

TEXAS AGRICULTURAL EXPERIMENT STATION

R. D. LEWIS, DIRECTOR
College Station, Texas

BULLETIN NO. 685

OCTOBER, 1946

**PEANUT MEAL AND COTTONSEED MEAL
AS PROTEIN SUPPLEMENTS IN RATIONS
FOR FATTENING YEARLING STEERS**

**Texas Agricultural Experiment Station and
Texas Technological College**



AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS
GIBB GILCHRIST, President

[Blank Page in Original Bulletin]

In six dry lot feeding trials, three at Spur, one at Stephenville, and two at Lubbock, in cooperation with Texas Technological College, peanut meal was as reliable a protein supplement in rations for fattening yearling steers as cottonseed meal. In five of the six trials the steers fed peanut meal made slightly greater gains than those fed cottonseed meal. There was no difference in carcass grades, but the steers fed peanut meal had a slight advantage in dressing percent. Steers fed cottonseed meal had a greater appetite for feed, while those fed peanut meal showed at the finish sleeker coats of hair. The cottonseed meal and peanut meal used were purchased in regular market channels and were guaranteed 43 percent protein.

CONTENTS

	Page
Introduction	5
Experimental Results	6
First Feeding Trial, Spur Station	7
Second Feeding Trial, Spur Station	8
Third Feeding Trial, Spur Station	9
Fourth Feeding Trial, Texas Technological College	10
Fifth Feeding Trial, Texas Technological College	11
Sixth Feeding Trial, Stephenville Station	12
Summary and Conclusions	14
Literature Cited	14

PEANUT MEAL AND COTTONSEED MEAL AS PROTEIN SUPPLEMENTS IN RATIONS FOR FATTENING YEARLING STEERS

J. H. Jones, R. E. Dickson, J. M. Jones, P. T. Marion, W. L. Stangel,
and B. C. Langley

Texas Agricultural Experiment Station and Texas Technological College

The annual production of cottonseed meal and cottonseed cake averaged 1,790,000 tons in the United States in the five-year period, 1941 to 1946, as compared with 85,000 tons of peanut meal (1). Stockmen are more familiar with cottonseed meal than with peanut meal; however, the acreage of peanuts has increased and there may be larger amounts of peanut meal to use in the future. The results of recent feeding trials are presented to better acquaint feeders with peanut meal.

Fuller, et al., (6) of the Texas Station, 1940, defined 43 percent protein peanut meal as the product from the kernels of sound peanuts, reasonably free from excess hulls and other foreign materials. Cottonseed meal of prime quality is likewise defined as the product from the kernels of cottonseed which must be reasonably bright in color, not brown or reddish, sweet in odor and free of excess lint.

Burns (3) of the Texas Station, in 1920, reported that choice peanut meal proved fully equal to cottonseed meal in respect to production of gain, but apparently was less palatable.

Massey (12) of the Georgia Station, in 1941, reported a series of four trials between peanut meal and cottonseed meal as protein supplements in rations for fattening yearling steers. He found 39.8 percent protein cottonseed meal and 43.4 percent protein peanut meal, also a mixture of equal parts of the two meals fed pound for pound, to have practically equal value. He concluded that a choice between the supplements should be determined largely by price.

McComas, Douglas, and Southwell (11) at the Georgia Coastal Plain Experiment Station, in 1942, reported that while steers fed cottonseed meal made more gain, those fed peanut meal had slightly more desirable carcasses and sold at a higher price, so that the net result was a slight advantage for peanut meal. In the series of four fattening trials with yearling steers, 45 percent protein peanut meal and 36 percent protein cottonseed meal supplying the same amount of crude protein were used to supplement broken corn in husk and peanut straw.

1. J. H. Jones, Animal Husbandman, Division of Range Animal Husbandry.
2. R. E. Dickson, Superintendent, Substation No. 7, Spur, Texas.
3. J. M. Jones, Chief, Division of Range Animal Husbandry.
4. P. T. Marion, Animal Husbandman, Substation No. 7, Spur, Texas.
5. W. L. Stangel, Dean of Agriculture, Texas Technological College, Lubbock, Texas.
6. B. C. Langley, Superintendent, Substation No. 20, Stephenville, Texas.

Shealy and Gratz (13) of the Florida Station, in 1938, found practically identical gains for peanut meal and cottonseed meal when used as supplements to corn and silage in fattening steers. It is noted that in the two trials Shealy and Gratz reported, 45 percent protein peanut meal and 41 percent protein cottonseed meal were fed approximately pound for pound.

Jacob and Duncan (9) of the Tennessee Station, in 1938, reported as a result of three steer fattening trials that peanut meal was somewhat less efficient in producing gains than cottonseed meal; also, that the steers fed peanut meal had less keen appetites, and were off feed more frequently than those fed cottonseed meal. In these trials, 43 percent protein peanut meal and 41 percent protein cottonseed meal were fed pound for pound and at a rate of three to seven pounds daily per head with corn silage to two-year-old steers.

McC Campbell and Aicher (10) of the Kansas Station found cottonseed meal to be materially more efficient than peanut meal in wintering calves and yearlings on a full feed of sorghum silage and one pound of the protein supplement.

Clay (4) of the USDA, in 1941, called attention to irregularity in supply of peanut meal, also to variation of quality. He stated that both as a feed for most animals and as a fertilizer, peanut meal is considered to have more value than cottonseed meal. Clay cited Holdaway, et al., (8), of the Virginia Station, 1925, who found that more milk protein was produced from a pound of crude protein in peanut meal than from either cottonseed or soybean meal protein. Fraps (5) of the Texas Station, 1932, showed higher coefficients of digestibility for peanut meal than for cottonseed meal.

Brock and Holleman (2) reported an average composition of 42.5 percent crude protein, 6.31 percent fat and 26.67 percent nitrogen-free extract for 330 samples of cottonseed meal analyzed during the fiscal year 1944-45. The respective values for 34 samples of peanut meal the same year were 43.59 percent crude protein, 7.69 percent fat and 22.34 percent nitrogen-free extract. According to Guilbert, et al., of the National Research Council (7) prime cottonseed meal contained 0.19 percent calcium and 1.11 percent phosphorus, while prime peanut meal contained 0.10 percent calcium and 0.50 percent phosphorus.

The reports from these stations indicate that peanut meal is less palatable than cottonseed meal, but that the two meals have approximately equal value as protein supplements in steer fattening rations that include grain. The Kansas and Tennessee work indicates that peanut meal is not as valuable as cottonseed meal as a supplement to silage.

EXPERIMENTAL RESULTS

The six comparisons between cottonseed meal and peanut meal reported in this bulletin were conducted at the Spur and Stephenville stations, and at Texas Technological College, Lubbock, between 1940 and 1946.

First Feeding Trial, Spur Station

The yearling steers used in this trial were secured as calves in October, 1939. They were wintered and summer grazed until divided into two lots of 10 each and started on test September 26, 1940. At this time they were well grown and fleshy, and averaged 695 pounds.

Lot 1 steers were fed 2½ pounds of cottonseed meal daily per head, and Lot 2 steers were fed the same amount of peanut meal. The respective meals were guaranteed to contain 43 percent crude protein but were not analyzed. Cottonseed hulls, chopped sumac fodder and ground milo heads were fed alike to each lot. Salt was supplied free choice as a lick, and 0.1 pound pulverized limestone per head daily was mixed with the ration. The roughage was composed largely of cottonseed hulls. This feeding trial is summarized in Table 1.

Table 1. Summary of first trial—Spur Station—Sept. 26, 1940, to Feb. 13, 1941—140 days

Lot.....	1 8*	2 10
Number of steers.....	Cottonseed meal	Peanut meal
Averages in pounds per steer:		
Initial weight.....	693	695
Final weight at feedlot.....	1041	1038
Weight at Fort Worth market.....	984	988
Gain basis feedlot weight.....	348	343
Daily gain basis feedlot weight.....	2.49	2.45
Shrinkage en route market, %.....	5.48	4.82
Carcass weight (hot).....	625.0	627.4
Dressing % basis feedlot weight.....	60.04	60.44
Hide weight (untrimmed).....	72.4	68.1
Carcass grading: Choice.....	3	1
Good.....	5	8
Medium.....	0	1
Average ration (consumed) pounds:		
Ground milo heads (grain equivalent).....	11.27	11.24
Protein supplement.....	2.49	2.48
Roughage**.....	15.51	15.47
Limestone.....	.10	.10
Salt (estimated) ounces.....	.57	.57
Cost and returns per steer:		
Feed cost (feed consumed).....	\$ 24.21	\$ 24.13
Feed cost per cwt. of feedlot gain.....	6.96	7.03
Cost into feedlot @ \$9 per cwt.....	62.37	62.55
Marketing cost @ \$0.494 per cwt.....	4.86	4.88
Selling price per cwt.....	11.22	11.50
Amount received.....	110.40	113.62
Net return (no charge for labor).....	18.96	22.06

**Consisting of cottonseed hulls, ground sumac fodder and ground milo "pommies."

*Two steers dropped from trial because of tapeworm infestation.

Feed prices per ton: Ground grain \$13.34; cottonseed meal and peanut meal \$28; roughage \$8; salt and limestone \$12.

The steers fed cottonseed meal consumed slightly more feed and cleaned up their ration in less time than the steers fed peanut meal.

Observers rated Lot 2 steers, fed peanut meal, the more desirable, and this was reflected in selling price, \$11.50 per cwt. for Lot 2 and \$11.22 for Lot 1. According to carcass grades and dressed yield, a difference in selling price was not warranted. Had the two lots sold at the same price, the net return would have been almost equal.

Second Feeding Trial, Spur Station

The 20 yearling steers used in this trial were secured as calves from the same ranch as those used in the first trial, and had been similarly wintered and summer grazed. The two lots of 10 each were started on test November 11, 1942, at an average weight of 669 pounds.

The cottonseed meal and peanut meal were fed at the approximate rate of four pounds daily per head. Ground milo was fed only during the last 70 days of the 196-day feeding period. Mixed sorghum silage was full fed throughout. A small amount of cottonseed hulls was fed during the first 28-day feeding period. Granulated salt was supplied free choice.

The silages used—sweet sorghum (sumac) and grain sorghum (hegari) were mixed together at feeding time. Sumac silage formed 52 percent of the total silage fed. Nine samples of the silages drawn at intervals during the feeding period averaged 72 percent moisture for sumac and 61 percent moisture for hegari. Samples of the cottonseed meal and peanut meal fed had the following percentage composition:

	Crude protein	Ether extract	Crude fiber	Nitrogen-free extract	Water
Cottonseed meal.....	42.75	5.80	11.80	25.70	7.00
Peanut meal.....	41.61	8.02	11.02	25.24	7.26

Table 2. Summary of second trial—Spur Station—Nov. 11, 1942, to May 26, 1943—196 days

Lot.....	1 10	2 10
Number of steers.....	Cottonseed meal	Peanut meal
Averages in pounds per steer:		
Initial weight.....	669	669
Final weight at feedlot.....	1121	1128
Weight at Fort Worth market.....	1039	1054
Gain basis feedlot weight.....	452	459
Daily gain basis feedlot weight.....	2.31	2.34
Shrinkage en route market, %.....	7.31	6.56
Carcass weight (hot).....	642.6	661.8
Dressing % basis feedlot weight.....	57.32	58.67
Hide weight (untrimmed).....	82.1	85.8
Carcass grading: Choice.....	2	4
Good.....	8	6
Average ration (consumed) pounds:		
Ground grain.....	1.78	1.77
Protein supplement.....	3.89	3.87
Mixed sorghum silage.....	49.72	49.45
Cottonseed hulls.....	.19	.19
Salt, ounces.....	.54	.58
Costs and returns per steer:		
Feed cost (feed consumed).....	\$ 41.00	\$ 40.79
Feed cost per cwt. of feedlot gain.....	9.07	8.89
Cost into feedlot @ \$12.00 per cwt.....	80.28	80.28
Marketing cost @ \$0.593 per cwt.....	6.16	6.25
Amount received @ \$16 per cwt.....	166.24	168.64
Net return (no charge for labor).....	38.80	41.32

Feed prices per ton: Ground grain \$24.60; cottonseed meal and peanut meal \$41; mixed sorghum silage \$4.25; cottonseed hulls \$9; salt \$15.

Both meals were below 43 percent in protein content. The cottonseed meal was higher in protein but lower in ether extract than the peanut meal. This feeding trial is summarized in Table 2.

Lot 1 steers fed cottonseed meal had keener appetite and consumed slightly more feed than Lot 2 steers fed peanut meal. The difference in feed consumption occurred because of feed refusals by Lot 2 and not because Lot 1 was given more feed. The supply of equal amounts of feed to both lots did not permit full expression of the factor of appetite.

Lot 2 steers fed peanut meal had the advantage over Lot 1 steers fed cottonseed meal in gain, finish and net return. The advantage in gain for Lot 2 is more noticeable in the comparison of average carcass weight, 661.8 pounds and 642.6 pounds respectively.

According to chemical composition and the method of Fraps (5) for determining productive values, the peanut meal supplied approximately 0.45 therms more productive energy daily per steer than the cottonseed meal. Also, since both lots received ample protein and the feeding period extended for 196 days, the difference in energy probably accounted for the increased gain of the lot fed peanut meal.

Third Feeding Trial, Spur Station

The 20 yearling steers used in the third feeding trial were again similar in kind, quality and previous treatment to those used in the first two trials, but were fleshier and heavier, the average initial weight being 729 pounds. The feeding period of 126 days resulted because of a limited supply of silage. A small amount of ground grain was fed from the outset. Cottonseed meal and peanut meal were again fed at the approximate rate of four pounds daily per head. Other feeds were fed in similar amount to both lots.

Samples of the cottonseed meal and peanut meal fed showed the following percentage composition:

	Crude protein	Ether extract	Crude fiber	Nitrogen-free extract	Water
Cottonseed meal.....	41.48	7.94	11.45	25.80	8.14
Peanut meal.....	42.39	9.26	13.25	24.14	6.91

Peanut meal was slightly higher in protein and ether extract than the cottonseed meal. The mixed silage fed consisted of 62 percent sweet sorghum (sumac) and 38 percent grain sorghum (hegari) silage. The average moisture content of five samples of each silage was 68.5 percent

for sumac and 63.6 percent for hegari. The grain mixture consisted of nine parts of ground milo to one part ground wheat. Salt and bone meal were supplied as separate licks during the first 28 days of the feeding period, but afterwards were combined in the proportion of two parts salt and one part bone meal. In this trial the total ration was fed at a level low enough to avoid any refusal of feed by the steers. This feeding trial is summarized in Table 3.

Table 3. Summary of third trial—Spur Station—Nov. 10, 1944, to March 15, 1945—126 days

Lot.....	1	2
Number of steers.....	10	10
	Cottonseed meal	Peanut meal
Averages in pounds per steer:		
Initial weight.....	728	730
Final weight at feedlot.....	991	1000
Weight at Fort Worth market.....	939	953
Gain basis feedlot weight.....	263	270
Daily gain basis feedlot weight.....	2.09	2.14
Shrinkage en route market, %.....	5.25	4.70
Carcass weight (hot).....	560.5	572.7
Dressing % basis feedlot weight.....	56.56	57.27
Hide weight (untrimmed).....	75.0	79.9
Carcass grading: Choice.....	0	4
Good.....	9	6
Medium.....	1	0
Average ration (consumed) pounds:		
Ground grain.....	3.23	3.23
Protein supplement.....	3.92	3.92
Mixed sorghum silage.....	48.41	48.41
Bone meal, ounces.....	.93	.85
Salt, ounces.....	1.75	1.61
Costs and returns per steer:		
Feed cost (feed consumed).....	\$ 40.33	\$ 40.31
Feed cost per cwt. of feedlot gain.....	15.33	14.93
Cost into feedlot @ \$10.50 per cwt.....	76.44	76.65
Marketing cost @ \$0.60 per cwt.....	5.63	5.72
Amount received @ \$14.75 per cwt.....	138.50	140.57
Net return (no charge for labor).....	16.10	17.89

Feed prices per ton: Ground grain \$40; cottonseed meal and peanut meal \$55; mixed sorghum silage \$6; bone meal \$58.12; salt \$14.

Lot 2, steers fed peanut meal, had the advantage in gain and finish over Lot 1, steers fed cottonseed meal. Results with respect to gain are in the same direction for the three trials at Spur.

Fourth Feeding Trial, Texas Technological College

The 20 yearling steers used in this trial were pastured on fields of mature milo maize for 90 days before division into two lots of 10 each. In the 90-day period December 14, 1942, to March 14, 1943, the steers were allowed one pound of cottonseed cake and one pound of alfalfa hay daily per head in addition to the milo pasturage. The average gain was 165 pounds per head, and the steers entered the dry lot feeding trial in good flesh. In dry lot each lot was fed equal amounts of the concentrates but the sumac (sweet sorghum) silage was fed according to appetite. This feeding trial is summarized in Table 4.

Table 4. Summary of fourth trial—Texas Technological College—March 14, 1943, to June 9, 1943—87 days

Lot.....	1 10 Cottonseed meal	2 10 Peanut meal
Number of steers.....		
Averages in pounds per steer:		
Initial weight.....	704	704
Final weight at feedlot.....	926	901
Weight at Fort Worth market.....	860	844
Gain basis feedlot weight.....	222	197
Daily gain basis feedlot weight.....	2.55	2.26
Shrinkage en route market, %.....	7.13	6.33
Carcass weight (hot).....	501.4	493.7
Dressing % basis feedlot weight.....	54.15	54.79
Carcass grading: Good.....	8	9
Medium.....	2	1
Average ration (consumed) pounds:		
Ground grain.....	9.91	9.91
Protein supplement.....	2.00	2.00
Sumac silage.....	36.20	34.87
Limestone.....	.10	.10
Salt, ounces.....	1.07	1.12
Costs and returns per steer:		
Feed cost (feed consumed).....	\$ 23.66	\$ 23.43
Feed cost per cwt. feedlot gain.....	10.66	11.89
Cost into feedlot @ \$12.06 per cwt.....	84.90	84.90
Marketing cost @ \$0.56 per cwt.....	4.82	4.73
Amount received @ \$15.50 per cwt.....	133.30	130.82
Net return (no charge for labor).....	19.92	17.76

Feed prices per ton: Ground grain \$32; cottonseed meal and peanut meal \$40; sumac silage \$4; limestone \$10; salt \$15.

In the fourth trial, the dressed yields and carcass grades were low, considering the 90 days of feeding in the milo fields and the 87 days in dry lot. The steers fed cottonseed meal had the advantage in gain and ate slightly more silage than the steers fed peanut meal. This is the only trial out of the six in which steers fed cottonseed meal had the advantage in gain.

Fifth Feeding Trial, Texas Technological College

The 24 short yearling steers used in this trial were started on test February 15, after having been used in an 84-day test in "cattling-down" milo. They made an average gain of 139 pounds in the 84 days on milo fields, and were in strong flesh when started on feed. The same amounts of the respective feeds were supplied both lots. The slight difference in rations consumed resulted from feed refusals by Lot 2, fed peanut meal. A grain ration was fed throughout. Counting the 84-day period on milo fields, the steers were fed 182 days. This feeding trial is summarized in Table 5.

The steers fed peanut meal consumed slightly less feed and made slightly greater gain than the steers fed cottonseed meal. These results were in agreement with the three feeding trials at the Spur station.

Table 5. Summary of fifth trial—Texas Technological College—Feb. 15, 1944, to May 23, 1944—98 days

Lot.....	1	2
Number of steers.....	12	12
	Cottonseed meal	Peanut meal
Averages in pounds per steer:		
Initial weight.....	626	626
Final weight at feedlot.....	816	828
Weight at Fort Worth market.....	769	778
Gain basis feedlot weight.....	190	202
Daily gain basis feedlot weight.....	1.94	2.06
Shrinkage en route market, %.....	5.76	6.04
Carcass weight (hot).....	462.9	466.8
Dressing % basis feedlot weight.....	56.73	56.38
Carcass grading: Choice.....	6	4
Good.....	6	8
Average ration (consumed) pounds:		
Ground grain.....	8.36	8.29
Protein supplement.....	1.98	1.97
Sumac silage.....	29.48	27.00
Alfalfa.....	.24	.24
Limestone.....	.10	.10
Salt, ounces.....	.70	.97
Costs and returns per steer:		
Feed cost (feed consumed).....	\$ 27.95	\$ 27.21
Feed cost per cwt. of feedlot gain.....	14.71	13.47
Cost into feedlot @ \$12 per cwt.....	75.12	75.12
Marketing cost @ \$0.56 per cwt.....	4.33	4.36
Selling price per cwt.....	15.13	14.93
Amount received.....	116.35	116.16
Net return (no charge for labor).....	8.95	9.47

Feed prices per ton: Ground grain \$37; cottonseed meal and peanut meal \$53; sumac silage \$5; alfalfa \$30; limestone \$10; salt \$15.

Sixth Feeding Trial, Stephenville Station

Nineteen Good to Choice yearling steers were secured from the Amarillo Conservation Experiment Station in July. The steers were pastured on Johnson grass fields about 70 days before being started on test, but pasture conditions were unfavorable and they did not gain.

The principal feeds, ear corn with husk and Johnson grass hay, were of good quality. The cottonseed meal and peanut meal were guaranteed to contain 43 percent protein, but samples were not analyzed. The ear corn and Johnson grass hay were ground for feeding. Except that Lot 1 steers received cottonseed meal and Lot 2 steers received peanut meal, the two lots were self-fed similar mixtures. There was some waste of feed out of the self-feeders, but waste was considered equal for both lots. The steers sold locally and carcass grades were not obtained. This feeding trial is summarized in Table 6.

Lot 1, steers fed cottonseed meal, made slightly less gain and took slightly more feed than Lot 2, steers fed peanut meal. Both lots of steers were sold at the same price, \$15.44 per cwt., at the feedlot.

Table 6. Summary of sixth trial—Stephenville Station—Sept. 29, 1945, to Jan. 19, 1946—112 days

Lot.....	1 10	2 9
Number of steers.....	Cottonseed meal	Peanut meal
Averages in pounds per steer:		
Initial weight.....	735	735
Final weight at feedlot.....	1049	1060
Gain basis feedlot weight.....	314	325
Daily gain basis feedlot weight.....	2.80	2.90
Carcass weight (hot).....	600.4	604.4
Dressing % basis feedlot weight.....	57.24	57.02
Hide weight (untrimmed).....	90.7	90.0
Average ration (consumed) pounds:		
Ground ear corn (grain equivalent*).....	11.22	10.96
Protein supplement.....	2.96	2.88
Dry roughage**.....	14.32	14.05
Bonemeal, ounces.....	.70	.83
Granulated salt, ounces.....	.70	.83
Costs and returns per steer:		
Feed cost (feed consumed).....	\$ 51.76	\$ 50.63
Feed cost per cwt. of feedlot gain.....	16.48	15.57
Cost into feedlot @ \$13.50 per cwt.....	99.22	99.22
Amount received @ \$15.44 per cwt.....	161.96	163.66
Net return (no charge for labor).....	10.98	13.81

*Ear corn estimated to contain 75 percent grain.

**Principally ground Johnson grass hay with ear corn husks and cobs and small amount of peanut hay.

Feed prices per ton: Ground ear corn, \$33.33; cottonseed meal and peanut meal, \$63; Johnson grass hay, \$22; peanut hay, \$30; granulated salt, \$20; bonemeal, \$70.

Table 7. Average results—six feeding trials—cottonseed meal vs. peanut meal

	Cottonseed meal	Peanut meal
Number of steers.....	60	61
Days of feeding.....	126.5	126.5
Averages in pounds per steer:		
Initial weight.....	692.5	693.2
Final weight at feedlot.....	990.7	992.5
Gain basis feedlot weight.....	298.2	299.3
Daily gain basis feedlot weight.....	2.36	2.37
Carcass weight (hot).....	565.5	571.1
Dressing % basis feedlot weight.....	57.08	57.54
Average ration (consumed) pounds:		
Ground grain.....	7.63	7.57
Protein supplement.....	2.87	2.85
Dry roughage.....	5.04	4.99
Silage.....	27.30	26.62
Mineral supplement, ounces.....	1.07	1.08
Granulated salt, ounces.....	.89	.95
Costs and returns per steer:		
Feed cost (feed consumed).....	\$ 34.82	\$ 34.42
Feed cost per cwt. of feedlot gain.....	11.68	11.50
Cost into feedlot.....	79.72	79.79
Marketing cost.....	4.30	4.32
Amount received.....	137.79	138.91
Net return (no charge for labor).....	18.95	20.38

SUMMARY AND CONCLUSIONS

Three feeding trials were conducted at the Spur station, two at Texas Technological College, and one at the Stephenville station, to determine the comparative utility of cottonseed meal and peanut meal. The respective protein meals were such as could be obtained from regular market outlets and were bought on guarantee of 43 percent protein content. In most years, peanut meal cost more than cottonseed meal largely because of increased transportation costs, but in each trial for the purpose of comparing net returns both meals were charged at the same price. The six feeding trials are averaged in Table 7.

Steers fed peanut meal had a slight advantage in gain in five out of six feeding trials, and had sleeker coats of hair than steers fed cottonseed meal. The steers fed cottonseed meal showed keener appetite and ate more feed. There was no appreciable difference in carcass grade between the steers fed the respective meals.

According to the available analyses, the two meals used were approximately equal in protein content, but the peanut meal was the higher in ether extract.

Peanut meal was as good or better than cottonseed meal as a protein supplement in rations for fattening yearling steers.

LITERATURE CITED

1. Annual Bulletins, U.S. Department of Commerce, Washington, D. C.
2. Brock, F. D., and M. P. Holleman, 1945, Commercial Feeding Stuffs, Texas Agri. Experiment Station Bulletin 673.
3. Burns, John C., 1920, Rations for Fattening Steers, Texas Agricultural Experiment Station Bulletin 263.
4. Clay, Harold J., 1941, Marketing Peanuts and Peanut Products, USDA Misc. Pub. 416.
5. Fraps, G. S., 1932, The Composition and Utilization of Texas Feeding Stuffs, Texas Agricultural Experiment Station Bulletin 461.
6. Fuller, F. D., and J. Sullivan, 1940, Commercial Feeding Stuffs, Texas Agricultural Experiment Station Bulletin 594.
7. Guilbert, H. R., Paul Gerlaugh and L. L. Madsen, National Research Council, 1945, Recommended Nutrient Allowances for Beef Cattle No. 4.
8. Holdaway, C. W., W. B. Ellet and W. G. Harris, 1925, The Comparative Value of Peanut Meal, Cottonseed Meal and Soybean Meal as Sources of Protein for Milk Production, Virginia Agricultural Experiment Station Technical Bulletin 28.
9. Jacob, M., and H. R. Duncan, 1938, A Comparison of Cottonseed Meal, Cottonseed Meal and Tankage, Peanut Oil Meal, and Soybean Oil Meal, Fed with Corn Silage for Fattening Two-Year-Old Steers, University of Tennessee Agricultural Experiment Station Bulletin 167.
10. McCampbell, C. W., and L. C. Aicher, 1941, A Review of Stock Cattle Feeding and Management Tests, Kansas Agricultural Experiment Station 28th Annual Cattlemen's Round-up.
11. McComas, E. W., J. R. Douglas and B. L. Southwell, 1942, Velvetbeans, Cottonseed Meal, and Peanut Meal as Protein Feeds for Fattening Steers in the Coastal Plain Area, USDA Technical Bulletin 831.
12. Massey, Z. A., 1941, Beef Cattle Feeding Investigations, Georgia Agricultural Experiment Station Bulletin 211.
13. Shealy, A. L., and L. O. Gratz, 1938, A Comparison of Sorghum Silage, Peanut Hay and Cottonseed Hulls as Roughage for Fattening Steers, Florida Agricultural Experiment Station Bulletin 310.