	27.3	226.0	99.4	176.2	342.4	446.4	0.98	0.43	13.24	16.14
16.19	6.22	27.3	205.0	102.1	148.4	314.8	421.3	0.98	0.32	13.09	15.94
18.29	6.30	27.3	254.0	89.2	139.2	25.5	399.2	0.98	0.29	10.18	12.59
19.64								0.98	0.31	12.89	15.66
22.16	6.65	27.3	251.0	118.3	160.4	108.5	449.6	0.99	0.71	12.35	15.08
24.42	6.42	27.3	230.0	150.0	126.0	23.4	446.8	0.98	0.23	14.13	18.87
26.24	6.63	27.3	237.0	76.3	180.0	248.9	427.1	0.98	0.22	12.39	15.55
28.25	6.54	27.3	252.0	126.3	137.7	327.6	434.8	0.98	0.26	12.03	15.62
30.37	6.34	27.3	220.0	111.3	165.7	234.0	447.8	0.97	0.25	12.05	15.37
32.28	6.43	27.3	226.0	112.4	131.6	291.4	414.8	0.97	0.27	11.60	14.62
34.29	6.19	27.3	113.0	108.5	151.1	278.6	430.4	0.97	0.32	10.29	12.78
36.30		27.3	412.0	4.2	135.5	208.4	310.5	0.97	0.47	11.47	13.69
37.82	5.89	27.3	373.0	224.0	209.2	285.0	604.0	0.96	0.33	12.79	14.96
40.26	5.74	27.3	425.0	212.9	184.4	268.0	568.1	0.94	0.35	12.68	14.76
42.27	5.57	27.3	330.0	280.6	168.6	306.3	620.0	0.95	0.37	11.81	14.05
44.25	5.56	27.3	358.0	162.2	191.5	314.8	524.5	0.95	0.41	13.54	15.75
45.64	5.61	27.3	374.0	200.2	138.0	199.9	509.0	0.95	0.39	13.63	15.82
48.42	5.64	27.3	353.0	228.9	168.8	202.1	568.5	0.95	0.40	13.23	15.32
50.35	5.80	27.3	252.0	194.6	181.1	291.4	546.5	0.96	0.39	12.50	14.77
52.30	6.05	27.3	284.0	148.5	138.8	255.2	458.1	0.96	0.38	14.51	17.60
54.32	6.72	27.3	305.0	152.0	128.4	365.8	451.2	0.97	0.32	18.09	23.22
56.35	6.67	27.3	276.0	173.9	155.1	461.6	499.8	0.97	0.21	17.69	22.93
58.26	6.78	27.3	258.0	133.4	170.0	604.1	474.2	0.98	0.23	16.02	20.54
60.23	6.68	27.3	260.0	169.2	117.9	561.5	457.9	0.99	0.26	16.40	20.87
62.31	6.63	27.3	273.0	135.9	152.2	533.9	458.9	0.98	0.31	15.89	20.15
64.35	6.65	27.3	236.0	138.4	160.7	574.3	469.9	0.99	0.31	13.36	17.01
66.26	6.64	27.3	269.0	130.4	133.2	421.1	434.4	0.98	0.26	12.22	15.49
68.43	6.52	27.3	211.0	147.8	149.7	416.9	468.3	0.98	0.28	15.32	19.37
70.44	6.70	27.3	249.0	71.6	162.1	395.6	404.5	0.97	0.23	13.58	17.22
72.60	6.34	27.3	268.0	125.7	142.1	419.0	438.6	0.97	0.22	12.98	16.44

Table G-5. Continued.

Train R2 – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
74.21	6.25	27.3	150.0	103.8	196.4	299.9	471.0	0.97	0.26	13.42	16.90
76.20	6.34	27.3	255.0	116.2	155.7	370.1	442.7	0.98	0.27	13.49	16.85
77.87	6.06	27.3	258.0	136.6	147.8	516.9	455.2	0.97	0.34	12.77	15.98
80.29	6.33	27.3	258.0	139.6	142.1	355.2	452.5	0.98	0.34	15.89	20.15
82.15	6.19	27.3	249.0	118.7	158.7	248.9	448.2	0.97	0.28	13.08	16.35
84.07	6.18	27.3	236.0	134.5	143.5	519.0	448.8	0.98	0.31	14.30	17.66
86.14	6.34	27.3	284.0	102.2	158.4	368.0	431.4	0.97	0.31	12.85	16.00
88.15	6.34	27.3	242.0	134.9	171.2	391.4	476.9	0.98	0.30	12.63	15.59
90.20	6.32	27.3	223.0	85.4	182.1	302.0	438.3	0.97	0.29	14.62	18.02
92.21	6.28	27.3	222.0	109.9	137.6	319.1	418.3	0.97	0.26	16.02	20.54
94.14	6.23	27.3	226.0	102.2	142.6	368.0	415.6	0.97	0.27	13.41	16.63
96.05	6.30	27.3	227.0	108.8	138.6	261.6	418.2	0.98	0.37	12.92	15.80
98.09	6.57	27.3	234.0	55.7	141.0	161.7	367.5	0.98	0.33	12.32	15.06

Table G-6. Transfer data for Train R2 Fermentor 2 at low C-N ratio and near-neutral pH.

Train R2 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	8.27	121.5	236.0	149.7	171.5	97.8	479.8
2.27	7.62	138.5	270.0	141.8	248.0	272.3	531.4
3.64							
5.64							
8.17	6.91	131.2	325.0	204.0	207.4	582.8	560.3
10.35	6.74	140.2	306.0	258.5	220.6	485.0	619.0
12.24	6.74	133.4	297.0	251.4	209.1	363.7	607.2
14.27	6.50	176.2	260.0	223.5	245.9	285.0	573.3
16.19	6.65	148.4	306.0	200.6	204.6	312.7	536.9
18.29	7.41	139.2	324.0	252.1	204.7	163.8	597.7
19.64							
22.16	7.10	160.4	306.0	247.1	235.6	97.8	602.3
24.42	7.10	126.0	305.0	230.0	217.3	291.4	601.4
26.24	7.02	180.0	315.0	238.6	263.7	244.6	602.4
28.25	6.96	137.7	308.0	250.7	199.9	212.7	593.0
30.37	6.41	165.7	282.0	218.4	271.6	895.5	604.4
32.28	6.37	131.6	164.0	224.7	202.0	629.6	575.2
34.29	5.96	151.1	451.0	113.8	198.9	502.0	441.7
36.30	5.81	135.5	414.0	410.4	187.9	380.7	742.9
37.82	5.59	209.2	445.0	371.4	249.6	340.3	708.7
40.26	5.68	184.4	361.0	426.6	234.2	255.2	756.5
42.27	8.56	168.6	356.0	328.4	214.0	221.2	653.9
44.25	5.58	191.5	380.0	353.6	227.7	174.4	671.7
45.64	5.55	138.0	374.0	371.9	154.6	308.4	668.6
48.42	5.63	168.8	322.0	354.3	205.0	219.1	670.6
50.35	6.08	181.1	333.0	250.9	265.3	293.5	615.2
52.30	7.08	138.8	320.0	280.8	202.3	404.1	624.4
54.32	6.91	128.4	330.0	307.3	184.6	374.4	643.6
56.35	7.27	155.1	332.0	274.8	228.3	321.2	628.1
58.26	7.65	170.0	297.0	256.4	260.5	238.2	627.0
60.23	6.96	117.9	338.0	260.9	169.9	414.8	593.0
62.31	6.99	152.2	287.0	274.8	234.6	450.9	637.3
64.35	6.96	160.7	308.0	236.5	230.1	453.1	586.0
66.26	7.08	133.2	273.0	268.8	189.4	333.9	605.1
68.43	6.88	149.7	317.0	210.8	224.1	287.1	565.3
70.44	7.05	162.1	308.0	244.1	246.9	357.3	609.0
72.60	6.30	142.1	326.0	267.5	195.8	316.9	601.3

Table G-6. Continued.

Train R2 – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.21	7.38	196.4	316.0	248.9	266.4	191.4	601.1
76.20	6.20	155.7	313.0	257.7	218.1	391.4	600.2
77.87	6.96	147.8	310.0	255.1	203.4	293.5	590.8
80.29	6.76	142.1	324.0	255.5	211.4	302.0	604.9
82.15	7.94	158.7	287.0	250.6	248.3	172.3	620.3
84.07	7.00	143.5	334.0	233.7	216.0	248.9	586.3
86.14	7.04	158.4	300.0	279.3	230.9	297.8	631.9
88.15	6.99	171.2	276.0	239.0	226.6	225.5	574.5
90.20	6.78	182.1	269.0	227.4	234.1	289.3	559.5
92.21	7.14	137.6	298.0	219.4	182.9	180.8	544.8
94.14	7.03	142.6	304.0	221.6	212.6	255.2	571.7
96.05	7.12	138.6	293.0	226.1	211.7	242.5	579.3
98.09	7.15	141.0	280.0	229.0	194.0	257.4	580.1

Table G-7. Transfer data for Train R2 Fermentor 3 at low C-N ratio and near-neutral pH.

Train R2 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	8.71	171.5	281.0	235.1	181.1	95.7	542.8
2.27	7.88	248.0	303.0	260.1	245.5	125.5	582.6
3.64							
5.64							
8.17	6.67	207.4	320.0	322.9	203.7	835.9	617.3
10.35	7.14	220.6	298.0	306.8	229.9	351.0	614.2
12.24	6.59	209.1	295.0	296.6	213.2	274.4	598.8
14.27	6.95	245.9	308.0	257.6	253.8	231.8	590.8
16.19	7.44	204.6	323.0	301.6	240.7	240.4	635.8
18.29	7.24	204.7	303.0	321.5	209.9	299.9	624.8
19.64						270.1	0.0
22.16	7.14	235.6	314.0	303.5	223.3	138.3	603.7
24.42	7.15	217.3	303.0	305.8	237.3	346.7	623.9
26.24	6.93	263.7	299.0	315.8	226.9	276.5	620.2
28.25	7.30	199.9	281.0	306.7	231.7	165.9	636.6
30.37	5.83	271.6	265.0	282.8	212.0	1561.2	590.8
32.28	6.12	202.0	401.0	63.9	129.8	48.9	289.8
34.29	6.11	198.9	381.0	450.4	148.0	697.7	697.6
36.30	5.67	187.9	399.0	412.4	151.3	391.4	673.9
37.82	5.74	249.6	330.0	444.7	170.0	293.5	693.6
40.26	5.79	234.2	303.0	360.9	212.5	248.9	654.1
42.27	5.69	214.0	333.0	353.7	179.2	197.8	617.0
44.25	5.68	227.7	323.0	375.2	182.0	163.8	627.6
45.64	6.14	154.6	306.0	373.4	100.4	229.7	617.3
48.42	5.81	205.0	316.0	322.6	179.2	231.8	594.9
50.35	6.11	265.3	309.0	328.3	200.4	270.1	606.5
52.30	7.36	202.3	307.0	318.3	238.3	246.7	652.4
54.32	8.08	184.6	326.0	330.8	159.6	117.0	603.9
56.35	6.89	228.3	307.0	332.2	212.4	459.4	622.8
58.26	7.19	260.5	307.0	295.1	240.7	478.6	613.6
60.23	7.10	169.9	303.0	338.8	182.0	399.9	649.0
62.31	7.24	234.6	287.0	288.3	232.8	385.0	600.1
64.35	6.98	230.1	315.0	307.6	217.3	482.8	601.8
66.26	7.24	189.4	323.0	272.6	185.9	12.8	567.2
68.43	7.02	224.1	299.0	316.8	224.1	499.8	618.2
70.44	6.43	246.9	310.0	303.6	227.2	438.2	608.1
72.60	7.88	195.8	339.0	323.1	205.5	180.8	630.9

Table G-7. Continued.

Train R2 – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.21	8.40	266.4	293.0	314.4	244.0	61.7	634.5
76.20	6.09	218.1	307.0	313.0	248.9	282.9	641.9
77.87	6.84	203.4	315.0	307.9	208.6	340.3	611.2
80.29	6.74	211.4	293.0	321.8	203.8	238.2	612.3
82.15	6.93	248.3	297.0	288.0	231.7	295.7	596.6
84.07	7.24	216.0	299.0	333.8	212.0	259.5	627.9
86.14	6.99	230.9	279.0	295.0	228.8	342.4	602.1
88.15	7.15	226.6	285.0	273.7	236.6	321.2	587.7
90.20	6.97	234.1	297.0	269.7	241.5	248.9	588.5
92.21	6.94	182.9	299.0	297.7	203.7	268.0	616.6
94.14	7.07	212.6	295.0	299.0	216.7	312.7	601.2
96.05	7.25	211.7	289.0	291.4	219.4	276.5	597.2
98.09	7.26	194.0	290.0	273.9	208.5	253.1	586.5

Table G-8. Transfer data for Train R2 Fermentor 4 at low C-N ratio and near-neutral pH.

Train R2 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00	9.08	181.1	300.0	281.5	169.6	104.2	568.1	0.86	0.32
2.27	9.17	245.5	300.0	285.9	237.2	87.2	599.2	0.87	0.31
3.64								0.87	0.32
5.64								0.87	0.32
8.17	8.85	203.7	300.0	313.3	217.6	131.9	625.3	0.83	0.37
10.35	7.02	229.9	300.0	301.4	220.8	238.2	598.6	0.82	0.35
12.24	7.06	213.2	300.0	295.6	230.0	316.9	610.5	0.83	0.35
14.27	8.88	253.8	300.0	307.2	213.8	93.6	600.6	0.82	0.34
16.19	8.95	240.7	300.0	323.3	235.4	136.1	635.8	0.84	0.23
18.29	8.90	209.9	300.0	301.5	231.9	140.4	621.6	0.82	0.32
19.64						138.3	0.0	0.83	0.32
22.16	8.82	223.3	300.0	308.1	216.4	110.6	600.8	0.82	0.33
24.42	6.55	237.3	300.0	306.7	215.8	485.0	601.5	0.84	0.32
26.24	7.07	226.9	300.0	299.7	221.3	91.5	597.5	0.84	0.30
28.25	7.71	231.7	300.0	281.7	242.7	100.0	605.4	0.84	0.33
30.37	8.85	212.0	300.0	266.8	268.1	97.8	621.0	0.84	0.33
32.28	6.36	129.8	300.0	400.5	1.3	631.7	570.1	0.84	0.32
34.29	5.69	148.0	300.0	380.9	65.3	852.9	596.3	0.78	0.39
36.30	5.75	151.3	300.0	399.0	52.5	342.4	598.3	0.69	0.43
37.82	5.70	170.0	300.0	330.4	139.8	453.1	598.3	0.77	0.39
40.26	6.03	212.5	300.0	304.9	209.7	265.9	600.2	0.79	0.34
42.27	5.88	179.2	300.0	333.4	149.2	199.9	601.5	0.77	0.30
44.25	5.98	182.0	300.0	320.9	165.3	159.5	602.3	0.78	0.29
45.64	5.93	100.4	300.0	303.2	87.6	195.7	588.5	0.78	0.27
48.42	6.20	179.2	300.0	313.3	171.4	148.9	603.6	0.77	0.34
50.35	8.93	200.4	300.0	310.6	191.6	95.7	599.9	0.78	0.35
52.30	9.02	238.3	300.0	305.8	238.3	108.5	603.9	0.80	0.30
54.32	7.76	159.6	300.0	327.5	156.7	110.6	622.7	0.83	0.26
56.35	8.66	212.4	300.0	304.3	211.3	187.2	601.3	0.81	0.34
58.26	6.84	240.7	300.0	309.0	214.3	127.6	600.5	0.81	0.36
60.23	8.72	182.0	300.0	300.5	203.4	121.2	620.0	0.83	0.32
62.31	8.95	232.8	300.0	287.0	233.8	108.5	600.1	0.82	0.34
64.35	8.62	217.3	300.0	311.8	221.4	172.3	614.0	0.82	0.35
66.26	8.73	185.9	300.0	319.6	167.6	195.7	599.4	0.80	0.33
68.43	8.80	224.1	300.0	299.1	221.3	221.2	599.4	0.81	0.35
70.44	7.20	227.2	300.0	309.1	211.8	459.4	599.4	0.80	0.38
72.60	6.65	205.5	300.0	339.9	175.1	448.8	607.6	0.80	0.32

Table G-8. Continued.

Train R2 – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
74.21	8.96	244.0	300.0	294.9	226.6	76.6	599.5	0.83	0.32
76.20	9.03	248.9	300.0	308.1	239.4	68.1	624.7	0.85	0.31
77.87	7.18	208.6	300.0	317.2	222.4	204.2	629.1	0.85	0.30
80.29	8.85	203.8	300.0	295.4	209.5	53.2	599.2	0.84	0.30
82.15	8.89	231.7	300.0	297.3	226.3	155.3	600.8	0.84	0.31
84.07	8.66	212.0	300.0	300.6	225.1	174.4	611.8	0.84	0.33
86.14	8.89	228.8	300.0	276.0	248.8	85.1	601.2	0.84	0.31
88.15	8.33	236.6	300.0	282.4	248.8	127.6	607.2	0.85	0.31
90.20	8.97	241.5	300.0	296.3	242.3	89.3	615.5	0.84	0.30
92.21	8.98	203.7	300.0	297.8	228.9	74.4	621.1	0.85	0.30
94.14	8.97	216.7	300.0	294.2	225.3	74.4	600.9	0.86	0.30
96.05	8.95	219.4	300.0	288.6	233.7	57.4	601.0	0.85	0.29
98.09	9.04	208.5	300.0	284.3	222.0	74.4	595.9	0.85	0.30

**SUPPLEMENTAL H. DATA FOR CELLULAR BIOMASS RECYCLE IN
COUNTERCURRENT MIXED-ACID FERMENTATION: EFFECT OF TWO REFLUX
RATIOS AND THREE CARBON-NITROGEN RATIOS**

Table H-1. Transfer data for Train CR Fermentor 1 at the lower reflux ratio and medium C-N ratio.

Train CR – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00	5.93	27.3	206.0	107.5	185.9	304.2	464.2	0.98	0.44	10.80	14.38
2.07	6.72	27.3	308.0	125.7	109.2	450.9	405.7	0.98	0.43	10.49	13.82
4.10	6.28	27.3	424.0	229.9	106.5	546.6	507.2	0.97	0.53	12.86	16.90
6.07	6.37	27.3	367.0	267.5	187.5	676.4	625.8	0.98	0.36	14.30	19.16
8.01	7.37	27.3	257.0	216.5	80.1	710.4	561.6	0.97	0.49	16.13	25.77
10.27	5.56	27.3	177.0	178.7	204.5	623.2	552.0	0.97	0.49	21.57	35.46
11.86	5.36	27.3	266.0	229.4	177.4	295.7	577.6	0.97	0.34	15.07	22.22
14.00	6.00	27.3	249.0	137.4	160.0	365.8	468.2	0.97	0.45	15.99	23.90
16.05	6.00	27.3	208.0	146.6	135.7	448.8	453.1	0.97	0.38	16.61	25.30
18.03	6.00	27.3	245.0	105.4	128.7	450.9	404.9	0.97	0.39	17.07	26.53
20.09	6.00	27.3	277.0	89.5	189.2	559.4	449.5	0.97	0.44	19.21	28.59
22.05	5.66	27.3	231.0	124.2	181.8	578.5	476.8	0.97	0.37	18.78	28.34
24.12	5.08	27.3	252.0	96.4	164.0	1029.5	431.2	0.97	0.42	17.53	26.53
25.85	5.05	27.3	304.0	142.2	164.4	852.9	477.4	0.97	0.42	21.98	33.21
28.02	4.88	27.3	279.0	183.2	152.2	689.1	506.2	0.97	0.40	18.80	28.46
29.86	5.45	27.3	300.0	220.9	186.4	606.2	578.1	0.97	0.34	19.26	29.03
32.16	4.82	27.3	312.0	175.7	158.0	587.1	503.3	0.97	0.39	19.79	29.90
34.04	5.10	27.3	304.0	170.9	169.4	567.9	511.1	0.97	0.35	17.85	27.43
36.14	5.19	27.3	209.0	154.9	195.3	646.6	503.0	0.97	0.38	16.77	25.84
38.00	5.33	27.3	311.0	173.7	136.5	370.1	481.0	0.97	0.37	15.97	24.49
40.09	5.13	27.3	298.0	163.5	186.0	574.3	520.3	0.97	0.37	16.51	25.45
42.07	5.36	27.3	283.0	145.8	187.1	342.4	503.7	0.97	0.37	15.29	23.75
44.13	5.37	27.3	366.0	193.0	121.8	380.7	485.6	0.97	0.34	16.08	24.54
46.03	5.30	27.3	270.0	215.5	182.7	463.7	568.0	0.97	0.37	15.35	23.60
48.08	5.28	27.3	260.0	144.2	149.8	533.9	464.8	0.97	0.38	15.30	23.00
50.04	5.67	27.3	81.0	153.2	198.0	619.0	522.0	0.98	0.42	15.71	24.07
51.38		27.3	294.0	1.7	114.9	559.4	286.4	0.97	0.37	21.89	33.24
53.84	5.37	27.3	282.0	163.7	156.8	687.0	491.3	0.97	0.39	20.91	31.85
55.95	5.38	27.3	159.0	139.9	177.9	1095.4	488.6	0.97	0.45	21.54	33.25
57.83	5.30	27.3	382.0	61.9	131.1	861.4	363.8	0.96	0.43	24.22	37.10

Table H-1. Continued.

Train CR – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
59.94	5.19	27.3	346.0	223.9	189.7	550.9	584.4	0.97	0.40	20.21	31.44
62.20	4.72	27.3	325.0	178.2	204.8	619.0	552.8	0.97	0.32	21.29	33.23
64.09	4.88	27.3	343.0	186.7	167.9	781.7	524.4	0.97	0.38	17.61	27.32
66.16	5.12	27.3	366.0	191.0	194.9	703.2	555.7	0.97	0.39	19.56	30.31
67.97	5.18	27.3	350.0	221.1	177.1	663.7	569.0	0.97	0.38	18.74	29.22
69.93	4.99	27.3	359.0	183.0	196.9	691.9	550.7	0.97	0.41	19.59	30.51
72.20	4.93	27.3	348.0	204.7	185.9	293.5	560.4	0.97	0.39	18.69	29.48
74.00	5.20	27.3	354.0	217.6	165.0	199.9	553.4	0.97	0.39	18.23	28.49
76.05	5.09	27.3	368.0	214.1	174.0	412.6	558.9	0.97	0.29	17.63	27.61
78.16	5.73	27.3	344.0	228.4	167.7	487.1	565.9	0.97	0.37	17.69	27.89
80.28	5.38	27.3	304.0	172.6	205.3	846.5	547.7	0.97	0.36	17.50	27.36
82.04	5.35	27.3	318.0	160.4	178.2	565.8	509.4	0.97	0.39	17.73	27.41
84.06	5.67	27.3	336.0	192.4	146.3	578.0	509.5	0.97	0.41	17.98	27.61
86.02	5.39	27.3	268.1	175.6	185.6	929.5	532.0	0.97	0.40	19.03	29.57
87.87	5.74	27.3	359.0	133.4	164.8	770.0	469.0	0.97	0.39	18.60	29.39
90.24	5.36	27.3	410.0	208.6	178.7	791.2	558.1	0.97	0.43	18.63	29.38
92.11	4.95	27.3	394.0	246.4	182.0	1057.1	599.2	0.97	0.38	19.99	31.05
94.07	4.88	27.3	417.0	261.6	153.3	852.9	585.7	0.96	0.41	20.11	31.64
96.05	4.89	27.3	296.0	323.9	212.8	459.4	707.5	0.97	0.38	19.07	30.09
98.11	4.63	27.3	297.0	162.2	155.4	529.6	488.4	0.96	0.40	18.99	29.96
100.01	4.76	27.3	295.0	162.3	156.9	697.7	490.0	0.94	0.26	20.35	32.94
102.19	4.67	27.3	330.0	171.9	151.3	-342.4	494.0	0.91	0.13	20.18	32.33
104.24	4.99	27.3	325.0	162.2	193.6	257.4	526.6	0.97	0.36	19.06	30.54
106.14	4.95	27.3	301.0	148.4	196.7	217.0	515.9	0.96	0.28	18.26	29.20
108.08	4.77	27.3	307.0	171.7	151.8	355.2	494.3	0.97	0.38	18.07	28.51
110.14	4.52	27.3	372.0	213.1	125.4	467.9	509.3	0.93	0.18	18.15	28.67
112.10	5.18	27.3	346.0	242.2	168.1	382.9	581.1	0.97	0.36	16.85	26.61
113.98	5.40	27.3	312.0	190.1	175.7	848.7	536.6	0.97	0.33	15.35	24.02
116.05	5.25	27.3	263.0	169.8	173.8	480.7	514.4	0.97	0.35	18.67	29.05
118.17	5.40	27.3	314.0	132.2	160.5	570.0	463.5	0.97	0.36	15.53	23.95
120.15	6.06	27.3	318.0	144.3	192.8	697.7	507.9	0.98	0.43	16.87	26.03
122.05	5.79	27.3	220.0	192.0	153.1	878.5	515.9	0.97	0.46	17.46	26.74
123.95	5.78	27.3	326.0	107.1	148.0	661.5	425.9	0.97	0.44	19.52	29.82
126.19	5.54	27.3	296.0	203.1	147.5	801.9	521.4	0.97	0.41	18.88	29.07
128.32	5.53	27.3	342.0	132.4	182.9	799.8	486.1	0.97	0.42	16.65	25.32

Table H-2. Transfer data for Train CR Fermentor 2 at the lower reflux ratio and medium C-N ratio.

Train CR – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.82	185.9	286.0	209.7	250.6	236.1	572.5
2.07	6.31	109.2	367.0	307.9	86.7	522.2	583.5
4.10	5.95	106.5	456.0	425.9	44.0	887.0	661.5
6.07	6.48	187.5	306.0	367.2	269.0	712.5	746.8
8.01	7.37	80.1	315.0	281.5	0.0	621.1	621.2
10.27	5.48	204.5	326.0	378.5	263.5	397.7	733.6
11.86	5.48	177.4	304.0	265.5	230.1	268.0	616.3
14.00	6.00	160.0	253.0	253.7	207.3	1423.0	599.1
16.05	6.00	135.7	297.0	205.4	183.4	288.2	551.2
18.03	6.00	128.7	346.0	248.0	177.0	346.7	594.4
20.09	6.00	189.2	312.0	277.0	258.3	329.7	644.2
22.05	5.68	181.8	377.0	236.6	255.2	293.5	608.1
24.12	5.20	164.0	320.0	251.1	185.7	587.1	570.9
25.85	5.37	164.4	384.0	303.3	173.6	370.1	610.6
28.02	5.17	152.2	302.0	381.6	153.7	282.9	681.2
29.86	5.51	186.4	376.0	300.5	186.9	263.7	599.1
32.16	5.24	158.8	323.0	310.2	161.6	375.9	609.1
34.04	5.46	169.4	319.0	303.7	181.3	436.0	613.7
36.14	5.49	195.3	345.0	301.5	212.0	442.4	616.3
38.00	5.44	136.5	314.0	310.7	166.8	395.6	639.1
40.09	5.27	186.0	318.0	300.6	197.0	476.4	609.7
42.07	5.35	187.1	367.0	286.3	219.6	346.7	616.9
44.13	5.18	121.8	339.0	365.6	120.2	421.1	662.1
46.03	5.40	182.7	290.0	267.1	255.4	414.8	636.9
48.08	5.49	149.8	82.0	261.2	174.6	472.2	584.1
50.04	5.79	198.0	293.0	86.5	192.9	495.6	379.5
51.38	5.61	114.9	305.0	296.8	115.0	818.9	594.0
53.84	5.21	156.8	196.0	285.2	175.2	633.8	601.7
55.95	5.45	177.9	385.0	163.7	211.9	661.5	495.8
57.83	5.35	131.1	372.0	382.0	136.2	614.7	685.2
59.94	5.23	189.7	340.0	348.7	213.0	497.7	670.1
62.20	5.19	204.8	345.0	327.3	219.9	502.0	639.5
64.09	5.22	167.9	377.0	345.9	157.4	569.0	632.5
66.16	5.22	194.9	370.0	365.1	207.1	545.8	674.4
67.97	5.31	177.1	354.0	351.4	186.9	528.6	659.3
69.93	5.18	196.9	334.0	362.4	188.5	536.4	652.1

Table H-2. Continued.

Train CR – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
72.20	5.17	185.9	350.0	350.1	170.0	223.3	631.3
74.00	5.33	165.0	372.0	353.8	159.0	151.0	645.9
76.05	5.16	174.0	359.0	307.5	165.7	319.1	597.3
78.16	5.35	167.7	338.0	348.6	177.9	336.1	655.9
80.28	5.35	205.3	334.0	306.4	236.0	287.1	634.2
82.04	5.41	178.2	339.0	314.8	195.8	325.4	630.5
84.06	5.49	146.3	310.0	333.6	143.4	399.9	628.8
86.02	5.51	185.6	373.0	268.1	221.3	453.1	601.9
87.87	5.45	164.8	407.0	354.4	176.5	519.0	664.2
90.24	5.24	178.7	420.0	400.3	177.0	765.7	696.7
92.11	4.93	182.0	401.0	390.3	200.6	510.5	707.0
94.07	5.15	153.3	382.0	415.4	130.1	561.5	690.3
96.05	5.07	212.8	326.0	295.3	294.6	474.3	675.2
98.11	5.06	155.4	326.0	295.3	170.3	646.6	608.3
100.01	5.08	156.9	324.0	295.3	177.2	680.6	613.7
102.19	4.95	151.3	359.0	322.7	149.0	633.8	618.5
104.24	5.09	193.6	322.0	295.3	234.1	838.0	633.9
106.14	4.80	196.7	340.0	299.0	241.9	506.2	618.0
108.08	4.76	151.8	386.0	307.3	153.2	431.8	606.8
110.14	4.79	125.4	370.0	374.8	132.7	421.1	680.2
112.10	5.32	168.1	349.0	345.6	182.0	467.9	657.6
113.98	5.45	175.7	283.0	311.9	201.1	606.2	635.4
116.05	5.42	173.8	319.0	259.6	197.7	387.1	581.6
118.17	5.74	160.5	348.0	311.0	161.6	467.9	610.2
120.15	6.28	192.8	239.0	316.0	221.6	559.4	642.9
122.05	6.82	153.1	358.0	221.2	168.7	385.0	534.9
123.95	6.40	148.0	324.0	325.0	178.8	444.5	653.9
126.19	6.15	147.5	389.0	296.6	170.1	582.8	617.3
128.32	5.65	174.9	387.0	346.4	200.1	495.6	669.7

Table H-3. Transfer data for Train CR Fermentor 3 at the lower reflux ratio and medium C-N ratio.

Train CR – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.84	250.6	298.0	289.6	236.9	208.4	603.2
2.07	6.08	86.7	394.0	367.1	39.0	1131.6	617.5
4.10	5.87	44.0	354.0	457.7	0.0	1129.4	688.2
6.07	6.35	269.0	297.0	305.8	221.2	827.4	607.4
8.01	7.59	0.0	311.0	335.5	0.0	504.1	658.7
10.27	5.55	263.5	319.0	320.6	235.6	546.6	634.3
11.86	5.30	230.1	269.0	304.8	269.0	495.6	652.5
14.00	6.00	207.3	321.0	257.3	229.4	665.8	577.5
16.05	6.00	183.4	346.0	297.2	204.4	550.9	616.3
18.03	6.00	177.0	350.5	346.5	173.2	516.9	640.8
20.09	6.00	258.3	327.0	311.6	257.8	393.5	647.6
22.05	5.56	255.2	385.0	280.1	302.5	363.7	660.6
24.12	5.28	185.7	365.0	319.4	185.1	440.3	616.9
25.85	5.46	173.6	289.0	384.2	151.4	246.7	660.1
28.02	5.29	153.7	361.0	305.0	113.3	202.1	562.7
29.86	5.53	186.9	301.0	376.0	172.4	299.9	659.6
32.16	5.07	161.6	325.0	318.4	144.5	412.6	597.4
34.04	5.38	181.3	336.0	318.9	159.7	365.8	595.4
36.14	5.40	212.0	320.0	347.8	200.1	368.0	634.0
38.00	5.46	166.8	309.0	314.6	168.4	333.9	614.3
40.09	5.17	197.0	353.0	320.4	185.8	721.1	607.3
42.07	5.44	219.6	323.0	371.2	205.0	331.8	654.7
44.13	5.54	120.2	310.0	339.1	100.9	285.0	617.9
46.03	5.60	255.4	25.0	287.3	223.3	346.7	588.9
48.08	6.31	174.6	284.0	82.3	149.9	710.4	355.7
50.04	5.81	192.9	303.0	299.8	172.5	1601.6	577.5
51.38	5.45	115.0	161.0	306.0	110.4	1116.7	598.5
53.84	5.35	175.2	375.0	198.3	135.1	536.0	456.3
55.95	5.61	211.9	349.0	391.3	198.1	712.5	675.6
57.83	5.61	136.2	343.0	372.6	114.6	612.6	649.1
59.94	5.56	213.0	311.0	341.7	211.3	431.8	638.1
62.20	5.68	219.9	360.0	346.3	191.9	457.3	615.4
64.09	5.23	157.4	347.0	380.8	136.0	553.6	656.5
66.16	5.55	207.1	363.0	365.1	188.9	513.8	644.0
67.97	5.47	186.9	293.0	356.5	188.1	489.1	655.8
69.93	5.55	188.5	345.0	336.5	141.6	503.4	587.7

Table H-3. Continued.

Train CR – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
72.20	5.48	170.0	347.0	350.1	119.3	253.1	596.5
74.00	5.92	159.0	328.0	372.0	132.3	474.3	643.4
76.05	5.65	165.7	336.0	358.8	139.7	423.3	630.9
78.16	5.53	177.9	333.0	340.0	174.3	421.1	633.6
80.28	5.66	236.0	317.0	334.9	217.5	340.3	627.7
82.04	5.43	195.8	310.0	339.2	190.0	299.9	631.5
84.06	5.67	143.7	359.0	309.0	142.2	453.1	605.9
86.02	5.33	221.3	383.0	367.9	202.1	767.8	647.1
87.87	5.51	176.5	377.0	399.8	152.3	1167.7	673.7
90.24	5.40	177.0	400.0	410.2	133.6	542.4	664.9
92.11	5.22	200.6	345.0	398.6	196.3	667.9	692.4
94.07	5.45	130.1	330.0	378.7	81.7	759.3	633.8
96.05	5.87	294.6	321.0	321.8	227.5	621.1	626.1
98.11	5.42	170.3	311.0	321.8	212.7	678.5	662.3
100.01	5.30	177.2	309.0	321.8	154.1	610.4	596.8
102.19	5.31	149.0	395.0	354.5	98.1	644.5	601.7
104.24	5.31	234.1	312.0	321.8	279.1	599.8	679.9
106.14	5.00	241.9	341.0	337.9	198.2	684.9	615.4
108.08	5.16	153.2	334.0	382.6	134.6	584.9	662.1
110.14	4.99	132.7	333.0	366.4	95.8	533.9	627.6
112.10	5.39	182.0	239.0	347.2	161.6	470.1	624.9
113.98	5.55	201.1	308.0	284.0	192.0	563.7	573.0
116.05	5.62	197.7	325.0	312.4	189.2	465.8	602.0
118.17	5.69	161.6	217.0	348.8	132.3	470.1	617.6
120.15	5.69	221.6	334.0	237.3	194.0	416.9	509.6
122.05	6.28	168.7	328.0	357.6	138.0	467.9	625.0
123.95	5.92	178.8	353.0	321.8	179.4	806.1	620.5
126.19	5.72	170.1	401.0	388.8	125.9	1329.4	642.7
128.32	5.70	192.1	60.0	391.6	184.5	818.9	682.1

Table H-4. Transfer data for Train CR Fermentor 4 at the lower reflux ratio and medium C-N ratio.

Train CR – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00	5.83	236.9	300.0	301.6	220.9	527.5	600.1	0.83	0.36
2.07	6.05	39.0	300.0	397.2	35.2	1765.4	608.8	0.83	0.36
4.10	5.91	0.0	300.0	353.9	0.0	1016.7	509.5	0.83	0.36
6.07	6.81	221.2	300.0	299.7	76.5	516.9	454.7	0.75	0.48
8.01	7.73	0.0	300.0	313.3	27.9	546.6	597.1	0.81	0.38
10.27	5.82	235.6	300.0	317.0	161.9	608.3	556.6	0.73	0.48
11.86	5.45	269.0	300.0	271.6	246.0	1452.7	605.1	0.78	0.41
14.00	6.00	229.4	300.0	326.4	247.0	1461.2	650.4	0.78	0.43
16.05	6.00	204.4	300.0	349.3	164.8	1528.2	607.8	0.83	0.37
18.03	6.00	173.2	300.0	354.0	112.3	1142.2	591.2	0.83	0.39
20.09	6.00	257.8	300.0	326.8	191.3	1299.6	597.0	0.83	0.42
22.05	5.72	302.5	300.0	288.3	268.3	589.2	635.9	0.86	0.36
24.12	5.40	185.1	300.0	367.6	199.4	440.3	680.0	0.81	0.33
25.85	5.54	151.4	300.0	290.5	157.4	402.0	594.6	0.79	0.35
28.02	5.11	113.3	300.0	363.9	80.5	993.3	629.2	0.80	0.36
29.86	5.59	172.4	300.0	304.3	135.3	935.9	565.3	0.81	0.37
32.16	4.96	144.5	300.0	322.2	122.4	1286.8	596.2	0.77	0.40
34.04	5.02	159.7	300.0	339.4	133.7	1856.9	611.5	0.77	0.42
36.14	5.27	200.1	300.0	323.1	174.0	1346.4	595.1	0.78	0.42
38.00	5.39	168.4	300.0	311.5	153.8	1484.6	595.0	0.80	0.39
40.09	5.22	185.8	300.0	361.0	128.6	1522.9	601.9	0.78	0.40
42.07	5.69	205.0	300.0	325.1	179.4	331.8	597.6	0.78	0.41
44.13	5.76	100.9	300.0	313.2	88.5	376.5	598.9	0.80	0.36
46.03	7.10	223.3	300.0	27.9	148.5	929.0	258.5	0.77	0.38
48.08	6.86	149.9	300.0	286.8	140.3	482.8	575.3	0.83	0.33
50.04	6.25	172.5	300.0	58.3	41.9	530.0	225.8	0.76	0.49
51.38	6.60	110.4	300.0	164.2	0.7	265.9	350.6	0.79	0.39
53.84	5.50	135.1	300.0	381.4	50.6	1567.6	595.0	0.71	0.47
55.95	5.82	198.1	300.0	354.3	141.2	2282.3	595.5	0.71	0.46
57.83	5.47	114.6	300.0	345.1	68.9	1397.4	597.5	0.78	0.35
59.94	5.55	211.3	300.0	316.0	191.6	1965.3	594.4	0.78	0.42
62.20	5.78	191.9	300.0	365.0	118.9	704.0	588.1	0.78	0.39
64.09	5.45	136.0	300.0	350.2	90.0	1587.3	600.3	0.77	0.39
66.16	5.93	118.9	300.0	365.4	120.9	1413.5	593.5	0.76	0.40
67.97	5.64	188.1	300.0	296.8	187.2	1417.5	594.0	0.82	0.42
69.93	5.77	141.6	300.0	348.2	85.2	1280.6	589.9	0.78	0.47

Table H-4. Continued.

Train CR – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
72.20	5.73	119.3	300.0	351.2	112.0	774.2	640.0	0.80	0.36
74.00	5.87	132.3	300.0	331.2	98.5	1229.4	595.5	0.78	0.36
76.05	5.71	139.7	300.0	339.3	97.1	1116.7	594.8	0.75	0.40
78.16	5.45	174.3	300.0	334.7	140.2	1282.6	596.7	0.74	0.42
80.28	5.35	217.5	300.0	324.3	192.6	1299.6	595.5	0.77	0.40
82.04	5.66	190.0	300.0	318.9	109.4	561.5	596.4	0.88	0.38
84.06	5.47	142.2	300.0	355.1	78.7	1903.7	589.7	0.79	0.35
86.02	6.01	202.1	300.0	381.8	113.2	3607.4	591.0	0.78	0.42
87.87	5.78	152.3	300.0	372.8	74.1	3160.7	592.7	0.79	0.40
90.24		133.6	300.0	395.0	31.7	3124.6	591.2	0.72	0.48
92.11	5.56	196.3	300.0	343.3	146.4	2001.5	591.5	0.74	0.44
94.07	5.73	87.1	300.0	333.4	38.9	2246.1	583.3	0.77	0.40
96.05	5.34	227.5	300.0	308.8	206.8	2256.7	594.4	0.79	0.46
98.11	5.57	212.7	300.0	308.8	200.7	718.9	594.9	0.83	0.29
100.01	5.26	154.1	300.0	308.7	125.9	1110.3	578.6	0.86	0.34
102.19	4.86	98.1	300.0	385.5	18.0	2114.2	596.4	0.80	0.39
104.24	5.01	279.1	300.0	308.8	194.9	2335.4	586.3	0.80	0.42
106.14	5.29	198.2	300.0	345.6	209.9	680.6	655.4	0.81	0.36
108.08	5.01	134.6	300.0	334.4	72.5	1433.6	570.4	0.76	0.40
110.14	4.72	95.8	300.0	330.3	50.5	1761.2	583.1	0.76	0.42
112.10	5.32	161.6	300.0	285.8	106.4	1871.8	528.7	0.75	0.43
113.98	5.69	192.0	300.0	308.9	175.0	1167.7	590.0	0.77	0.39
116.05	5.59	189.2	300.0	323.0	161.2	1174.1	593.1	0.83	0.31
118.17	5.60	132.3	300.0	221.7	79.9	1961.1	467.4	0.79	0.35
120.15	5.66	194.0	300.0	328.1	141.6	1827.1	573.8	0.77	0.44
122.05	5.54	138.0	300.0	329.0	75.9	1561.2	565.0	0.75	0.39
123.95	5.49	179.4	300.0	351.0	123.3	2684.3	593.0	0.76	0.40
126.19	5.81	125.9	300.0	404.1	27.8	3441.5	604.1	0.73	0.49
128.32	6.06	176.5	300.0	75.0	18.0	151.0	199.0	0.76	0.41

Table H-1. Transfer data for Train CR Fermentor 1 at the higher reflux ratio and medium C-N ratio.

Train CR – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00	5.12	27.3	408.0	216.2	153.4	857.2	540.4	0.97	0.32	14.43	22.05
1.93	5.26	27.3	160.0	268.4	168.2	1118.8	607.4	0.97	0.39	17.19	26.58
3.89	5.53	27.3	417.0	36.1	129.4	874.2	336.3	0.96	0.39	21.55	32.97
5.80	5.47	27.3	403.0	327.7	122.8	1033.7	621.3	0.97	0.40	18.88	29.50
7.87	5.45	27.3	295.0	162.2	125.7	908.2	458.7	0.96	0.41	15.77	25.02
9.93	5.44	27.3	357.0	265.1	190.2	967.8	629.1	0.97	0.38	18.05	28.89
11.97	5.52	27.3	317.0	197.2	181.1	778.5	549.1	0.97	0.32	15.69	25.27
13.99	5.51	27.3	382.0	157.6	188.8	587.1	517.2	0.97	0.37	17.96	29.18
15.89	5.45	27.3	386.0	269.0	155.8	863.6	595.6	0.98	0.37	16.11	26.19
17.88	5.63	27.3	375.0	339.7	182.2	808.3	692.7	0.98	0.39	13.78	22.29
19.83	5.52	27.3	381.0	318.4	99.8	553.0	589.0	0.97	0.37	17.07	27.65
21.88	5.52	27.3	362.0	219.9	192.1	134.0	582.8	0.97	0.36	12.15	19.90
23.74	5.83	27.3	345.0	216.5	170.7	31.9	558.0	0.97	0.35	12.78	20.98
25.72	5.56	27.3	365.0	209.0	164.3	461.6	544.1	0.98	0.37	15.47	24.36
27.92	5.56	27.3	334.0	228.7	59.2	487.1	458.7	0.98	0.39	16.96	26.68
29.13		27.3				278.6	0.0	0.97	0.37	16.81	26.52
31.92	5.67	27.3	379.0	355.2	201.3	1050.7	727.3	0.98	0.43	15.99	26.01
33.83	5.24	27.3	388.0	281.5	146.6	1110.3	598.9	0.98	0.41	18.50	30.15
35.94	5.49	27.3	376.0	252.8	169.0	833.8	592.6	0.98	0.33	17.19	28.07
37.90	5.27	27.3	389.0	247.5	165.2	995.4	583.5	0.99	0.54	17.87	29.06
39.75	5.34	27.3	375.0	263.5	151.6	1146.5	585.9	0.98	0.41	18.36	29.91
41.77	5.60	27.3	324.0	235.2	169.7	872.1	575.7	0.98	0.35	17.38	28.36
43.81	5.45	27.3	366.0	228.5	130.8	1161.3	530.1	0.97	0.39	18.08	29.18
46.08	5.35	27.3	419.0	270.4	120.2	993.3	561.4	0.97	0.34	19.66	32.00
47.79	5.44	27.3	426.0	311.4	135.5	508.4	617.7	0.97	0.32	18.14	29.91
49.99	5.46	27.3	374.0	277.8	186.6	884.8	635.2	0.97	0.36	18.14	29.48
51.79	5.42	27.3	345.0	258.9	154.1	625.3	577.8	0.98	0.34	17.98	29.31
53.72	5.40	27.3	304.0	228.7	143.0	727.4	542.5	0.97	0.32	18.40	29.97
55.95	5.37	27.3	388.0	178.3	166.4	761.5	515.5	0.97	0.33	18.46	30.13
57.66	5.46	27.3	380.0	265.4	156.0	555.1	592.2	0.97	0.37	18.41	29.66
59.94	5.46	27.3	333.0	276.2	174.3	867.8	621.3	0.98	0.37	17.17	27.65
61.55	5.48	27.3	346.0	200.5	168.4	597.7	539.7	0.97	0.36	18.09	29.34
63.64	5.44	27.3	304.0	214.0	173.8	667.9	558.6	0.97	0.36	18.11	29.35
65.61	5.48	27.3	319.0	186.8	154.3	453.1	511.9	0.97	0.36	18.05	29.23
67.71	5.49	27.3	250.0	172.3	165.1	559.4	507.2	0.97	0.36	17.96	29.05
70.00	5.63	27.3	112.0	131.8	159.5	201.0	462.1	0.97	0.38	17.87	28.92

Table H-1. Continued.

Train CR – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
72.05		27.3	348.0	9.4	140.4	846.5	319.6	0.97	0.36	18.01	29.18
74.07	5.45	27.3	142.0	185.9	198.1	1133.7	554.8	0.98	0.44	16.30	25.04
75.89	5.40	27.3	374.0	42.0	135.5	561.5	348.3	0.97	0.38	17.96	27.06
77.81	5.54	27.3	135.0	227.7	181.8	874.2	580.3	0.98	0.41	17.62	27.85
79.80	5.52	27.3	377.0	40.4	118.1	474.3	329.3	0.97	0.39	13.12	21.09
82.02	5.54	27.3	334.0	208.3	203.2	1078.4	582.3	0.97	0.35	15.15	24.27
83.95	5.21	27.3	208.0	201.9	180.8	270.1	553.5	0.97	0.39	15.52	24.77
85.80	5.24	27.3	425.0	132.2	120.1	674.3	423.1	0.97	0.42	14.25	22.26
87.93	5.26	27.3	333.0	264.4	185.1	624.3	620.3	0.99	0.19	18.72	29.00
89.78	5.35	27.3	394.0	213.9	192.7	661.8	537.8	0.97	0.39	17.09	26.64
91.97	5.53	27.3	342.0	376.0	216.9	557.6	763.6	0.98	0.41	13.16	20.86
93.79	5.64	27.3	407.0	244.6	181.2	538.1	596.6	0.98	0.42	14.77	23.61
95.85	5.51	27.3	390.0	250.9	185.6	1021.0	607.3	0.98	0.41	15.34	24.50
97.94	5.61	27.3	356.0	214.6	166.8	110.6	552.2	0.98	0.36	15.65	24.95
99.88	5.69	27.3	356.0	211.3	171.8	191.4	553.9	0.98	0.40	15.55	24.50
102.05	5.59	27.3	364.0	261.2	172.4	610.4	604.4	0.98	0.40	14.89	23.68
103.95	5.61	27.3	328.0	232.7	169.3	767.8	572.8	0.98	0.40	10.93	17.12
105.96	5.77	27.3	266.0	168.6	187.7	735.9	527.1	0.98	0.40	14.44	22.77
107.81	5.49	27.3	315.0	182.7	113.9	1265.6	467.4	0.98	0.39	16.54	26.90
110.00	5.57	27.3	430.0	194.7	140.8	1021.0	506.3	0.98	0.40	15.95	25.38
111.96	5.86	27.3	454.0	275.7	181.8	176.5	628.3	0.98	0.40	15.05	23.77
114.06	5.59	27.3	348.0	294.3	184.5	614.7	649.6	0.98	0.40	14.31	23.08
116.02	5.64	27.3	335.0	233.4	159.6	582.8	563.8	0.97	0.39	14.78	23.65
117.86	5.65	27.3	389.0	189.0	174.4	225.5	534.2	0.97	0.34	14.41	22.91
119.83	5.94	27.3	104.0	224.2	196.2	465.8	591.2	0.97	0.38	15.06	23.97
122.11	5.78	27.3	345.0	23.0	14.8	348.8	308.6	0.96	0.42	15.94	24.22
123.84	5.58	27.3	400.0	259.4	212.9	338.2	643.1	0.97	0.35	15.55	24.22

Table H-2. Transfer data for Train CR Fermentor 2 at the higher reflux ratio and medium C-N ratio.

Train CR – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.37	153.4	136.0	406.2	135.2	599.8	686.1
1.93	5.32	168.2	450.0	144.8	165.5	465.8	440.3
3.89	5.83	129.4	379.0	420.8	108.3	372.2	697.8
5.80	5.74	122.8	429.0	396.8	103.3	527.5	675.4
7.87	5.69	125.7	319.0	295.3	248.4	529.6	716.1
9.93	5.77	190.2	322.0	350.5	159.5	629.6	617.9
11.97	5.76	181.1	378.0	312.7	186.3	512.6	616.0
13.99	5.77	188.8	368.0	381.8	181.9	550.9	673.0
15.89	5.87	155.8	362.0	385.4	131.9	578.5	659.6
17.88	5.99	182.2	341.0	375.1	161.4	470.1	652.4
19.83	6.48	99.8	378.0	318.8	53.7	189.3	570.8
21.88	6.48	192.1	338.0	361.2	202.6	485.0	669.8
23.74	6.06	170.7	342.0	348.1	158.2	129.7	633.7
25.72	5.85	164.3	348.0	364.2	140.6	182.9	638.6
27.92	5.94	59.2	366.0	334.0	72.3	208.4	645.2
29.13						251.5	0.0
31.92	6.04	201.3	341.0	380.5	204.5	621.1	681.8
33.83	5.66	146.6	352.0	349.8	105.6	429.7	606.9
35.94	5.85	169.0	362.0	375.2	139.2	448.8	643.5
37.90	5.66	165.2	383.0	386.7	135.9	493.5	655.5
39.75	5.83	151.6	337.0	364.8	128.8	450.9	640.1
41.77	5.80	169.7	337.0	324.8	174.0	608.3	627.2
43.81	5.76	130.8	390.0	365.9	102.5	550.9	635.7
46.08	5.62	120.2	405.0	422.6	85.8	533.9	686.3
47.79	5.74	135.5	389.0	422.5	117.2	561.5	702.3
49.99	5.71	186.6	308.0	374.8	199.5	710.4	685.8
51.79	5.68	154.1	361.0	344.5	104.4	665.8	592.9
53.72	5.59	143.0	388.0	303.8	138.5	1014.6	597.4
55.95	5.65	166.4	360.0	386.5	164.0	704.0	682.2
57.66	5.61	156.0	337.0	381.3	131.2	546.6	654.6
59.94	5.65	174.3	354.0	333.7	169.9	610.4	627.4
61.55	5.64	168.4	312.0	344.4	172.3	391.4	646.4
63.64	5.50	173.8	330.0	300.8	183.7	408.4	608.8
65.61	5.77	154.3	282.0	310.7	166.2	372.2	620.7
67.71	5.89	165.1	110.0	253.5	177.0	527.5	572.5
70.00	5.70	159.5	374.0	112.2	166.7	363.7	417.5

Table H-2. Continued.

Train CR – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
72.05	5.87	140.4	194.0	347.9	165.2	629.6	669.8
74.07	5.86	198.1	372.0	143.0	249.4	374.4	492.4
75.89	5.56	135.5	150.0	375.8	129.2	374.4	667.6
77.81	5.67	181.8	380.0	136.2	190.9	463.7	443.4
79.80	5.60	118.1	367.0	381.9	109.7	480.7	671.6
82.02	5.53	203.2	222.0	334.7	237.4	1044.4	667.0
83.95	5.40	180.8	416.0	207.8	493.3	189.3	518.4
85.80	5.45	120.1	345.0	422.5	111.7	544.5	712.2
87.93	5.59	185.1	400.0	335.6	193.2	564.7	641.8
89.78	5.75	152.7	362.0	392.6	160.0	585.7	698.0
91.97	5.66	216.8	390.0	339.0	236.3	471.1	656.6
93.79	5.77	181.2	362.0	410.7	158.0	210.6	685.6
95.85	5.69	185.6	380.0	387.2	159.2	485.0	658.9
97.94	5.67	166.8	334.0	355.6	189.6	476.4	676.5
99.88	5.66	171.8	366.0	351.7	149.9	280.8	627.9
102.05	5.67	172.4	359.0	367.2	166.2	542.4	659.1
103.95	6.13	169.3	294.0	325.1	195.1	487.1	649.0
105.96	6.05	180.8	317.0	268.9	203.3	548.8	589.6
107.81	5.90	113.9	425.0	314.4	106.1	427.5	604.7
110.00	5.77	140.8	428.0	426.7	131.4	482.8	715.4
111.96	5.96	181.8	360.0	448.2	155.9	255.2	720.4
114.06	5.63	184.5	326.0	342.2	179.0	589.2	634.8
116.02	5.79	159.6	353.0	338.7	143.8	514.7	621.0
117.86	5.78	174.4	123.0	386.9	140.2	321.2	650.8
119.83	5.81	196.2	334.0	104.4	212.1	559.4	418.4
122.11	5.57	14.8	347.0	345.7	3.7	416.9	632.7
123.84	5.79	212.9	345.0	389.8	167.1	446.7	642.1

Table H-3. Transfer data for Train CR Fermentor 3 at the higher reflux ratio and medium C-N ratio.

Train CR – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.25	135.2	375.0	135.2	67.6	789.1	365.7
1.93	5.39	165.6	397.3	400.5	139.5	559.4	672.5
3.89	6.10	108.3	391.0	381.4	86.7	584.9	657.9
5.80	5.89	103.3	355.0	418.7	69.1	619.0	682.6
7.87	5.85	248.4	301.0	321.8	242.8	1601.6	644.3
9.93	5.85	159.5	355.0	319.1	167.6	691.3	625.3
11.97	6.22	186.3	349.0	375.0	152.5	493.5	639.3
13.99	6.05	181.9	331.0	361.4	161.5	576.4	639.1
15.89	5.16	131.9	325.0	356.5	98.1	1116.7	620.8
17.88	6.13	161.4	345.0	337.9	143.0	533.9	617.6
19.83	6.24	53.7	347.0	376.2	14.1	168.0	634.7
21.88	6.13	202.6	313.0	337.8	207.9	346.7	641.2
23.74	6.22	158.2	325.0	341.9	127.7	306.3	609.5
25.72	5.88	140.6	342.0	348.0	114.5	423.3	620.0
27.92	5.93	72.3	360.0	365.9	45.8	214.8	637.5
29.13						322.8	0.0
31.92	6.14	204.5	335.0	341.3	184.5	755.1	619.4
33.83	5.96	105.6	343.0	345.2	89.8	638.1	627.5
35.94	6.10	139.2	363.0	358.3	116.7	616.8	633.9
37.90	5.77	135.9	327.0	380.4	116.8	665.8	659.4
39.75	5.75	128.8	329.0	328.5	142.8	861.4	640.6
41.77	5.92	174.0	347.0	336.5	154.1	493.5	614.7
43.81	5.81	102.5	374.0	388.8	60.0	601.9	644.4
46.08	5.75	85.8	361.0	409.7	48.0	610.4	670.0
47.79	5.89	117.2	298.0	384.9	91.5	684.9	657.3
49.99	6.04	199.5	343.0	303.3	188.7	793.4	590.6
51.79	5.79	104.4	288.0	363.3	73.1	846.5	630.1
53.72	6.01	138.5	350.0	385.2	96.7	340.3	641.5
55.95	5.80	164.0	323.0	355.9	154.7	595.6	644.7
57.66	5.81	131.2	347.0	331.7	114.8	761.5	613.4
59.94	5.78	169.9	297.0	349.9	168.7	472.2	646.8
61.55	5.77	172.3	311.0	310.2	161.1	453.1	597.1
63.64	5.86	183.7	235.0	323.8	168.0	372.2	606.2
65.61	6.10	166.2	69.0	276.7	136.1	548.8	544.7
67.71	5.87	177.0	347.0	92.5	129.6	765.7	342.2
70.00	6.09	166.7	199.0	371.5	139.7	348.8	642.6

Table H-3. Continued.

Train CR – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
72.05	6.90	165.2	340.0	196.2	170.2	693.4	498.3
74.07	5.78	249.4	130.0	373.7	182.7	589.2	634.1
75.89	5.63	129.2	349.0	150.7	134.5	355.2	454.1
77.81	5.75	190.9	367.0	378.7	159.9	597.7	645.8
79.80	5.69	109.7	192.0	370.4	98.5	625.3	657.3
82.02	5.70	237.4	387.0	223.7	189.4	1069.9	489.3
83.95	5.54	193.3	321.0	410.2	185.4	272.3	700.4
85.80	5.70	111.7	362.0	343.5	89.5	641.3	619.4
87.93	6.41	193.2	326.0	403.9	149.3	652.2	658.1
89.78	6.17	160.0	364.0	360.3	122.6	658.9	621.0
91.97	5.81	236.3	325.0	386.0	186.2	556.2	658.3
93.79	5.86	158.0	337.0	363.9	139.8	229.7	643.8
95.85	5.96	159.2	361.0	377.0	120.3	491.3	636.2
97.94	5.95	189.6	321.0	332.4	213.2	514.7	654.1
99.88	6.21	149.9	336.0	361.0	108.2	465.8	617.4
102.05	6.72	166.2	317.0	363.2	139.2	397.7	634.3
103.95	6.43	193.1	289.0	292.5	213.1	553.0	608.6
105.96	5.90	195.8	382.0	316.4	165.9	1691.0	584.6
107.81	5.85	106.1	393.0	420.9	55.5	584.9	668.4
110.00	6.14	131.4	331.0	422.4	95.6	646.6	684.7
111.96	6.10	155.9	327.0	355.6	124.4	623.2	622.2
114.06	5.87	179.0	325.0	323.6	183.4	-46.8	626.1
116.02	5.83	143.8	87.0	356.5	111.6	733.8	622.4
117.86	5.75	140.2	344.0	122.3	104.8	861.4	385.0
119.83	6.20	212.1	311.0	336.2	217.9	619.0	640.1
122.11	5.82	3.7	315.0	349.4	0.0	221.2	610.2
123.84	6.03	167.1	347.0	335.6	109.5	521.1	576.1

Table H-4. Transfer data for Train CR Fermentor 4 at the higher reflux ratio and medium C-N ratio.

Train CR – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00	5.48	67.6	300.0	377.8	18.0	1897.3	580.2	0.75	0.43
1.93	5.23	139.5	300.0	364.8	30.1	2435.4	553.5	0.68	0.48
3.89	6.02	86.7	300.0	388.8	18.0	3039.5	607.1	0.74	0.44
5.80	6.06	69.1	300.0	352.0	2.4	3301.1	583.4	0.65	0.49
7.87	5.87	242.8	300.0	308.8	192.7	1571.9	588.5	0.74	0.48
9.93	6.04	167.6	300.0	346.5	154.2	1014.6	631.2	0.76	0.36
11.97	5.88	152.5	300.0	347.0	103.6	482.8	596.2	0.75	0.44
13.99	5.78	161.5	300.0	327.6	128.6	2178.0	592.8	0.76	0.44
15.89	5.70	98.1	300.0	325.8	70.3	1765.4	596.1	0.64	0.51
17.88	5.68	143.0	300.0	340.0	100.3	2178.0	595.4	0.73	0.46
19.83	5.80	14.1	300.0	346.0	0.0	1169.9	595.8	0.73	0.44
21.88	5.62	207.9	300.0	316.1	155.9	325.4	562.2	0.69	0.50
23.74	5.69	157.7	300.0	327.0	98.6	997.6	596.0	0.73	0.39
25.72	5.65	114.5	300.0	342.9	69.6	1333.6	596.1	0.72	0.42
27.92	5.72	45.8	300.0	363.1	19.2	1818.6	596.2	0.72	0.44
29.13			300.0			1118.8	0.0	0.72	0.44
31.92	6.03	184.5	300.0	333.1	145.8	2822.5	592.5	0.71	0.50
33.83	5.90	89.8	300.0	339.3	48.0	2341.8	595.6	0.72	0.44
35.94	6.25	116.7	300.0	365.1	49.2	2463.1	595.7	0.67	0.47
37.90	5.73	116.8	300.0	322.5	91.4	3103.3	595.2	0.73	0.45
39.75	5.91	142.8	300.0	320.9	113.8	314.8	590.0	0.71	0.46
41.77	5.85	154.1	300.0	332.5	91.0	2382.2	567.5	0.73	0.47
43.81	5.75	60.0	300.0	377.0	0.0	3598.9	595.5	0.71	0.46
46.08	5.81	48.0	300.0	364.9	0.0	3073.5	575.7	0.71	0.46
47.79	6.61	91.5	300.0	297.9	57.1	1293.2	561.6	0.58	0.56
49.99	5.88	188.7	300.0	345.3	138.9	3986.0	593.6	0.62	0.55
51.79	5.86	73.1	300.0	291.2	72.3	2358.8	588.5	0.74	0.42
53.72	5.65	96.7	300.0	350.9	43.7	2688.5	596.0	0.67	0.49
55.95	5.65	154.7	300.0	321.5	127.5	2195.1	592.4	0.70	0.49
57.66	5.71	114.8	300.0	351.0	63.0	1876.0	597.3	0.67	0.46
59.94	5.67	168.7	300.0	303.6	163.8	1769.7	596.8	0.69	0.41
61.55	6.25	161.1	300.0	311.9	149.5	701.9	598.4	0.76	0.36
63.64	6.06	168.0	300.0	38.6	32.4	436.0	201.1	0.70	0.44
65.61	6.67	136.1	300.0	66.8	0.0	1195.9	223.2	0.71	0.43
67.71	5.71	129.6	300.0	350.1	70.9	1816.5	587.5	0.71	0.42
70.00	5.79	139.7	300.0	202.3	83.5	1037.6	444.2	0.74	0.44

Table H-4. Continued.

Train CR – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
72.05	5.84	170.2	300.0	341.2	125.6	3075.6	593.7	0.76	0.46
74.07	5.99	182.7	300.0	131.7	46.7	1180.5	293.8	0.72	0.44
75.89	5.85	134.5	300.0	349.5	83.5	2641.7	596.6	0.73	0.44
77.81	5.83	159.9	300.0	369.0	86.6	2588.6	593.8	0.74	0.47
79.80	5.91	98.5	300.0	193.3	0.0	1771.8	378.9	0.74	0.45
82.02	5.80	189.4	300.0	392.7	83.1	4768.7	584.5	0.65	0.54
83.95	6.12	185.4	300.0	321.6	160.8	421.1	595.1	0.76	0.44
85.80	5.62	89.5	300.0	363.4	26.9	2387.6	598.9	0.72	0.47
87.93	5.97	149.3	300.0	327.8	118.5	2337.3	595.1	0.75	0.44
89.78	5.95	122.6	300.0	364.0	53.7	2478.7	593.2	0.80	0.42
91.97	5.68	186.2	300.0	324.5	155.9	1906.2	592.3	0.75	0.50
93.79	6.22	139.8	300.0	341.6	99.7	1403.8	599.6	0.76	0.42
95.85	5.87	120.3	300.0	360.9	56.5	2765.1	595.2	0.76	0.45
97.94	5.74	273.3	300.0	323.4	213.2	2158.9	596.7	0.76	0.44
99.88	8.15	108.2	300.0	332.8	83.2	106.4	605.9	0.79	0.37
102.05	8.42	139.2	300.0	315.7	123.9	80.8	598.5	0.76	0.44
103.95	8.22	213.1	300.0	290.8	224.6	176.5	600.4	0.77	0.42
105.96	5.88	158.6	300.0	383.4	74.1	3260.7	597.0	0.77	0.42
107.81	5.99	55.5	300.0	389.4	0.0	2305.7	598.4	0.77	0.42
110.00	5.95	95.6	300.0	329.4	29.9	2258.9	561.8	0.71	0.51
111.96	6.04	124.4	300.0	326.1	99.2	1984.5	599.0	0.72	0.50
114.06	5.80	183.4	300.0	323.0	150.4	2146.1	588.1	0.75	0.50
116.02	6.35	111.6	300.0	90.8	0.0	393.5	231.7	0.76	0.45
117.86	6.33	104.8	300.0	345.5	12.1	871.0	550.9	0.74	0.47
119.83	6.35	217.9	300.0	315.6	202.5	1480.4	598.3	0.70	0.50
122.11	6.31	0.0	300.0	314.2	0.0	306.3	598.3	0.73	0.48
123.84	9.10	109.5	300.0	337.1	62.4	112.7	588.1	0.71	0.41

Table H-1. Transfer data for Train CR Fermentor 1 at low C-N ratio.

Train CR – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00	5.61	27.3	278.0	218.5	203.3	380.7	592.6	0.97	0.39	14.83	22.52
1.80	6.05	27.3	342.0	173.7	136.2	408.4	480.7	0.97	0.29	13.14	20.47
3.85	5.69	27.3	308.0	191.1	186.3	467.9	548.2	0.98	0.38	15.20	22.23
6.03	5.87	27.3	157.6	172.5	161.9	995.4	505.2	0.97	0.34	14.34	21.43
8.09	6.00	27.3	408.0	240.6	123.9	557.3	535.3	0.98	0.43	14.91	22.67
9.95	5.88	27.3	347.0	233.4	199.9	1027.3	604.1	0.98	0.33	17.94	27.52
11.99	6.31	27.3	334.0	180.3	200.4	642.4	551.5	0.99	0.41	15.97	23.92
14.03	6.46	27.3	325.0	184.2	174.4	508.4	529.4	0.99	0.38	15.19	21.89
16.02	6.85	27.3	300.0	187.2	163.1	370.1	521.1	0.99	0.46	14.21	19.98
18.04	6.62	27.3	287.0	201.9	129.3	353.1	502.0	0.99	0.32	13.37	18.52
20.00	7.15	27.3	260.0	134.6	182.7	491.3	488.1	0.99	0.38	14.48	19.51
22.07	7.22	27.3	272.0	133.2	161.6	404.8	465.6	0.99	0.32	12.80	17.16
24.08	7.78	27.3	255.0	172.8	145.5	346.7	489.0	0.99	0.36	15.95	19.64
25.98	7.63	27.3	235.0	156.8	138.7	351.0	466.3	0.99	0.34	11.36	14.39
28.09	7.14	27.3	240.0	104.8	162.2	674.3	437.8	0.99	0.41	15.30	18.28
30.07	7.32	27.3	220.0	127.3	130.0	582.8	428.1	0.99	0.41	16.76	19.56
31.92	7.55	27.3	229.0	118.4	151.2	342.4	440.4	0.99	0.44	13.32	15.70
33.63	7.78	27.3	242.0	106.7	155.0	316.9	426.5	0.99	0.42	13.19	15.37
36.07	7.83	27.3	240.0	117.7	156.1	199.9	444.6	0.99	0.36	12.24	14.12
37.94	8.02	27.3	237.0	93.5	186.5	278.6	450.8	0.99	0.41	10.41	12.04
39.87	7.99	27.3	242.0	139.8	136.3	257.4	446.9	0.99	0.40	10.42	11.94
41.65	7.92	27.3	236.0	134.4	165.9	180.8	471.1	0.99	0.40	9.82	11.18
43.95	7.91	27.3	194.0	80.4	188.3	357.3	439.5	0.99	0.35	10.07	11.41
45.67	7.88	27.3	203.0	76.1	145.1	378.6	392.0	0.99	0.42	10.64	12.01
47.94	7.58	27.3	222.0	99.7	241.4	368.0	401.4	0.99	0.38	10.98	12.39
49.93	7.73	27.3	215.0	104.7	129.8	373.3	405.3	0.99	0.37	11.33	12.68
51.90	7.76	27.3	217.0	100.6	143.8	370.6	415.2	0.99	0.40	11.89	13.26
53.86	7.71	27.3	186.0	47.0	205.6	372.0	423.4	0.99	0.32	11.55	12.89
55.71	7.65	27.3	200.0	100.1	138.9	371.3	392.7	0.99	0.44	13.97	15.67
57.82	7.55	27.3	204.0	104.2	112.7	371.6	387.7	0.99	0.43	13.56	15.19
59.89	7.63	27.3	205.0	23.7	138.6	371.5	333.1	0.99	0.44	13.46	15.02
61.87	7.12	27.3	228.0	94.6	141.7	499.8	407.1	0.99	0.38	11.91	13.44
63.89	6.81	27.3	230.0	107.6	147.4	408.4	425.8	0.99	0.43	11.54	13.03
65.22	7.21	27.3	227.0	92.7	163.9	338.2	427.4	0.99	0.40	13.38	15.22
67.43	7.41	27.3	195.0	64.0	192.5	423.3	427.3	0.99	0.41	13.46	15.20
69.83	7.53	27.3	185.0	74.3	158.1	53.2	403.2	0.99	0.44	12.57	14.22
71.86	7.62	27.3	198.0	52.9	164.1	327.6	387.8	0.99	0.34	13.51	15.17

Table H-1. Continued.

Train CR – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
73.85	7.39	27.3	315.0	63.7	168.1	374.4	406.2	0.99	0.44	11.06	12.35
75.91	7.73	27.3	200.0	88.2	152.0	223.3	411.0	0.99	0.39	13.61	15.23
77.81	7.02	27.3	210.0	59.4	169.4	359.5	399.6	0.99	0.44	12.40	13.85
79.77	7.55	27.3	219.0	74.5	145.0	236.1	390.3	0.99	0.38	14.27	15.96
81.86	7.70	27.3	228.0	90.1	165.9	421.1	426.8	0.99	0.42	10.16	11.39
83.85	7.29	27.3	197.0	82.4	185.4	159.5	432.6	0.99	0.38	12.61	14.04
85.15	7.60	27.3	182.0	59.7	136.6	308.4	367.1	0.99	0.39	14.39	16.10

Table H-2. Transfer data for Train CR Fermentor 2 at low C-N ratio.

Train CR – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	5.73	203.3	340.0	279.7	258.2	827.4	632.7
1.80	6.68	136.2	344.0	344.0	131.5	408.4	637.4
3.85	6.37	186.3	330.0	303.2	230.4	410.5	645.9
6.03	6.16	161.9	388.0	328.1	157.6	574.3	621.9
8.09	6.00	123.9	376.0	400.5	109.7	523.2	686.3
9.95	6.89	199.9	357.0	345.0	229.0	442.4	672.2
11.99	7.42	200.4	326.0	330.5	221.3	295.7	649.5
14.03	7.70	174.4	335.0	315.8	181.0	176.5	620.5
16.02	6.94	163.1	290.0	289.4	194.4	285.0	618.8
18.04	6.51	129.3	323.0	277.8	134.7	442.4	581.3
20.00	7.32	182.7	324.0	258.4	234.2	295.7	608.0
22.07	8.56	161.6	286.0	269.4	213.2	341.0	619.1
24.08	8.48	145.4	271.0	253.9	172.9	36.2	579.5
25.98	8.53	138.7	265.0	232.4	175.9	112.7	567.7
28.09	8.05	162.2	260.0	227.9	190.6	280.8	554.4
30.07	8.05	130.0	266.0	220.1	162.9	282.9	551.1
31.92	8.54	151.2	299.0	222.6	193.4	110.6	562.9
33.63	8.67	155.0	290.0	240.2	202.1	155.3	585.4
36.07	8.62	156.1	294.0	240.2	205.1	85.1	587.3
37.94	8.66	186.5	281.0	239.7	242.0	123.4	593.3
39.87	8.54	136.3	196.0	242.4	177.5	85.1	581.7
41.65	8.60	165.9	258.0	232.4	228.8	112.7	593.4
43.95	8.51	188.3	254.0	189.9	257.1	110.6	556.8
45.67	8.61	145.1	269.0	200.4	189.7	102.1	543.1
47.94	8.40	130.9	256.0	203.8	192.2	106.4	563.2
49.93	8.67	129.8	280.0	210.3	172.1	104.2	550.7
51.90	8.57	143.8	252.0	220.8	200.3	105.3	575.4
53.86	8.34	205.6	268.0	177.9	280.4	104.8	550.8
55.71	8.43	138.9	265.0	201.2	190.9	105.0	551.3
57.82	8.21	112.7	285.0	202.5	175.5	104.9	563.4
59.89	8.40	138.6	267.0	204.4	215.1	170.2	579.0
61.87	8.01	141.7	278.0	220.6	187.1	108.5	564.1
63.89	7.92	147.4	275.0	227.5	189.8	172.3	568.0
65.22	8.30	163.9	263.0	225.1	211.5	172.3	570.8
67.43	8.35	192.5	230.0	196.9	246.2	127.6	548.6
69.83	8.08	158.1	265.0	184.1	203.7	121.2	527.8
71.86	8.31	164.1	274.0	189.4	237.7	148.9	561.1

Table H-2. Continued.

Train CR – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.85	8.43	168.1	261.0	214.7	241.7	148.9	569.3
75.91	8.52	152.0	284.0	194.9	196.0	76.6	537.0
77.81	8.04	169.4	260.0	210.2	232.8	161.7	571.7
79.77	8.51	145.0	277.0	218.9	184.5	100.0	556.5
81.86	8.45	165.9	268.0	224.9	210.1	102.1	567.2
83.85	8.12	185.4	229.0	194.9	252.9	108.5	562.4
85.15	8.30	136.6	246.0	178.9	181.1	48.9	521.5

Table H-3. Transfer data for Train CR Fermentor 3 at low C-N ratio.

Train CR – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00	7.01	258.2	297.0	341.6	212.9	268.0	631.1
1.80	7.47	131.5	340.0	345.7	119.5	268.0	632.0
3.85	5.99	230.9	345.0	326.5	227.0	621.1	635.4
6.03	6.21	157.6	335.0	389.0	117.1	2320.6	646.6
8.09	7.50	109.7	34.7	373.8	72.5	306.3	634.7
9.95	8.47	229.0	303.0	355.3	200.3	121.2	638.0
11.99	8.65	221.3	309.0	322.6	210.8	142.5	610.2
14.03	8.04	181.0	312.0	322.7	162.8	106.4	602.6
16.02	6.61	194.4	307.0	281.4	205.8	476.4	590.9
18.04	7.21	134.7	347.0	312.6	126.7	244.6	602.7
20.00	8.70	234.2	293.0	321.5	230.4	131.9	628.2
22.07	8.85	213.2	295.0	281.3	234.6	284.3	600.8
24.08	8.84	172.9	297.0	270.7	196.5	74.4	591.5
25.98	8.92	175.9	282.0	257.3	210.4	87.2	592.9
28.09	8.95	190.6	297.0	251.4	211.5	23.4	570.4
30.07	8.79	162.9	293.0	264.9	182.0	104.2	582.1
31.92	8.96	193.4	317.0	291.4	194.0	91.5	590.1
33.63	9.05	202.1	307.0	286.3	219.8	125.5	602.1
36.07	8.93	205.1	301.0	293.2	218.3	104.2	604.5
37.94	8.94	242.0	307.0	284.7	239.5	83.0	599.3
39.87	8.90	177.5	295.0	295.7	205.5	43.6	621.8
41.65	8.91	228.8	283.0	255.5	261.8	10.6	592.0
43.95	8.91	257.1	287.0	250.4	261.4	85.1	587.6
45.67	8.92	189.7	269.0	268.4	239.2	76.6	616.0
47.94	8.79	192.2	310.0	253.0	194.1	80.8	553.0
49.93	8.95	172.1	287.0	276.6	198.0	78.7	600.6
51.90	8.96	200.3	302.0	254.2	227.7	79.8	579.7
53.86	8.90	280.4	293.0	254.2	269.9	79.2	600.5
55.71	8.77	190.9	307.0	264.3	267.4	79.5	638.9
57.82	8.64	175.5	300.0	281.2	201.9	79.4	605.7
59.89	8.78	215.1	295.0	268.8	241.2	102.1	593.0
61.87	8.78	187.1	307.0	269.4	212.5	51.0	592.9
63.89	8.40	189.8	282.0	272.5	210.7	89.3	591.5
65.22	8.74	211.5	275.0	259.1	236.4	85.1	582.1
67.43	8.67	246.2	297.0	228.7	253.9	117.0	558.7
69.83	8.28	203.7	302.0	262.5	259.9	89.3	616.8
71.86	8.90	237.7	300.0	269.6	259.4	104.2	605.4

Table H-3. Continued.

Train CR – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
73.85	8.73	241.7	300.0	259.6	271.0	102.1	605.9
75.91	8.93	196.0	293.0	274.6	253.8	17.0	630.5
77.81	8.46	232.8	297.0	258.4	250.4	136.1	584.9
79.77	8.91	184.5	302.0	271.7	221.7	83.0	607.0
81.86	8.86	210.1	289.0	265.4	241.8	117.0	595.0
83.85	8.75	252.9	280.0	228.0	279.8	68.1	584.4
85.15	8.77	181.6	308.0	245.3	239.8	14.9	601.6

Table H-4. Transfer data for Train CR Fermentor 4 at low C-N ratio.

Train CR – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00	8.79	212.9	300.0	302.1	211.4	372.2	599.0	0.70	0.46
1.80	6.47	119.7	300.0	340.4	76.7	1776.0	595.5	0.75	0.40
3.85	6.56	227.0	300.0	339.6	178.6	2988.4	600.7	0.75	0.47
6.03	8.53	117.1	300.0	338.9	93.2	253.1	613.1	0.77	0.38
8.09	9.00	72.5	300.0	344.9	30.3	80.8	600.8	0.73	0.45
9.95	9.17	200.3	300.0	303.7	202.2	114.9	603.7	0.74	0.41
11.99	8.77	210.8	300.0	306.6	210.2	123.4	604.1	0.77	0.42
14.03	8.28	162.8	300.0	300.9	161.6	51.0	597.8	0.79	0.38
16.02	6.47	205.8	300.0	305.6	200.8	382.9	598.7	0.77	0.41
18.04	8.97	126.7	300.0	331.5	96.5	89.3	599.4	0.76	0.41
20.00		230.4	300.0	294.3	231.7	117.0	602.5	0.82	0.42
22.07	9.02	234.6	300.0	294.8	223.2	196.4	603.0	0.80	0.38
24.08	8.99	195.6	300.0	293.8	222.0	106.4	618.3	0.83	0.37
25.98	9.15	210.4	300.0	274.0	239.7	65.9	601.4	0.85	0.39
28.09	9.20	211.5	300.0	283.4	229.4	46.8	599.4	0.85	0.39
30.07	9.11	182.0	300.0	296.3	202.0	74.4	614.4	0.84	0.38
31.92	9.21	194.0	300.0	309.2	188.7	74.4	602.0	0.80	0.42
33.63	9.25	219.8	300.0	307.4	213.4	95.7	599.1	0.83	0.39
36.07	9.15	218.3	300.0	303.6	219.3	36.2	602.7	0.82	0.38
37.94	9.19	239.5	300.0	308.4	219.5	74.4	603.5	0.83	0.39
39.87	9.08	202.5	300.0	299.2	228.2	48.9	620.0	0.82	0.39
41.65	9.14	261.8	300.0	283.2	238.3	102.1	598.2	0.82	0.40
43.95	9.10	261.4	300.0	286.3	264.4	95.7	627.5	0.84	0.36
45.67	9.15	239.7	300.0	268.1	249.2	57.4	594.0	0.84	0.39
47.94	8.91	194.1	300.0	305.2	211.9	76.6	621.1	0.84	0.39
49.93	9.09	198.0	300.0	285.4	222.3	67.0	607.8	0.83	0.39
51.90	9.26	227.7	300.0	305.7	218.3	71.8	601.3	0.83	0.38
53.86	9.16	269.9	300.0	285.0	243.6	69.4	607.1	0.85	0.34
55.71	8.97	267.4	300.0	309.1	269.7	70.6	651.7	0.82	0.39
57.82	8.90	201.9	300.0	300.4	251.5	70.0	648.1	0.84	0.37
59.89	9.06	241.2	300.0	296.1	227.2	91.5	600.4	0.84	0.38
61.87	9.09	212.5	300.0	297.3	235.8	65.9	618.7	0.86	0.39
63.89	8.72	210.7	300.0	286.5	228.1	89.3	602.0	0.86	0.37
65.22	9.06	236.4	300.0	267.6	253.0	93.6	601.6	0.84	0.34
67.43	8.74	253.9	300.0	298.1	236.8	93.6	613.0	0.87	0.37
69.83	8.57	259.9	300.0	310.0	247.3	76.6	635.1	0.83	0.33
71.86	9.14	259.4	300.0	295.0	265.8	70.2	640.7	0.84	0.31

Table H-4. Continued.

Train CR – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
73.85	9.01	271.0	300.0	345.4	258.8	61.7	680.7	0.87	0.33
75.91	9.12	253.8	300.0	289.4	283.6	38.3	649.5	0.87	0.33
77.81	8.72	250.4	300.0	300.0	255.8	89.3	632.7	0.86	0.32
79.77	9.11	221.7	300.0	298.4	254.5	76.6	630.2	0.85	0.31
81.86	9.02	241.8	300.0	289.4	234.3	17.0	601.3	0.86	0.34
83.85	8.99	279.8	300.0	281.1	258.5	68.1	617.1	0.87	0.33
85.15	9.06	239.8	300.0	304.8	255.0	42.5	659.3	0.86	0.34

Table H-1. Transfer data for Train CR Fermentor 1 at high C-N ratio.

Train CR – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
0.00											
1.00	6.07										
2.00						259.5	0.0				
3.00											
4.00	6.09					138.3	0.0				
5.00											
6.00	6.04										
7.54	6.18	27.3	208.0	221.5	172.5	95.7	566.7	0.99	0.46		
9.68	6.03	27.3	199.0	93.8	140.0	576.4	404.6	0.98	0.46	16.11	21.04
11.93	5.84	27.3	150.0	70.4	157.8	544.5	399.0	0.99	0.46	19.79	25.98
14.57	5.63	27.3	140.0	42.3	135.7	591.3	348.8	0.96	0.48	25.38	34.48
16.79	5.68	27.3	164.0	21.8	144.3	691.3	336.9	0.96	0.46	22.95	31.57
18.77	5.84	27.3	159.0	48.3	143.9	519.0	363.0	0.97	0.46	27.00	37.26
21.57	5.69	27.3	142.0	34.5	152.6	570.0	357.9	0.96	0.49	25.04	34.82
23.84	5.73	27.3	153.0	36.8	152.5	519.0	342.1	0.96	0.48	26.74	37.20
25.98	5.87	27.3	155.0	19.5	147.1	433.9	337.4	0.96	0.47	26.57	36.88
28.72	5.92	27.3	170.0	65.7	120.3	372.2	356.8	0.95	0.47	28.32	39.84
30.95	5.66	27.3	165.0	42.0	159.4	410.5	372.2	0.92	0.24	25.88	36.58
32.93	5.76	27.3	198.0	49.5	145.6	431.8	365.9	0.95	0.46	27.12	38.01
35.67	5.52	27.3	186.0	60.1	167.2	416.9	398.1	0.95	0.38	25.35	35.30
37.95	5.51	27.3	303.0	177.7	33.6	440.3	382.1	0.96	0.45	24.01	33.47
39.85	5.49	27.3	198.0	126.5	203.9	378.6	501.2	0.96	0.45	24.49	33.93
42.62	5.73	27.3	138.0	78.9	151.9	459.4	401.6	0.95	0.40	24.42	34.70
44.84	5.84	27.3	247.0	131.3	34.2	163.8	336.3	0.96	0.48	23.68	33.73
46.00	5.77	27.3	165.0	73.1	193.1	140.4	437.0	0.96	0.48	23.37	33.30
49.69	6.05	27.3	124.0	68.4	126.3	136.1	365.5	0.96	0.42	22.44	32.04
51.81	5.99	27.3	90.0	38.1	129.2	40.4	338.1	0.96	0.45	22.48	32.10
53.00		27.3	130.0	0.0	122.6	127.6	293.4	0.96	0.44	23.28	33.17
56.58	5.54	27.3	115.0	12.9	147.1	419.0	330.8	0.96	0.45	21.61	30.36
58.66		27.3	119.0	11.0	135.8	376.5	317.6	0.96	0.45	22.64	32.20
60.58		27.3	130.0	4.7	145.3	372.2	320.8	0.96	0.44	22.59	31.95
62.64		27.3	144.0	8.1	150.9	344.6	329.8	0.96	0.45	20.54	29.17
64.62		27.3	190.0	12.9	162.4	338.2	346.1	0.96	0.45	23.19	32.55
66.69	5.66	27.3	185.0	59.9	163.1	323.3	393.8	0.96	0.45	20.28	28.73
68.67	5.45	27.3	194.0	72.2	142.4	457.3	385.4	0.96	0.36	19.53	27.23
70.53	5.76	27.3	220.0	69.5	154.7	402.0	395.0	0.96	0.62	19.56	27.39
72.53	5.71	27.3	220.0	76.4	170.5	399.9	417.7	0.96	0.55	19.28	26.35

Table H-1. Continued.

Train CR – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
74.87	5.99	27.3	217.0	142.5	113.2	308.4	426.5	0.97	0.69	18.38	25.50
76.57	6.50	27.3	201.0	91.0	156.0	308.4	417.8	0.97	0.16	17.63	24.41
78.63	6.05	27.3	234.0	117.5	114.3	357.3	402.6	0.97	0.36	15.46	21.36
80.61	5.95	27.3	188.0	114.4	150.4	231.8	435.6	0.97	0.37	15.19	21.01
82.58	5.82	27.3	242.0	39.6	177.8	316.9	388.2	0.97	0.46	12.66	17.38
84.56	5.86	27.3	196.0	107.4	162.8	274.4	441.0	0.97	0.43	14.07	19.12
86.60	6.05	27.3	226.0	43.7	181.7	240.4	396.2	0.97	0.41	13.78	18.41
88.50	5.91	27.3	206.0	106.5	151.3	240.4	428.6	0.97	0.66	11.68	15.56
90.56	6.50	27.3	196.0	63.8	170.7	227.6	405.3	0.97	0.46	15.74	20.62
92.58	6.16	27.3	228.0	85.0	142.0	236.1	397.8	0.97	0.41	13.07	17.35
94.57	6.29	27.3	220.0	97.3	161.2	306.3	429.3	0.97	0.47	11.49	15.17
96.58	6.43	27.3	238.0	93.1	157.4	316.9	421.3	0.98	0.51	12.19	16.06
98.58	6.35	27.3	203.0	149.0	120.1	234.0	439.9	0.97	0.97	13.04	17.30
100.64	6.03	27.3	201.0	67.5	164.8	323.3	403.1	0.98	0.51	12.54	16.57
102.58	5.93	27.3	217.0	74.7	155.8	331.8	402.2	0.98	0.51	13.46	17.78
104.54	5.99	27.3	201.0	85.1	163.0	287.1	418.9	0.98	0.59	12.11	16.06
106.67	6.27	27.3	212.0	47.7	183.2	325.4	401.7	0.98	0.38	12.27	16.25
108.57	6.52	27.3	258.0	59.2	89.0	165.9	319.0	0.98	0.36	10.67	14.02
110.63	6.30	27.3	243.0	80.3	114.2	95.7	369.3	0.98	0.51	11.08	14.63
112.73	6.25	27.3	234.0	92.0	182.2	302.0	445.0	0.98	0.36	10.31	13.58
114.85	6.14	27.3	255.0	158.4	108.5	259.5	437.7	0.98	0.40	11.83	15.59
116.77	6.11	27.3	243.0	109.3	175.5	263.7	455.6	0.98	0.43	12.28	16.28
118.60	6.19	27.3	334.0	85.4	183.0	170.2	439.2	0.98	0.41	11.38	15.16
120.78	6.20	27.3	285.0	193.8	79.1	185.0	443.7	0.99	0.41	9.52	12.63
122.56	6.17	27.3	186.0	169.9	52.0	199.9	392.7	0.98	0.37	10.47	13.81
124.61	6.40	27.3	254.0	78.2	46.5	231.8	295.5	0.98	0.43	11.22	14.75
126.70	5.96	27.3	291.0	77.7	204.4	325.4	452.9	0.98	0.40	10.33	13.57
128.87	5.85	27.3	247.0	121.9	200.2	282.9	492.9	0.98	0.44	10.59	14.03
130.68	5.98	27.3	240.0	98.6	178.5	263.7	447.9	0.98	0.53	10.30	13.63
132.76	6.07	27.3	282.0	129.0	136.4	276.5	436.2	0.98	0.51	11.31	14.96
134.63	6.17	27.3	269.0	156.5	64.2	270.1	391.5	0.98	0.52	10.64	14.02
136.52	5.95	27.3	278.0	119.2	180.1	378.6	470.1	0.98	0.53	11.88	15.87
138.56	6.13	27.3	240.0	121.6	186.9	234.0	479.3	0.98	0.37	11.06	14.69
140.70	6.38	27.3	304.0	128.9	48.5	187.2	348.2	0.98	0.35	11.19	14.77
142.84	5.94	27.3	215.0	145.4	189.3	316.9	505.5	0.98	0.46	10.86	14.44
144.85	6.01	27.3	234.0	104.9	142.8	282.9	417.5	0.98	0.42	10.70	14.24
146.59	6.09	27.3	251.0	113.3	149.4	257.4	433.5	0.98	0.31	11.57	15.53

Table H-1. Continued.

Train CR – Fermentor 1											
Day	pH	Feedstock added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content	Acid conc.	Aceq
		(g)	(mL)	(g)	(g)	(cm ³)	(g)			(g/L)	(g/L)
148.68	5.61	27.3	290.0	119.4	50.1	176.5	340.3	0.98	0.41	11.08	14.74
150.72	6.12	27.3	251.0	122.7	103.4	189.3	396.9	0.98	0.50	10.89	14.37
152.63	6.14	27.3	257.0	127.0	154.6	108.5	452.4	0.98	0.47	10.56	14.06
154.70	6.14	27.3	245.0	139.6	150.6	299.9	461.0	0.98	0.37	12.66	16.77
156.64	5.85	27.3	212.0	99.3	170.2	363.7	440.3	0.98	0.44	9.70	12.91
158.69	5.85	27.3	226.0	105.7	135.1	282.7	411.6	0.98	0.47	10.50	13.98
160.51	5.99	27.3	259.0	104.3	140.2	274.4	415.3	0.98	0.45	9.87	13.13

Table H-2. Transfer data for Train CR Fermentor 2 at high C-N ratio.

Train CR – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00							
1.00	6.03						0.0
2.00						265.9	0.0
3.00							0.0
4.00	6.09					127.6	0.0
5.00							0.0
6.00	6.06						0.0
7.54		172.5	222.0	208.7	219.7	114.9	552.6
9.68	5.94	140.0	173.0	202.3	158.1	421.1	518.5
11.93	5.95	157.8	158.0	150.4	178.5	355.2	469.2
14.57	5.50	135.7	201.0	140.8	149.7	312.7	452.9
16.79	5.41	144.3	193.0	167.0	175.2	229.7	496.0
18.77	5.72	143.9	176.0	158.6	174.1	219.1	488.8
21.57	5.60	152.6	184.0	183.7	184.4	316.9	478.0
23.84	5.61	152.5	179.0	156.3	177.6	193.6	479.5
25.98	5.72	147.1	198.0	157.6	167.4	276.5	476.0
28.72	5.69	120.3	210.0	172.5	144.8	278.6	495.1
30.95	5.57	159.4	222.0	170.1	199.8	293.5	508.6
32.93	5.79	145.6	218.0	197.9	168.6	280.8	519.0
35.67	5.65	167.2	200.0	185.5	197.3	308.4	513.7
37.95	5.49	33.6	342.0	307.5	0.0	199.9	495.3
39.85	5.54	203.9	187.0	200.6	269.0	251.0	563.8
42.62	5.56	151.9	137.0	139.7	200.7	206.3	486.6
44.84	5.56	34.2	313.0	250.5	0.0	170.2	434.2
46.00	5.58	193.1	204.0	164.0	261.7	236.1	530.7
49.69	5.84	126.3	111.0	119.4	189.0	255.2	480.2
51.81	5.80	129.2	179.0	95.1	145.2	134.0	409.2
53.00	5.37	122.6	153.0	131.1	172.0	165.9	478.6
56.58	5.33	147.1	166.0	116.2	181.5	208.4	448.7
58.66	5.37	135.8	173.0	123.4	177.2	148.9	462.9
60.58	5.39	145.3	187.0	130.7	187.5	153.1	471.0
62.64	5.63	150.9	248.0	145.3	192.2	161.7	484.7
64.62	5.74	162.4	229.0	195.8	213.9	168.0	545.4
66.69	5.52	163.1	241.0	183.4	209.3	168.0	527.7
68.67	5.27	142.4	271.0	193.9	186.3	78.7	535.9
70.53	5.56	154.7	287.0	218.5	207.4	244.6	569.3
72.53	5.68	170.5	258.0	228.8	226.6	195.7	583.0

Table H-2. Continued.

Train CR – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.87	5.51	113.2	257.0	215.9	155.6	206.3	556.4
76.57	6.00	156.0	277.0	201.0	209.8	202.1	552.9
78.63	5.90	114.3	258.0	237.1	160.1	212.7	581.0
80.61	5.90	150.4	300.0	186.0	221.1	187.2	554.8
82.58	5.93	177.8	242.0	241.2	236.0	210.6	597.5
84.56	6.01	162.8	290.0	196.2	208.7	187.2	540.2
86.60	5.88	181.7	261.0	227.1	242.6	191.4	586.1
88.50	5.94	151.3	255.0	206.5	204.7	238.2	558.0
90.56	6.50	170.7	273.0	196.6	226.8	231.8	550.8
92.58	6.19	142.0	272.0	230.5	182.8	202.1	569.4
94.57	6.45	161.2	305.0	219.2	214.4	180.8	570.5
96.58	6.40	157.4	260.0	238.1	224.4	212.7	603.2
98.58	6.25	120.1	272.0	202.9	176.3	163.8	557.2
100.64	5.98	164.8	287.0	204.1	232.6	199.9	570.0
102.58	5.90	155.8	264.0	216.8	225.3	231.8	584.4
104.54	5.90	163.0	288.0	200.9	225.6	170.2	561.6
106.67	6.12	183.2	316.0	215.0	255.9	208.4	585.8
108.57	6.04	89.0	308.0	258.5	199.4	159.5	667.0
110.63	6.03	114.2	275.0	243.0	140.2	155.3	585.1
112.73	6.09	182.2	298.0	235.1	221.3	212.7	572.3
114.85	6.03	108.5	286.0	258.0	146.7	182.9	621.3
116.77	6.05	175.5	420.0	239.5	220.9	185.0	583.0
118.60	6.00	183.0	348.0	335.1	263.3	212.7	713.5
120.78	5.96	79.1	247.0	288.6	191.0	148.9	698.6
122.56	5.88	52.0	331.0	186.4	64.2	170.2	496.7
124.61	6.11	46.5	324.0	254.1	46.7	159.5	552.7
126.70	5.88	204.4	308.0	291.0	237.0	210.6	621.7
128.87	5.74	200.2	265.0	250.2	258.1	168.0	606.2
130.68	5.82	178.5	321.0	237.5	202.4	172.3	559.5
132.76	5.99	136.4	368.0	283.2	165.7	238.2	610.6
134.63	5.89	64.2	314.0	272.4	167.9	214.8	674.2
136.52	5.87	180.1	291.0	277.5	216.3	244.6	611.8
138.56	5.93	186.9	328.0	244.1	233.4	155.3	588.7
140.70	6.05	48.5	259.0	304.1	132.4	185.0	686.1
142.84	5.84	189.3	290.0	218.1	230.0	219.1	556.9
144.85	5.88	142.8	305.0	234.6	198.9	187.2	587.8
146.59	5.93	149.4	374.0	251.5	203.8	123.4	604.0

Table H-2. Continued.

Train CR – Fermentor 2							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
148.68	5.74	50.1	344.0	293.2	152.3	102.1	693.5
150.72	5.97	103.4	295.0	251.4	117.2	148.9	563.3
152.63	5.98	154.6	294.0	256.6	190.7	125.5	590.8
154.70	6.01	150.6	267.0	245.3	196.6	180.8	589.4
156.64	5.89	170.2	272.5	212.5	219.0	240.4	559.4
158.69	5.74	135.1	310.0	221.6	181.8	176.5	566.4
160.51	5.82	140.2	274.0	258.6	188.9	170.2	605.4

Table H-3. Transfer data for Train CR Fermentor 3 at high C-N ratio.

Train CR – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
0.00							
1.00	6.04						0.0
2.00						236.1	0.0
3.00							0.0
4.00	6.01					157.4	0.0
5.00							0.0
6.00	6.03						0.0
7.54	6.03	219.7	189.0	222.8	250.4	85.1	555.2
9.68	5.88	158.1	137.0	175.5	166.6	372.2	482.1
11.93	5.89	178.5	195.0	158.6	153.3	391.4	431.5
14.57	5.51	149.7	207.0	201.1	138.5	244.6	488.0
16.79	5.40	175.2	184.0	197.0	180.5	168.0	500.4
18.77	5.68	174.1	185.0	175.7	178.0	151.0	477.7
21.57	5.60	184.4	183.0	183.7	180.6	212.7	478.0
23.84	5.65	177.6	223.0	182.9	174.3	125.5	477.7
25.98	5.77	167.4	224.0	198.9	189.2	146.8	518.8
28.72	5.69	144.8	234.0	212.6	155.5	217.0	535.2
30.95	5.58	199.8	197.0	226.7	207.5	223.3	532.5
32.93	5.87	168.6	216.0	217.9	167.5	189.3	514.9
35.67	5.64	197.3	227.0	199.9	208.6	208.4	509.3
37.95	5.58	0.0	317.0	345.6	0.0	182.9	518.7
39.85	5.72	269.0	136.0	189.7	220.6	140.4	488.7
42.62	5.59	200.7	207.0	138.5	245.9	185.0	481.8
44.84	5.52	0.0	332.0	316.5	0.0	193.6	501.8
46.00	5.54	261.7	95.0	201.8	245.9	163.8	525.1
49.69	5.73	189.0	220.0	111.7	210.8	285.0	431.6
51.81	5.86	145.2	170.0	185.1	178.5	229.7	516.5
53.00	5.34	172.0	197.0	151.9	189.6	157.4	467.6
56.58	5.29	181.5	212.0	166.8	206.0	265.9	489.4
58.66	5.40	177.2	207.0	177.1	208.9	76.6	506.9
60.58	5.42	187.5	285.0	186.3	207.7	114.9	504.6
62.64	5.62	192.2	281.0	248.1	225.1	202.1	579.1
64.62	5.89	213.9	286.0	233.5	258.8	214.8	576.5
66.69	5.63	209.3	300.0	239.0	249.9	155.3	577.7
68.67	5.43	186.3	310.0	272.2	213.2	27.7	597.2
70.53	5.59	207.4	297.0	286.0	230.4	248.9	607.1
72.53	5.77	226.6	291.0	260.8	256.0	372.2	593.1

Table H-3. Continued.

Train CR – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
74.87	5.81	155.6	314.0	255.6	193.8	268.0	591.9
76.57	6.00	209.8	290.0	277.2	242.5	234.0	608.0
78.63	6.04	160.1	328.0	161.2	183.3	178.7	482.5
80.61	5.99	221.1	278.0	300.1	248.2	246.7	625.3
82.58	5.93	236.0	295.0	242.1	256.4	193.6	574.4
84.56	5.92	208.7	308.0	289.1	227.3	251.0	605.8
86.60	6.00	242.6	276.0	261.0	267.2	236.1	604.9
88.50	5.92	204.7	305.0	257.5	219.3	134.0	593.9
90.56	6.50	226.8	294.0	272.3	269.0	212.7	617.7
92.58	5.94	182.8	319.0	275.1	203.2	193.6	593.6
94.57	6.38	214.4	299.0	305.0	228.3	206.3	617.0
96.58	6.30	224.4	283.0	259.1	261.8	208.4	597.1
98.58	6.36	176.3	320.0	272.2	189.1	187.2	583.1
100.64	5.98	232.6	287.0	290.1	249.4	219.1	616.0
102.58	6.00	225.3	315.0	263.9	255.3	199.9	594.9
104.54	5.86	225.6	306.0	287.7	250.4	187.2	614.4
106.67	6.12	255.9	315.0	319.5	258.8	210.6	620.5
108.57	6.05	199.4	273.0	309.1	278.6	140.4	686.4
110.63	6.01	140.2	313.0	273.0	250.8	144.6	681.7
112.73	6.10	221.3	274.0	297.3	237.1	204.2	611.7
114.85	6.07	146.7	327.0	289.2	130.6	176.5	571.2
116.77	6.07	220.9	367.0	416.7	127.5	255.2	621.4
118.60	6.07	263.3	221.0	348.4	275.2	223.3	658.4
120.78	5.99	191.0	315.0	253.0	235.3	240.4	595.4
122.56	5.83	64.2	294.0	331.9	161.8	119.1	727.6
124.61	6.09	46.7	352.0	323.2	28.4	131.9	603.5
126.70	5.85	237.0	247.0	308.6	262.7	223.3	649.8
128.87	5.80	258.1	315.0	267.8	218.4	291.4	561.7
130.68	5.81	202.4	349.0	315.8	234.7	187.2	646.2
132.76	5.97	165.7	334.0	368.2	137.9	312.7	638.5
134.63	5.94	167.9	267.0	317.1	214.8	191.4	662.1
136.52	5.86	216.3	359.0	291.2	191.4	429.7	564.4
138.56	5.90	233.4	266.0	331.7	258.8	180.8	655.2
140.70	6.09	132.4	304.0	259.3	184.9	182.9	609.9
142.84	5.84	230.0	314.0	292.9	231.6	295.7	600.5
144.85	5.89	198.9	306.0	306.8	214.4	214.8	619.4
146.59	5.97	203.8	362.0	374.5	134.2	140.4	603.0

Table H-3. Continued.

Train CR – Fermentor 3							
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass
		(g)	(mL)	(g)	(g)	(cm ³)	(g)
148.68	6.29	152.3	273.0	347.8	217.5	187.2	711.1
150.72	5.86	117.2	306.0	295.0	219.5	170.2	695.4
152.63	5.97	190.7	266.0	294.2	201.4	2.1	603.0
154.70	6.03	196.6	298.0	267.4	198.6	286.1	567.5
156.64	5.93	219.0	322.1	271.3	229.4	302.0	579.8
158.69	5.79	181.8	299.0	308.6	186.5	206.3	611.4
160.51	5.83	188.9	310.0	274.4	208.0	229.7	591.6

Table H-4. Transfer data for Train CR Fermentor 4 at high C-N ratio.

Train CR – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
0.00									
1.00	6.13								
2.00						276.5	0.0		
3.00									
4.00	6.09					131.9	0.0		
5.00									
6.00	6.05								
7.54	6.12	250.4	160.0	192.5	274.0	106.4	545.7	0.80	0.46
9.68	6.21	166.6	160.0	138.9	212.6	202.1	483.0	0.80	0.33
11.93	5.99	153.3	160.0	197.5	112.4	887.0	454.7	0.91	0.40
14.57	5.53	138.5	160.0	207.9	86.8	508.4	454.3	0.75	0.41
16.79	5.55	180.5	160.0	185.9	149.8	344.6	453.3	0.82	0.40
18.77	5.81	178.0	160.0	187.0	146.7	310.5	453.8	0.82	0.40
21.57	5.73	180.6	220.0	186.2	148.7	268.0	452.4	0.77	0.37
23.84	5.76	174.3	220.0	225.2	165.7	323.3	514.7	0.79	0.37
25.98	5.83	189.2	220.0	229.0	177.0	499.8	514.9	0.81	0.33
28.72	5.74	155.5	220.0	239.0	133.8	633.8	515.4	0.82	0.32
30.95	5.69	207.5	220.0	22.4	203.4	448.8	316.4	0.82	0.34
32.93	5.90	167.5	220.0	216.8	168.7	331.8	516.1	0.82	0.35
35.67	5.74	208.6	220.0	227.6	198.1	504.1	515.1	0.81	0.33
37.95	5.84	0.0	220.0	319.5	0.0	204.2	512.2	0.81	0.33
39.85	5.93	220.6	220.0	139.3	194.0	440.3	410.8	0.80	0.35
42.62	5.66	245.9	220.0	212.0	222.6	436.0	516.9	0.82	0.37
44.84	5.76	0.0	220.0	345.1	0.0	165.9	548.3	0.81	0.35
46.00	5.78	245.9	220.0	96.1	247.8	495.6	422.7	0.79	0.34
49.69	5.86	210.8	220.0	223.5	231.2	565.8	542.0	0.80	0.36
51.81	5.89	178.5	220.0	173.7	220.4	355.2	513.7	0.82	0.31
53.00	5.58	189.6	220.0	197.9	208.5	17.0	514.9	0.83	0.49
56.58	5.38	206.0	220.0	214.0	208.9	599.8	515.0	0.82	0.49
58.66	5.66	208.9	300.0	211.5	215.2	146.8	515.9	0.81	0.40
60.58	5.49	207.7	300.0	286.8	219.8	363.7	597.0	0.83	0.47
62.64	5.73	225.1	300.0	284.0	238.1	442.4	595.1	0.84	0.48
64.62	6.50	258.8	300.0	288.9	237.0	285.0	603.0	0.85	0.52
66.69	5.82	249.9	300.0	302.9	254.6	338.2	634.7	0.85	0.54
68.67	5.53	213.2	300.0	313.5	228.0	89.3	626.4	0.84	0.47
70.53	5.86	230.4	300.0	299.5	219.7	368.0	595.8	0.84	0.53
72.53	5.88	256.5	300.0	293.6	234.4	438.2	604.7	0.84	0.57

Table H-4. Continued.

Train CR – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
74.87	5.79	193.8	300.0	314.7	213.3	376.5	632.3	0.85	0.56
76.57	6.00	242.5	300.0	292.9	223.7	385.0	593.0	0.86	0.47
78.63	6.06	183.3	300.0	330.9	172.6	382.9	618.3	0.84	0.34
80.61	6.06	248.2	300.0	280.5	237.8	399.9	595.2	0.87	0.34
82.58	6.06	256.4	300.0	297.7	249.5	361.6	624.2	0.84	0.38
84.56	6.10	227.3	300.0	311.7	243.3	389.2	632.5	0.85	0.35
86.60	6.02	267.2	300.0	278.8	243.1	357.3	601.6	0.85	0.36
88.50	6.04	219.3	300.0	307.7	260.2	68.1	646.7	0.85	0.37
90.56	6.00	269.0	300.0	296.2	222.9	351.0	597.3	0.85	0.34
92.58	6.24	203.2	300.0	322.1	229.1	346.7	646.1	0.84	0.65
94.57	6.50	228.3	300.0	301.6	217.9	374.4	596.7	0.84	0.64
96.58	6.56	261.8	300.0	285.5	239.0	346.7	604.5	0.85	0.38
98.58	6.42	189.1	300.0	322.3	210.1	289.3	641.4	0.85	0.60
100.64	6.13	249.4	300.0	289.7	228.0	346.7	595.3	0.86	0.38
102.58	5.99	255.3	300.0	317.6	230.8	329.7	625.1	0.85	0.38
104.54	6.10	250.4	300.0	309.0	244.7	293.5	629.8	0.84	0.36
106.67	6.20	258.8	300.0	318.8	265.7	302.0	623.8	0.85	0.30
108.57	6.23	278.6	300.0	277.0	290.7	193.6	587.2	0.84	0.32
110.63	6.08	250.8	300.0	316.3	283.1	261.6	676.1	0.84	0.35
112.73	6.22	237.1	300.0	276.6	271.4	302.0	627.6	0.86	0.34
114.85	6.14	130.6	300.0	329.5	119.5	323.3	616.5	0.86	0.34
116.77	6.14	127.5	300.0	365.8	48.6	368.0	585.0	0.85	0.39
118.60	6.15	275.2	300.0	221.8	351.9	402.0	596.6	0.83	0.35
120.78	6.10	235.3	300.0	318.8	229.0	278.6	610.6	0.82	0.35
122.56	6.00	161.8	300.0	297.8	207.9	174.4	642.0	0.83	0.33
124.61	6.09	28.9	300.0	355.4	71.8	395.6	696.4	0.85	0.36
126.70	5.85	262.7	300.0	250.7	267.2	584.9	647.4	0.83	0.36
128.87	5.82	218.4	300.0	317.7	243.3	433.9	640.7	0.84	0.37
130.68	5.93	234.7	300.0	345.0	170.7	433.9	593.9	0.80	0.40
132.76	6.00	137.9	300.0	338.3	109.1	380.7	627.6	0.80	0.35
134.63	6.00	214.8	300.0	270.9	216.6	431.8	570.8	0.83	0.38
136.52	5.84	191.4	300.0	362.3	132.6	716.8	601.6	0.80	0.29
138.56	6.09	258.8	300.0	269.5	287.1	251.0	595.9	0.85	0.29
140.70	6.12	184.9	300.0	306.9	207.7	323.3	627.8	0.85	0.32
142.84	5.80	231.6	300.0	317.0	199.5	629.6	594.5	0.82	0.33
144.85	5.92	214.4	300.0	310.5	197.1	482.8	608.3	0.83	0.35
146.59	6.04	134.2	300.0	365.4	84.8	204.2	614.1	0.80	0.36

Table H-4. Continued.

Train CR – Fermentor 4									
Day	pH	Solids added	Liquid added	Liquid removed	Solids removed	Gas	Total ferm. mass	Moisture content	Ash content
		(g)	(mL)	(g)	(g)	(cm ³)	(g)		
148.68	6.31	217.5	300.0	300.2	150.1	431.8	530.9	0.79	0.34
150.72	5.97	219.5	300.0	309.0	275.6	329.7	663.2	0.83	0.35
152.63	6.15	2014.0	300.0	269.2	230.2	242.5	596.1	0.84	0.32
154.70	6.07	198.6	300.0	292.2	202.4	433.9	594.1	0.83	0.36
156.64	5.96	229.4	300.0	319.3	193.3	516.9	586.1	0.83	0.37
158.69	5.77	186.5	300.0	297.6	196.2	519.0	605.4	0.83	0.37
160.51	6.06	208.0	300.0	309.8	197.8	316.9	597.7	0.83	0.35