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MINNESOTA
farm business NOTES

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BEEF COW HERD COSTS AND RETURNS

A. R. Wells and T. R. Nodland

On January 1, 1963 there were 424,000 head of beef cows 2 years old and over on Minnesota farms. While beef-breeding herds are not a major enterprise in Minnesota, they are a major enterprise on many individual farms—particularly in western areas of the state. This article presents helpful information on the economics of maintaining beef-breeding herds.

Records were obtained from 56 owners of breeding herds in 1962; most of these were located in west-central Minnesota. This analysis is based on records for 48 herds producing feeder calves. Herds were omitted from which breeding stock was sold or where some or all of the young stock were kept with the breeding herd until they were yearlings.

Results obtained are only preliminary; data for following years will help give more detailed and reliable information.

Costs and Returns for 1962

Gross return and return over feed cost per cow on farms studied were $115 and $51, respectively (table 1).

The selling price of feeder calves greatly affected gross returns per cow.

Table 1. Costs and returns per cow of beef cow herds, 1962

Item	Amount
Number of farms	48
Calves saved per cow	.86
Average weight of calves weaned, pounds	451
Value per cwt. of calves*	$28.65
Beef produced per cow, pounds	414
Value of beef produced per cow†	$115
Feed cost (other than pasture)	$47
Pasture cost	$17
Total feed cost per cow	$64
Return over total feed cost per cow	$51

* Sold or transferred to feedlot.

† Includes herd sire, replacements, death loss, and inventory changes.

Favorable conditions on western range areas last year pushed up the price of feeder calves. Many ranchers with a good feed supply kept more heifers for breeding stock, held more calves for yearlings, and practically stopped culling their cow herds. A shortage of cattle producing utility grades of beef also forced feeder calf prices higher. Estimated value of calves on farms studied averaged $28.65 per 100 pounds.

The only cost shown in table 1 is for feed. The return over feed cost of $51 per cow is the amount available to the farmer as payment for his labor, equipment, buildings, veterinary fees, and capital invested in the beef herd.

Sources of Variation in Returns Among Herds

Not all herds studied were equally profitable. Gross returns per cow varied from $56 to $177. Return over feed cost per cow varied from —$29 to $116. Several factors accounted for these variations:

Percentage of Calf Crop—Return over feed cost per cow dropped rapidly as percentage of calf crop fell below 80 percent (table 2). Feed cost per cow in the group having a calving percentage below 80 percent was higher than might be expected. But there were only 10 herds in this category and two of these had feed costs per cow of nearly $100.

Keeping a cow that raises a calf usually costs about the same as keeping one that does not. So if a profit is to be realized it is important to keep calf crop percentages high. For example: If the total cost of keeping a beef cow for a year is $100 and there is a 90-percent calf crop, the cost per calf is $111.11. Lower calf crop percentages increase costs per calf raised.

The main reasons for low percentage of calf crop were failure of cows to conceive, lack of proper culling, unsuitable lots and buildings for calving, disease, and lack of attention by the producer at calving time.

Table 2. Relationship of calving percentage to returns per cow

Percentage of calf crop	Number of farms	Feed cost per cow	Return over feed cost per cow
		dollars	
90-100	20	66	54
80-89	18	57	56
Below 80	10	72	37

Weaning Weights—The total value produced per cow increased as weaning weights increased—especially for calves over 500 pounds—even though estimated price per pound declined. However, feed cost did not increase with heavier weaning weights (table 3).

Under the conditions assumed before —$100 total cost and 90-percent calf crop—a producer selling a 500-pound calf covers costs at $22.22 per hundredweight (cwt.). But a producer weaning calves at 350 pounds needs a breakeven price of $31.75 per cwt.

Good Quality Calves—The selling price of calves was affected by their quality. Since most production costs remained about the same regardless of quality, production of high quality calves by the farmer usually was more profitable.

Table 3. Relationship of weaning weights to costs and returns per cow

Weaning weight of calves	Total receipts per cow	Feed cost per cow	Return over feed cost per cow
pounds		dollars	
300-374	86	60	26
375-449	104	64	40
450-524	133	65	68
525 and over	137	64	73

Early Calves—Returns to the beef cow herd were generally better when cows calved from January to April. These cows had an adequate supply of milk for their calves, yet not enough to cause udder trouble. Early born calves were better able to utilize pasture and the cow's increased milk flow than were calves born in May, June, and July.

Other Factors—Wet and muddy lots were a serious problem in raising calves. This caused sickness and disease, with death in some instances.

Castration and dehorning increased the value of calves. When these operations were performed when calves were less than a month old, handling was easier and danger from stress was minimized.

Comparative Income and Cost Data

The records were sorted into three equal groups on the basis of net return per cow. Differences then showed up in calves saved per cow, average weaning weights, total receipts per cow, and costs per cow (table 4).

The high profit group (upper one-third) saved more calves per cow, weaned heavier calves, received greater returns per cow, and maintained feed costs at a lower level. This group also had a higher cost for pasture which probably lowered other feed costs.

Where Do Beef Cows Fit

This study showed that three types of farms were particularly well suited for beef cow herds. One type is the rolling-to-hilly farm that needs pastures and forages to control erosion. Nearly half of the farms studied fell into this category.

Beef cow herds require relatively less labor and more capital per dollar of income than do most other livestock enterprises. So, beef cow herds are adaptable to many small farms where the operator has off-farm employment. They also fit on the farm where the operator is older and wants to cut down his work load. About one-third of the farm situations studied were of this type.

Beef cow herds are also suited to farms that produce grain. Beef cows provide a market for stalks, stubble, native pasture, and roughages that otherwise would not be utilized. But if the herd becomes so large that land suitable for grain is used for feed production, profits are likely to be cut.

If you are thinking of starting a beef cow herd or expanding your present herd, do so only on the basis that you can wean a 90- to 95-percent calf crop of good quality 450-pound calves and still keep total costs below $100 per cow. These factors, combined with good management, are necessary to make the beef cow herd a profitable enterprise.

Table 4. Comparison of selected factors by profit group

Factor	High profit	Medium profit	Low profit
Calves saved per cow	.89	.85	.83
Average weaning weights, pounds	498	459	393
Total receipts per cow	$143	$112	$89
Feed cost (other than pasture)	$ 36	$ 44	$60
Pasture cost	$ 19	$ 17	$15
Total feed cost per cow	$ 55	$ 61	$75
Return over total feed cost per cow	$ 88	$ 51	$14

Corn Silage for Fattening Cattle?

W. A. Tinsley and S. A. Engene

Cattle feeders often include corn silage in fattening rations. They assume that corn silage gives more nutrients per acre than do other farm crops. So this would give a larger beef output per crop acre than would a ration of hay and shelled corn.

The corn silage ration normally does give more beef output per acre and fewer total acres are needed to fatten beef cattle. But extra costs are incurred with silage use that are missing with a conventional corn and hay ration:

- Specialized harvest equipment and storage facilities are needed.
- Extra protein supplement must be purchased.
- A larger amount of labor may be required to harvest and feed the silage.
- More capital may be used for harvesting, distributing, and storage facilities.

Do these extra costs more than offset the value of the extra output of beef? To answer this question, feeders must first know the kinds and amounts of feeds saved when silage is added to a ration.

In Minnesota corn silage generally is used as a replacement for hay and/or shelled corn. The saving in hay cannot be large since most feeders currently use rather small amounts.

Most Minnesota cattle feeders grow some hay on their farms. Some use hay crops to help control erosion; others feel that a legume crop is beneficial to the cropping system. Since they have this hay available on the farm, and usually have no other use for it, they feed it and use corn silage to replace shelled or ear corn. By harvesting the corn crop as silage, stalks and leaves as well as grain are saved. The important question then becomes, "How much corn do the stalks and leaves in the silage replace?"

Three beef-feeding trials, recently completed at the University of Minnesota, provided some information. These trials compared silage and nonsilage rations for yearling cattle (top section of table). The corn silage in the rations was fed as a replacement for shelled corn; no hay was removed from the rations when the silage was fed.

The three trials involved nearly 200 yearlings. As an average, 1 ton of silage replaced 7.4 bushels of corn. But 56 pounds extra of protein supplement were used.

Is the yield of corn silage sufficiently high to make this substitution profitable? Yield records kept by members of the Southwestern Minnesota Farm Management Service indicate that feeders harvested approximately 10½ tons of silage or 61 bushels of corn per acre as an average since 1955. These farmers must give up 5.8 bushels of ear corn for every ton of corn silage harvested.

According to the feeding experiment 7.4 bushels of shelled corn substitute for 1 ton of silage. So feeding 1 ton of corn silage means a net gain of 1.6 bushels of corn. To offset this the farmers must buy an additional 56 pounds of protein supplement. At today's prices of about 4.5 cents per pound, the 56 extra pounds cost $2.52. At $1.20 per bushel (including costs of shelling or grinding) the 1.6 bushels of corn saved sell for $1.92.

In other words, the net amount of shelled corn saved by harvesting the corn crop as silage is not enough to pay for the extra protein supplement.

Recent experiments with calves at the University of Illinois showed somewhat more favorable gains from silage (lower part of the table). One ton of

Feed required per 100 pounds of gain and rates of substitution when corn silage replaced shelled corn

Feed per cwt. gain				Per ton silage	
Corn silage (ton)	Corn (bushel)	Hay (ton)	Protein supplement (pounds)	Corn saved (bushel)	Extra protein (pounds)
Yearling					
		Trial 1*			
0.52	12.2	0.05	106	7.5	65
None	16.1	0.05	72		
		Trial 2†			
0.39	7.7	0.05	86	7.7	56
None	10.6	0.04	64		
		Trial 3†			
0.43	9.6	0.04	79	7.2	49
None	12.7	0.04	58		
Calves					
		Trial 1‡			
1.10	0.9	0.04	83	7.9	30
0.61	4.8	0.03	68		
		Trial 2§			
0.91	3.1	None	92	7.4	43
0.56	5.7	None	65		

Source:
* *Beef Grasslands Field Day Report*, 1962, University of Minnesota, p. 26.
† Unpublished data from O. E. Kolari, Department of Animal Husbandry, University of Minnesota.
‡ *Illinois Cattle Feeders' Day Report*, 1960, University of Illinois, p. 33.
§ *Illinois Cattle Feeders' Day Report*, 1962, University of Illinois, p. 5.

silage saved about 7.6 bushels of corn, one-quarter bushel more than in Minnesota trials. Also, only 36 extra pounds of supplement were needed. At todays prices this is a net saving of 1.8 bushels of corn valued at about $2.16, compared with an increased protein supplement cost of $1.62. This is a saving in favor of silage.

Difference in Other Costs

When corn silage is fed as a substitute for shelled corn, annual costs for storage are probably greater than annual costs of storage for an equivalent amount of shelled corn.

The initial investments in upright silos per ton of silage is approximately $8.30, even with rather large units. Investment in corn storage is 70 cents per bushel. Annual costs (depreciation, interest, taxes, insurance, and repairs) of owning both types of storage are about 10 percent of the original investment, or 83 cents per ton of silage and 7 cents per bushel of corn.

Adding silage increases storage costs by 83 cents per ton. However, the quantity of corn to be stored can be cut by 7.4 bushels. This cuts corn storage costs by 52 cents. Adding 1 ton of silage and reducing ear corn by 7.4 tons increases storage costs by about 30 cents.

The annual costs of owning silage-harvesting equipment are high. Even when this machinery is used nearly to capacity the annual costs of ownership probably are $1 per ton of silage harvested. But nearly all farmers own and use a cornpicker. So annual costs of owning it are virtually no greater when all corn is harvested as grain than when a portion is harvested as silage.

In addition to the higher annual costs of owning storage and harvesting equipment for corn silage, labor and fuel costs for harvesting and feeding silage are normally greater than for ear or shelled corn. More water must be handled with silage.

Adding the cost of extra protein supplement and storage to this handling cost, the total extra costs incurred when 1 ton of silage is fed totals $3.82 according to results of Minnesota experiments with yearlings. The extra costs are about $2.92 according to Illinois experiments with calves. This extra cost releases about 1.6 bushels of corn for sale or for other use. Considering only these factors, this seems to be a high cost for saving this amount of corn.

Other Considerations

This analysis is based upon only two experiments—the best data available from recent years. Additional research would be desirable in order to determine the influence of silage under many different circumstances.

The decision as to whether or not to feed silage is affected by other considerations than those discussed here. Some farmers already have silos and silage-making equipment available; the extra costs for their use are small.

Many farmers prefer to feed silage because it helps them reduce their harvest risks. High quality silage, in adequate quantity, can be produced practically every year. Soft corn is always a danger with ear corn. Unfavorable weather reduces hay quality.

Harvesting part of the corn crop as silage helps spread the labor load over a longer season. It gives the farmer an opportunity to move part of his harvest up into September. This is becoming increasingly important as acreage of corn per farm increases.

This early harvest for part of the crop also enables the farmer to do some early fall plowing. It reduces the acreage to be plowed late in the fall, after corn picking is completed, or in the spring. This, in turn, may increase yields the following year.

This analysis only evaluates the returns from silage when it is used to replace part of the corn. Larger amounts of silage could be fed; available experimental data indicate that this does not increase the advantage of silage. Other analyses also indicate that some gains are made if the farmer can omit all hay from his cropping system, using silage as the only forage. The corn crop then gives a higher return from the land than the hay crop and the associated nurse crop.

Only whole plant silage has been considered here. The conclusions given above cannot be extended to ear corn silage, hay crop silage, and other uses of the silo.

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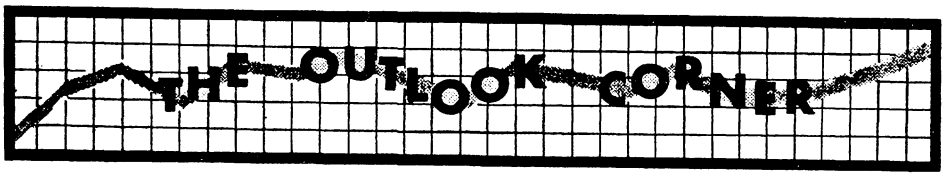

U. S. Beef Production

K. E. Egertson

Beef production is growing rapidly in the United States. Larger total beef supplies have resulted from an increase in: (1) number of head slaughtered, and (2) pounds of carcass beef produced per animal slaughtered.

Total production increased from an average of 10.1 billion pounds of beef and veal per year in 1949-51 to 15.6 billion pounds in 1960-62—a 55-percent increase. Of this 5.5-billion pound increase, 46 percent was accounted for by the greater number of cattle and calves slaughtered and 54 percent by increased carcass weight (productivity of animals slaughtered).

Cattle and calf slaughter increased from an average 27.1 million head per year in 1949-51 to 33.5 million head in 1960-62—a 24-percent increase. Slaughter rates have been heavily influenced by: (1) the number of cattle and calves in inventory; (2) to some degree, the makeup of the cattle inventory; and (3) the position of the cattle cycle as reflected largely in the price level.

The U.S. cattle and calf inventory (January 1) has grown rapidly since the 1949-51 period. Except for a slight downturn in 1956 and 1957, the trend has been steadily upward. The average inventory was 97.7 million head in 1960-62. This was 23 percent above the average of 78.9 million head in 1949-51.

The makeup of the inventory is also different. For example, almost 45 percent of the 1949-51 inventory consisted of dairy animals. This is now only 30 percent. Since the rate of slaughter is higher for beef than dairy cattle, this partially explains the increase in slaughter from inventory.

Rate of slaughter is also influenced by position of the cattle cycle. When prices are strong and ranchers are building herds, slaughter rates are generally low. The two time periods compared here were similar. So this factor contributed only slightly to the relative increase.

The increase in average carcass weight of beef and veal has also contributed to increased beef supplies. Average carcass weights were 372 pounds in 1949-51 and 466 pounds by 1960-62. Three major reasons account for this:

1. Fewer calves are slaughtered at veal calf "weights."

Of the total U.S. cattle slaughter, 35 percent was made up of young calves in 1949-51; this is now only 21 percent. Dairy cattle numbers have been decreasing, so relatively fewer calves are available. And more calves move into feedlots before slaughter.

2. More cattle move from range areas to feedlots before moving to slaughter.

In the 1949-51 period only 37 percent on the cattle slaughtered was classified as fed cattle. Because of the strong demand for fed beef, strong cattle prices, and large feed supplies, this figure climbed to 52 percent. This factor probably contributed the most to increased productivity.

3. Cattle on feed are fed to slightly heavier weights. However, the increase has been only about 5 percent since 1949-51.

In the 1950's the beef industry expanded in response to consumer demand for beef. What about the period ahead to 1970-72? What will our cattle inventories and slaughter have to be to meet these needs? Estimates which may help to answer these questions are in the table.

Population is expected to maintain its present 1.5-to 1.8-percent growth rate. So there should be at least 210 million people by 1970-72. Our slaughter and inventory needs will depend on: (1) yearly per capita increase in demand for beef, and (2) productivity of each animal slaughtered.

Three increases in per capita demand per year are projected: no change per year, 1-pound increase, and 2-pound increase. In order to satisfy these demand levels, the slaughter and cattle inventory needs by 1970-72 vary according to productivity levels of animals slaughtered.

The most realistic approximate estimates would be those underlined in the table. Per capita demand increased by almost 2 pounds per year during the 1950's but the increase will be slightly less during this decade. Total commercial supply needs would have to be about 22 to 23 billion pounds of beef and veal. Slaughter would have to climb from the present 33.5 million head average per year to 43 to 45 million head. Cattle and calf inventories would have to be about 122 to 128 million head.

This rather strong longrun outlook picture for beef herds and feeding is encouraging.

Projected beef and veal needs, 1970-72

	Per capita demand increase per year—pounds		
	0	1.0	2.0
Population (millions)	210	210	210
Per capita demand* (pounds)	98	106	114
Total pounds needed (billions)	20.6	22.6	23.9
Slaughter needed†			
460‡	44.8	49.1	51.9
500‡	41.2	45.2	47.8
Inventory needed†			
460‡	124	136	144
500‡	114	126	133

* Assuming increased demand is reflected in increased consumption rather than price.
† Million head of beef and veal.
‡ Pounds carcass per animal slaughtered.

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