

BREAK-EVEN COSTS FOR COW/CALF PRODUCERS

L.R. Sprott*

CALCULATING BREAK-EVEN COSTS of production can help cow/calf producers make better management decisions for the current year or for the near future.

By definition, break-even cost is the total cost of production divided by the total pounds of calf produced, whether marketed or retained. Another way to describe break-even is that it is the minimum sale price needed to recover all cash costs in a given year. The total cost of

production for a cow/calf operation must include all costs associated with the cow/calf enterprise.

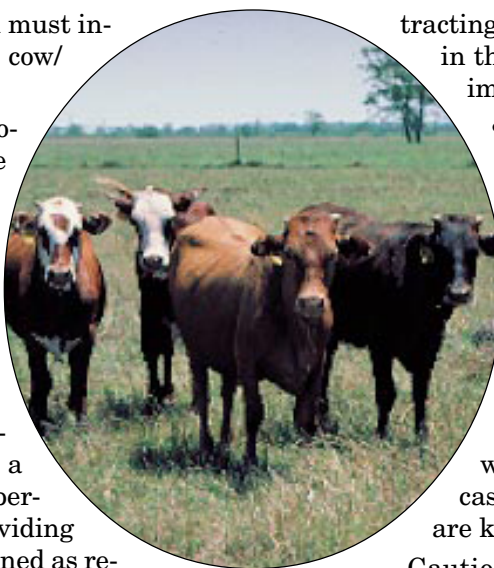
To determine break-even, a producer must know or closely estimate three values:

- Annual costs (cash basis) of owning a cow. The value will vary from year to year and among different ranches. Use the value for your ranch and keep records of all costs to determine this value;
- Annual calf crop. In the following formulas, enter the value as a decimal number; for example: 90 percent = 0.9. Calculate calf crop by dividing the number of calves sold and retained as replacements in a year by the number of females exposed for breeding; and
- Average weaning or market weight of calves.

Using these three values, multiply the calf crop times the average weaning or market weight of calves sold and retained, and divide that number into the annual cash cost per cow to determine the break-even cost per pound of calf produced. The formula for break-even:

$$\frac{\text{annual cash cost per cow}}{\text{calf crop} \times \text{average weaning or market weight of calves sold and retained}} = \text{break-even cost per pound of calf produced}$$

Producers who know the market prices can determine the potential income per pound of calf by sub-



tracting the break-even cost. Adjustments in this formula can answer three other important questions:

- What are the maximum allowable cash costs per cow if calf crop, average weaning (or market) weight and market price are known?
- What is the minimum calf crop needed if annual cash costs, average weaning (or market) weight and market price are known?
- What is the minimum market weight needed if calf crop, annual cash costs per cow and market price are known?

Caution: When trying to answer these questions, producers who don't know some of the values will need to make estimates. For example, producers who pregnancy test their cows can estimate their next calf crop fairly closely by adjusting their pregnancy rates down by 1 to 3 percent (accounting for embryonic death loss and death before marketing). Estimate the average weaning or market weights by weighing calves, calculating the weight per day of age, and then projecting to the expected day of sale (or weaning).

If it is not possible to weigh calves, estimate the projected market weight by using an average daily gain

*Professor, Extension Beef Cattle Specialist and Research Scientist; The Texas A&M University System.

for calves of 1.8 to 2.0 pounds per day. The problem with estimating market weight is that producers cannot predict variables such as weather, and hence available feed, which affects gain. Although estimating market prices is difficult, help is available from market specialists, order buyers and market reports. Obviously, dependable answers to the three questions above can be obtained only when close estimations (or actual values) of the variables in the formula are available.

What are the maximum allowable annual cash costs per cow?

To answer this question, rearrange the formula and multiply calf crop (as a decimal) by the average weaning (or market) weight of calves sold and retained; then multiply that number by the market price. The formula:

Calf crop x Average weaning or market weight of calves sold and retained x Market price = Maximum allowable annual costs per cow

Example: Assumes \$0.80 per pound market, 450 pound weaning (or market) weight and a 90 percent (0.9) calf crop

Annual cash costs per cow (maximum allowed under these conditions) = \$.80 x 450 x 0.9 = \$324 per cow

This formula obviously implies that high market prices afford a better chance at profit.

Less obvious is that when market prices are low, controlling costs can help increase the chances of profit. However, costs must be controlled in such a way that production is not sacrificed disproportionately. Sacrificing production is acceptable as long as the lost production's value is less than the reduction in cost. This can be accomplished by using practices known to have a moderate or high return rate, such as conducting annual pregnancy tests, vaccinating to control disease, providing adequate nutrition and using quality herd sires with genetics for growth.

What minimum calf crop is needed?

To answer this question, rearrange the formula again. Multiply the market price times the average weaning or market weight of calves sold and retained, and divide that number into the annual cash cost per cow. The formula:

$$\frac{\text{Annual cash cost per cow}}{\text{Market price} \times \text{Average weaning or market weight of calves sold and retained}} = \text{Minimum calf crop needed}$$

Example: Assumes \$250 annual cash cost per cow, 450 pound weight and \$0.80 per pound.

$$\text{Calf crop} = \frac{\$250}{\$0.80 \times 450} = 0.694, \text{ or } 69 \text{ percent}$$

This implies that even a marginal calf crop may be profitable under relatively high market prices, but lower market prices require a higher market weight, improved calf crop or lower annual production costs.

What minimum weaning (or market) weight is needed?

To figure the minimum weaning or market weight required to break even, multiply the market price by the calf crop, and divide that number into the annual cash cost per cow. The formula:

$$\frac{\text{Annual cash cost per cow}}{\text{Market price} \times \text{calf crop}} = \text{Minimum weaning or market weight to break even}$$

Example: Assumes \$250 annual cash cost per cow, \$0.80 per pound market price and 90 percent (0.9) calf crop.

$$\text{Average weaning (or market) weight} = \frac{\$250}{\$0.9 \times 0.80} = 347 \text{ pounds}$$

Practice using these formulas, entering different values for the variables. For instance, choose a particular annual cow cost and compare break-even between two different calf crops at the same market price. Then compare break-even between two different market weights at the same calf crop.

Tables 1 through 4 show various production scenarios at different market prices.

Remember: Heavier calves usually bring less per pound than lighter calves. For example, on a \$50/cwt market (see tables), not all calves are worth exactly \$50/cwt. Consequently, knowing an accurate price for each weight category is essential to determining an accurate value not shown in the tables.



Producers should pay particular attention to the pasture and range quality so that grazing is adequate in quality and quantity.

Table 1 shows break-even costs for 12 production scenarios and four annual cash costs per cow. Table 2 shows the calf crop percent needed to break even at different annual cash costs per cow and average calf weights of 350, 450 and 500 pounds. Table 3 lists the average calf market weight needed to break even at different annual cash costs per cow and calf crops of 70, 80 and 90 percent. Table 4 shows the maximum affordable annual cash costs per cow at different market weights and calf crops of 70, 80 and 90 percent.

Low production can be profitable only when annual cash costs per cow are low or market prices are high. A higher production level affords the best chance for profit even when annual cash costs are relatively high (more than \$200 per cow). Clearly, producers should work to ensure high production levels while keeping their annual cash costs as low as possible without unduly sacrificing calf crop and calf weights.

If a break-even analysis indicates that the calf crop is too low, producers should learn why. Poor nutrition, inadequate disease control and bulls of low fertility are usually the culprits. If calf weights are too low, the reason may be poor-quality sires with minimal genetics for growth, or nutrition so limited that cows produce too little milk to sustain or ensure calf growth.

Pay particular attention to pasture and range quality so that grazing is adequate in quality and quantity. Producers may need to adjust the stocking rate, particularly during drought. Test hay samples for quality, and provide feed supplements that supply what is absent in the hay. Remember that cows with calves need more nutrients than cows that have not yet calved.

Break-even analysis can be used as a starting point to determine possible shortcomings in production practices. For a more detailed analysis, use NCBA-IRM-SPA Cow Calf (SPA), a computer software package available through the Texas Agricultural Extension Service. It calculates not only break-even costs, but also a number of other variables much more useful in identifying problems missed by a simple break-even analysis.

The package can track a ranch's historic production costs and compare costs against regional and national averages. It also calculates a return on assets, which is needed by producers trying to compare returns of alternative investments. For more information on this program, call (409) 845-8012.

Acknowledgment

Appreciation is given to Dr. L.A. Lippke for his comments and editorial suggestions regarding this document.



If it is not possible to weigh calves, estimate the projected market weight by using an average daily gain for calves of 1.8 to 2.0 pounds per day.

Table 1. Break-even prices per pound of calf at 12 production levels and 4 annual cash costs per cow.

Calf crop percent/average market weight	Pounds of calf per cow	Annual cash costs per cow			
		\$100	\$200	\$300	\$400
90/600	540	\$0.19	\$0.37	\$0.56	\$0.74
90/500	450	\$0.22	\$0.44	\$0.66	\$0.89
90/400	360	\$0.28	\$0.56	\$0.83	\$1.11
90/300	270	\$0.37	\$0.74	\$1.11	\$1.48
80/600	480	\$0.21	\$0.42	\$0.63	\$0.83
80/500	400	\$0.25	\$0.50	\$0.75	\$1.00
80/400	320	\$0.31	\$0.63	\$0.94	\$1.25
80/300	240	\$0.42	\$0.83	\$1.25	\$1.67
70/600	420	\$0.24	\$0.48	\$0.71	\$0.95
70/500	350	\$0.29	\$0.57	\$0.86	\$1.14
70/400	280	\$0.36	\$0.71	\$1.07	\$1.43
70/300	210	\$0.48	\$0.95	\$1.43	\$1.90

Table 2. Calf crop needed to break even at various annual cash costs per cow and average calf weights of 350, 450 and 500 pounds.

On a \$50/cwt market

Average calf weight	Annual cash costs per cow												
	(\$)180	200	220	240	260	280	300	320	340	360	380	400	
350 lbs.	impossible, unless costs are below \$175 per cow												
450 lbs.	80	89	98	>100	impossible								
500 lbs.	72	80	88	96	>100	impossible							

On a \$60/cwt market

Average calf weight	Annual cash costs per cow												
	(\$)180	200	220	240	260	280	300	320	340	360	380	400	
350 lbs.	86	95	>100	impossible									
450 lbs.	67	74	82	89	97	>100	impossible						
500 lbs.	60	67	74	80	87	94	100	impossible					

On a \$70/cwt market

Average calf weight	Annual cash costs per cow												
	(\$)180	200	220	240	260	280	300	320	340	360	380	400	
350 lbs.	74	82	90	98	>100	impossible							
450 lbs.	57	64	70	76	83	89	96	>100	impossible				
500 lbs.	52	57	63	69	74	80	86	92	97	>100	impossible		

On an \$80/cwt market

Average calf weight	Annual cash costs per cow												
	(\$)180	200	220	240	260	280	300	320	340	360	380	400	
350 lbs.	64	72	79	86	93	100	impossible						
450 lbs.	50	56	61	67	72	78	84	89	95	100	impossible		
500 lbs.	45	50	55	60	65	70	75	80	85	90	95	100	

On a \$90/cwt market

Average calf weight	Annual cash costs per cow												
	(\$)180	200	220	240	260	280	300	320	340	360	380	400	
350 lbs.	57	64	70	76	83	89	95	>100	impossible				
450 lbs.	45	50	55	59	64	69	74	79	84	89	94	99	
500 lbs.	40	45	49	54	58	63	67	71	76	80	85	89	

Table 3. Average calf market weight needed to break even at various annual cash costs per cow and calf crop percentages of 70, 80 and 90.

On a \$50/cwt market

Calf crop percentage	Annual cash costs per cow												
	(\$)180	200	220	240	260	280	300	320	340	360	380	400	
70	514	571	628	685	.....	.....	.....	.....	.....	.....	.....	.....
80	450	500	550	600	650	.....	.....	.....	.....	.....	.....	.....
90	400	445	489	533	578	622	.....	.....	.....	.....	.....	.....

On a \$60/cwt market

Calf crop percentage	Annual cash costs per cow												
	(\$)180	200	220	240	260	280	300	320	340	360	380	400	
70	428	476	524	571	619	.....	.....	.....	.....	.....	.....	.....
80	375	417	458	500	541	583	625	.....	.....	.....	.....	.....
90	333	370	407	445	481	518	555	592	629	.....	.....	.....

On a \$70/cwt market

Calf crop percentage	Annual cash costs per cow												
	(\$)180	200	220	240	260	280	300	320	340	360	380	400	
70	367	408	448	489	530	571	612	.....	.....	.....	.....	.....
80	321	357	392	428	464	500	535	571	607	.....	.....	.....
90	285	317	349	380	413	445	476	507	539	571	.....	.....

On a \$80/cwt market

Calf crop percentage	Annual cash costs per cow												
	(\$)180	200	220	240	260	280	300	320	340	360	380	400	
70	321	357	392	428	464	500	536	571	607	.....	.....	.....
80	281	313	343	375	407	438	469	500	531	563	594	.....
90	250	278	306	333	361	389	417	445	472	500	528	556	

On a \$90/cwt market

Calf crop percentage	Annual cash costs per cow												
	(\$)180	200	220	240	260	280	300	320	340	360	380	400	
70	286	317	349	381	413	445	476	508	540	571	603	.....
80	250	278	306	333	361	389	417	445	472	500	528	556	
90	222	247	271	296	321	345	370	395	420	445	469	494	

Table 4. Maximum affordable annual cash costs per cow at various average market weights and calf crop percentages of 70, 80 and 90.

On a \$50/cwt market

Calf crop percentage	Average calf market weight (lbs.)								
	350	375	400	425	450	475	500	525	550
70	(\$)123	131	140	149	158	167	175	184	193
80	140	150	160	170	180	190	200	210	220
90	158	169	180	192	203	214	225	237	248

On a \$60/cwt market

Calf crop percentage	Average calf market weight (lbs.)								
	350	375	400	425	450	475	500	525	550
70	(\$)147	158	168	179	189	200	210	221	231
80	168	180	192	204	216	228	240	252	264
90	189	203	216	230	243	257	270	284	297

On a \$70/cwt market

Calf crop percentage	Average calf market weight (lbs.)								
	350	375	400	425	450	475	500	525	550
70	(\$)172	184	196	209	221	233	245	258	270
80	196	210	224	238	252	266	280	294	308
90	221	237	252	268	284	300	315	331	347

On a \$80/cwt market

Calf crop percentage	Average calf market weight (lbs.)								
	350	375	400	425	450	475	500	525	550
70	(\$)196	210	224	238	252	266	280	294	308
80	224	240	256	272	288	304	320	336	352
90	252	270	288	306	324	342	360	378	396

On a \$90/cwt market

Calf crop percentage	Average calf market weight (lbs.)								
	350	375	400	425	450	475	500	525	550
70	(\$)221	237	252	268	284	300	315	331	347
80	252	270	288	306	324	342	360	378	396
90	284	304	324	345	365	385	405	426	446

Produced by AgriLife Communications & Marketing, The Texas A&M System
 Extension publications can be found on the Web at: <http://AgriLifebookstore.org>

Educational programs of the Texas AgriLife Extension Service are open to all citizens without regard to race, color, sex, disability, religion, age or national origin.
 Issued in furtherance of Cooperative Extension Work in Agriculture and Home Economics, Acts of Congress of May 8, 1914, as amended, and June 30, 1914, in cooperation with the United States Department of Agriculture. Texas AgriLife Extension Service, The Texas A&M System.
 10,000, New