

Staff Paper P77-18

August 1977

STAFF PAPER SERIES

Cattle Situation and Outlook
1978-87

Paul R. Hasbargen

Department of Agricultural and Applied Economics

University of Minnesota
Institute of Agriculture, Forestry and Home Economics
St. Paul, Minnesota 55108

CATTLE SITUATION AND OUTLOOK

1978 - 87

**Paul R. Hasbargen
Professor and Extension Economist
Department of Agricultural & Applied Economics
University of Minnesota**

**Paper Presented At The Midwest Regional Outlook Conference
In Minneapolis, Minnesota, On August 17 & 18, 1977**

Short-run outlook projections are usually price forecasts based on expected changes in supply and demand in the coming year. These might best be made by a market analyst--a marketing specialist.

By contrast, long-run outlook projections might rather be supply forecasts based on expected production costs and future demand changes. Expected average production costs, or some historical fraction of those costs, becomes the long-run price forecast. Determination of these production costs (long-run planning prices) might best be made by a production economist--a farm management specialist.

Over a longer period of time, for example one 10-year cattle cycle, average market prices should about equal average production costs in an open market economy. Therefore, the question of what long-run planning price to use is really a question of what average production costs are expected to be over the period in question. The purpose of this paper is to attempt to answer this question.

LONG-RUN PLANNING PRICES

Estimating average production costs for beef cattle is much more difficult than for hogs because of the many different types of beef programs--beef cow-calf operations, cow-yearling programs, various cattle feeding systems and beef as a by-product of dairy operations. Also, production costs vary quite widely from one area of the country to another as illustrated in a recent USDA study of the costs of producing feeder cattle where "variable expenses" were four times greater in the southeast than in the southwest in 1975. (LMS-210, August 1976). Finally, feeder production "costs" vary considerably depending upon how the producer prices the inputs that he uses.

Despite the above enumerated difficulties, we must make an attempt to estimate a future equilibrium price. Lets start with the most difficult segment of the beef industry--the feeder production sector. Following are several different production cost estimates for 1977 based on different methods of pricing resources for different types of Minnesota feeder calf producers.

Table 1. Estimated Feeder Cattle Production Costs For 1977 For Different Types Of Minnesota Producers

<u>Cost Item</u>	<u>Market-Price Paul</u>	<u>Full-Cost Fred</u>	<u>Debt-Free Dick</u>	<u>Beef-Baron Bob</u>
Feed	\$155	\$192	\$ 82	\$130
Cash	25	25	25	25
Interest	28	35	21	.0
Labor	32	48	0	16
Facility (dep. & int.)	<u>18</u>	<u>25</u>	<u>18</u>	<u>15</u>
Total	\$258	\$295	\$146	\$186

It is my contention that those who expect to recover total production costs from a beef cow herd--the Full-Cost Freds--do not keep this enterprise for more than one cattle cycle since "full costs" are recovered only one or two years in each cycle. On the other end of the cost spectrum are the part-time rural residents who have beef cattle for a hobby and show very low costs because when calculating feed costs home-grown feed is priced at the variable cost of harvesting it. (Land rent cost is excluded since they are going to own it anyway.) This group is a very substantial proportion of today's beef producers and they will not make any significant changes in cattle numbers based on variations in feeder price levels.

Upward adjustments in cattle numbers after the current liquidation stage is over will be made primarily by the remaining two types. The "Beef Barons"--the farmer-ranchers who recently shifted from cow-calf to cow-yearling programs--will shift back to more cows once the price relationship between calves and yearlings changes. And the lower cost "market price" producers will probably start expanding when returns per cow get over \$220-\$230. Thus, I am suggesting that the equilibrium price (cost of production or long-run planning price) for choice steer calves during the next cattle cycle will be in the \$56-\$60 range (1977 dollars). For some example cost and return budgets at such planning prices, see the attached copy of our Beef Cow Herd Planning Guide.

There is probably less variation in cattle feeding costs than in feeder production costs among geographic regions. Also, there is less disagreement on how to price the inputs that are used--especially the major input, feed. Feed grains, the major cost component in cattle feeding, are readily marketable at known prices in all major cattle feeding areas. Thus, the important question to answer in projecting future cattle feeding costs is what will nonfeed costs be or, perhaps more to the point, what will be an acceptable return over feed costs to allocate to nonfeed inputs. Table 2 shows what feed costs, returns over feed and estimated nonfeed costs have been to Minnesota cattle feeders during the past four cattle cycles.

Table 2. Average Value Produced, Feed Costs, Returns Over Feed Costs And Estimated Nonfeed Costs For Southern Minnesota Cattle Feeders By Cattle Cycles.^{1/}

<u>Years</u>	<u>Value Produced Per Cwt. Of Gain^{2/}</u>	<u>Feed Costs Per Cwt. Of Gain</u>	<u>Returns Over Feed Costs/Cwt. Gain</u>	<u>Estimated Nonfeed Costs^{3/}</u>
1940-'49	\$25.34	\$19.45	\$5.89	\$5.00
1949-'58	27.73	19.32	8.41	6.00
1958-'67	21.47	16.61	4.86	7.00
1967-'76	32.23	26.38	5.85	9.00

^{1/} Source of data other than Estimated Nonfeed Costs is from annual Agricultural Economic reports entitled "Feeder Cattle Costs and Returns", by Truman Nodland, et. al.

^{2/} The Value Produced figure includes death losses. It is determined by subtracting the purchase cost of the feeder animals from the sales value of the slaughter animals and dividing by the number of cwt. produced.

^{3/} Excludes death losses and feed storage costs. These and other figures in tables are for calf feeding.

Given a corn grain price of \$2.00 to \$2.25 (1977 dollars) over the next cattle cycle, feed costs in calf feeding programs would be in the \$32 to \$34 range. Average nonfeed costs will probably be in the \$12 to \$14 range. However, I don't expect that returns over feed costs will average more than about \$10 per cwt. of gain because of the continued poor competitive position of our corn belt cattle feeders. For purposes of developing planning prices, I will suggest a \$43 feedlot cost for calf feeding programs and a \$46 feedlot cost for yearling programs. Fat cattle prices would then need to be as follows:

Table 3. Calculated Choice Steer Prices Needed To Cover Given Feeder And Feedlot Costs.

	<u>Calf Program</u>	<u>Yearling Program</u>
Feeder price	\$ 60.00	\$ 56.00
Feeder weight	450 lbs.	650 lbs.
Feeder cost	270.00	364.00
Feedlot cost/cwt.	43.00	46.00
Cwt. of gain	600 lbs.	500 lbs.
Cost of gain	258.00	230.00
Death loss charge	5.00	4.00
Total cost/head	533.00	594.00
Selling price needed	50.76	51.65

Therefore, my suggested long-run planning prices for the next cattle cycle (1978-87) are:

Choice steer calves	\$60
Choice heifer calves	\$52
Good to choice steer calves	\$56
Choice 650 pound steers	\$56
Choice slaughter steers, avg.	\$51
Choice slaughter steers, 1150 lbs.	\$52

These are in 1977 dollars. For 1987 dollars, the above prices should be doubled since an annual 7 percent inflation rate compounded for 10 years will double the original value.

An alternative method of estimating future planning prices would be to start with some historical "equilibrium" prices and inflate these to current dollars. The two key factors here are the selection of appropriate equilibrium prices and inflation factors.

Looking at historical data on feeder prices, it appears that 20 years ago a feeder calf price of \$25 to \$30 was needed to generate a 1 percent expansion rate (about equilibrium) in beef cow numbers. (See Ferris, John, Cattle Situation and Outlook, 1977-78). Ten

years ago a price of \$30 to \$35 was necessary to generate a 1 percent rate and a \$40 to \$45 price more recently increased the rate to a bit over 2 percent. If we adjust production costs up by 75 to 80 percent (feed costs have about doubled, nonfeed costs have increased 50 percent in the past 10 years) this would suggest that feeder calf prices would have to average \$55 to \$60 (in 1977 dollars) before beef cow herds would again expand by a 1 percent per year rate (about equilibrium).

Likewise, if the fed cattle price equilibrium was about \$28 in the past cycle it might be expected to be about 80 percent higher in the coming one, or about \$50.

CYCLICAL PATTERNS

Long-run planning prices are needed for planning major investments or changes in business organization. However, cyclical price patterns are also of value in order to select the most appropriate times to start, expand, or sell out a particular enterprise.

Familiarity with the beef cycle is useful for intermediate outlook projections--especially for feeder cattle prices. (See Minnesota Agricultural Economist, number 579, May 1976, for a discussion of beef cycles.) Given the current position of the beef cycle, after four years of large losses to the beef cow enterprise, only fair returns can be expected for the next few years. After two or three years of just covering feed and cash costs, the beef cow herd can be expected to give some returns to fixed resources during the 1980-83 period. Then, if history repeats itself for the eighth time in this century, there will be another large break in feeder prices and returns to cow herds in the mid-eighties.

Cattle feeding will also likely remain a low-return enterprise for the next two to three years because of the current over-capacity in the feeding sector. We have capacity to feed out some 28 million head per year--a level of feeding that will not be reached again for several years. Consequently, cattle feeders will likely keep feeder prices bid high enough to allow no more than a token return to feedlot facilities and management. Thus, despite the large losses of the past four years, I expect that returns over feed costs for corn belt feedlots will remain below \$10 per cwt. of gain for the next two to three years. Only that minority of feeders who are above average in their buying and selling ability and below average in feedlot costs will retain large enough margins to cover all their feedlot costs until the industry moves into another feedlot expansion phase. This will probably be after 1980.

CONCLUSIONS AND MANAGEMENT CONSIDERATIONS

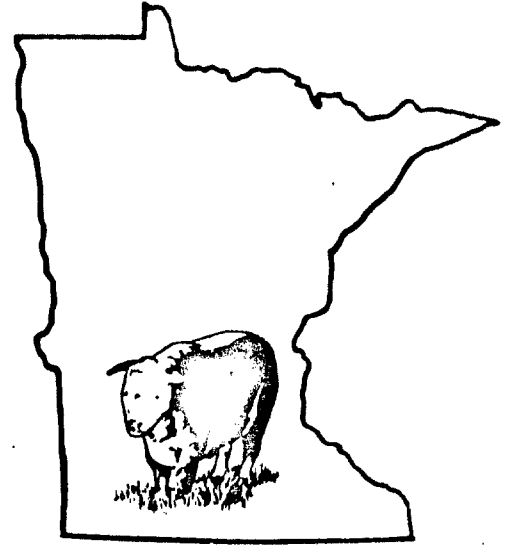
The rapid escalation in the costs of producing beef that occurred at the same time that beef numbers were peaking cyclically in the mid-seventies brought about a severe over-supply problem. The magnitude of the adjustments needed by the industry have been underestimated by most analysts during the past few years. Some have been saying that we may already have cut beef cow numbers too far. I don't think so. Rather, I

think that if we do our homework and study current costs and returns we can only conclude that the cow herd should remain low until the current sluggish consumer demand is given a chance to catch up enough to bring prices up to cover production costs.

Beef cow enterprises should be managed as cow-yearling systems for the next few years. Culling rates should remain high.

This is not the time to expand feedlot capacity. Rather, management must be tightened and feeders must be bought with care. Feedlot operators with below average management performance records should be encouraged to drop the cattle feeding enterprise. Facilities might better be used for hogs. Or sheep. Or, with a little remodeling, for storing government grain.

Beef Cow Herd PLANNING GUIDE



Should I Produce Feeder Cattle in Southern Minnesota

The beef cow enterprise has been a money loser for four years (1974-1977). Losses were larger than ever before because of the large jump in feed prices in 1973--at the same time that cattle numbers were reaching their cyclical peak. Cow numbers have declined sharply since 1975. Lower feeder cattle supplies and greater demand will command higher beef prices in each of the next several years. Our suggested planning price for the next cattle cycle is \$56 to \$60 per cwt. for choice steer calves.

- LOCATION:**
- On farms in the southeastern and southwestern corners of the state with large acreage of non-tillable land.
 - On farms where the operator wants supplemental income from live-stock and where low cost crop residues are available.
- RESOURCES:**
- Labor is limited relative to forage supplies because of off-farm employment, partial retirement, or large forage acreages.
 - Land is better suited to forage production than to feed grains.
 - Capital is available for long time, slow turn-over investment.
- MANAGEMENT:**
- Able to limit total feed costs to \$140 per cow unit per year.
 - Able to obtain a 90 percent calf crop with a 450 pound average weaning weight.
 - Able to produce 80 percent choice calves.
 - Able to handle a 250 cow herd--per full-time man on a specialized beef cow farm.

Paul R. Hasbargen and Richard O. Hawkins
Extension Economists in Farm Management
Department of Agricultural Economics

Robert Jacobs
Extension Animal Husbandman
Department of Animal Science

Agricultural Extension Service
Department of Agricultural Economics
UNIVERSITY OF MINNESOTA
U.S. Department of Agriculture

Mervin Freeman
Area Extension Agent

Planning Information - Beef Cow

Home Produced Feed Used - Daily ration needs per 1, 100 pound cow and annual feed requirements per beef cow and normal replacements as shown below for several different rations.

<u>Example Rations</u>	<u>Daily Ration for Cow</u>		<u>Winter Requirements per Cow Unit</u>	
	<u>Pregnant</u>	<u>Lactating</u>	<u>150 Days</u>	<u>200 Days</u>
Alfalfa Hay	20#	20#	2.0 ton	2.6 ton
Corn Equivalent	0	5#	8.0 bu.	5.0 bu.
Alfalfa Hay	12#	12#	1.3 ton	1.6 ton
Corn Stalks	12#	12#	1.3 ton	1.7 ton
Corn Equivalent	0	5#	8.0 bu.	5.0 bu.
Protein Supplement	0	3/4#	30#	18#
Alfalfa Hay	8#	8#	1.0 ton	1.2 ton
Corn Stalks	18#	18#	1.9 ton	2.5 ton
Corn Equivalent	0	5#	8.0 bu.	5.0 bu.
Protein Supplement	0	1#	36#	24#
Alf. Hay for Heifer Repl.	0	0	.4 ton	.5 ton
Corn Stalks	30#	28#	2.9 ton	3.9 ton
Corn Equivalent	0	3#	5.0 bu.	3.0 bu.
Protein Supplement	3/4#	2#	155#	180#

* All rations need salt and mineral fed free choice.

Winter Feed - The per cow unit requirements above include an added 20 percent feed for normal replacement heifers and bulls. Also a 10 percent waste is allowed for hay and a 20 percent waste for stalks. The 150 day requirements above assumes maximum pasture use of crop residue into late fall and February-March calving. The 200 day requirements assume a shorter fall pasture period and April calving.

Pasture - Pasture variable costs include fence repair costs, pasture fertilization and weed control. This usually ranges between \$4 and \$14 per acre. This would convert to \$2 to \$4 per cow per month. Beef cow pasture, land rental charges, are usually \$7 to \$8 per month per beef cow unit in southern Minnesota. Beef cows pastured on corn stalks on land owned should be charged the equivalent of \$7 to \$9 per ton of corn stalks removed, or about \$15 per acre of stalks grazed.

Breeding - Annual bull depreciation or artificial insemination will be \$5 to \$10 per beef cow.

Veterinary - Medicine, sprays and veterinarian costs average \$3 to \$6 per cow.

Repairs - Repairs on all buildings, equipment and farm machinery repair that is used exclusively for beef cows. The normal range of expenses is \$4 to \$8 per beef cow.

Utilities, Power and Fuel - The beef cow share of telephone electricity, fuel and oil: \$2 to \$4 per cow.

Bedding - Requirements vary with the housing system and the time of year cows freshen.

Usually the cost of the bedding and the value of the manure produced results in a net cost of \$0 to \$5 per cow.

Miscellaneous - Overhead cost, like advertising, farm magazines, farm auto or whatever other miscellaneous costs that have been reported on federal income taxes and should be allocated to this livestock enterprise. The range of costs is \$1 to \$6 per cow.

RETURN TO LABOR, FACILITIES AND LIVESTOCK - These returns are after paying all variable costs, except interest on cattle loan and after deducting the market value for home grown feeds.

FIXED COSTS - Those costs which tend to continue even if production stops plus interest.

ESTIMATING INCOME ABOVE COSTS PER COW

	Supplemental Herd		Commercial Herd
	Average Management	Good Management	
Cash Income			
Percent calf crop weaned	85%	95%	87%
Average farm weaning weight (steers)	430#	470#	450#
Average terminal weight	413#	450#	432#
Gross sales per beef cow:			
Steer calf 113# x 56¢ x 42%	\$ 97	---	\$112
Steer calf 450# x 60¢ x 48%	---	\$130	50
Heifer calf 386# x 50¢ x 23%	44	---	15
Heifer calf 420# x 52¢ x 27%	---	59	51
Cull Heifer Repl. \$300/hd. x 5%	15	15	---
Cull cows 1050 x 33-35¢ x 14%	49	52	---
Total Income Per Beef Cow	(A) \$205	\$256	\$228
Variable Expenses			
Feed costs (winter ration for average management is 200 days & 150 days for good management)			
Hay - 12# & 8#/day @ \$50/ton (\$45 for com'l)	\$ 80	\$ 50	\$ 72
Corn stalks - 12# & 18#/day @ \$18/ton	30	34	30
Grain - 5 & 8 bu./yr. @ \$2.50/bu.	13	20	15
Protein - 18# & 36# @ \$9/cwt.	2	4	2
Salt and mineral	7	8	8
Pasture - 5.5 & 7 mo. @ \$3/mo. (\$7/mo. for com'l)	18	23	45
Total Feed Costs	(B) \$150	\$139	\$176
Other Variable Costs			
Breeding fees or bull	\$ 5	\$ 8	\$ 6
Veterinary and medicine	4	5	2
Repair and maintenance	6	6	5
Utilities, power and fuel	3	3	3
Bedding vs. manure credit	2	2	0
Miscellaneous	3	3	3
Marketing costs	4	4	3
Total Other Costs	(C) \$ 27	\$ 31	\$ 22
Total Variable Costs (B + C)	(D) \$177	\$170	\$198
RETURN TO LABOR, FACILITIES AND LIVESTOCK (A - D)	(E) \$ 28	\$ 76	\$ 30
Fixed Costs and Interest			
Buildings and fence \$40 @ 10%	\$ 4	\$ 4	\$ 4
Livestock equipment \$40 @ 15%	6	6	3
Power & machinery \$60 @ 15%	8	8	8
Interest on livestock \$350 @ 8%	28	28	28
Real estate taxes	10	8	0
Labor & management charge	40	40	40
Total Fixed Costs	(F) \$ 96	\$ 94	\$ 83
RETURN OVER ALL COSTS (E - F)	(G) \$-68	\$ -7	\$-53

Return over all costs should be adjusted up or down as the following changes occur:

	Average Management	Good Management
\$5 per cwt. change in calf prices	\$13.10	\$16.45
5% change in calf crop sold	11.10	12.20
25 pound change in weaning calf weight	11.50	13.60
\$10 change in feed costs per cow	10.00	10.00

Decision Making Aids

Beef cow operators must decide whether to sell their feeder's (1) in the fall as weaning calves, (2) winter them and sell in the spring or (3) after wintering them, pasture them and sell in the fall as yearlings. Alternatively, they can feed to slaughter weights (see Cattle Feeders Guide).

To compare the profitability of these alternatives they can: (1) estimate probable increase in value of the feeder, (2) estimate the likely additional costs of wintering and pasturing a feeder, and (3) compare the expected added income with the added costs to help determine whether the difference is worth the risk of holding.

ADDED RETURNS: Estimate probable increase in value of feeder. In projecting future sales value of heavier feeders remember that heavier feeders bring fewer dollars per hundredweight. Also, feeder prices are usually lowest in the fall and highest in the spring. The examples use typical price relationships and weight gains.

ADDED COSTS: Estimate added cash costs first. The return over cash costs figure can be useful in making cash flow projections. Then place a value on home produced resources and estimate what returns you expect to your labor and management. Is it worth the risk?

Item	Wintering Calf 180 Days (425# - 650#)		Pasturing a Yearling (650# - 800#)	
	Typical	Estimate	Typical	Estimate
ADDED RETURNS				
Sales value at end of period	(56¢) \$364	_____	(50¢) \$400	_____
Minus beginning value of feeder	(58¢) 247	_____	(56¢) 364	_____
Added Returns	\$117	_____	\$ 36	_____
ADDED CASH COSTS				
Mineral and salt	1	_____	1	_____
Health and death loss	3	_____	2	_____
Repairs	1	_____	1	_____
Interest paid	10	_____	12	_____
Miscellaneous	1	_____	1	_____
Marketing	2	_____	1	_____
Total Cash Costs	\$ 18	_____	\$ 18	_____
RETURN OVER CASH COSTS	\$ 99	_____	\$ 18	_____
COST OF HOME PRODUCED RESOURCES				
Bedding vs. manure value	\$ 0	_____	\$ --	_____
Grain (500 lbs. @ 5¢)	25	_____	--	_____
Hay (2300 lbs. @ 2.5¢)	58	_____	--	_____
Pasture (\$3.00/head/month for 5 months)	--	_____	15	_____
Total Feed and Bedding Cost	\$ 83	_____	\$ 15	_____
RETURN TO LABOR AND SHELTER	\$ 16	_____	\$ 3	_____