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FEEDER CATTLE
COSTS AND RETURNS

1940 - 1952

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UNIVERSITY OF MINNESOTA

Institute of Agriculture

and

UNITED STATES DEPARTMENT OF AGRICULTURE

Bureau of Agricultural Economics

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FEEDER CATTLE COST AND RETURNS
1940-1952

R. B. Zoller, T. R. Nodland, and G. A. Pond

	Page
Introduction	1
Minnesota Prices	2
Return Above Costs Per Lot	4
Return Above Costs per 100 Pounds Net Gain in Weight	4
Feed Costs and Returns per 100 Pounds Net Gain in Weight	5
Feed Costs and Returns, 1951-1952 Feeding Periods	6
Average Cost and Returns, 1940-1952	7
Range in Return Above Feed Cost	9
Relation of Feed Cost to Return Above Feed Cost	9
Relation of Price Spread to Return Above Feed Cost	10
Cumulative Effect of Excelling in a Number of Management Factors	11

INTRODUCTION

Feeding beef cattle is an important enterprise on many farms in Minnesota. The purpose of this report is to present data on the costs and returns from this type of feeding operation and to illustrate the type of information which can be secured from farm records. These data were secured from the records of the Farm Management Services operating in the southern part of the state.^{1/}

The facts presented in this report differ from that in the annual reports prepared for the Farm Management Services in that all the information is on a "lot" basis beginning with the time of purchase and continuing until the animals are sold. The data presented annually are on a calendar year basis. This usually results in combining portions of the feeding periods for different lots of cattle in one report. These data by lots as included in this report represents results from feeding cattle under ordinary farm conditions. They should be helpful to individual farmers for comparison with their own accomplishment or for the purpose of planning their feeding operations. Although the farmers included in this study are, in general, above average in managerial ability, the quantity of feed required to produce 100 pounds gain in weight represents an accomplishment well within the grasp of most farmers.

Each enterprise statement for cattle shows the quantity and market value of feeds consumed per 100 pounds net gain in weight, the financial returns, and other information on rates of production. The enterprise statements also show the amount by which the total return from the feeding operations exceeds the feed cost. Two measures of "return above feed cost" are shown: (1) the return above feed cost per 100 pounds net gain in weight and (2) the return per \$100 of feed. It must be understood that in neither case is it a "net return". In addition, there are other costs such as labor, power, shelter, taxes, insurance, interest, equipment, and other items that must be met from the gross income.

^{1/} Southwest Minnesota Farm Management Service, Southeast Minnesota Farm Management Service and the Farm Management Service for Veterans Taking On-The-Farm Training.

However, feed is the largest single item and may constitute up to 80 per cent or more of the total cost of fattening cattle.

Arithmetic averages are used throughout this report. Equal weight is given to the data from each lot regardless of the number of animals fed. Wherever twelve-year averages are given, they represent arithmetic averages giving each year equal weight.

MINNESOTA PRICES

The farm-raised feeds were valued at average farm prices. The purchased feeds were valued at the price the farmer paid for them. Feeds for which there is no regularly established price, such as corn silage, were valued on the basis of their feeding value relative to similar feeds for which a market price was available. The average annual price for the major feeds utilized by feeder cattle is shown in table 1.

Table 1. Average Annual Feed Prices.

	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952
	Dollars										
Alfalfa hay, per ton	8.00	11.00	15.00	15.00	16.00	22.00	20.00	20.00	21.00	19.00	17.00
Timothy and/or brome, per ton	5.15	6.75	9.00	9.00	9.60	12.50	11.60	11.60	12.20	11.00	9.80
Corn silage, per ton	2.75	3.62	5.00	5.00	5.50	8.00	5.85	6.00	6.70	6.00	5.75
Ear corn, per bu.	.65	.88	.90	.84	1.14	1.54	1.64	1.02	1.20	1.36	1.34
Oats, per bu.	.41	.60	.70	.64	.70	.90	.88	.59	.72	.81	.76
Linseed oil meal, per cwt.	2.42	2.55	2.85	2.88	3.30	4.25	4.55	4.00	3.95	3.85	5.00
Soybean oil meal, per cwt.	2.75	2.82	3.15	3.00	3.80	4.80	5.10	4.05	3.95	4.50	5.80

Stocker and feeder cattle prices at South St. Paul for January 1951 through April 1953 are presented in figure 1. Although farmers in southern Minnesota secure cattle for their feed lots from many sources the prices reported on the South St. Paul market are reasonably representative of the relative price situation.

The average price paid for feeder cattle by farmers included in this study and the price received for fat cattle are shown in figure 2. The difference between purchase and sale price is the price spread. The 1951-52 feeding period is significant in that the purchase price exceeded the sale price by an average of \$5.30. This is the largest negative spread which has occurred in the last 12 years. Only in one other year, the 1948-49 feeding period, was the spread negative and this time by an average of 45 cents for the lots studied. The average price spread for the 12 year period was \$2.94. See page 10. for further discussion of the significance of price spread.

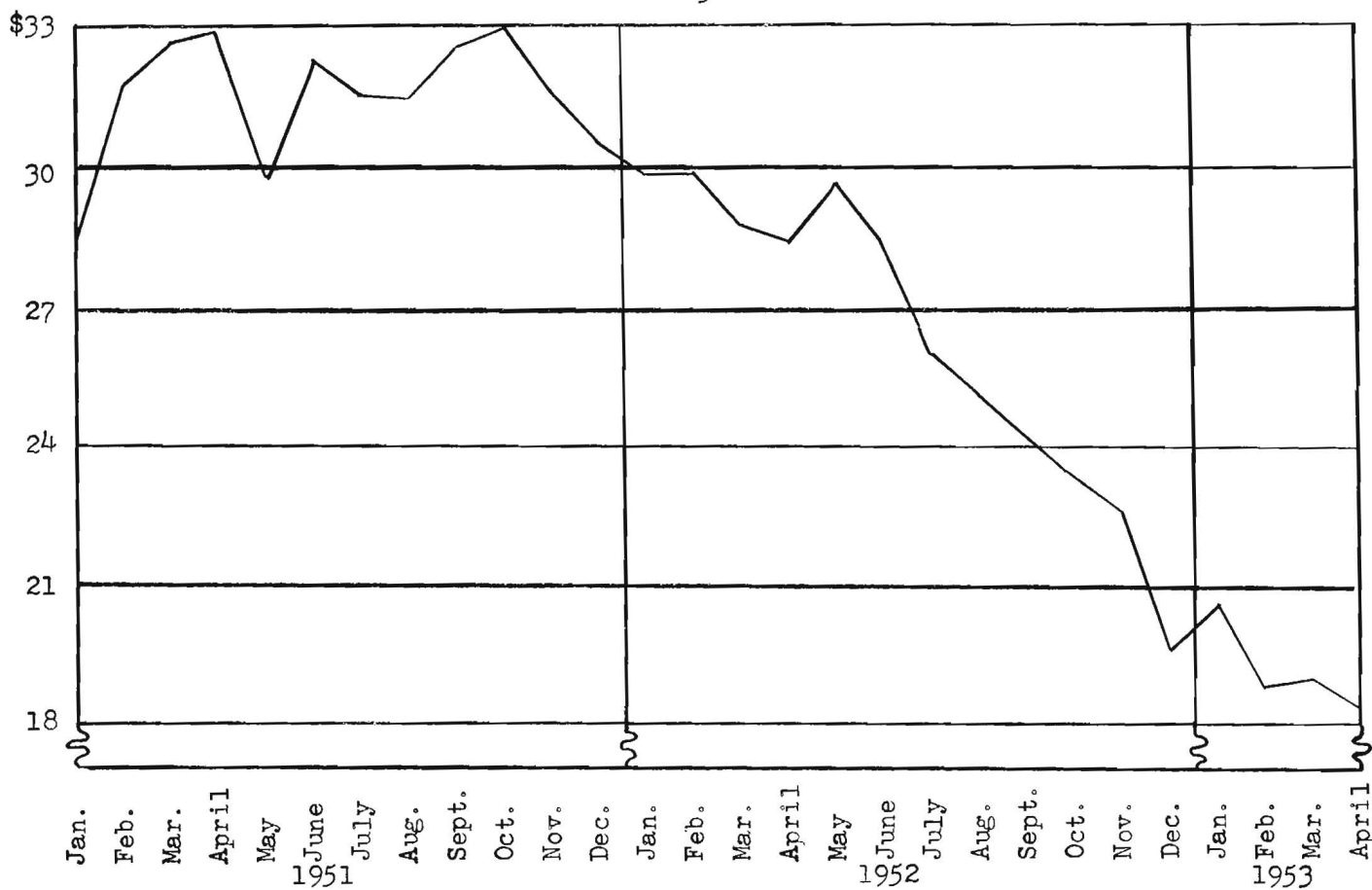


Figure 1, Average Monthly Prices per Cwt, Stockers and Feeders, All Weights, So. St. Paul, Jan. 1951 - April 1953. (Compiled from Livestock Market News Statistics and Related Data USDA, PMA 1951-1953.)

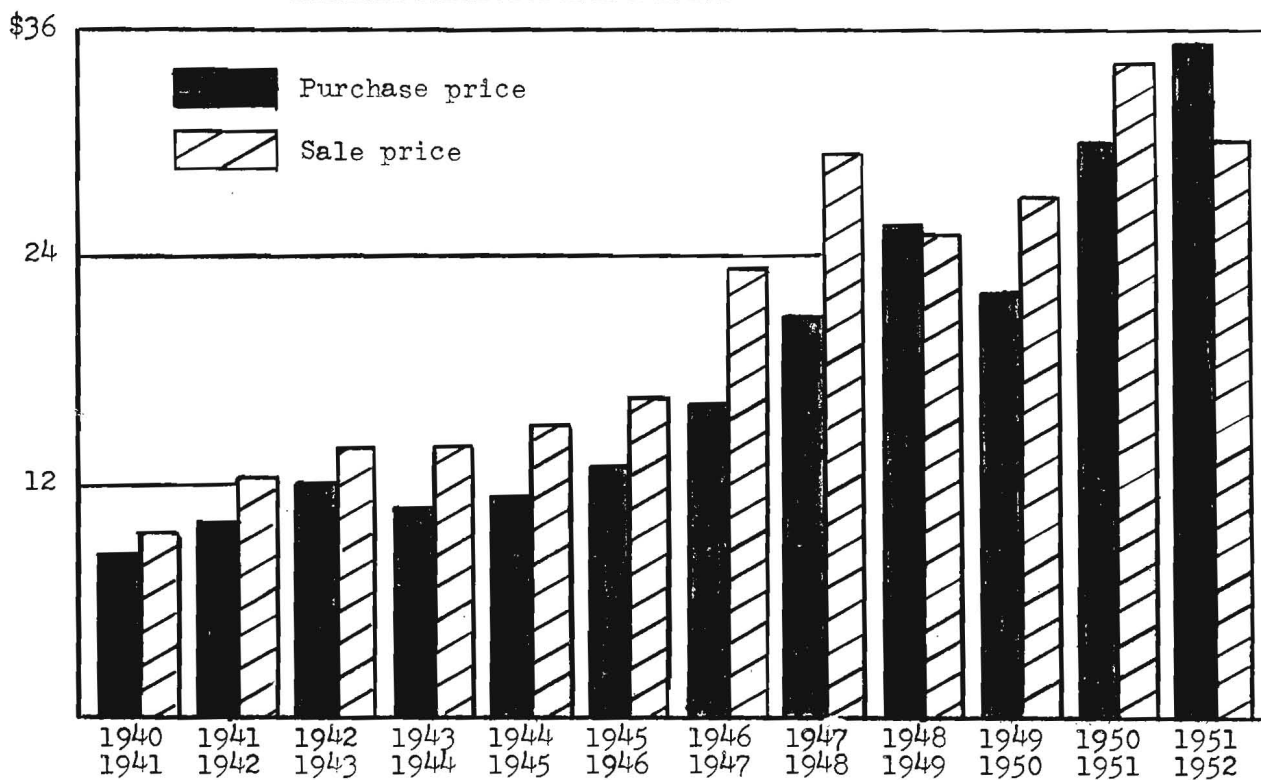


Figure 2. Average Purchase and Sale Price per Cwt. of Feeder Cattle on farms studied by Feeding Periods 1940-1952.

RETURN ABOVE COSTS PER LOT

The average dollar returns per lot for the 1951-1952 feeding period are presented in table 2. These data give an indication of the average size of the feeding operation and the contribution the enterprise makes to the farmers' income. The "return above feed cost" is the amount available to cover the cost of labor, power, shelter, equipment, interest on investment, and other miscellaneous costs. The "total net returns" is the amount remaining after all costs have been deducted. Not all cost items represent direct cash outlay. They do, however, constitute significant charges to be covered by the income from the cattle. Failure to cover all costs, both cash and non-cash items, over a period of years suggests that the cattle feeder should study his practices in feeding and handling his cattle in order to find opportunities for reducing costs. In addition he should watch the market trends carefully so as to time his sales to widen the spread between sale and purchase price. Otherwise he might well consider shifting his labor, feed, and other resources to some alternative use.

Table 2. Average Return Above Costs Per Lot, 1951-1952.

Item	Your lot	Average of all lots
Number of lots		30
Total returns		\$6526
Total feed cost		6165
Return above feed cost		361
Total costs other than feed		
(5.37 per 100 lbs. produced)		1415
Total net returns		-1054

RETURN ABOVE COSTS PER 100 POUNDS NET GAIN IN WEIGHT

The average cost and returns for all lots of cattle included in this study during the feeding years 1948-1952 is shown in tables 3 and 4. The information on costs other than feed were obtained from a limited number of cooperators who kept detailed records of labor and other items of cost.^{1/} These costs were obtained in 1951 and 1952 but have been adjusted for the other years in line with the price levels of these years.

An average of 2.1 hours of labor were required to produce 100 pounds of beef (table 4). A total of 433 hours of labor was required for the average net gain in weight per lot of 20,609 pounds and with the return of \$3.39 per hour the average lot of cattle fed during the four feeding periods (1948-1952) returned the farmer \$1468 for his labor and management.

^{1/} Mimeographed Report No. 203. Department of Agricultural Economics; University Farm, St. Paul, Minnesota. October 1952.

Table 3. Returns above all costs for each 100 pounds of beef produced 1948-52.

	1948-49	1949-50	1950-51	1951-52	Average 1948-52
Costs per cwt. beef produced					
Feed cost	\$21.13	\$19.39	\$23.26	\$23.39	\$21.79
Interest*	1.32	1.17	1.60	1.79	1.47
Man labor	1.51	1.48	1.55	1.68	1.56
Shelter (depreciation, repairs, etc.)	.69	.70	.75	.79	.73
Equipment	.19	.20	.21	.22	.21
Power (tractor, truck, etc.)	.33	.34	.35	.37	.35
Misc. cash cost (vet., etc.)	.46	.47	.49	.52	.49
Total cost	25.63	23.75	28.21	28.76	26.60
Net increase in value per cwt.	25.35	36.19	42.28	24.76	32.15
Return above all cost per cwt. produced	\$ -.28	\$12.44	\$14.07	\$-4.00	\$ 5.55

* interest on average investment in cattle at 5 per cent per annum.

Table 4. Returns to labor for each 100 pounds of beef produced 1948-52.

	1948-49	1949-50	1950-51	1951-52	Average 1948-52
Costs other than labor to produce 100# beef	\$24.12	\$22.27	\$26.66	\$27.08	\$25.04
Net increase in value	25.35	36.19	42.28	24.76	32.15
Returns to labor	1.23	13.92	15.62	-2.32	7.11
Average hours labor to produce 100# beef	2.1	2.1	2.1	2.1	2.1
Returns per hour of labor	\$.59	\$6.63	\$7.44	None	\$3.39

FEED COSTS AND RETURNS PER 100 POUNDS NET GAIN IN WEIGHT

The presentation of cost and return data on the basis of "100 pounds gain in weight" or "100 pounds of cattle produced" facilitates comparisons among individual lots. It provides the cattleman with a common unit as a basis for comparing his efficiency in feeding and management with that of other producers. This type of comparison is presented in table 5. Included here are averages of all the lots studied in the 1951-1952 feeding period. In addition averages of the one-third high in return above feed cost and the one-third low in returns are included. Twelve of the thirty lots studied in this period did not increase in value sufficiently to cover feed costs. Twenty of the thirty lots did not return enough above feed costs to pay the other expenses, of production, (see table 4).

Data showing costs and returns over a longer period are included in table 6. Here trends in feeding methods, feed costs, price spreads, returns, and other significant data are shown. A moderate increase in the use of pasture in recent

Table 5. Feed Cost and Returns, 1951-1952 Feeding Period.

Items	Your lot	Average of 30 lots	10 lots highest in return above feed	10 lots lowest in return above feed
Feeds per cwt net gain in wt, lbs:				
Corn	_____	624	472	823
Small grain	_____	52	36	54
Commercial feeds	_____	45	37	54
Legume hay	_____	287	166	466
Other hay	_____	86	33	80
Fodder and stover	_____	-	-	-
Total concentrates	_____	721	545	931
Total hay and fodder	_____	373	190	546
Silage	_____	465	554	503
Pasture days	_____	14	18	10
Total digestible nutrients*	_____	872	667	1140
% TDN that is protein	_____	12.8	13.4	12.9
Feed costs per cwt net gain in wt:				
Concentrates	_____	\$18.16	\$13.81	\$22.94
Roughages	_____	4.20	3.20	5.76
Pasture	_____	1.03	1.29	.82
Total feed costs	_____	\$23.39	\$18.30	\$29.52
Net increase in value per cwt	_____	\$24.76	\$28.25	\$21.22
Return above feed cost per cwt	_____	\$ 1.37	\$ 9.95	\$-8.30
Return for \$100 feed	_____	\$106	\$154	\$72
Purchase price per cwt	_____	\$35.63	\$35.76	\$35.01
Sale price per cwt	_____	\$30.33	\$31.95	\$28.39
Price spread	_____	\$-5.30	\$-3.81	\$-6.62
Wt per head bot, lbs	_____	555	504	609
Wt per head sold, lbs	_____	1031	1057	1002
Total gain per head, lbs	_____	476	553	393
Daily gain per head, lbs	_____	1.5	1.5	1.4
Number of days on farm, per head	_____	316	366	273
Number of days on pasture, per head	_____	70	94	55
Number of head bot per lot	_____	55	58	36
Per cent death loss	_____	1.3	.9	1.9
Net gain in wt of lot, lbs	_____	26356	32132	12694

* Not including nutrients received from pasture.

Table 6. Average Costs and Returns, 1940-1952.

Items	1940- 1943	1943- 1946	1946- 1949	1949- 1952
1 Number of lots	21	22	25	30
Feeds per cwt net gain in wt, lbs:				
2 Corn	799	762	715	651
3 Small grain	74	25	43	29
4 Commercial feeds	41	46	51	46
5 Legume hay	228	226	230	218
6 Other hay	71	61	107	73
7 Fodder and stover	52	30	11	2
8 Total concentrates	914	833	809	726
9 Total hay and fodder	351	317	348	293
10 Silage	467	450	488	454
11 Pasture days	5	5	10	12
12 Total digestible nutrients*	978	908	907	807
13 % T.D.N. that is protein	11.3	11.5	11.8	12.1
Feed costs per cwt net gain in wt.				
14 Concentrates	\$11.08	\$14.44	\$22.72	\$17.47
15 Roughages	1.79	3.01	4.49	3.87
16 Pasture	.15	.20	.46	.67
17 Total feed costs	\$13.02	\$17.65	\$27.67	\$22.01
18 Net increase in value per cwt	\$15.99	\$23.16	\$36.87	\$34.41
19 Return above feed cost per cwt	\$ 2.97	\$ 5.51	\$ 9.20	\$12.40
20 Return for \$100 feed	\$123	\$131	\$133	\$156
21 Purchase price per cwt	\$10.23	\$11.74	\$21.00	\$29.31
22 Sale price per cwt	\$11.99	\$15.38	\$26.05	\$30.63
23 Price spread	\$ 1.76	\$ 3.64	\$ 5.05	\$ 1.32
24 Wt. per head bot, lbs.	642	658	625	610
25 Wt. per head sold, lbs.	978	991	978	1039
26 Total gain per head, lbs.	336	333	353	429
27 Daily gain per head, lbs.	1.6	1.6	1.6	1.6
28 Number of days on farm per head	207	202	226	272
29 Number of days on pasture per head	16	17	31	54
30 Number of head bot per lot	38	49	47	50
31 Per cent death loss	1.2	.9	1.1	1.2
32 Net gain in wt. of lot, lbs.	13033	16359	16352	21691

* Not including nutrients received from pasture

years is evident from these data. During the last six feeding periods, 1946-1952, 51 per cent of the lots had access to pasture, compared with 30 per cent during the six preceeding feeding periods, 1940-1946. The number of pasture days per head had also increased sharply since 1946.

A comparison of amounts of feed consumed, costs, and returns for those feeder cattle lots pastured and those not pastured are shown for the 1946-1952 feeding periods in table 7. The estimated feeding value of pasture varied from \$1.35 to \$2.50 per head per month during the period. The effect of price spread on the net increase in value was to the advantage of the lots not pastured due to the heavier average purchase weight of these cattle. Approximately \$6.83 of the \$36.03 average net increase in value for the lots not pastured was accounted for by the price spread of \$3.49 whereas \$4.14 of the \$35.31 average net increase in value for the lots pastured was accounted for by the price spread of \$3.06.

Table 7. Comparison of Feeds Consumed, Costs, Returns
and Other Factors for Feeder Cattle Pastured
Versus Those not Pastured, 1946-1952.

	Fed on Pasture	Not Pastured
Number of lots	84	80
Number of days on pasture per lot	83	-
Feed per 100 lbs net gain in weight:		
Concentrates, lbs	695	847
Dry Roughage, lbs	306	333
Silage, lbs	457	479
Pasture, days	21	-
Cost and returns per 100 lbs net gain in weight:		
Feed Costs		
Concentrates	\$17.77	\$22.57
Roughages	3.98	4.33
Pasture	1.12	-
Total feed cost	\$22.87	\$26.90
Net Increase in value	35.31	36.03
Return over feed	12.44	9.13
Return for \$100 feed	\$154	\$134
Purchase price per 100 lbs.	\$25.46	\$24.70
Sale price per 100 lbs.	\$28.52	\$28.19
Price spread	\$ 3.06	\$ 3.49
Weight per head bought	576	664
Weight per head sold	1003	1013
Gain per head	427	349
Days on farm	280	211
Per cent death loss	1.5	.8

RANGE IN RETURN ABOVE FEED COST

The range in return above feed cost per 100 pounds net gain in weight for the twelve-year period 1940-1952 between the one-third of the lots high in return above feed and the low one-third was \$14.13 (table 8). These differences in the returns received by farmers from year to year are due primarily to changes in the general price levels, and are largely outside his control. The variation among lots in any one year are to a large extent within the control of the farmer. Some of the major factors causing this variation among lots are discussed in the following paragraphs.

Table 8. Range in Return Above Feed Cost from Cattle per 100 Pounds Net Gain in Weight, 1940-1952.

Year	1/3 highest in return above feed	Average	1/3 lowest in return above feed	Range
-1940-1941	\$ 6.29	\$ 3.41	\$.66	\$ 5.63
1941-1942	8.21	4.98	2.41	5.80
1942-1943	5.03	.51	-4.76	9.79
1943-1944	9.43	2.85	-3.40	12.83
1944-1945	10.73	6.56	1.56	9.17
1945-1946	12.93	7.10	1.15	11.78
1946-1947	24.04	9.25	-7.83	31.87
1947-1948	25.06	14.14	4.10	20.96
1948-1949	12.14	4.22	-6.00	18.14
1949-1950	23.16	16.80	10.61	12.55
1950-1951	25.25	19.02	12.39	12.86
1951-1952	9.95	1.37	-8.30	18.25
Average of 12 yrs	14.35	7.52	.22	14.13

RELATION OF FEED COST TO RETURN ABOVE FEED COST.

Feed costs account for approximately 80 per cent of the total cost of producing beef. The remaining 20 per cent are represented in such costs as labor interest, shelter, power, and miscellaneous cash costs. Detailed cost data are not available on sufficient farms to facilitate comparisons between costs other than feed. However, it is in the feeding practices where widest variations among farms occur and where the opportunity for improving profits are greatest. The differences in feed cost between 98 lots with low feed costs and the 98 with high feed costs was \$9.51 per 100 pounds. Cost differences among individual farmer's were considerably greater. The age and weight of cattle bought and the type of feeding program used has, of course, a marked effect on the feed costs per 100 pounds of beef produced. These factors must be considered when comparing any individual lot with the average. In general the gains of older and heavier cattle are more expensive; however, these animals achieve a faster daily rate of gain than yearlings or calves. In addition, older cattle seemed to be able to utilize greater quantities of roughages per unit of gain, particularly of silage, than younger animals.^{1/}

^{1/} Profit and Losses From Feeding Cattle in Illinois, 1938-1949 Department of Agricultural Economics, University of Illinois, October 1952.

Table 9. Relation of Feed Cost per 100 Pounds Net Gain in Weight to Various Factors Affecting Beef Cattle Production 1940-1952.

	Feed cost		
	Low 1/3	Middle 1/3	High 1/3
Pounds of feed per 100 pounds net gain in weight:			
Concentrates	618	748	1095
Hay & fodder	252	330	400
Silage	458	501	430
Pasture days	9	7	6
T.D.N.**	685	857	1150
% protein in ration**	11.6	11.7	11.8
Net increase in value*	\$26.57	\$27.29	\$28.96
Feed cost per 100 pounds net gain in weight	\$15.87	\$18.92	\$25.38
Return over feed cost*	\$10.70	\$ 8.37	\$ 3.58
Average price received	\$21.21	\$21.05	\$20.81
Price spread	\$ 2.69	\$ 3.05	\$ 3.09
Weight per head bought	569	625	706
Pounds gain per head	402	372	316
Pounds produced	18787	18617	13464

* Per 100 pounds net gain in weight

** Not including nutrients received from pasture

RELATION OF PRICE SPREAD TO RETURN ABOVE FEED COST

The spread between the purchase and sale price is generally recognized as having an important influence on profits from cattle feeding. It is also one of the factors which is largely outside the control of the individual farmer. Figure 2, presented earlier, indicates the extent of year to year variations in price spread. The following table summarizes the relation of price spread to various production factors. The difference in return above feed cost between the group with the small price spread and those with the widest price spread was \$8.12 per cwt. produced.

Table 10. Relation of Price Spread to Various Beef Cattle Production Factors, 1940-1952.

	Price spread		
	Low 1/3	Middle 1/3	High 1/3
Average price spread	\$.81	\$ 3.00	\$ 4.99
Per 100 pounds net gain in weight:			
Return over feed	3.17	8.12	11.29
Total feed cost	21.10	19.38	19.75
Net increase in value	24.27	27.50	31.04
T.D.N.	945	876	877
Average purchase price	19.16	17.87	17.19
Average sale price	19.97	20.87	22.18
Weight per head bought	648	615	636
Weight per head sold	986	976	1025
Pounds gain per head	338	361	389
Pounds produced	15905	13769	20745
No. days on farm	213	225	241
No. of head bought	46	38	54

CUMULATIVE EFFECT OF EXCELLING IN A NUMBER OF MANAGEMENT FACTORS

The return above feed cost and the profit of the feeding enterprise is affected by a number of management factors. Because of the interrelation among these factors and the effect of the interrelation on the profitableness of the enterprise it is difficult to measure the effect of each factor separately. Two of the factors have already been discussed--feed cost and price spread. Others for which data are available from this study are: (1) rate of daily gain, (2) quality of ration as indicated by the per cent of protein in the total digestible nutrients fed (other than pasture), and (3) death loss. Although the individual effect of each has not been measured separately, the cumulative effect of these five factors on returns is shown in figure 3.

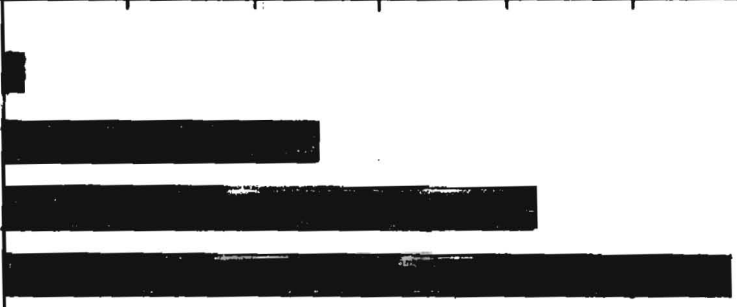
No. of factors in which farmers excelled	No. of lots	Average Return Over Feed Cost from Cattle per 100 Pounds Net Gain in Weight 1940-1952					
		\$2	\$4	\$6	\$8	\$10	\$12
None or 1	40						\$.31
2	76						5.05
3	91						8.47
4 or 5	88						11.60

Figure 3. Average Return over Feed Cost from Cattle per 100 Pounds Net Gain in Weight Grouped according to Number of Selected Factors in Which Farmers Excelled, 1940-1952.

Some farmers excelled in nearly all the factors while others were below the average of the group in most of them. The 88 farmers who excelled in four or five factors received a return above feed cost of \$11.60 per 100 pounds net gain in weight. The 40 farmers who were below the average in all or above in only one factor received a return barely large enough to cover the cost of the feed for their lots of cattle. The difference between the extremes amounts to \$11.29 per 100 pounds net gain in weight. This is a difference of \$1903 for the average production of 16,859 pounds of beef per lot. These five factors alone are responsible for a considerable proportion of the variation among these farmers in the return above feed cost secured from feeding cattle.