



The feasibility of cooperative cattle feeding and slaughtering in Montana
by Elroy C McDermott

A Thesis Submitted to the Graduate Faculty in Partial Fulfillment of the Requirements for the Degree
of DOCTOR OF PHILOSOPHY in Agricultural Economics

Montana State University

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Abstract:

Montana has experienced a slow rate of economic growth during the past decade. Many suggestions have been made for improving incomes and overall economic activity. Further processing of raw agricultural products within the state is one way in which economic growth can be realized.

Montana exports large quantities of both feed grains and feeder cattle. The combining of these resources through increased cattle feeding has been strongly encouraged. A number of little used or abandoned feedlots, idle as a result of inadequate information, poor analysis, poor planning and hasty action would impede, not stimulate the state's economy, however. The purpose of this study is to determine the feasibility of additional profitable investment in cattle feeding and slaughtering in Montana through cooperative feeding and slaughtering facilities. To facilitate analysis of feasible expansion in greater depth, the Northeast district of the state was selected for detailed study.

It is concluded that opportunities for expansion of feeding and slaughtering do exist in Montana. Feeder cattle and feed grain production are sufficient for approximately an 800 percent increase in cattle feeding over present levels. The lack of other factors, however, such as capital, management and markets were found major obstacles to significant expansion over present levels.

Cooperative feeding operations provide a means to overcome most of these limitations. However, an upper level for profitable increased feeding is dictated by the capacity of slaughter facilities, and market outlets.

Significant expansion of slaughter facilities at this time does not appear warranted until greater year-around supplies of fed cattle are available. The expansion of feeding and slaughtering in many areas is extricably intermingled. A significant expansion of feeding tends to be inhibited by the lack of slaughter facilities, while at the same time, immediate expansion in slaughtering is hindered by the lack of year-around feeding in the area. Simultaneous development through a coordinated feeding and slaughtering enterprise provides one means of solution to this problem. A coordinated cooperative operation is one method by which this could be effectively accomplished. A growing out-of-state market is seen as rapid population expansion continues on the West Coast. While our contribution to this market is relatively small at the present time, the potential does exist. The ability to serve a given market depends more on the location and development of feeding and slaughter components of the industry than on the location of primary feeder cattle or feed grain production. Through sound expansion of its feeding and slaughter industries, Montana is in a position to competitively obtain a share of this market. Such expansion would increase net returns and stimulate economic growth throughout the state.

THE FEASIBILITY OF COOPERATIVE CATTLE FEEDING
AND SLAUGHTERING IN MONTANA

199

by

ELROY C. McDERMOTT

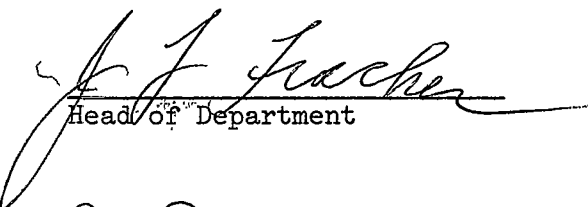
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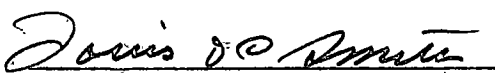
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Approved:


Head of Department


Chairman, Examining Committee


Dean, Graduate Division

Montana State University
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The author assumes sole responsibility for any errors or omissions that may be contained herein.

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ABSTRACT

Montana has experienced a slow rate of economic growth during the past decade. Many suggestions have been made for improving incomes and overall economic activity. Further processing of raw agricultural products within the state is one way in which economic growth can be realized.

Montana exports large quantities of both feed grains and feeder cattle. The combining of these resources through increased cattle feeding has been strongly encouraged. A number of little used or abandoned feedlots, idle as a result of inadequate information, poor analysis, poor planning and hasty action would impede, not stimulate the state's economy, however. The purpose of this study is to determine the feasibility of additional profitable investment in cattle feeding and slaughtering in Montana through cooperative feeding and slaughtering facilities. To facilitate analysis of feasible expansion in greater depth, the Northeast district of the state was selected for detailed study.

It is concluded that opportunities for expansion of feeding and slaughtering do exist in Montana. Feeder cattle and feed grain production are sufficient for approximately an 800 percent increase in cattle feeding over present levels. The lack of other factors, however, such as capital, management and markets were found major obstacles to significant expansion over present levels.

Cooperative feeding operations provide a means to overcome most of these limitations. However, an upper level for profitable increased feeding is dictated by the capacity of slaughter facilities, and market outlets.

Significant expansion of slaughter facilities at this time does not appear warranted until greater year-around supplies of fed cattle are available. The expansion of feeding and slaughtering in many areas is extricably intermingled. A significant expansion of feeding tends to be inhibited by the lack of slaughter facilities, while at the same time, immediate expansion in slaughtering is hindered by the lack of year-around feeding in the area. Simultaneous development through a coordinated feeding and slaughtering enterprise provides one means of solution to this problem. A coordinated cooperative operation is one method by which this could be effectively accomplished. A growing out-of-state market is seen as rapid population expansion continues on the West Coast. While our contribution to this market is relatively small at the present time, the potential does exist. The ability to serve a given market depends more on the location and development of feeding and slaughter components of the industry than on the location of primary feeder cattle or feed grain production. Through sound expansion of its feeding and slaughter industries, Montana is in a position to competitively obtain a share of this market. Such expansion would increase net returns and stimulate economic growth throughout the state.

CHAPTER I

INTRODUCTION

The General Problem Setting

A slow rate of economic growth in Montana over the past decade has called forth an intensive search for ways to enhance economic activity. The social, economic, and political aspects of a slackening economy in the state have been the focus of increasing concern by individuals, groups and local government agencies.

Many suggestions have been made for improving incomes and overall economic activity. One idea suggested has been to speed industrial development as a means of providing more opportunity for surplus and under-employed labor. Another approach would be to increase efficiency and net returns to a given resource base through some type of resource-use adjustment.

Beyond efforts to encourage industrialization and increase efficiency, it seems only natural that attention be directed toward improving the marketing of products produced in the state.

Agriculture continues to be Montana's most important industry and is based primarily upon the production of raw products which leave the state for additional processing. Further processing of these products within the state is one way in which economic growth can be realized.

Montana exports large quantities of both feed grain and feeder cattle. The possibility of fattening more cattle within the state has received considerable attention in recent years. Studies made to determine the

feasibility of additional cattle feeding have usually indicated opportunities do exist but due to lack of know-how, financial resources or fat-cattle markets, development is proceeding slowly.

The Research Problem

This study is designed to examine the feasibility of additional cattle feeding and slaughtering in Montana. Particular attention is given to the cooperative form of organization, and the contribution it might provide in bringing about such expansion. Other methods of operation may prove equally successful but will not be analyzed in this study.

An analysis of the availability of those resources necessary to expansion of feeding and slaughtering must first be made to see if they do, in fact, exist in sufficient quantities to allow for significant expansion. The mere availability of these resources does not insure the feasibility of expansion, however.

Before individuals or groups move too far in encouraging the building of large new feedlots or slaughtering facilities, additional information is needed regarding conditions under which these feeding and slaughtering facilities might become established and be reasonably sure of survival. A number of little used or abandoned feedlots and slaughter plants, idle as a result of inadequate information, poor analysis, poor planning and hasty action would impede, not stimulate, the state's economy. Further analysis is necessary to determine both the existence and significance of other factors that would tend to inhibit increased levels of feeding and slaughtering in the state. Such factors must be considered as the availability of markets, capital, labor and skilled management; freight rate structures for both live and carcass beef, cost of operation, the attitudinal structure of those involved and areas for most opportune expansion. This research attempts to isolate those factors which impede

the immediate expansion of feeding and slaughter and evaluate the effectiveness of cooperatives as a means of overcoming them.

This study examines a specific area of the state referred to as the Northeast district. This includes the following eight counties: Daniels, Dawson, Garfield, McCone, Richland, Roosevelt, Sheridan and Valley. Inferences are drawn from this analysis and applied to the entire state. The availability of some state-wide data has served to add more validity to these inferences.

Objectives

The purpose of this study is to determine the feasibility of additional profitable investment in cattle feeding and slaughtering in Montana through cooperative feeding and slaughter facilities. Although much of the analysis is centered in the Northeast district, it is believed to be applicable throughout the entire state. Whether or not expansion is feasible, and the manner in which such expansion should take place rests on several vital considerations.

Specifically, the research objectives are:

1. Evaluate the availability of those resources required for a significant expansion of cattle feeding and slaughtering in Montana.
2. Evaluate present and potential markets for Montana fed cattle and meat, and make analysis and comparison of the transportation cost structure to alternative markets for both live and carcass beef. Determination will also be made of the state's competitive position in achieving new markets.
3. Determine the most feasible size of feedlot and slaughtering facilities for the state and make recommendations as to the most suitable areas for expansion.

4. Analyze the opportunities for feasible expansion through the cooperative form of organization and consider the location, distribution and size of feedlots necessary to support a cooperative slaughter facility in the state.
5. Estimate and project increased benefits that would accrue as a result of expanded cooperative cattle feeding and slaughtering in Montana.

Procedure

Selection of Study Area

The Northeast district was selected as the specific area to be studied. By limiting the analysis to a particular area, examination of the feasibility of feeding and slaughter expansion is permitted in greater depth than would otherwise be possible. Initial interest in the feasibility of cooperatively owned feeding and slaughtering facilities was expressed by feed and livestock producers and business interests in this area. Realizing that their area normally produces a surplus of feed grains and feeder cattle, these individuals desired to expand local industry through further processing and utilization of their agriculture production. It was largely a result of this expressed interest that this particular area was chosen. This study serves to test the hypothesis that a potential for increased feeding and slaughter does, in fact exist, and that such expansion may be facilitated through the cooperative form of operation. This is an established feeding area and is the second largest feed grain producing area of the state. Large quantities of both feeder cattle and feed grains are shipped out of the area each year.

Source of Data

Data used in determining the feasibility of expanded feeding and slaughtering for both the area and the state have been developed largely through the use of secondary sources. However, analysis of many factors associated directly with the study area required information from individuals in the area. To meet these data needs personal interviews were conducted.

General Procedure

The research approach taken in this study differs somewhat from the methodological approach normally utilized in determining the feasibility of further resource development.

The conventional approach would involve thorough evaluation of all resources in the area, both natural and human, as well as climatic conditions, markets, availability of capital, transportation facilities, etc. Examination of such factors would indicate those industries that would be most applicable to an area and establish limitations as to the particular industries in which growth and development could take place. Economic analysis is then made of each of these to determine their relative priority for development or expansion. Ranking is not always based upon relative net returns per dollar invested according to the usual investment criteria, however. Priority would normally be affected and often resolved on the basis of a comparative appraisal of the strength with which development in one industry will induce development in others. In determining the

sequence of development projects, planning authorities would usually give attention to the induced investment creating ability of particular industries.

In contrast, this study resulted from a request to study one industry, cattle feeding per se, in a given area, and therefore approaches the usual method in a somewhat reverse manner. We were also requested to analyze opportunities for expansion of slaughtering facilities in the Northeast area.

The scope of this study was limited by cost, time and personnel considerations. It was determined that it would be more meaningful, in view of the stated limitations, to proceed on the basis of selective sampling. Individuals to be interviewed were selected largely on the basis of being in some way connected with the livestock industry, and their ability to provide information regarding those factors to be considered in determining the feasibility of expanded feeding and slaughtering. Included in the interviews were county agents, farmers, ranchers, feeders, packers, bankers, merchants, Chambers of Commerce leaders, freight rate agents, cooperative managers and members and livestock auction operators.

On the basis of data collected through these interviews and from secondary sources, this report first attempts to evaluate the economic potential of expanded livestock feeding and slaughtering in Northeastern Montana and then to extend the overall analysis to other areas of the state.

CHAPTER II

OPPORTUNITIES FOR EXPANDED CATTLE FEEDING AND SLAUGHTERING IN MONTANA

Montana Cattle Industry

Approximately 65 percent of the land surface in Montana is considered to be pasture or rangeland. ^{1/} These lands amount to 61 million acres and provide the basis for an extensive beef cattle industry.

Cattle and calf sales compete with wheat for first place in agricultural receipts (Table I). Total cattle and calf numbers on Montana farms and ranches reached an all-time high of 2.76 million head January 1, 1965. This is an increase of 3.2 percent over 1964 and up 18.7 percent from 1963. However, cash receipts from cattle and calf sales decreased both in absolute dollar figures and in relative percentage of total farm receipts between 1961 and 1963. Beef cattle numbers, cash receipts and out-of-state shipments for 1950-1964 are shown in Table II. Both the increase in numbers and lowering of cash receipts have been closely tied to low cattle prices.

Other factors contributing to the build-up in numbers were plentiful supplies of feed, larger calf crops and increased cattle imports into the state. The bulk of the inventory increase has been calves, although substantial increases in cow and heifer numbers have also occurred.

^{1/} Montana Agriculture--Basic Facts, Bulletin 293, Cooperative Extension Service and Agriculture Experiment Station, Montana State College, Bozeman, Montana, June, 1962.

The success of the Montana cattle industry depends on out-of-state demand for its feeder cattle. Annual out-of-state shipments averaged over one million head from 1956 through 1961, then declined to 977 thousand in 1962 and continued to decrease to 881 thousand head in 1963. This decrease in out-of-state shipments resulted from the large increase in numbers held within the state during this period. In 1964, out-of-state shipments increased to 1,094 thousand head.

During the past two decades the flow of out-of-state shipments has shifted from westward to eastward. The destination and number of out-of-state cattle shipments for 1961-1964 are presented in Table III. Where West Coast states were taking over 65 percent 15 years ago, they were taking only 9 percent in 1959 and 8 percent in 1964. On the other hand, approximately 65 percent are now going to six Midwest states. Iowa alone received 28.9 percent of total out-of-state shipments in 1964, followed by Minnesota with 12.1 percent, Illinois with 10.2 percent and Nebraska with 9.1 percent.

The makeup of out-of-state shipments has changed considerably during the last three decades. Records show that during the period of the early thirties, over one half of total out-of-state shipments consisted of steers, while approximately 37 percent were cows and only 11 percent were calves.

In 1962, calves accounted for over 47 percent of total shipments, followed by yearling steers at 26.4 percent, cows at 13.8, yearling heifers at 11.1 and bulls running at only 1.4 percent. In 1964 the breakdown was 42 percent calves, 33 percent steers, 12 percent cows, 11 percent heifers and 1 percent bulls.

TABLE I. CASH RECEIPTS FROM FARM MARKETINGS, BY COMMODITIES, AS A PERCENTAGE OF TOTAL RECEIPTS FOR ALL COMMODITIES--1958-1963.*

Commodities	1958	1959	1960	1961	1962	1963
Percent of Total						
Livestock and Products	52.6	52.6	54.5	58.4	50.7	46.0
Cattle and calves	41.3	40.5	42.9	44.8	38.6	34.0
Dairy products	3.5	3.5	3.4	3.9	3.4	3.5
Sheep and lambs	3.3	3.1	3.2	3.3	2.9	2.7
Wool	1.0	2.0	1.7	1.9	1.6	1.8
Hogs	1.6	1.6	1.6	2.4	2.3	2.1
Eggs	1.3	1.3	1.2	1.5	1.3	1.3
Chickens	.2	.1	.1	.1	.1	.1
Other	.4	.5	.4	.5	.5	.5
Crops	47.4	47.4	45.5	41.6	49.3	54.0
Wheat	33.1	34.2	32.6	28.8	35.2	39.0
Barley	7.5	6.0	5.4	4.7	6.6	6.2
Sugar beets	2.7	2.3	2.6	2.8	2.8	3.8
Hay	1.1	1.6	1.6	1.6	1.6	1.5
Potatoes	.7	.6	.7	.8	.5	.6
Other	2.3	2.7	2.6	2.9	2.6	2.9
All Commodities	100.0	100.0	100.0	100.0	100.0	100.0

* Source: Statistical Reporting Service, United States Department of Agriculture, Helena, Montana. (1964 figures not available.)

TABLE II. MONTANA CATTLE AND CALVES--PRODUCTION, INCOME AND OUT-OF-STATE SHIPMENTS, 1950 TO 1964. *

Year	Cash Income Mil. Dol.	Production Pounds Mil. Lbs.	Calf Crop Thous. Hd	Beef Cattle Population Thous. Hd.	Out-of-State Shipments Number Thous.
1950	112	528	811	1,533	598 <u>a/</u>
1951	169	629	872	1,696	658 <u>a/</u>
1952	129	657	923	1,892	733 <u>a/</u>
1953	90	703	1,044	1,984	780 <u>a/</u>
1954	108	770	1,089	2,131	855 <u>a/</u>
1955	110	793	1,117	2,229	897 <u>a/</u>
1956	133	794	1,111	2,282	1,308
1957	137	740	1,060	2,072	1,120
1958	181	748	1,069	2,033	1,086
1959	172	740	1,063	2,063	1,069
1960	175	788	1,081	2,113	1,228
1961	162	728	1,105	2,028	1,202
1962	157	727	1,112	1,990	977
1963	137	806	1,183	2,212	881
1964	<u>b/</u>	<u>b/</u>	1,211	2,563	1,094

* Source: Statistical Reporting Service, U. S. Department of Agriculture, Helena, Montana.

a/ Estimated on basis of inventory births, farm and commercial slaughter in shipments and deaths.

b/ Unavailable.

TABLE III. CATTLE SHIPMENTS OUT-OF-STATE, NUMBER OF HEAD AND PERCENTAGES
BY STATE OF DESTINATION, 1961-1964. *

Destination	1961		1962		1963		1964	
	No.of Head	Pct.of Total	No.of Head	Pct.of Total	No.of Head	Pct.of Total	No.of Head	Pct.of Total
Midwest, total	705,961	58.7	623,152	63.8	531,046	60.2	714,134	65.4
Iowa	256,198	21.3	259,537	26.6	227,433	25.8	315,534	28.9
Minnesota	131,029	10.9	129,655	13.3	102,240	11.6	132,537	12.1
Illinois	116,805	9.7	111,949	11.5	94,411	10.7	111,118	10.2
Nebraska	126,989	10.5	86,239	8.8	67,690	7.7	99,637	9.1
Wisconsin	37,922	3.2	24,484	2.5	29,473	3.3	46,709	4.3
Kansas	37,018	3.1	11,288	1.1	9,799	1.1	8,599	.8
Bordering states, Total	295,092	24.5	232,041	23.7	229,228	26.0	236,414	21.6
South Dakota	108,230	9.0	70,084	7.2	61,593	7.0	75,852	6.9
Wyoming	76,013	6.3	68,940	7.0	74,220	8.4	73,451	6.7
Idaho	66,654	5.5	54,877	5.6	47,697	5.4	40,942	3.8
North Dakota	44,195	3.7	38,140	3.9	45,718	5.2	46,169	4.2
West Coast, Total	87,204	7.3	76,897	6.7	73,705	8.4	86,015	7.8
Washington	46,118	3.8	49,037	5.0	54,691	6.2	62,743	5.7
California	32,122	2.7	12,514	1.3	12,404	1.4	15,387	1.4
Oregon	8,964	.8	4,346	.4	6,610	.8	7,885	.7
Other states, Total	113,636	9.5	56,316	5.8	47,213	5.4	57,202	5.2
Colorado	49,448	4.1	30,094	3.1	27,310	3.1	29,546	2.7
Utah	10,709	.9	10,565	1.1	9,270	1.0	13,542	1.2
Texas	22,327	1.9	1,962	.2	484	.1	241	--
Michigan	3,898	.3	3,175	.3	2,926	.3	4,281	.4
Ohio	1,336	.1	774	.1	661	.1	861	.1
Missouri	7,742	.7	740	.1	415	.1	2,631	.2
Arizona	1,307	.1	314	.0	450	.1	373	.1
All Other	16,869	1.4	8,692	.9	5,697	.6	5,727	.5
Total	1,201,893	100.0	977,406	100.0	881,192	100.1	1,093,765	100.0

* Source: Statistical Reporting Service, U. S. Department of Agriculture,
Helena, Montana.

Seasonal variation in out-of-state cattle shipments is great. In Table IV, the average monthly variation is shown for the period 1958-1962.

Indications are that the Midwest will continue to be Montana's top feeder market. As a rule, feeder cattle come off the range at just the right time to fill the needs of the corn belt feeder. This, together with their proven ability to put on fast gains in the feedlot, helps maintain the brisk demand for Montana feeder cattle.

Present Level of Cattle Feeding in Montana

The cattle feeding industry in Montana has not experienced rapid growth through the years, though the trend has been one of gradual increase. Table V gives a comparison of the number of cattle on feed, as of January 1, for the years 1948-1965. On January 1, 1965 the number on feed reached 95,000 head, highest on record for the state. This compares with 85,000 on feed January 1, 1964 and the 1958-63 average of 72,000 head. The number of fat cattle moving from feedyards during the period from January 1, 1959 through 1964 is shown in Table VI. The total number of cattle fattened in the state set a new high of approximately 128,000 in 1964.

In Table VII, cattle and calves on feed are listed by class and size. Of the 95,000 head on feed January 1, 1965, 61 percent were steers and steer calves, 35 percent were heifers and heifer calves and 4 percent were listed as "cows and other". Steers and steer calves have consistently comprised over 50 percent of the total number fed. Only at the beginning of the first quarter has there been a significant number on

feed weighing less than 500 pounds, these being spring calves which are put into the feedlot shortly after weaning. Since these calves are not placed in the feedlot until after the beginning of the fourth quarter, they do not show up in Table VII as being on feed until the beginning of the first quarter.

It is difficult to determine the exact number of feedlots operating within the state at a given time. Some feeders may feed out only two or three lots in a 5-year period while others are regular feeders but only feed 10 to 25 head at a time. Some "warm-up" operations also consider and report themselves to be feedlots.

Data are not available as to the approximate number of feedlots nor the annual number of cattle fed in each individual crop reporting district since 1961. There has been some combining of district totals since that time so as not to reveal individual operations where the number of large feeders are small. On January 1, 1964, the Southcentral district (Billings) was reported to have 28,000 head of cattle on feed. This was 1,000 more than a year earlier. Districts 2 and 5 (mainly the Great Falls area) had a total of 26,000 head or 3,000 more than the previous year. In the other feeding areas, which include the eastern third and western part of the state, there were 24,000 head on feed compared with 21,000 a year earlier. This total of 78,000 head was later revised to 84,000 head.^{2/}

^{2/} Montana Department of Agriculture, Statistical Reporting Service, Helena, Montana.

TABLE IV. SEASONAL VARIATION OF OUT-OF-STATE CATTLE SHIPMENTS--AVERAGE OF 1958 TO 1962. *

Month	Percent of Annual Shipment				
	All Cattle	Steers	Heifers	Cows	Calves
January	5.1	3.5	3.3	7.9	4.3
February	2.8	2.6	2.8	5.4	1.8
March	3.6	4.2	5.4	4.7	2.1
April	3.5	5.5	7.5	3.3	1.5
May	2.2	3.3	4.2	4.3	.6
June	2.4	2.4	3.0	6.9	.7
July	3.7	3.6	5.0	9.5	.9
August	6.2	8.9	10.8	10.4	2.1
September	14.1	26.0	27.6	9.0	4.6
October	32.2	28.6	18.5	13.8	47.5
November	18.4	8.4	8.8	15.3	26.7
December	5.8	3.0	3.1	9.5	7.2
Total	100.0	100.0	100.0	100.9	100.0
Average Numbers	1,113,000	271,000	118,057	134,183	424,000

* Source: Clive R. Harston and Elmer L. Menzie, Montana Cattle Movements, Montana State College, Montana Agricultural Experiment Station, Bozeman, Montana.

TABLE V. CATTLE AND CALVES ON FEED IN MONTANA, JANUARY 1, 1948-1965. *

Year	No. (000)	Pct. of Previous Year	Year	No. (000)	Pct. of Previous Year
1948	35	73	1957	75	110
1949	38	109	1958	73	97
1950	25	66	1959	72	99
1951	26	104	1960	70	97
1952	32	123	1961	77	110
1953	45	141	1962	69	90
1954	54	120	1963	71	103
1955	49	91	1964	85	120
1956	68	139	1965	95	112

* Source: Statistical Reporting Service, U. S. Department of Agriculture, Helena, Montana

TABLE VI. NUMBER OF FED CATTLE MARKETED, BY QUARTERS, 1959-1964. *

Quarter	1959 (000)	1960 (000)	1961 (000)	1962 (000)	1963 (000)	1964 (000)
1st	39	34	34	35	28	35
2nd	28	30	29	27	32	44
3rd	17	28	28	23	20	26
4th	15	23	22	15	20	23
Total	99	115	113	100	100	128

* Source: Statistical Reporting Service, U. S. Department of Agriculture, Helena, Montana

TABLE VII. CATTLE AND CALVES ON FEED IN MONTANA, BY QUARTERS, JANUARY 1, 1963-JANUARY 1, 1965. *

	Jan.1 1963	April 1 1963	July 1 1963	Oct.1 1963	Jan. 1 1964	April 1 1964	July 1 1964	Oct.1 1964	Jan.1 1965
	Thousand Head								
Total number on feed	71	56	34	37	85	73	44	50	95
Placed on feed <u>a/</u>	59	13	10	23	66	23	15	32	68
Marketed <u>a/</u>	15	28	32	20	18	35	44	26	23
Number on feed by kind and weight.									
Steers and steer calves	36	29	18	19	52	40	25	29	58
Under 500 pounds	6	2	--	--	10	1	--	--	8
500-699 pounds	7	9	2	4	10	16	2	5	13
700-899 pounds	12	6	8	8	23	8	12	13	17
900-1099 pounds	9	8	6	7	7	12	8	10	15
1100-pounds and over	2	4	2	--	2	3	3	1	5
Heifers and heifer calves	30	25	16	18	31	31	19	20	33
Under 500 pounds	9	2	--	--	6	4	--	--	6
500-699 pounds	10	10	3	7	10	13	5	8	9
700-899 pounds	9	8	9	8	12	8	11	8	13
900-1099 pounds	2	5	4	3	3	6	3	4	5
1100 pounds and over	--	--	--	--	--	--	--	--	--
Cows and other	5	2	--	--	2	2	--	1	4
Length of time on feed beginning each quarter									
Less than 3 months	59	13	9	23	66	23	15	31	68
3 to 6 months	10	39	11	9	17	47	16	13	26
More than 6 months	2	4	14	5	2	3	13	6	1

* Source: Statistical Reporting Service, U. S. Department of Agriculture, Helena, Mont.

a/ For the three months preceding date shown.

The feeding industry is particularly well established in the South-central district. On January 1, 1964, 36 percent of the state's total number on feed were being fed in this district. Concentrated in this district, particularly in the area of Billings, are the largest cattle feeding operations between Minnesota and North Pacific Coast. ^{3/} Between 35,000 and 50,000 head are fattened annually in this area, mostly in commercial feedlots.

On January 1, 1961 there were approximately 602 feedlots operating within the state. These are broken down by crop reporting district according to the number of head on feed and presented in Table VIII. At that time, 386 or 64 percent of the feedlots had less than 100 head on feed, with 84 percent having less than 200 head and 92 percent ranging below the 300 head level. There were only eight feedlots reporting more than 1,000 head, with seven of these being near Billings, in the Southcentral district. Only three of these lots had over 2,000 head on feed. One lot had between 2,000 and 2,999 while the other two had between 3,000 and 3,999 head. There were no feedlots reporting more than 4,000 head on feed at the beginning of the first quarter in 1961. Figure 1 shows the area of the state included in each district and the number of feedlots in each, as reported in 1961.

^{3/} "The Northwest and Its Resources", Vol. XXXVI, Northern Pacific Railway Company, St. Paul, Minnesota, November-December, 1962.

TABLE VIII. NUMBER OF FEEDLOTS IN MONTANA, BY CROP REPORTING DISTRICTS, ACCORDING TO NUMBERS OF HEAD ON FEED, JANUARY 1, 1961. *

District	1 to 49	50 to 99	100 to 199	200 to 299	300 to 399	400 to 499	500 to 999	1000 to 1999	2000 to 2999	3000 to 3999	Total
Northwest	24	15	5	4	--	1	--	--	--	--	49
North- central	50	48	24	6	--	2	3	--	--	--	133
Northeast	44	39	35	11	--	2	2	--	--	--	133
Central	15	18	9	6	6	2	4	1	--	--	61
Southwest	2	9	4	--	1	1	3	--	--	--	20
South- central	43	54	37	18	3	8	4	4	1	2	174
Southeast	14	11	5	1	1	--	--	--	--	--	32
Total	192	194	119	46	11	16	16	5	1	2	602

* Source: C. A. Infanger, et. al., The Economics of Cattle Feeding, Cooperative Extension Service, Special Report No. 1, Montana State College, Bozeman, Montana, September, 1961. Data obtained from USDA, AMS, Helena, Montana.

The total number fed in 1964 increased approximately 15,000 over the 1961 level, but there does not appear to have been a significant change in the number of feedlots throughout the state since that time. There were approximately 600 feedlots in operation on January 1, 1964, 574 of which were under 1,000 head capacity and 26 that had capacity in excess of 1,000 head. 4/

Cattle feeding in Montana is highly seasonal. In 1962, for example, the number onfeed dropped from 69,000 on January 1, to 27,000 head on October 1. This is primarily the result of (1) the present seasonal pattern of feeder cattle marketing within the state, and (2) the large number of feeders who feed only one lot of cattle per year.

Meat Packing in Montana

In 1963 there were 63 licensed slaughtering firms in Montana. 5/ These firms are well dispersed throughout the state. The location and size of these firms are shown in Figure 2. These firms vary in size from the very small plants which often kill less than five head of cattle per week to the large plants that average from 100 to 400 head per week.

4/ "Cattle on Feed", Statistical Reporting Service, United State Department of Agriculture, Washington, D. C., January 17, 1964.

5/ Montana Crop and Livestock Reporting Service, Helena, Montana

For purposes of analysis, these firms are divided into four general groups. The first group consists of those plants which have federal inspection. These are the only plants in Montana that can participate in interstate trade. To qualify for federal inspection, plants must slaughter over two million pounds liveweight annually. In 1963, Montana had four federally-inspected slaughter plants, two of these being in Great Falls and the other two in Billings. The second group consists of 12 firms which also slaughter over two million pounds liveweight annually but do not have federal inspection. These firms will be referred to as medium plants. The third group is made up of 20 small plants which slaughter over 300,000 pounds but less than two million pounds liveweight annually. These slaughtering firms shall be defined as small plants. The remaining 27 firms make up the fourth group and will be termed local plants. They each slaughter less than 300,000 pounds liveweight annually.

The total dressed weight of livestock slaughtered in Montana has been increasing through the years, with the 1964 total of 125.4 million pounds dressed weight exceeding that of any previous year. The number and average weight of livestock slaughtered in Montana from 1961 through 1964 is presented by specie in Table IX.

In this dynamic era of rapidly changing technology, the packing industry must look to and prepare for the future. Progressive management is a must if Montana firms hope to meet the keen competition that exists throughout the industry. Remodeling, adjustments and reorganization require additional finances, and in most cases this will mean longer-term

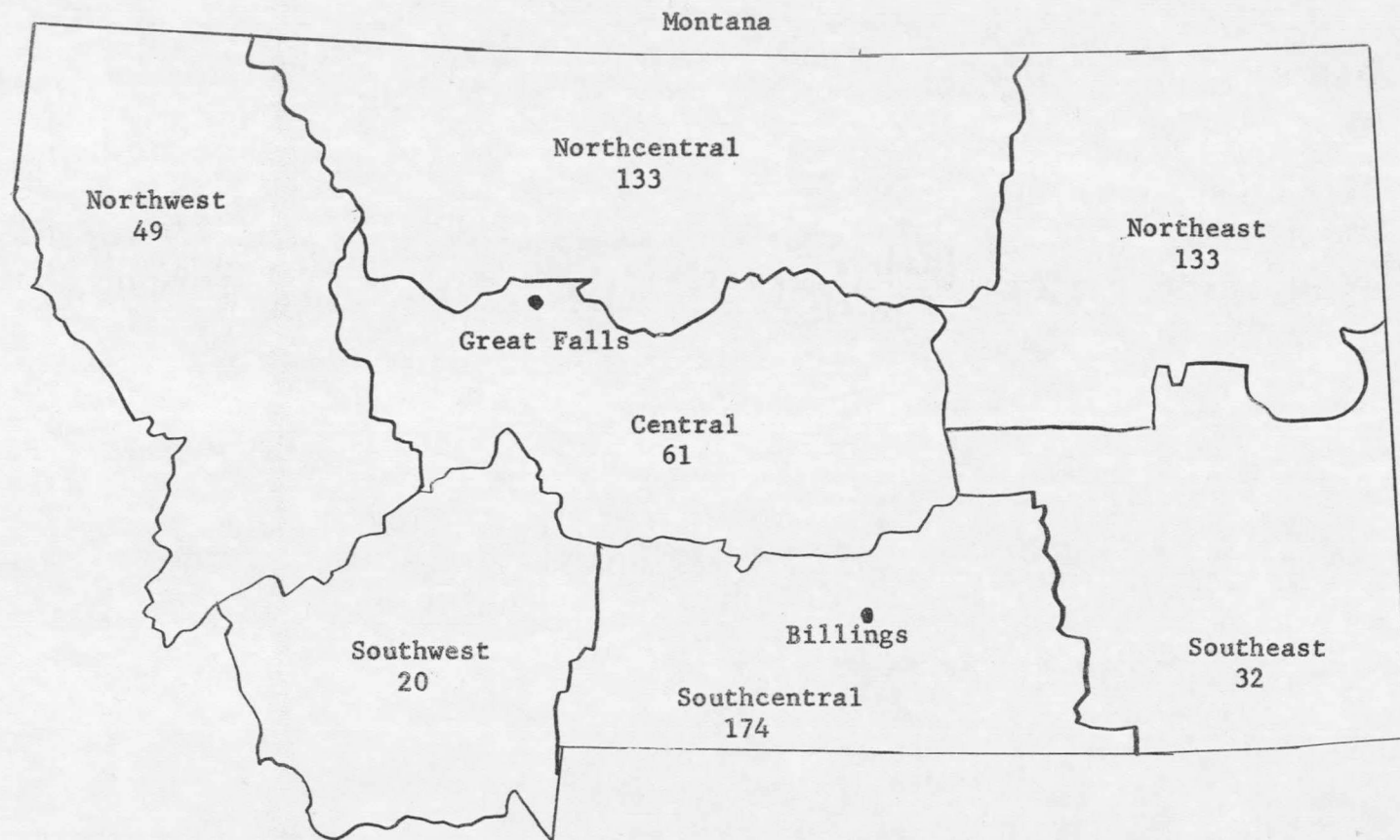


Figure 1. Number of feedlots in Montana by crop reporting districts, January 1, 1961. *

* Source: C. A. Infanger, et. a., The Economics of Cattle Feeding, Cooperative Extension Service, Special Report No.1, Montana State College, Bozeman, Montana, September, 1961. Data obtained from USDA, AMS, Helena, Montana

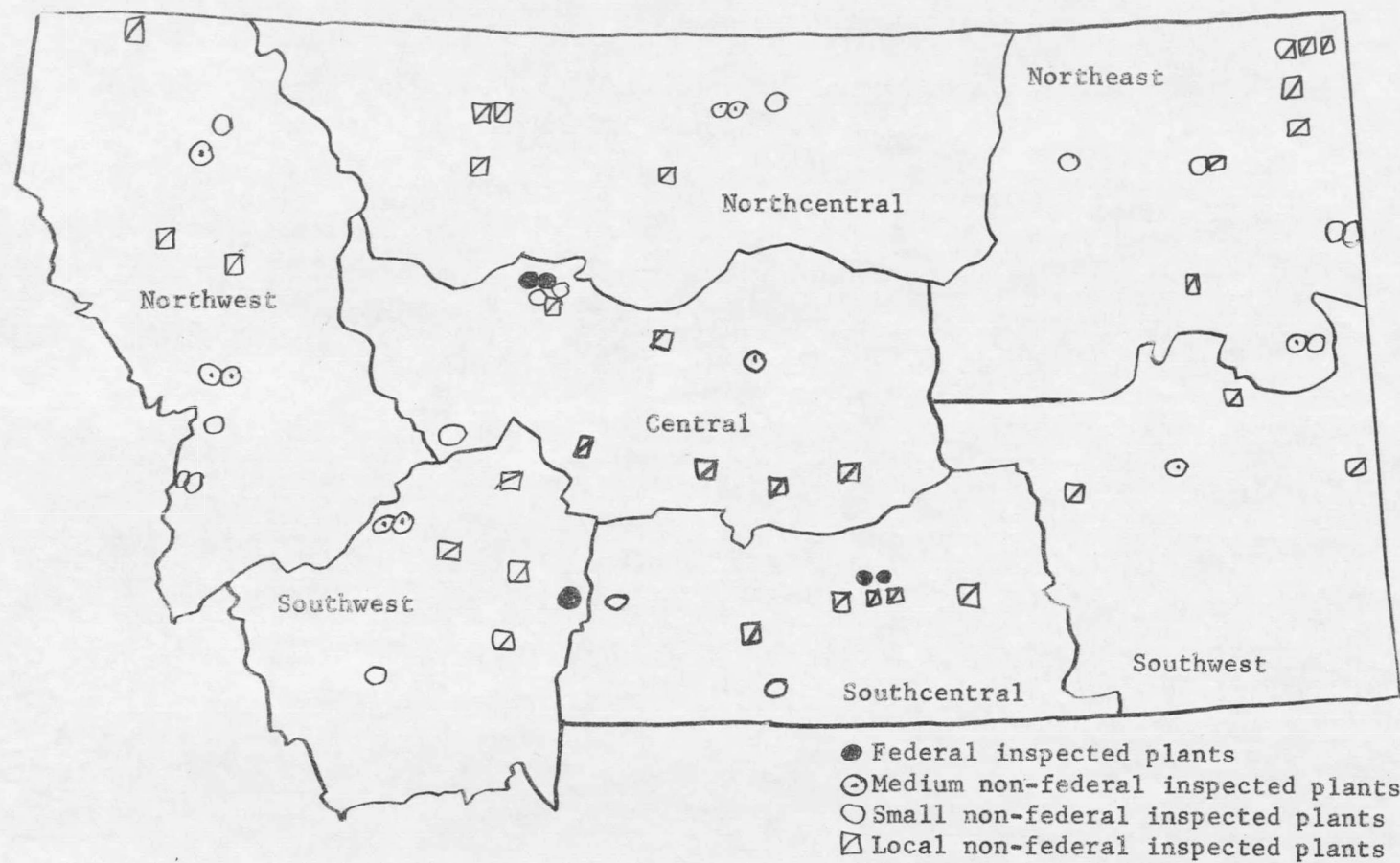


Figure 2. Location and size of meat packing plants in Montana, 1963. *

* Source: Montana Crop and Livestock Reporting Service, Helena, Montana

financing. As these firms face the future, they will find adequate financing and competent management the keys to continued success.

Opportunities for Expanded
Feeding in Montana

Availability of Feeder Cattle and Feed Grains

Numerous and diverse factors affect the development of cattle feeding in the state. However, the availability of sufficient quantities of feeder cattle and feed grains is most basic.

In 1964, Montana had a record calf crop of approximately 1.27 million head, of which approximately 1.2 million were beef calves. In addition to this number, there were approximately 35,000 steer calves of dairy origin. After making proper allowance for beef replacement stock, the number of cattle available for feeding in the state would exceed the number placed in feedlots by approximately 800 percent. This would provide a base for a cattle feeding industry of approximately 1 million head annually.

In addition, Montana has greatly increased its production of feed grains, particularly barley. Acreage, production, price and the total value of barley produced within the state from 1948 through 1964 are shown in Table X. The rapid expansion in barley production since 1954 has made Montana a leading producer of feed grain, with present production being far in excess of local demand.

Barley production for 1960-1964 has averaged 43.3 million bushels. During this period production has exceeded that needed for cattle feeding

TABLE IX. NUMBER AND WEIGHT OF LIVESTOCK SLAUGHTERED IN MONTANA, BY SPECIE,
1961-1964. * a/

Species and Year	Number Slaughtered Thous. Hd.	Average live- weight Pounds	Total Dressed weight b/ Thous. Pounds
Cattle			
1961	100.5	990	54,160
1962	94.4	986	50,993
1963	114.0	1,017	63,508
1964	160.5	1,017	89,526
Calves			
1961	3.2	356	607
1962	2.6	347	474
1963	1.5	339	287
1964	2.1	303	334
Hogs			
1961	255.5	237	34,333
1962	285.4	228	36,942
1963	299.5	226	38,374
1964	275.5	225	35,213
Sheep and Lambs			
1961	8.7	98	417
1962	9.5	100	455
1963	7.7	99	364
1964	6.2	99	302
Total			
1961	367.9		89,546
1962	391.9		88,864
1963	422.5		102,533
1964	444.3		125,381

* Source: Compiled from reports of the Montana Crop and Livestock Reporting Service, Helena, Montana

a/ Does not include farm slaughter.

b/ Derived from liveweight figures using average dressed percentages.

TABLE X. ACREAGE, PRODUCTION, PRICE AND TOTAL VALUE OF MONTANA BARLEY, 1948-1964. *

Year	Acres		Production		Value	
	Planted (000)	Harvested (000)	Yield Per Acre Bushels	Total (000)	Price Per Bu. (\$)	Total Value (\$000)
1948	930	876	29.0	25,404	.97	24,642
1949	614	526	21.0	11,046	.89	9,831
1950	884	852	27.5	23,430	.95	22,258
1951	504	460	27.5	12,650	1.07	13,536
1952	534	474	28.5	13,509	1.22	16,481
1953	582	550	27.0	14,850	1.02	15,147
1954	1,350	1,265	25.0	31,625	.97	30,676
1955	1,404	1,354	30.0	40,620	.77	31,277
1956	1,165	1,043	28.5	29,726	.83	24,673
1957	1,806	1,721	26.5	45,606	.72	32,836
1958	1,680	1,583	34.0	53,822	.75	40,366
1959	1,915	1,852	27.5	50,930	.67	34,123
1960	1,801	1,704	23.5	40,044	.66	26,429
1961	1,801	1,465	18.0	26,370	.85	22,414
1962	1,909	1,802	30.5	54,961	.74	40,671
1963	1,642	1,514	29.5	44,663	.72	32,157
1964	1,626	1,529	33.0	50,457	.77	38,852

* Source: Statistical Reporting Service, U. S. Department of Agriculture, Helena, Montana.

by more than 1000 percent. The bulk of this excess production has either been placed under loan with the Commodity Credit Corporation or shipped out of the state as livestock feed.

With feeder cattle production sufficient to increase feeding eight times its present level and barley production sufficient for ten times the present level of feeding, it becomes readily apparent that the availability of feeder cattle and feed grains are not the important limitations to expanded cattle feeding in Montana.

Feeding Potential by District

Table XI presents a comparison of barley production and cattle and calf numbers by crop reporting district for the seven crop reporting districts of the state. If a concentrate ration, comprising 75 percent barley is fed, then approximately 450 pounds of barley would be required for each 100 pounds of gain. Assuming an average of 400 pounds gain is put on each animal, then the per head barley requirement would be approximately 1800 pounds or 37.5 bushels.

On January 1, 1962, 53 percent of total cattle and calf numbers for the state were beef cows two years old or over. Assuming a corresponding percentage to be representative for each district, it is possible to estimate the number of beef cows, and consequently the number of beef calves in each district. A 90 percent calf crop will be assumed in determining the number of beef calves produced annually. ^{6/} Table XII gives a break-

^{6/} The state average for 1962 was estimated to be 91 percent by the Montana Crop and Livestock Reporting Service.

TABLE XI. MONTANA BARLEY PRODUCTION AND CATTLE AND CALF NUMBERS BY CROP REPORTING DISTRICTS
1961-1964. * a/

District	Barley Prod. (000 Bu.)				Cattle and Calf			
	1961	1962	1963	1964 b/	1961	1962	1963	1964
			Bu. (000)		No.	No.	No.	No.
Northwest	1,758	2,157	2,440	2,210	249,400	264,400	275,000	299,800
Northcentral	15,361	23,906	18,089	26,654	357,300	346,800	367,600	411,700
Northeast	2,491	12,410	10,000	9,393	265,600	260,300	306,700	371,100
Central	2,887	7,675	6,236	5,321	417,500	391,900	431,100	491,500
Southwest	1,367	2,143	2,029	1,678	257,000	272,200	283,000	322,600
Southcentral	2,235	4,985	4,096	3,775	332,400	345,300	359,300	416,600
Southeast	271	1,687	1,673	1,426	275,800	252,100	302,500	360,700
Total	26,370	54,963	44,663	50,457	2,155,000	2,133,000	2,325,000	2,674,000

* Source: Statistical Reporting Service, U. S. Department of Agriculture, Helena, Montana

a/ Cattle and calf numbers as of January 1.

b/ Preliminary figures.

TABLE XII. MONTANA CATTLE FEEDING POTENTIAL, BY DISTRICT, BASED ON BARLEY AND FEEDER CATTLE PRODUCTION FOR 1962. *

District	Number of cattle that could be fed with barley produced in each area	# of beef calves born in each area	No. fed in 1962 a/	Number fed as a percentage of column No. 1	Number fed as a percentage of column No. 2
Northwest	57,520	123,734	3,700	6.4	3.0
Northcentral	637,490	164,183	20,000	3.1	12.2
Northeast	330,930	122,875	23,000	7.0	18.7
Central	204,670	186,221	28,800	14.1	15.5
Southwest	57,150	128,695	1,000	1.7	.8
Southcentral	132,930	163,325	21,300	16.0	13.0
Southeast	44,610	118,391	1,500	3.4	1.3
Totals	1,465,300	1,007,424	100,000	6.8	9.9

* Source: Derived from data supplied by Montana Department of Agriculture, Statistical Reporting Service, Helena, Montana

a/ Estimated on basis of an unpublished survey of cattle feeding operations made by FERD, ERS, 1962.

down by district of the approximate number of cattle fed and the feeding potential based upon barley and beef calves produced in each area for 1962.

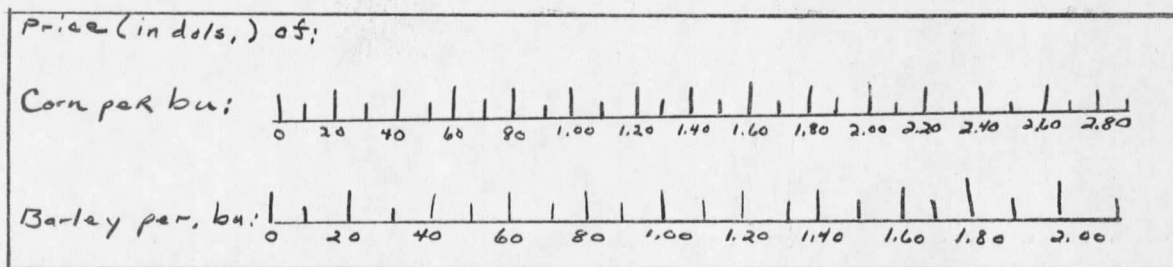
Each of the seven districts in the state has sufficient production of feed grain and feeder cattle to greatly expand cattle feeding operations. The Northeast and Northcentral districts indicate greatest possibilities for feeding expansion, followed by the Central and Southcentral districts. Even in the three districts where feed grain production is limited, there are sufficient quantities produced to greatly expand feeding over its present low level.

The price of barley in Montana not only varies from year to year, but from one district to another. The production, price per bushel, and total value of Montana barley are presented by district for 1962 and 1963 in Table XIII. Barley prices in the Northwest and Southwest districts usually run 10 to 15 cents above the state average while the average price in the Northeast district is usually about 8 cents below the state average, as was the case in both 1962 and 1963. This could cause a difference in feeding costs of as high as \$7.00 a head. This adds to the position of the Northeast district as an area for expanded feeding. The cost of barley in the Northcentral district is usually close to the state average.

The cost of the feed constituting the basic ration is vitally important in determining the economic feasibility of feeding beef. The feed value of barley has been estimated to be 88 percent of the feed value of corn for fattening beef cattle. On the basis of this relationship, as

well as the different bushel weights, a feed grain substitution scale, as shown below, can be prepared, whereby the value of barley can be determined under various corn price situations. ^{7/}

Feed Grain Substitution Scale



The average price of barley in Montana for 1960-1963 was 74 cents per bushel, while corn averaged approximately \$1.10 per bushel in the Corn Belt during the same period. Assuming all other things were equal, it was more profitable to feed barley in Montana than corn in the Corn Belt by approximately 10 cents per bushel.

This analysis suggests that the feeder in Montana would be obtaining cheaper gains than the Corn Belt feeder by approximately 10 cents per bushel of grain fed. In addition, barley is superior to corn in rations that require additional protein. Barley averages approximately 9.3 percent digestible protein compared to an average of 7.3 for No. 1 dent corn. ^{8/} The barley produced in the state is of excellent quality, averaging between 12 and 14 percent protein.

^{7/} Leonard W. Schruben and R. E. Clifton, Grain Substitution in Feeding Livestock, Agricultural Experiment Station, Kansas State College, Cir. 299, July, 1953.

^{8/} F. B. Morrison, Feeds and Feeding, Twentieth Edition, The Morrison Publishing Company, Ithaca, New York, pp. 976-980.

TABLE XIII. MONTANA BARLEY PRODUCTION, PRICE AND VALUE, BY DISTRICT, 1962-1963. * a/

District	Production		Price Per Bushel		Value	
	1962 (000 bu)	1963 (000 bu)	1962 (dol)	1963 (dol)	1962 (000 dol)	1963 (000dol)
Northwest	2,156.6	2,440.2	.90	.82	1,938.3	2,009.0
Northcentral	23,905.8	18,089.7	.74	.72	17,667.6	12,982.9
Northeast	12,409.5	10,099.5	.66	.64	8,221.2	6,437.7
Central	7,674.9	6,235.9	.75	.74	5,736.8	4,614.1
Southwest	2,142.6	2,028.9	.84	.83	1,793.1	1,688.2
Southcentral	4,984.7	4,095.6	.82	.80	4,094.6	3,264.1
Southeast	1,686.0	1,673.2	.72	.69	1,219.4	1,161.0
Total	54,960.1	44,663.0	.74	.72	40,671.0	32,157.0

* Source: Statistical Reporting Service, U. S. Department of Agriculture, Helena, Montana

a/ Figures for 1964 not available.

Opportunities for expanded feeding in Montana then look very favorable from the standpoint of availability of high quality, low cost feed grain supplies and feeder cattle. However, there are indications that a local feeding industry in the state may not utilize to best advantage the quality of feeder cattle produced in the state. Through efficient feeding, a high percentage of the state's feeder cattle production has the proven ability to achieve the top slaughter grades, while the demand locally and on the West Coast is predominantly for a lower grade. Montana feeders are best situated to supply these markets and therefore many of the cattle presently fed within the state tend to run more to the lower grades. The degree of cost differential commanded by top quality feeder animals will determine whether or not the best alternative will be to continue selling these animals to the Corn Belt feeder or to feed them locally. Montana feeders, however, should not overlook the fact that the quality feeder animal will reach the lower grades in shorter time and at less cost. The cost differential between feeder cattle grades will be the determining factor, assuming a continuation of the present feeder cattle demand and consumer preference pattern.

Other resources essential to cattle feeding enterprises include labor, capital, management, and market. There is considerable underemployed farm labor in the state. Capital availability may be a problem in some areas of the state, although there is evidence that increasing numbers of individuals and institutions are becoming interested in investing in cattle feeding operations. Competent management is vitally important to successful

cattle feeding. It is difficult to determine the quantity or quality of management available within the state. There are few men who have had experience in managing large, highly mechanized feeding operations. If expanded feeding in the form of large lots takes place, then skilled management would very likely have to be obtained from outside Montana.

To make a more detailed and meaningful study of the impact availability of these factors will have on feeding expansion, subsequent analysis will be restricted to the Northeastern Crop Reporting District. This area appears to possess the greatest opportunity for expansion on the basis of feed and cattle supplies. The problems facing feeders in this area are indicative of those in other areas of the state, and the majority of findings will have direct application in considering the feasibility of expanded feeding throughout the state.

CHAPTER III

RESOURCES AND OPPORTUNITIES FOR EXPANDED FEEDING IN NORTHEASTERN MONTANA

Area Description

Northeastern Montana, as defined in this study, consists of eight counties, namely: Daniels, Dawson, Garfield, McCone, Richland, Roosevelt, Sheridan and Valley. (Figure 3) Encompassed within the area is the Fort Peck Indian Reservation. The topography of the area is flat to rolling plains, often severely cut by coulees and stream channels. The climate is semi-arid, typical of the Northern Great Plains, of which it is a part. It has a frost-free period of approximately 120 days, running from the middle of May to the middle of September, with an average annual precipitation of approximately 13 inches. High variations in temperature and precipitation are characteristic of this area. Small grains and beef cattle production are the basic agricultural enterprises. Irrigated farming is carried on in the river valleys. With many acres suitable only for grazing purposes, much of the area's agricultural income is derived from the sale of livestock, particularly beef cattle. See Table XIV.

Availability of Livestock and Feed Grain Supplies for Expanded Feeding

Feeder Cattle Production

The total number of cattle and calves in Northeastern Montana reached an all-time high in 1964 with 371,100 head (Figure 6). Though cattle numbers have varied considerably, the general trend has been one of increase.

Cyclical variations in cattle numbers have been more pronounced in the study area than for the state as a whole.

Cattle by Counties

Cattle numbers for 1958-1964 are presented by county in Appendix Table I. Valley County is the area's leading producer of cattle, with over 80,000 head on January 1, 1964. It is followed, in order by Garfield, Richland, Dawson and McCone counties. Total cattle and calf numbers for the 8-county area increased 35 percent during the period, going from 274,200 head in 1958 to 371,100 head in 1964.

In 1964 there were approximately 180,000 beef calves born in the district. An annual production of this amount is sufficient not only to supply needed replacement stock, but to provide the basis for a greatly expanded feeding industry in the area. Less than 20 percent of the feeder cattle produced in the area are presently fed locally. In addition to the cattle raised in the area, large numbers of feeder cattle are brought in from North Dakota to be marketed. This is the case particularly at Sidney and Glendive.

Cattle Movements

The number of cattle moved into and out of each county in the Northeast district for 1964 is shown in Table XV. Richland County not only had the largest number moved out of the county, but also by far the greatest number shipped in; approximately 29,000 compared to 16,000 for the next ranking county. An active livestock auction at Sidney accounts, to a

MONTANA

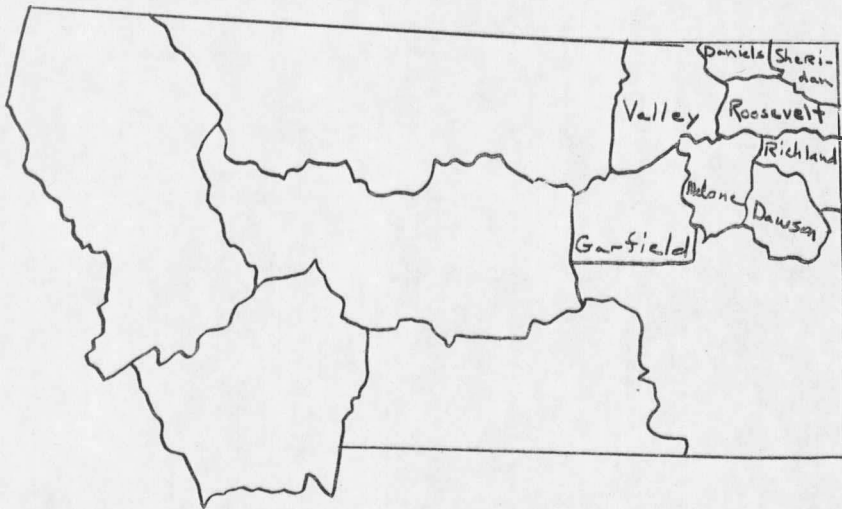


Figure 3. Counties of Northeastern Montana.

TABLE XIV. CASH RECEIPTS FROM SALE OF PRINCIPAL PRODUCTS AND GOVERNMENT PAYMENTS, FOR NORTHEASTERN MONTANA, 1950-1964. *

Year	Crops	Livestock and Livestock Products	Total Receipts From Marketings	Government Payments	All Cash Receipts	Cash Receipts Per Farm
	(000)	(000)	(000)	(000)	(000)	Dollars
1950	58,843	19,790	78,632	1,259	79,892	a/
1951	49,556	25,649	75,206	1,218	76,424	a/
1952	40,551	24,000	64,551	1,218	65,769	9,764
1953	71,072	16,884	87,956	1,032	88,988	13,211
1954	58,166	19,564	77,729	1,021	78,750	11,999
1955	50,924	20,979	71,903	701	72,604	11,187
1956	51,283	26,538	77,821	2,159	79,980	12,043
1957	43,323	27,769	71,092	5,341	76,433	11,714
1958	41,024	32,339	73,364	3,982	77,345	12,688
1959	34,321	24,478	58,799	4,647	63,446	10,631
1960	44,033	23,843	67,876	5,252	73,129	12,272
1961	31,630	26,309	57,939	5,707	63,645	10,815
1962	55,512	23,222	78,734	7,838	86,572	14,898
1963	69,604	22,779	92,383	7,196	99,579	17,360

* Source: Montana Agricultural Statistics, Volumes IV-X, Helena, 1952-1964.

a/ Not available.

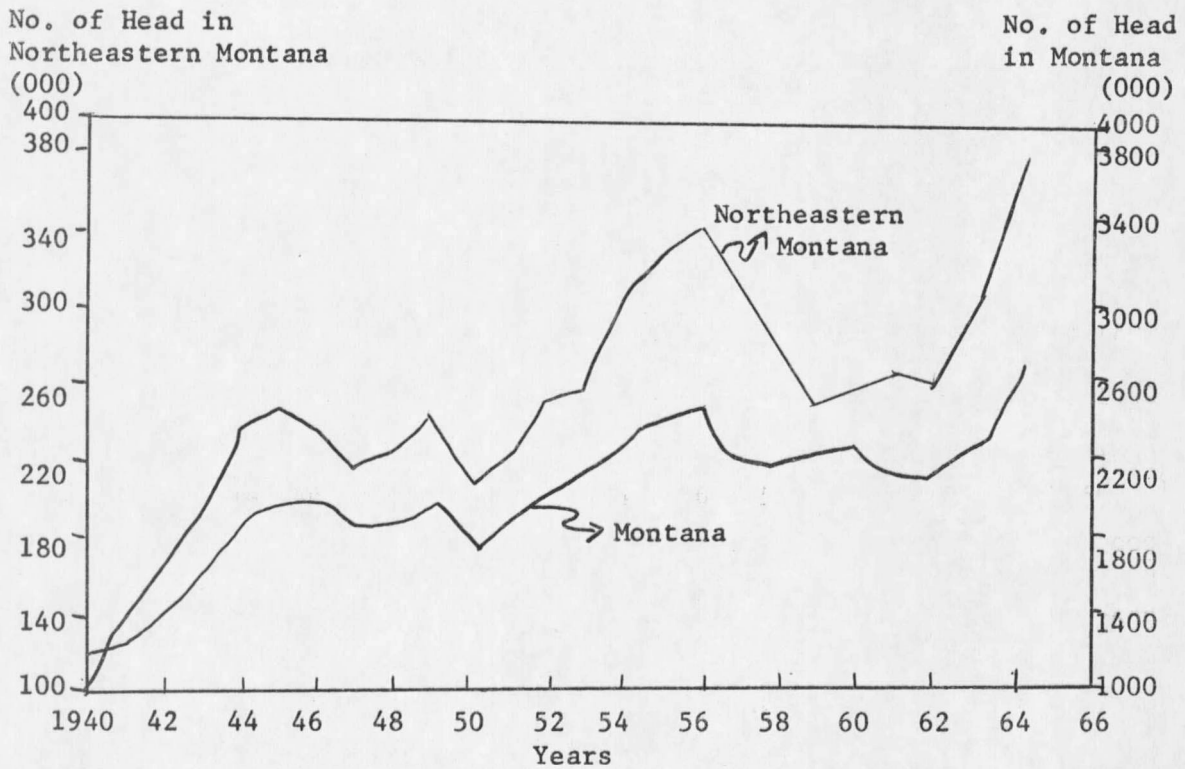


Figure 4. Comparison of cattle and calves' numbers in Northeastern Montana and the entire state, January 1, 1940-1964. *

*Source: Statistical Reporting Service, U. S. Department of Agriculture, Helena, Montana

large extent, for the greater numbers moved into and out of the county. Valley County consistently has the greatest net out-shipment. In 1964 this amounted to over 28,000 head.

In 1962, calves made up 54 percent of out-of-county shipments for the Northeastern area, cows 18 percent, steers 15 percent and heifers 11 percent. In 1963 this had changed somewhat with calves constituting 42 percent, steers 25 percent, cows 15 percent and heifers 14 percent. 9/

A large percentage of the cattle moving out of these counties leave the state. The destination of each county's out-of-state shipments for 1964 is shown in Table XVI. Iowa was the leading buyer, followed by Minnesota, North Dakota and Wisconsin. Daniels County sold approximately 86 percent of its total out-of-state shipments to Iowa buyers. Also finding Iowa their best market were Dawson, Garfield, McCone and Sheridan counties. North Dakota proved to be the best market for Richland County, while Minnesota was the leading out-of-state buyer of Roosevelt county cattle. Valley county shipped equal amounts to both Iowa and Minnesota.

9/ The out-of-county cattle movements, by class, for 1962 and 1964 are presented in Appendix Table II, for each of the counties in the Northeastern area.

TABLE XV. CATTLE MOVEMENTS, NORTHEASTERN MONTANA, NUMBER MOVED OUT OF COUNTY AND INTO COUNTY FOR 1964. *

County	Moved out-of-county			Moved into County				
	Inspected at:			Inspected at:				
	Counry Shipping Points	Markets	Total	Counry Shipping Points	Markets	Imported From Other States	Total	Net Movement Out of County
Daniels	4,376	6,785	11,161	1,099	882	90	2,071	9,090
Dawson	9,479	24,978	34,457	5,179	7,676	1,122	13,977	20,480
Garfield	19,532	11,440	30,972	7,165	1,797	3,192	12,154	18,818
McCone	17,319	7,889	25,208	6,926	2,699	381	10,006	15,202
Richland	5,724	41,096	46,820	3,800	23,011	2,457	29,268	17,552
Roosevelt	19,671	13,766	33,437	10,069	3,808	2,074	15,951	17,486
Sheridan	6,462	9,804	16,266	2,078	1,991	1,982	6,051	10,215
Valley	17,753	23,377	41,130	5,659	6,423	319	12,401	28,729
District Total	100,316	139,135	239,451	41,975	48,287	11,617	101,879	137,572

* Source: Statistical Reporting Service, U. S. Department of Agriculture, Helena, Montana.

TABLE XVI. PROPORTION OF EACH COUNTIES' OUT-OF-STATE SHIPMENTS GOING TO SELECTED STATES, 1964. *

County	Calif.	Colo.	Ill.	Iowa	Kansas	Minn.	N.D.	S.D.	Wash.	Wisc.	Wyo.	Other
Daniels				85.9		9.9	4.2					
Dawson <u>a/</u>	.4	4.8	4.8	29.6		24.0	13.7	6.4	5.6	8.4	.1	2.2
Garfield				29.1	9.6	14.7	.9	.7		19.1	25.9	
McCone	1.5	.3	.8	38.3		22.0	30.3		.3	5.2		1.3
Richland <u>a/</u>	.1	3.9	.9	17.2	.1	23.9	25.4	5.2	11.9	7.6	.4	3.4
Roosevelt			2.5	31.2		52.9	10.7	1.7	.3	.2	.5	
Sheridan			17.1	62.2		9.4	11.3					
Valley <u>a/</u>	.5		5.9	31.6		31.6	5.6	2.3	4.8	16.0	.8	.9
Total	.2	2.2	3.2	28.9	.4	27.3	16.2	3.7	6.4	7.6	1.0	2.9

* Source: Statistical Reporting Service, U. S. Department of Agriculture, Helena, Montana

a/ Includes Auction Yard Sales of Cattle, some of which originated in counties other than the county where the yard is located.

Richland, Dawson and Valley counties had the widest dispersion of out-of-state cattle sales, apparently due to better marketing facilities and ability to attract a more diverse group of prospective buyers.

Fed Cattle Production in the Northeast District

Cattle feeding in Northeastern Montana is located primarily in the irrigated valleys and along the Yellowstone River. The dryland farmers are just becoming interested in feeding prospects.

Current data as to either the number of feeders or the number of cattle on feed for the study area are not available. Figures for 1961 are available, however, and will give an indication as to the structure of cattle feeding in the area. The size and numbers of feedlots in the area, based on numbers on feed on January 1, 1961 were shown in Table VIII. The majority of these feedlots are small on-the-farm feeding operations. One third of these feedlots had less than 50 head, while 83 lots, or 62 percent of the total, had less than 100 head on feed. Eighty nine percent of the feedlots had less than 200 head, while the feedlots with less than 300 head included 97 percent of all feedlots in the area.

There were two feedlots with between 400 and 500 head, and two having between 500 and 1,000 head. There were no lots reporting more than 1,000 head on feed January 1, 1961. In 1963, however, there were two lots with over 1,000 head, and several others that were considering expansion of their present operations. Noticeably missing from the area are large commercial lots, as presently seen near Billings in the Southcentral district.

Most of the feeders handle only one lot of cattle each year. They usually put them in the fields shortly after crops are harvested to clean up the aftermath that would otherwise go unused. They are then put into the feedlot to utilize the feed crops produced on these irrigated farms. These small feeders usually empty their feed yards by the time spring crop work starts. This leads to highly seasonal marketings. As a result, local fat cattle prices tend to decline as these fed cattle all come to market.

Estimates as to the number of cattle fed in the study area each year vary from 15,000 to 50,000 head. Holly Sugar Company at Sidney estimates the number of cattle and lambs that will be fed annually in the irrigated areas along the lower Yellowstone River. Four of their seven reporting districts are in the study area. The estimates of the number of cattle and lambs on feed in each of these four districts for 1960-1963 are shown in Table XVII. These estimates include the majority of the irrigated feeders but do not include dryland feeders in the area.

The estimated number of cattle fed in these four districts increased during the three years, 1961-1963, reaching slightly over 16,000 for the 1962-1963 feeding period. This represents an increase over the previous year of approximately 3.7 thousand head, or 29 percent. This compares to an annual decrease during the 3-year period for the state as a whole. This suggests that the Northeast district is feeding an increasing percentage of total cattle numbers fed in the state. Of the 77,000 reported on feed January 1, 1961, the Northeastern area had 11,000 or 14 percent. On January 1, 1963 the state total had decreased to 71,000 head, while

the number reported on feed in the Northeast district increased to 12,000 head, or 17 percent of the total number reported on feed. 10/

Although specific data on the number of cattle fed annually throughout the area are not available, all indications point to a feeding industry now in excess of 20,000 head. The number fed in 1962 was estimated at 23,000 head, 11/ and will very likely reach 25,000 in 1964. In addition to the number fattened in the area, there are from 10,000 to 15,000 head partially fattened each year. The majority of these then go to the Corn Belt for additional feeding.

Barley Production in the Northeast District

Northeastern Montana has extensive production of feed grains. Barley production totaled 10.1 million bushels in 1963, representing 22.6 percent of the total produced in the state. Only the Northcentral district produced more, with 18.1 million bushels, or 40.5 percent of the state total for 1963. Barley production in the 8-county study area for 1950-1963 is shown in Table XVIII. Total barley production in the area averaged 7.9 million bushels for the 5-year period, 1959-1963.

10/ Figures provided by the Statistical Reporting Service, U. S. Department of Agriculture, Helena, Montana.

11/ Estimated on the basis of an unpublished survey of cattle feeding operations made by FERD, ERS, USDA, 1962 (See Table XII, p. 28).

TABLE XVII. ESTIMATED NUMBER OF CATTLE AND SHEEP FED IN IRRIGATED AREAS
ALONG THE LOWER YELLOWSTONE RIVER, 1960-1963.*

District	Cattle			Lambs		
	1960-61	1961-62	1962-63	1960-61	1962-62	1962-63
Fairview	1,998	1,615	2,256	15,590	13,350	9,115
Sidney	2,277	3,040	5,255	28,765	19,250	26,135
Savage	2,537	4,206	4,190	15,789	10,888	17,882
Glendive	4,289	3,779	4,623	3,448	---	---
Totals	11,101	12,640	16,324	63,592	43,488	53,132

* Source: Livestock Survey 1962-1963, Holly Sugar Company, Sidney, Montana.

TABLE XVIII. BARLEY PRODUCTION AND VALUE FOR NORTHEASTERN MONTANA, 1950-1963. * a/

Year	Irrigated		Not Irrigated		Total Production	Price Per bu. (dollars)	Total Value
	Acres Harvested	Yield Per Harvested Acre	Acres Harvested	Yield Per Harvested Acre			
1950	7,700	35.6	192,200	26.0	5,277,400	.92	4,855,200
1951	4,700	35.1	72,400	16.8	1,380,100	.93	1,283,500
1952	4,000	33.2	45,600	14.6	797,300	1.13	899,400
1953	5,200	30.9	69,600	23.4	1,788,800	.96	1,716,800
1954	5,900	31.8	254,500	15.1	4,038,400	.90	3,630,000
1955	6,500	41.5	335,000	24.0	8,311,000	.71	5,940,900
1956	6,300	38.6	167,700	15.5	2,834,000	.84	2,385,700
1957	7,100	44.0	450,600	18.8	8,798,900	.70	6,125,800
1958	8,400	44.1	356,300	16.7	6,366,300	.68	4,323,700
1959	8,300	35.5	380,000	17.1	6,802,100	.61	4,174,100
1960	6,500	37.4	327,400	23.1	7,791,300	.59	4,574,500
1961	6,000	37.5	239,200	9.5	2,490,800	.78	1,949,600
1962	6,000	39.0	342,800	35.5	12,409,500	.66	8,221,200
1963	4,300	48.7	286,900	34.5	10,099,500	.64	6,437,700

* Source: Statistical Reporting Service, U. S. Department of Agriculture, Helena, Montana.

a/ Figures for 1964 not available.

Table XVIII also indicates the variation in barley production for the area. Drouth, as well as changes in Government programs, have contributed to wide variations in acreage planted, acreage harvested and per acre yields..

A drouth as severe as that experienced by the area in 1961 would affect profits from feeding. Barley prices reflect variations in production. For example, with the greatly decreased production of 1961, the average price per bushel increased 32 percent over the previous year for the area, going from 59 cents to 78 cents per bushel. However, a ceiling, of sorts, is present inasmuch as large stocks of CCC barley are available in the area and would supplement local supplies as needed.

Montana barley production in 1962 reached a new record high of 55 million bushels, more than double the 1961 level. Abundant yields in the Northeastern district also resulted in tremendous production increases. The average total per acre yield in 1962 reached 34.4 bushels, with total production going to an unprecedented 12.4 million bushels. This was 41 percent greater than the previous high of 1957 and five times greater than the area's total production in 1961. In 1963 the per acre yield reached 34.7 bushels, with total production decreasing to 10.1 million bushels due to a decline in total acres harvested.

Where does all of this barley go? Mostly out-of-state. The area has been continually confronted with the problem of inadequate market outlets, with farmers looking to the government for aid in handling these large surpluses. The government loan program has created an outlet for this

barley, but unfortunately, has had the effect of stimulating additional production.

A study of barley marketing for 1955 indicated that methods of marketing differed considerably in the various areas of the state. ^{12/} In the Northeastern and Northcentral district approximately 72 percent of the crop was turned over to the CCC under non-recourse loans. Seed and home feeding accounted for 9 percent, with the remaining 19 percent being classified as cash barley. These CCC stocks are available if they should be needed in the expansion of feeding.

Oat Production

Oat production in Northeastern Montana has followed a general downward trend, as it has throughout Montana and the United States as a whole. Acres harvested and total production for the area, during the period from 1947-1963, are shown in Table XIX.

Production reached 4.4 million bushels in 1950, which proved to be high for the 15-year period. In 1961, oat production reached its lowest level in many years. Although there were approximately 112,000 acres of oats planted, due to the serious drouth only 20,800 were harvested. The average yield per acre on non-irrigated lands dropped to 12.4 bushels

^{12/} Duane L. Fedje, An Analysis of the Market Structure for Montana Barley and Potential Outlets, Montana Agricultural Experiment Station, Bozeman, Montana, May, 1957.

compared to 24.2 the previous year. Production for 1962 increased to 3.2 million bushels, highest since 1953, and then decreased to 2.5 million bushels in 1963. It appears quite unlikely that the production of oats will again reach the level of importance it once held.

Corn Production

Corn produced for grain amounted to 1800 harvested acres in 1962 and 3700 in 1963. Although this area normally has the highest production of any in the state, corn is still relatively unimportant as a feed grain in the area.

Production of corn silage, on the other hand, has increased over earlier years. It reached a high of 125,700 tons in 1957, but has since declined somewhat. Table XIX presents the acres harvested and total production of corn silage in the area for 1947-1963. The number of irrigated acres planted to corn silage has been generally increasing during the period, with a high of 4,700 acres in 1961. With continued increases in per acre yields on irrigated acres, corn silage is becoming more widely used in livestock feeding rations.

Safflower Production

Safflower production is relatively new in Northeastern Montana. A safflower processing plant in Roosevelt County makes safflower meal available as feed supplement to livestock producers and feeders in the area.

The use of safflower meal as a protein supplement in livestock feeding rations has been increasing rapidly. Large scale feeding of safflower

meal to beef cattle started in Colorado and Nebraska and has since spread throughout the cattle feeding states.

Many universities and experiment stations have tested the value of safflower meal as a feeding supplement. W. W. Heineman, M. E. Ensminger and W. E. Ham directed early tests of safflower meal feeding at the State College of Washington. ^{13/} They reported ". . . no significant difference among cull peas, safflower meal, and cottonseed meal as protein supplement." In reference to cost of gains, they went on to state that "only a very small difference in cost of gains resulted from the differences in protein supplements. The cost of gains for the steers fed safflower meal and cottonseed meal was practically identical." They summarized their report by stating that "undecorticated safflower meal served satisfactorily as a protein supplement. Apparently it is a satisfactory protein supplement for fattening cattle as judged by average daily gains and efficiency of feed utilization."

Feeding trials conducted by Dr. O. O. Thomas at the Montana State Experiment Station in 1961 indicated safflower meal is equal in value to other supplements, as judged by average daily gains. Table XX shows the weight gains realized in this experiment. Construction of a feed manufacturing plant is planned at Culbertson, in Roosevelt County; to become

^{13/} W. W. Heineman, M. E. Ensminger and W. E. Ham, The Feeding Value of Wood Molasses, Dehydrated Alfalfa, Dehydrated Apple Pomace and Undecorticated Safflower Meal When Fed to Fattening Cattle, Washington Agricultural Experiment Station, Institute of Agricultural Sciences, State College of Washington, Bulletin 543, October, 1953.

TABLE XIX. OAT AND CORN SILAGE PRODUCTION IN NORTHEASTERN MONTANA,
1947-1963. *

Year	Oats		Corn Silage		Total Production (tons)
	Acres Harvested	Total Production (000 bu)	Irrigated	Acres Harvested Non-irrigated	
1947	106,100	2,707.3	<u>a/</u>	<u>a/</u>	32,000
1949	72,100	1,404.2	1,700	1,700	32,000
1951	81,900	2,195.2	2,100	5,500	40,300
1953	100,700	3,558.4	2,200	11,400	71,000
1955	83,800	2,784.8	3,700	20,600	100,100
1957	66,800	1,738.4	3,400	29,700	125,700
1959	60,400	1,251.1	3,800	19,000	77,100
1961	20,800	432.9	4,700	9,200	86,600
1963	64,600	2,493.6	4,000	6,700	89,610

* Source: Montana Agricultural Statistics, Volumes II-X, Helena, Montana,
1948-1964.

a/ 7,000 total acres harvested; breakdown not available.

operational in 1965. With barley prices lower in the study area than in any other district and a safflower mill already in operation at Culbertson, production of a low cost pelleted ration appears feasible. This feed should become available to feeders within the area at a cost lower than comparable pelleted rations in any other district of the state.

Dried Beet Pulp Production

Large quantities of dried beet pulp and molasses are available in the area. From 10,000 to 20,000 acres of sugar beets are produced each year, yielding 60 to 80 million pounds of refined beet sugar annually. These sugar beets are processed at Sidney, in Richland County. The principal by-products of sugar beet production are molasses and beet pulp, both excellent livestock feeds. Large quantities of these products are shipped out of the area each year.

Feed Costs

Feed costs in the area compare very favorably with other areas in the state and also with those costs experienced in other feeding states. Barley prices averaged 66 cents per bushel in the study area for the period 1960-1963, while corn averaged approximately \$1.10 per bushel in the Corn Belt during the same period. Assuming all other things were equal, it was more profitable to feed barley in the study area than corn in the Corn Belt by approximately 18 cents per bushel. ^{14/}

^{14/} See feed grain substitution scale, p. 30.

TABLE XX. WEIGHT GAINS OF STEERS FED A SAFFLOWER-BASED PROTEIN SUPPLEMENT TO A HIGH BARLEY FATTENING RATION. *

Treatment	Safflower-based Supplement				Mixed Protein Supplement			
Lot No.	1	2	6	7	3	4	5	8
No. head per pen	50	50	50	49	50	49	52	50
Average wts., lbs.								
Initial	836	761	854	875	836	755	842	828
Final	1114	1022	1127	1153	1110	1033	1114	1094
Gain	278	261	273	278	274	278	272	266
Dail gain	2.48	2.33	2.44	2.48	2.44	2.48	2.46	2.38
No. Head per treatment				199				201
Average wts., lbs.								
Initial				832				815
Final				1104				1088
Gain				272				273
Daily gain				2.43				2.44

* Source: O. O. Thomas, Gary Wilcox and Gary Cowman, Safflower Meal as a Protein Supplement in Cattle Fattening Rations, Montana State Experiment Station, Animal Science and Range Management Department, A. S. Leaflet Number 42, Montana State College, Bozeman, Montana, September, 1961.

Northeastern Montana feeders not only enjoy a basic feed cost advantage over Corn Belt feeders but face a very favorable feed cost structure locally. The average price of barley in the study area normally runs 8 cents per bushel or \$3.30 per ton less than the state average. This would be a feed cost advantage of approximately \$3.00 per head fed. Production, price per bushel and total value of barley produced in the study area for 1962 and 1963 are shown by county in Table XXI.

Since feed grain production in Northeastern Montana is expected to continue to exceed the amount that can be utilized locally, large amounts will continue to be exported both from the area and from the state. The majority of this amount will be utilized in the feeding regions to the South and Southwest of Montana where rapid expansion of cattle feeding is taking place. Montana and study area feeders will continue to have a cost advantage over these states due to the necessary transportation costs involved.

The production of safflower meal in the area has also proven very advantageous. It has not only made available abundant supplies of a good supplement, but has brought about considerable reduction in the local cost of other supplements. Surplus production of dried beet pulp in the area is also available at less cost than in most areas due to little or no transportation charges.

An evaluation of resource supplied in Northeastern Montana indicate adequate supplies of low cost feed grains are available to support a greatly expanded livestock feeding industry. Feed costs in the area also

appear favorable for an expansion of cattle feeding.

Other Factors Influencing Feeding Expansion Potential

Adequate supplies of basic inputs and a favorable cattle-feed price ratio are necessary but not sufficient components for economical expansion of cattle feeding. Investment requirements, other non-feed costs, managerial resources, risk capital, market outlets and an amenable attitudinal structure also affect competitive position.

Investment and Other Non-feed Costs

Feeders in the study area should be able to realize non-feed costs comparable to those achieved by similar enterprises in other regions of the country. However, the amount of investment necessary per head is affected primarily by the degree of mechanization employed and the level at which these facilities are utilized, wherever cattle are fed.

Economics of size and utilization were studied in Montana in 1961. ^{15/} The 55 feedlots surveyed in this study were broken down into four size groups and a representative operation for each size group was obtained. Through the use of budgets, a technologically efficient operation of comparable size, and with varying levels of utilization was synthesized for each group and compared with the representative operation. The changes in investment requirements and non-feed costs, as utilization and mechanization were increased, are summarized in Table XXII. More detail on

^{15/} Robert Mueller, Economics of Size in Farm Feedlots in Montana, Unpublished Master's thesis, Agricultural Economics Department, Montana State College, Bozeman, Montana, 1962.

TABLE XXI. BARLEY PRODUCTION, PRICE AND TOTAL VALUE, BY COUNTY, FOR
NORTHEASTERN MONTANA, 1962-63. * a/

County	Production		Price		Total Value	
	1962	1963	1962	1963	1962	1963
	(000 bu)	(000 bu)	(\$/bu.)	(\$/bu.)	(000 \$)	(000 \$)
Daniels	1,704.3	1,351.0	.65	.62	1,107.8	837.6
Dawson	1,155.0	861.7	.67	.66	773.8	568.7
Garfield	246.0	234.0	.69	.65	169.7	152.1
McCone	833.0	902.6	.68	.66	556.4	595.7
Richland	1,491.9	989.2	.70	.67	1,044.3	662.8
Roosevelt	2,205.9	1,168.7	.67	.64	1,478.0	748.0
Sheridan	2,624.2	2,038.2	.65	.62	1,705.7	1,263.7
Valley	2,149.2	2,554.1	.64	.63	1,375.5	1,609.1
Totals	12,409.5	10,099.5	.66	.64	8,221.2	6,437.7

* Source: Statistical Reporting Service, U. S. Department of Agriculture,
Helena, Montana.

a/ Figures for 1964 not available.

equipment combinations utilized in the various alternatives is presented in Appendix Table III.

As would be expected, increased utilization significantly reduces the level of non-feed costs. In most cases addition of labor-saving facilities will reduce costs only at higher levels of usage.

In another study conducted in the Billings area, records from 34 enterprises were grouped according to average size as follows: 16/

Group I	36 head
Group II	70 head
Group III	165 head
Group IV	254 head
Group V	466 head

The investment in facilities and equipment used for feeding varied from \$65.81 per head for Group I down to \$29.11 for Group V. (See Table XXIII.) A complete breakdown of these costs are presented in Appendix Table IV.

On a pound of gain basis the non-feed costs involved in feeding ranged from a high of 11.9 cents in Group I to a low of 4.2 cents in Group V. When totaled, the non-feed plus feed costs per pound of gain ranged from 20.6 cents in Group IV to 28.5 cents in Group I. Again, as size increases, adoption of labor saving technology usually permits significant overall cost reductions.

16/ Pius Weisgerber, Organization and Costs of Cattle Feeding in the Yellowstone Valley, Research Report No. 11, Agricultural Experiment Station, Montana State College, Bozeman, Montana, 1960.

TABLE XXII. ESTIMATED INVESTMENT AND NON-FEED COSTS PER HEAD FOR ALTERNATIVE LEVELS OF USE OF FEEDLOTS OF 90, 175, 320 AND 520 HEAD CAPACITY. *

Capacity	1 <u>a/</u>	2 <u>b/</u>	3 <u>c/</u>
90 Head			
Average No. fed	45	90	90
Days operated	210	210	210
Average investment per head	\$23.74	\$11.87	\$23.06
Non-feed costs per head	14.46	10.40	11.75
175 Head			
Average No. fed	120	175	175
Days operated	220	220	220
Averaged investment per head	\$36.18	\$24.81	\$33.36
Non-feed costs per head	17.14	14.49	15.75
320 Head			
Average No. fed	240	640	640
Days operated	210	365	365
Average investment per head	\$35.36	\$13.26	\$17.16
Non-feed cost per head	17.87	12.99	12.21
520 Head			
Average No. fed	450	1040	
Days operated	275	365	
Average investment per head	\$27.80	\$12.04	
Non-feed costs per head	13.21	11.02	

* Source: Robert Mueller, Economics of Size in Farm Feedlots in Montana, Unpublished Master's Thesis, Agricultural Economics Department, Montana State College, Bozeman, Montana, 1962.

a/ Feedlot with partial utilization.

b/ Feedlot with increased level of utilization.

c/ Feedlot with added machinery and equipment.

Results from the above and other studies indicate that, in general, when up-to-date technology is utilized and feed lots are utilized near capacity, comparable reductions in non-feed costs can be achieved regardless of location. Narrowing profit margins due to rising costs and lower fed cattle prices have placed emphasis on lowering per unit costs through large volume year-around operations. For these reasons, feeding expansion in the Northeast area will be through the growth of larger and more efficient year-around feeding operations.

Small feeders in the area may still play a significant role, particularly due to low opportunity costs for crop aftermath, use of buildings and equipment that would otherwise go unused, and the lack of alternative uses for the farm feeder and his family's labor. When all this is taken into consideration, these small farm feeding operations can probably still compete costwise. However, they are in no position to compete effectively in the marketing of fed cattle. This growing market disadvantage will make it increasingly difficult for the small farm feeder to remain in the cattle feeding business.

Market Outlook for Cattle Fed in the Northeast Area

The majority of cattle fed in the area are marketed through local livestock auctions, though there is a gradual shift to more direct marketing. Most of the direct selling is done by the larger producers. The feeder with only a few head and with less uniformity, does not have the alternative of direct selling.

TABLE XXIII. AVERAGE DAILY COSTS OF FEEDING, COSTS PER POUND OF GAIN AND TOTAL EQUIPMENT AND FACILITY PER HEAD COSTS FOR VARIOUS SIZE FEEDLOT GROUPS IN THE YELLOWSTONE VALLEY, 1957. *

Cost Item	Group I	Group II	Group III	Group IV	Group V	All Groups
	Cents					
Labor	7.2	5.2	4.5	3.0	3.0	3.5
Taxes	.8	.7	.5	.4	.4	.5
Repairs and depreciation	8.5	4.6	3.1	2.3	1.9	2.6
Interest on investment	5.2	4.2	3.3	3.2	3.0	3.3
Veterinary and medicine	.6	.5	.2	.3	.3	.3
Death loss	2.3	1.7	1.2	.8	.8	1.0
Total daily non-feed cost per head	24.6	16.9	12.8	10.0	9.4	11.2
Non-feed costs per pound of gain	11.9	8.7	5.9	5.0	4.2	5.3
Total equipment and facilities	\$65.81	\$51.68	\$33.57	\$35.34	\$29.11	

* Source: Pius Weisgerber, Organization and Costs of Cattle Feeding in the Yellowstone Valley, Research Report No. 11, Agricultural Experiment Station, Montana State College, Bozeman, Montana, 1960.

A 1962 study ^{17/} of cattle feeding operations reveals pertinent information regarding the marketing of cattle fed in the Northeast district. This information is presented in Table XXIV. Over 50 percent of both the number of feeders in the area and the number of fed cattle marketed in 1961 are represented in this survey. It is therefore assumed to be representative of fed cattle marketing for the area. There were fat cattle sales of 13,617 head for 1961 reported in this survey. Of this number, 10,547 head or 77.5 percent were marketed through auctions, 2,126 head or 15.6 percent were marketed direct and 944 head or 6.9 percent were sold through terminal markets. With only one exception, the auction market accounted for over 50 percent of fed cattle sales for each capacity size group, and in most cases accounted for over 75 percent.

To most farm people the auction has a sociological appeal as well as economic. The auction also gives them an opportunity to meet and pass the time of day with other farm and ranch people.

Fed cattle sold direct go primarily to packers within or near the study area, although a few direct purchases have been made by firms as far away as Spokane. The fed cattle sold through auctions usually go in several directions. While only a small number are needed in the area, large numbers go to the bigger packers throughout the state and to the nearby plant at Williston, North Dakota. A large number are also purchased

^{17/} An unpublished survey of cattle feeding operations in the major feeding states, made by FERD, ERS, USDA, 1962.

TABLE XXIV. METHODS OF MARKETING FED CATTLE IN NORTHEASTERN MONTANA, BY FEEDLOT CAPACITY SIZE GROUPS, 1962. *

Capacity of Feedlot	Number of Op- erations Report- ing Sales	Total Sales in Cattle Terminal Mkted in 1961	Sales in Terminal Market No. of Head	Per- cent	Sales in Auction Market No. of Head	Per- cent	Direct Sales to Packers No. of Head	Per- cent	Direct Sales To Other Feeders No. of Head	Per- cent	Direct Sales to Others No. of Head	Per- cent
0-49	6	166	78	47.0	88	53.0						
50-99	6	262			247	94.3			15	5.7		
100-199	22	1,274	270	21.2	927	72.8	39	3.1			38	3.0
200-299	13	1,386	170	12.3	1,070	77.2	120	8.7			26	1.9
300-399	7	1,309	126	9.6	695	53.1	259	19.8	229	17.5		
400-499	4	570			470	82.5	100	17.5				
500-749	2	650	300	46.2	50	7.7	300	46.2				
2000-2499	3	8,000			7,000	87.5	1,000	12.5				
Total	63	13,617	944	6.9	10,547	77.5	1,818	13.4	244	1.8	64	.5

* Source: Unpublished survey of cattle feeding operations made by FERD, ERS, USDA, 1962.

by several large packers completely out of the area and shipped live. Approximately 50 percent of these go to the Pacific Northwest while the others go to the Midwest.

The extreme seasonality of feeding in the area had presented problems in the marketing of fat cattle. Larger packers near the area find it hard to acquire a constant supply of uniform fed cattle. In the spring there are large quantities of fed cattle available, then in the late summer and fall the supply is very limited. As a result, prices tend to be depressed during the season of heavy marketings and nearby packers find it difficult to service their bigger customers during the short seasons.

For a successful expansion of livestock feeding in the area, feeding must be done the year around. Packers state they could develop better markets and consequently sell much more beef from the area if a year-around supply of uniform, quality fed beef were available.

New developments in the Glasgow and Williston areas point to increased local demand for fed beef. Glasgow is presently constructing a new and larger packing plant, while the plant at Williston recently changed hands. A significant increase in kill is planned here as well. Besides these developments, there are at least two other groups who are presently interested in the establishment of new packing plants in the area.

With expanding Northwest markets and increasing local demand, the market for increased numbers of fed beef in Northeastern Montana would appear favorable.

Availability of Credit for Expansion of Cattle Feeding Operations
in the Northeast Area

Most present and potential cattle feeders in the area do not, of themselves, have sufficient capital to expand their present operations or to start new ones. Regardless of the economic opportunities that may exist in additional cattle feeding, the large capital requirements are a limiting factor. Many feeders in the area expressed the need for more capital and indicated that if it were more readily available, they would expand their operations.

The attitude of most lending institutions in the area toward expanded feeding is extremely conservative and in some cases almost negative. They take pride in stating that they haven't had a feeding account go bad in 15 years. They also agree that additional feeding is just what the area needs. Yet they think 90 head is a large operation and that it's not feasible to haul barley 60 miles if local stocks run low. The experienced feeder with lots of collateral is often the only one who can get local financing, and then only a limited amount.

A more progressive attitude prevails in the Glasgow area. Here the rapid expansion of feeding is strongly encouraged. Financiers are stressing large, efficient lots and would like to see an increase in large commercial lots. Banks in the area feel that is no better place to put their money to work than investing in livestock feeding. They are not only enabling experienced feeders to expand their present operations, but are providing new feeders an opportunity to get into the business.

Several large banks from outside the study area are now serving the capital needs of a few of the larger feeders. Although this is still on a limited basis, more and more feeders are looking to these outside sources in an attempt to acquire sufficient capital.

Cattle feeding in the Northeastern area can expand no faster than capital is made available to do so. Data collected in the area indicate that the shortage of available capital is one of the greatest deterrents to increased livestock feeding. Both short term and flexible longer term credit are needed: The former to finance livestock and/or feed purchases, the latter to permit sound investment to feedlot facilities.

Management Resources Available in the Area

The most important single factor in determining the success of livestock feeding is efficient management. The farm feeder in the area just simply does not have time to become skilled in every aspect of livestock feeding, nor is he able to give the undivided attention so necessary to efficient operation. The demands of modern agriculture keep the farm feeder so busy attempting to proficiently manage his farm that it is very difficult to acquire the necessary skills to become a competent feeder as well. Feeding on a commercial basis requires not only a high level of nutritional and husbandry skills but buying and selling skills as well. Feeders of the area have had continual problems in marketing their cattle effectively. The small feeder is in a very weak bargaining position.

Management skilled in all aspects of livestock feeding is in short supply within the study area. There are many individuals however, who have had considerable experience in some type of livestock feeding. With some additional training these individuals could develop the skills necessary to provide competent management for expanded feeding operations. Lack of available skilled management may prove an inhibiting factor to immediate expansion of livestock feeding in the Northeast area.

Attitudes Within the Area Regarding Expansion of Livestock Feeding

The success of an undertaking can be greatly affected by the attitudes which prevail in the area of proposed development. The majority of individual interviewed in the study area expressed a real interest in expansion of livestock feeding. Although opinions differed on how growth and expansion should come about, most people felt that increased feeding was feasible and that the entire area would greatly benefit from it. Most individuals in the area possess little understanding of present trends in cattle feeding. They are still of the opinion that 100 head is a large operation and are quite skeptical of those who speak in terms of every 500 head or more. Most felt that the increase in feeding should come about primarily through the medium of numerous additional small feeders. Included in this number were many of the influential people on main street.

Farmers and ranchers seem, by nature, to be highly individualistic and as such, do not all of a sudden change their opinions or way of doing things. This attribute has advantages, but too may prove a hinderance to

development, in that many of them have been slow to adapt to changes which would benefit them directly. An example of this is the continued persistence of many feeders to feed only one lot of cattle per year and allow their feedlots, in which they have a large capital investment, to lay idle the rest of the year. There are feeders, on the other hand, who are quick to adopt new techniques that will make their operations more efficient. This type of individual, in particular, felt that cattle feeding should be increased, with most of them thinking more in terms of new larger capacity feedlots. Many commented that, over a period of years, feeding has brought them a far greater return for both their crops and livestock.

The rate of increase in numbers of large feeders in the area has been relatively low, though many are finding that to stay in business they have to reduce their per head costs. Increasing costs are forcing many of them to take a serious look at the possibility of increasing the size of their present operation, in hopes of realizing some economics of large scale production.

Considerable interest in cattle feeding is mounting among dry-farmers in the area. The majority of which have previously shown little interest in feeding. Their comments indicate that they plan to feed significantly more cattle than they have in the past. Many of them made specific reference to the shortage of capital and indicated that this would be the limiting factor in their plans for expanded feeding.

A few of those interviewed expressed some concern that an increase in feeding in the area would flood the market and thus result in greatly

reduced fat cattle prices. This appears very doubtful, however, since any change in the quantity fed in the area would be such a minute fraction of total fed cattle production that the effect on price would not be significant.

The attitudes and opinions of farmers and ranchers tend to be greatly affected by the thinking of their banker. In areas where bankers are strongly encouraging the expansion of feeding, there is usually an active interest in it. There is a great need for further education regarding the problems and opportunities that exist for additional livestock feeding in the area. This not only pertains to those who might be feeding, but to those whom they look to as financial advisors.

The general attitude of the area is definitely in favor of increased livestock feeding, with more and more feeders planning some expansion in size as well as a move towards more year-around feeding.

There still appears, however, to be a general lack of familiarity with present trends in cattle feeding and a prevalent attitude that the large commercial type feeding operation will just not work in the Northeast area.

Evaluation of Potential

The foregoing analysis indicates Northeastern Montana produces feeder cattle and feed grains in abundance. In addition, large quantities of feeder cattle move into the area to be marketed. The availability of plentiful supplies of feeder cattle and feed grains do not, however,

guarantee the development of new or expanded feeding enterprises in the area.

Northeastern Montana presently feeds only 20 percent of the feeder cattle it produces and less than 10 percent of the potential number that could be fed with its average annual feed grain production.

Cattle feeding is a business of high risks and narrow margins. A slight change in price can have a strong influence on the feeder's net returns. A two cent decrease in price means \$20 less for each 1,000 pound steer sold. Even a one cent change in price can mean the difference between a profit and a loss.

Feed barley prices are lower in the study area than in any other district of the state and normally average 8 cents per bushel below the state average. Large quantities of high quality supplement are processed in the area and are available at less cost than in other districts of the state. Northeastern Montana feeders also appear to face no significant disadvantage with respect to non-feed costs.

The expansion of cattle feeding in the study area will depend largely on the capacity of local feeders to compete with feeders in other areas for fat cattle markets. They must be able to market their fed cattle effectively and do so at costs which are no greater than in other areas. The long term market outlook for increased numbers of fed cattle in the area does appear good. To reach this potential, however, there needs to be a shift to more year-around feeding, greater uniformity of product and development of better marketing methods, particularly improved direct selling. Many

of these will accrue with an expansion in large scale feeding operations.

As the level of feeding expands, increased slaughtering facilities will become feasible, providing additional markets for cattle fed in the area. If there should be extensive feeding expansion without the development of additional slaughter facilities, serious marketing problems could arise.

The area has an abundant supply of the basic resources. It faces both a favorable feed and non-feed cost structure and presently has available markets for some expansion of cattle feeding. However, there are limiting factors to immediate expansion. These are: (1) shortages of available capital, (2) limited management ability with respect to feeding skills, both to make gains most economically and to reach the standard of quality demanded by the consumer, and (3) a weak bargaining position and lack of marketing skills. In addition, there is a serious need to break with the established method of feeding in the area and move to year-around commercial sized operations. Attitudes within the area may also pose problems.

CHAPTER IV

OPPORTUNITIES FOR COOPERATIVE FEEDING IN NORTHEASTERN MONTANA

Cooperative Feeding as a Solution to Selected Problems

Cooperative livestock feeding is one method whereby farmers, ranchers and feeders in the area may be able to efficiently coordinate the production, feeding and marketing of their livestock and crops. 18/

This chapter will examine cooperative characteristics and attempt to determine the extent to which factors that serve as deterrents to expansion of feeding may find solutions through development of cooperative enterprises in Northeastern Montana. 19/

Cooperative Financing

A partial solution to capital acquisition problems facing present and potential feeders in the area is possible through cooperative financing. Technical assistance is available through State and Federal Extension Services and the USDA.

It is generally accepted that the higher the percentage of equity financing, the greater will be the interest of individual members in making an enterprise succeed. For example, the feedlot at Bainville, Montana organized with 10 members and required each to purchase one share of voting common stock at \$2,500 per share. Two additional members have since been

18/ The Agricultural Act of 1961 declared it a policy of Congress to recognize the importance of the family farm as an efficient unit of production. It also declared that this form of farm enterprise should be promoted and strengthened. Cooperatives help farmers improve their bargaining position, thereby strengthening this family farm system.

19/ Cooperative feeding is not completely new to the area, due to the successful operation of the Little Muddy Cooperative Livestock Feeders Yard at Bainville.

added. This relatively large membership fee stimulates greater member participation and tends to make each member feel more personally responsible for the success of the undertaking. This feeding operation was organized under the regular corporation laws of Montana, but operates in the same manner as a cooperative.

A cooperative feedlot would have three principle methods of acquiring additional capital--selling securities, retention of refunds or authorized deductions and borrowing. Certificates of indebtedness are widely used as security. These certificates bear interest and have a definite maturity date. The interest on these certificates qualifies as a business expense. Dollars which normally would not be invested in capital stock may often be obtained through certificates of indebtedness, due to the specified rate of interest. If the enterprise should end in failure, these certificates would also have priority over the capital stock in the distribution of assets. The sale of preferred stock is another method which is sometimes used. This can be sold to non-members as well.

The deference of patronage dividends has also proven a very successful means of obtaining additional capital. Certificates with a future redemption date are issued to the patrons in lieu of a cash dividend. On this basis, each member's investment is in direct proportion to the volume of business he does with the cooperative.

The most commonly used method of paying out patronage refunds is a distinctly cooperative financing device known as the revolving fund plan. Under this system, the individual's patronage contributions are allocated on the books of the cooperative and he is generally advised of his equity

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in the revolving fund at the close of each fiscal year. When sufficient capital has been built up, the oldest outstanding revolving fund obligations are retired. This is usually done from current retained patronage dividends, operating margins or savings.

Through retaining patronage dividends for a period of years, a cattle feeding cooperative would be able to retire its outstanding obligations, as well as maintain sufficient working capital and a reserve for emergencies. When this was accomplished, it could then begin revolving its oldest outstanding retained patronage dividends.

A cooperative feedlot would no doubt find it necessary to directly borrow a substantial amount of the capital required to finance a large feeding operation. Specialized financing services are available to qualified cooperatives through the Banks for Cooperatives of the Farm Credit Administration. The Spokane Bank for Cooperatives services this area and makes loans for both physical facilities and working capital to finance operations.

The local banks in the area could play an important role in the financing of cooperative feedlots, although the large amount of capital required may prohibit many from doing so. The Bainville feedlot has used local bank financing to advantage. A loan on its physical plant has been kept under one bank while its livestock and feed loans have been through another.

Rural electric cooperatives are another possible source of funds. The amount of capital this organization can loan is normally determined by the amount of electrical equipment to be used.

Funds may also be obtained through the Area Redevelopment Administration when available, for particular designated areas. The Fort Peck Indian Reservation which is located within the study area would normally so qualify.

Efficient Management

Farm feeders in the area have not had time to become skilled in all phases of livestock feeding and marketing. Due to the increasing demands of modern agriculture for his time, the farm feeder cannot hope to keep abreast with all the new developments in livestock feeding.

Combining resources in large cooperative feeding operations would make it possible to hire a manager who is a livestock feeding and marketing specialist. Such a person would be more capable of keeping a finger on the pulse of the market and be better aware of any new developments that might arise. The importance of efficient management cannot be over-emphasized.

A cooperative feeding operation would normally have a considerable advantage over the farm feeder in meeting standards of quality control. Their operating procedures would be the deciding factor in determining their relative advantage in achieving standards of quality and uniformity.

The procedure used by the Bainville feedlot is to put each member's cattle in an individual pen and to keep separate records of feed consumption for each. The individual members are responsible for buying and selling their own cattle and can specify the ration to be fed. This type of operating policy has relatively little advantage over the farm feeding

operation in achieving improved quality and uniformity. Great advantages can be realized when all cattle are pooled together.

Pooling

One method of pooling which has proven successful is the inventory contract system. Under this system all cattle are pooled together and no identity of ownership is maintained. Each member's cattle are sorted and appraised in accordance with current market prices. The member then signs a contract with the cooperative and receives credit on the books for the value of his cattle at the time of consignment to the lot. This type of pooling arrangement would also give the specialized manager sufficient latitude in which to make the most advantageous use of his talents.

The main advantages of pooling are improved quality control and more effective use of facilities. Through grouping the cattle according to weight, quality and grade, and in following a uniform feeding program, significantly improved levels of quality and uniformity in market offerings could be achieved. Final settlement for the finished cattle would then be made on a pro rata basis.

Inasmuch as the quality of cattle will vary among members, it may be necessary to establish some minimum quality standards on cattle being brought into the feed yards. To work effectively and to achieve better quality control this system requires that each member contribute high quality cattle. Cooperative feedlots could aid in establishing performance testing among their members.

In addition to assuring better quality control, there are additional advantages to operating the cooperative on a pool basis. A recent study listed the following: (1) requires fewer pens; (2) lessens record keeping; (3) makes it easier to group and handle small incoming lots of cattle; (4) facilitates grouping of cattle according to weight, quality, and grade for marketing; (5) levels seasonal price variations by continuous year-around marketing; (6) eliminates under--and over--utilization of individual pens, and; (7) provides greater potential bargaining power when marketing. 20/

Advantages of Year-around Feeding

The establishment of cooperative feeding operations would facilitate an expansion of year-around feeding in Northeastern Montana. Continuous year-around production would greatly stabilize the feeding industry and improve the marketing of these fed cattle. The reluctance of most small farm feeders to be tied up with feeding responsibilities during the cropping season is the main reason why additional year-around feeding has not been carried on.

20/ Gerald E. Marousek and Harlan J. Dirks, Economics and Organizational Aspects of Cooperative Feedlots, Bulletin 494, Economics Department, Agricultural Experiment Station, South Dakota State College, Brookings, South Dakota, 1962.

The specialization possible in a cooperative lot makes feeding rather than farming the main function, with success being dependent upon full utilization of facilities. The production of a continuous supply will bring more buyers to the area, thereby strengthening the local fat cattle market. Cooperative feeding could provide the small farmer with opportunities for expanding his beef operation and making initial gains without exerting great demands upon him for specialized managerial ability or increased capital investment in costly equipment.

The cooperative feedlot then, under efficient management and full year-around utilization of facilities, would enjoy definite non-feed cost advantages over the small farm feedlot operation. In a recent study conducted in South Dakota, costs and returns were budgeted for two alternative feeding systems, one a farm feedlot with 200 head capacity and the other a 5,000 head capacity cooperative feedlot. 21/ Each system was budgeted for 650 pound yearling steers fed 240 days to a finished weight of 1,150 pounds. In this analysis, the price of feeder steers, feed costs and the market value of the fed steers were all held constant and a comparison then made of the non-feed costs of the two alternative systems. The cooperative feedlot, under full utilization, showed an advantage of \$5.57 per head over the farm feedlot when it was also utilized to capacity (300 head annually). When only 200 head were fed annually, the cooperative showed an advantage of \$6.57 per head.

21/ Gerald E. Marousek, op. cit.

Per head capital investment for the cooperative lot was \$30.41, when utilized at maximum annual volume of 7,500 head. This is considerably less than for the farm feedlot. When fully utilized at 300 head annual volume, farm feedlot per head investment costs were \$45.00, while increasing to \$65.00 per head when only 200 head were fed annually. The volume of cattle fed in the cooperative feedlot would also have a direct effect upon per head capital investment costs. If only 7,000 head were fed annually, per head investment would increase to \$32.58, and if it were only used on a 5,000 head per year basis, per head capital investment would increase to \$45.61, or approximately the same as the farm feedlot when partially utilized. To fully realize the marketing economies of large scale production, the cooperative would need to operate under a pooling arrangement similar to the one previously discussed rather than the individual pen per member arrangement.

In addition, added savings could be realized by the cooperative feedlot through large volume purchase of feeds.

As a seasonal feeder, the small farmer has little chance to average out a poor purchase or develop necessary skills in buying and selling. The cooperative feedlot's market advantages may well be more significant than technical cost economies, relative to the small farm feedlot. In the preceding analysis, the cooperative feedlot showed an advantage of \$5.57 per head over the farm feedlot, when both were fully utilized. On the other hand, a marketing advantage of $\frac{3}{4}$ of a cent per pound would add up to approximately \$7.50 per head. As a result of its knowledge of the

market, bargaining skill and volume buying, the cooperative would also possess definite advantages over the small farm feeder in purchasing quality feeder cattle, feed and other supplies.

The cooperative manager or its specialized buyer could invest the time needed to know where quantities of feeder cattle could be obtained. The cooperative would be large enough to buy direct or purchase on contract from large producers of quality cattle. The best feeder cattle are often bought direct from the rancher and do not come to auction or terminal markets where the small farm feeder usually purchases his feeder cattle. The cooperative could provide its members with purchasing services on cattle for intermediate feeding as well as on cattle going directly to the feedlot.

The large cooperative feeding operation would have its greatest advantage in the marketing of fed cattle. By operating on a pool basis it is able to sort all of the cattle according to weight and grade, thus being able to offer prospective buyers greater uniformity in meeting required specifications. Through continuous marketing, seasonal price fluctuations are leveled out and greater bargaining power is achieved.

A cooperative feed yard should be able to interest the direct buyer and bargain with strength. The integration of marketing functions should reduce selling costs and afford a greater return to the feeder. This adds up to a substantial marketing advantage.

The size of feedlot necessary to achieve marketing advantage depends upon its location. Feedlots in the study area would be somewhat unique in this respect. Due to the scarcity of year-around feeders and extremely

small number of feedlots with capacity in excess of 1,000 head in the study area, considerable marketing economies would be realized with lots of 1,000-2,000 head capacity. Even a 2,000 head lot in this Northeast area would be of sufficient size to draw and bargain effectively with direct buyers. In some major feeding areas a lot of this size would be considered small.

Another advantage of the large cooperative would be its ability to sell on contract. This could provide an effective hedge against future price drops, though its success would depend heavily upon the manager's knowledge of the market and his ability to predict future price trends.

Coordination of Feeding Stages

The individual farm feeder in the study area does have some definite feeding advantages that the cooperative feedlot would not have. His biggest advantage lies in the cheap gains he obtains from crop aftermath which he successfully harvests with cattle each fall. This and other crops for which he has no profitable alternative use have proven very efficient in achieving early gains. These are not suitable for finishing, however. Therefore he must put his cattle in the feedlot for additional feeding. Many of these farm feeders make cheap early gains but then due to lack of up-to-date nutritional knowhow and efficient management often make little or no profit in finishing these cattle.

Can this intermediate farm feeding stage and the cooperative finishing stage be efficiently coordinated? There are several ways in which this could be done. There is certainly no reason why the farmer should

cease to obtain cheap early gains at which he has proven so efficient. He could operate much the same as he does now. He could buy young stock in the fall and utilize his crop residues and other feeds for which the opportunity value was relatively low. He could then put them in the cooperative feedlot to be finished.

The cooperative should make every effort to utilize as much of the members farm production as possible. This could be easily worked out on a basis proportional to the patronage of the cooperative, thus assuring the members of a market for farm production which they normally would feed themselves.

Another method farm feeders in the area could use to utilize feed crops would be to purchase lightweight feeder stock and carry them through the winter. By feeding a ration consisting mainly of hay or corn silage, economical gains can be obtained and the cooperative's needed supply of spring feeder cattle would also be partially met. To the farmer who has roughage feeds, this method has real promise since greater net returns can normally be realized from intermediate gains than from gains made at the finishing stage. This intermediate stage feeding would not require the time, specialization or investment that have become so essential to efficient finishing stage feeding. If the feeder had surplus feed grains that would normally have been fed, he could sell them to the cooperative, receiving credit to be applied against his feeding costs.

There are other ways in which coordination of farm and cooperative feeding can prove advantageous to both the farm feeder and the cooperative.

Those farm feeders who did not choose to participate in cooperative feeding, would also stand to benefit from its operating in the area. With the considerable expansion in year-around feeding that would result from cooperative feeding, a more constant demand for good feeder cattle would exist in the area. This would afford a ready market to compliment their expanded intermediate feeding program. They could coordinate this necessary function with the cooperative in several ways. Those who either feed their own or purchase stock for intermediate feeding might find it advantageous to sell on contract to a cooperative.

As feeding increased in the study area, good quality feeder cattle would be in short supply during part of the year. As cooperatives became better established they might find it advantageous to buy feeder cattle as they became available and then contract with farm feeders for intermediate feeding. This would enable the farmer to market many of his feeds without investing in cattle and would also assure the cooperative feeding operation full utilization of its facilities.

The success of cooperative feeding in the area would be greatly enhanced through a well-coordinated two stage feeding system. Various methods of implementing such an operation have been presented here to show how smoothly it could function. These are not necessarily alternative methods, since it may prove advantageous to use several or all of them at the same time. Both the cooperative feedlot and the individual farmers and ranchers would benefit from such a program. With cattle feeding margins continually narrowing, the small farm feeder should take a serious look at the advantages afforded through a well-coordinated two stage farm and cooperative

feeding operation.

Possible Problems

As with other types of business enterprises, history has recorded numerous failures among cooperatives and stands as a constant reminder that they do not possess some inherent quality that guarantees success. Many factors have contributed to cooperative failures in the past. Examination of these indicate they hinge almost completely upon the adequacy of cooperative management and leadership. Likewise, competent management is the most important component of successful operation.

If the caliber of management is sufficiently high and sound cooperative principles are followed and adhered to, most problems incident to cooperatives can be readily solved and the relatively few present cooperative failures avoided. Competent and efficient management and leadership are the crucial factors to successful cooperative feeding in the study area.

Another related problem is maintaining full utilization of the cooperative's feeding facilities. Unless operations are at or near capacity the enterprise cannot achieve economic efficiency. In organizing a cooperative feedlot, precautions should be taken to assure full utilization. The Bainville feedlot has found relatively high membership fees a fairly effective means of maintaining active membership support and participation. They have, however, found under-utilization by members a far more serious problem than they had anticipated. The cooperative has now found it necessary to purchase and keep several hundred head of cattle on feed at

all times. They refer to these as "cooperative cattle" and net returns accruing through this operation are distributed to the members on the basis of individual patronage. This has worked quite satisfactorily and could be utilized by other cooperative feedlots as a means of overcoming the problem of under-utilization. This method does require considerable amounts of additional capital, however. Another solution to the problem which may prove advantageous would be to provide custom feeding services for non-members. This would alleviate the capital problem and still maintain full utilization of facilities.

The general attitude has not been too favorable towards cooperatives within the study area. There are many mis-conceptions as to the purpose and function of cooperatives. To many in the area, even the name, cooperative, has implications of disrespect, being unjust and in opposition to the true ideals of free enterprise.

These ideas may inhibit the growth of cooperative feeding in the area. This is an educational problem and is not easily alleviated. The successful operation of several cooperative feedlots in the area would do much to convince the skeptical of the many advantages afforded through this type of organization.

Some interest has been expressed in large scale cooperative feeding. As yet, organization has not taken place. The depressed condition of current fat cattle prices have been a limiting factor. Interest is growing throughout the area, however, and further expansion of cooperative feeding does appear reasonably certain.

Guidelines to Organizing a Cooperative Feedlot

With the concept of cooperative cattle feeding still fairly new, those interested can profit from the experiences of the Little Muddy Cooperative Livestock Feeders Yard at Bainville. This lot has made it possible for many feeders in the area to become at least somewhat acquainted with the operations of a cooperative feedlot.

Location

Many feeding problems can be eliminated, or at least minimized by proper selection of the site upon which the feeding enterprise is to be located. The adequacy of space, water supply, drainage and transportation convenience are the paramount considerations. In determining the land area needed, a good rule of thumb is 80-120 head per acre. The wide variation is necessary to allow for differences in rainfall, soil characteristics and the size of cattle to be fed. There should be sufficient space to allow for future growth and expansion.

Important to the success of a feedlot is the abundance of a reliable water supply. It should be available in sufficient quantities as to allow for future expansion.

Drainage is also important. A site should be selected where the soil has good drainage characteristics, with the pens being located in such a manner as to facilitate the best possible drainage. Soils which are underlaid with sand and gravel are preferable. Wet, sloppy lots reduce gaining rates.

Year-around accessibility to transportation facilities is likewise vitally important to efficient operation. The lot should be located so that stormy, wet weather would not limit access to its facilities. In some cases it may also prove advantageous to be located on a rail siding if possible.

Size

The size of a feeding operation in the area should probably be determined by the needs of the immediate membership. Constructing a yard for anticipated membership might place too hard a burden on present membership through increased unit costs and capital requirements. Financial commitments should remain flexible until sufficient membership is obtained to guarantee feeding at levels necessary to justify the utilization of economic and technically efficient feeding systems.

In determining the size of facilities to be constructed, it is important to consider future expansion. In so doing, a firm could build on a relatively modest scale at first and yet be able to easily and economically expand at a later date.

Alternative Methods of Feedlot Charges

Several methods have been developed to determine cooperative feedlot charges. Income to the cooperative must be sufficient to cover current operating expenses as well as maintain and build reserves necessary to insure efficient operation.

There are four basic methods of determining charges for cattle fed in a cooperative feedlot, namely:

- (1) Charge straight tonnage feed markup in addition to cost of the feed.
- (2) Charge daily yardage plus feed costs.
- (3) Charge per pound of gain from entry into the lot until departure.
- (4) Charge a flat daily rate per head fed. 22/

The first two methods have gained wide use among custom feeding operations and appear most adaptable to cooperative feeding as well. The straight tonnage markup is used by the Bainville cooperative and has worked out well. It offers accuracy in allocating costs and the simplicity of a single charge. This method does require adequate equipment for weighing, measuring and mixing the feed. Most feedlots would have this equipment anyway, and so additional investment would not be required. Another advantage is that the exact amount of feed used is always known and therefore facilitates easy determination of rates of gain. The cooperative would determine the amount needed to cover operating expenses and whatever margin they felt necessary, and then add this amount to the tonnage feed costs.

The cost per pound of gain method is used primarily for cattle owned by meat packers. If cooperatives engage in contract feeding with packers, this type of arrangement would usually be insisted upon. The packer feels that this method provides the feeder a stronger incentive to achieve

22/ Gerald E. Marousek, op. cit.

efficient gains.

The cooperative feedlot must initiate and maintain strict credit policies. Frequent billing and prompt payment minimize the amount of operating capital required and shifts the responsibility directly to the members. It may be easier to secure financing through the cooperative than by the individual. This could be an important service of the cooperative.

Suggested Size and Location for Cooperative Feedlots in Northeastern Montana

Recommended Size

For the establishment of cooperative feedlots to be advantageous to farmers and ranchers in this area, the units must be large enough to achieve the economies associated with size.

A unit with approximately 5,000 head capacity seems to most nearly achieve these economies for this area. Adequate utilization of quality management appears to be the most important consideration in making this judgment. Considerable market economies and a "reasonable" level of efficiency in non-feed costs could probably be achieved with a smaller capacity lot. Due to the small number of feeders with capacity in excess of 1,000 head, a lot of 2,000 capacity would attract additional buyers and have adequate bargaining power. The 5,000 head lot would probably realize some additional marketing economies. It is doubtful however, that these would be sufficiently significant past the 2,000 head level to

justify choosing the larger unit. Non-feed economies, however, are still significant beyond the 2,000 head level. A recent Oklahoma feedlot study indicates that with full utilization of facilities, approximately 75 percent of the cost savings per pound of gain associated with scale of operation are achieved with a 2,000 head feedlot. It also points out that little non-feed cost savings are realized when feedlot capacity exceeds 5,000 head. ^{23/} Recently completed research in Oregon also points to a saving in non-feed costs for the 5,000 head unit. In this study, a savings of \$.67 (\$3.05 to \$3.72) was realized per hundredweight of gain for a 5,000 head lot over a 2,000 head capacity lot. ^{24/} These savings, however, are probably not so significant as to rule out profitable operation at levels between 2,000 and 5,000 head.

Studies do indicate, however, that the quality of management needed to assure success in a cooperative feeding enterprise would have the capacity to manage lots in excess of 5,000 head. A 5,000 head capacity feeding operation would therefore seem a minimum size operation at which adequate utilization could be made of top quality management.

Investment costs for a 5,000 head capacity operation will run over \$200,000. This would include the feed mill and storage as well as feeding

^{23/} James I. McDowell, Scale Economies and Returns in Commercial Feedlots, unpublished Ph.D thesis, Oklahoma State University, 1963.

^{24/} Jack A. Richards and Gerald E. Korzen, Beef Cattle Feedlots in Oregon-- A Feasibility Study, Special Report 170, Agricultural Experiment Station, Oregon State University, Corvallis, March, 1964.

and manure handling equipment. Cost estimates tend to vary with different regions of the country. An Oregon study 25/ budgeted these costs at approximately \$261,000 while a North Dakota study 26/ placed the figure at approximately \$214,000. It would appear that investment costs for the study area would more nearly approximate those reported in the North Dakota study.

Recommended Location

Proper location of cooperative feedlots in the area will depend upon careful analysis of the advantages and disadvantages of alternative locations. Criteria for determining the best locations for large scale operations should include:

1. Availability of feeder cattle;
2. Availability of feed grain supplies;
3. Location of feed processing plants if operation does not include a feed mill;
4. Location of auctions and other marketing channels;
5. Location of slaughtering facilities;
6. Adequacy of transportation facilities;
7. Proximity to trading centers which provides services essential to feeding operations.

25/ Richards, op. cit.

26/ Rex W. Cox and Fred R. Taylor, Feasibility of Cooperatively Owned Feedlots, Agricultural Economics Report No. 36, Department of Agricultural Economics, Agricultural Experiment Station, North Dakota State University of Agriculture and Applied Science, Fargo, North Dakota, July, 1964.

The locations suggested here should not exclude further consideration of other locations. On the basis of the criteria listed above, however, they do appear to be the most feasible sites for expansion of large scale feeding operations in the area.

Glasgow should be given first consideration as a location for the establishment of a cooperative feeding operation. A new packing plant now under construction will be ready for operation in the spring of 1965. This plant will have an annual capacity of approximately 18,000 head which is much greater than the present number fed in the vicinity. Glasgow is also an important trading center and the site for an active livestock auction. It is located on a principle railroad and also on the main east-west highway running through the northern part of the state. The availability of feeder cattle and feed grains would present no problem.

Sidney appears to be the next most feasible location for a cooperative feedlot. It is an important trade center and has the largest livestock auction in the study area. Large numbers of packer buyers are drawn to the area by the auction market. Feeder cattle and feed grain supplies are readily available, as well as large supplies of hay and dried beet pulp. A large cooperative feedlot here would be easily accessible to the slaughtering plant at Williston, North Dakota, which presently buys large numbers of fed cattle in the area.

The third most suitable location for a cooperative feedlot appears to be at Glendive. This is the largest city in the area and is an important trade center. A livestock auction is located here as well as two

packing plants, one small and one medium sized. Although the number fed in the vicinity considerably exceeds the slaughter of these two plants, they have expressed some desire to expand their operations. Packer buyers from Billings, Great Falls, Williston and other locations attend the weekly sales here. A large feedlot would attract buyers desiring to fill their slaughter needs through direct purchases. Glendive is located on a main rail line and is serviced by a large network of highways. Feeder cattle and feed grain resources of the area are sufficient to support increases in feeding beyond the present level. However, local slaughter facilities would probably not warrant additional expansion at this time.

If slaughtering is expanded significantly in the study area, then additional cooperative feedlots may also become feasible. The location of these would largely be determined by the section of the area in which expanded slaughter took place. The opportunities for expanded slaughtering facilities in the Northeast area will be discussed in Chapter V and will be followed in Chapter VI with an analysis of coordinated cooperative feeding and slaughtering.

Additional Areas of the State in Which Cooperative Feedlots Could be Established

Increased feeding throughout Montana would offer a means of generating greater economic activity, and consequently, great returns to the people of the state. The feeding potential of the state based on cattle and feed resources was presented by crop reporting districts in Table XII page 28, and is summarized graphically here in Figures 5 and 6. On the

basis of the supply of these resources and certain of the locational criteria cited earlier in this Chapter, suggestions for possible location of cooperative feedlots for areas outside the Northeast district will be made.

The Northcentral district appears the second most likely area for expanded cattle feeding. Establishment of two or three large cooperative feedlots would probably be feasible in this area. The number presently fed is only 3 percent of the potential number that could be fattened on barley produced in the area. This represents only approximately 12 percent of the number of beef calves born annually. There are two auction markets in the area. They are located at Shelby and at Havre. Seven relatively small packing plants are located in the area and it is only a short distance to Great Falls where there are five slaughtering plants, two of which are federally-inspected.

The Central district could also support two or three large cooperative feedlots. It has the largest beef cattle production and ranks next to the Northcentral and Northeast districts in barley production. It presently feeds approximately 29,000 head annually. This represents 14 percent of the potential number that could be fed with its total barley production and approximately 15.5 percent of its annual beef calf production. Located within this area, at Great Falls, are two federally-inspected slaughter plants which afford market opportunities for increased numbers of fed cattle. Auction markets are located at Great Falls and Lewistown.

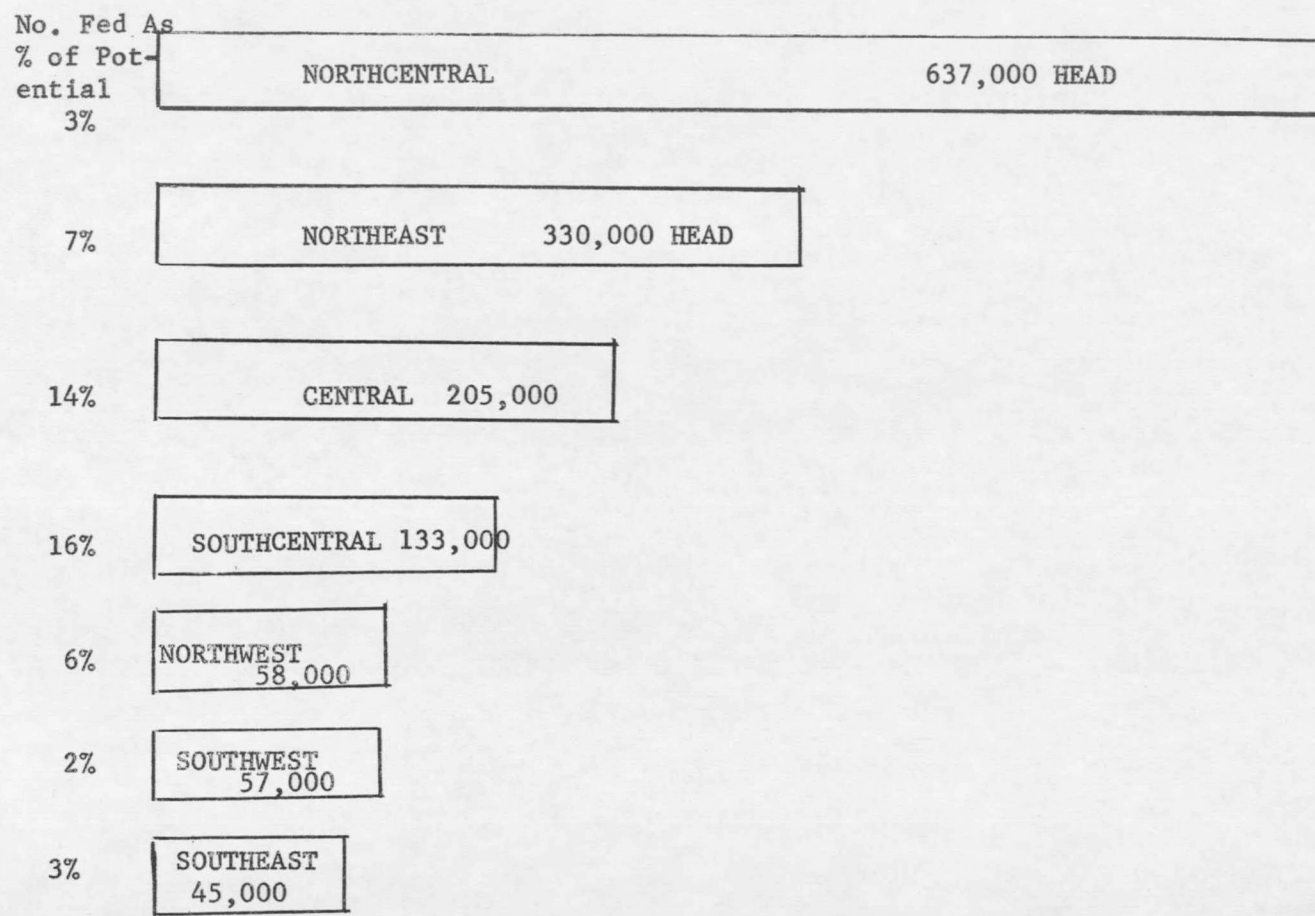


Figure 5. Cattle feeding potential, by district, based on barley production, 1962. *

* Source: Data taken from Table XII, page 28.

No. Fed 28,800	Percent of Potential 16%	CENTRAL	186,000 HEAD
20,000	12%	NORTHCENTRAL	164,000 HEAD
21,300	13%	SOUTHCENTRAL	163,000 HEAD
1,000	1%	SOUTHWEST	129,000 HEAD
3,700	3%	NORTHWEST	124,000 HEAD
23,000	19%	NORTHEAST	123,000 HEAD
1,500	1%	SOUTHEAST	118,000 HEAD

Figure 6. Cattle feeding potential by district based on feeder cattle production, 1962. *

* Source: Data taken from Table XII, page 28.

Opportunities for expanded feeding also exist in the Southcentral district. The large commercial type operation has seen its greatest growth in this area. The present number fed is approximately 16 percent of its potential based upon total barley production and represents approximately 13 percent of its annual beef calf production. Two federally-inspected slaughter plants are located at Billings and would provide market outlets for additional fed cattle. The area also has two auction markets, both of which are located at Billings. It would appear that two cooperative feedlots of the size recommended or a larger unit of approximately 10,000 head capacity could reasonably operate in the area.

The Northwest district should also be able to support a cooperative feeding operation. A new federally-inspected slaughter plant has recently been constructed at Kalispell. It will not only provide a market for additional fed cattle, but will require an increase in the number of cattle fed in the area. A livestock auction is also planned at Kalispell. The auction located at Missoula is the only one in the area at the present time.

It must be emphasized that these recommendations are based primarily on the livestock feed balance of these areas. A detailed study of each district, such as was made in the Northeast area, would be necessary in order to determine more fully the extent to which feeding expansion could be carried out in the state. Opportunities for increased feeding do appear favorable, however, in the areas mentioned above. Cooperative feedlots would provide a means of bringing about this expansion. Much of the present

opposition to the cooperative form of organization must be overcome, however, before feeding expansion through cooperative feedlots will be significant.

CHAPTER V

THE FEASIBILITY OF ADDITIONAL SLAUGHTERING IN THE NORTHEAST AREA

Present Structure of Meat Packing

Northeastern Montana had 13 licensed slaughtering firms in 1963. This represents an increase of two small local plants since 1960. There are no federally-inspected plants in the area at the present time. The 13 existing plants, divided into three size groups, are shown both by size and location in Figure 7.

The first group consists of plants slaughtering over two million pounds liveweight annually and are referred to as medium plants. Plants in the second group have an annual slaughter volume of over 300,000 but less than two million pounds and are referred to as small plants. The third group is made up primarily of local butchers slaughtering less than 300,000 pounds annually and will thus be termed local plants.

There is only one medium sized plant in the area. This is located at Glendive in Dawson County. This plant slaughters approximately 2.5 million pounds liveweight annually, with a cattle to hog slaughter ratio in liveweight pounds of approximately five to one. 27/

There are five small size plants in the area, located at Glasgow, Wolf Point, Glendive and two at Sidney. Average annual slaughter for these plants is approximately 1.3 million pounds with an approximate cattle to hog ratio of three to one in liveweight pounds slaughtered. These

27/ Much of the slaughter information for the plants within the area is taken from data collected by Charles H. Rust and Clive R. Harston in their study, The Survival and Growth Potential of Small Meat Packing Businesses in Montana, Technical Bulletin 580, Montana Agricultural Experiment Station, Montana State College, Bozeman, Montana, July, 1963.

plants slaughtered very few calves and sheep.

There were seven local plants in 1963, four of which were in Sheridan County. The local sized plants have annual average slaughter of approximately 150,000 pounds, made up almost entirely of cattle and hogs. The liveweight of cattle slaughtered is approximately five times that of hogs slaughtered for these plants. This would amount to only approximately 120 head of cattle per year for each operation. These normally slaughter only the amount needed to supply the small towns or localized areas in which they operate.

Feasibility of Expansion of Slaughtering in the Northeastern Area

Interest in the establishment of a large new packing plant in the northeastern area is high. At least two groups have investigated possibilities to date. In addition, several of the presently existing plants in the area indicate that they also would like to expand their facilities.

Plant and operating costs of well managed plants in the area appear to be competitive with other regions of the country. The question of how much expansion is feasible would depend upon such factors as the availability of a constant supply of uniform fed cattle, the labor supply in the area, transportation costs, the market potential for the increased meat that would result, the attitude of the local people and methods of financing a new plant. The remainder of this chapter will be concerned with a discussion of these factors.

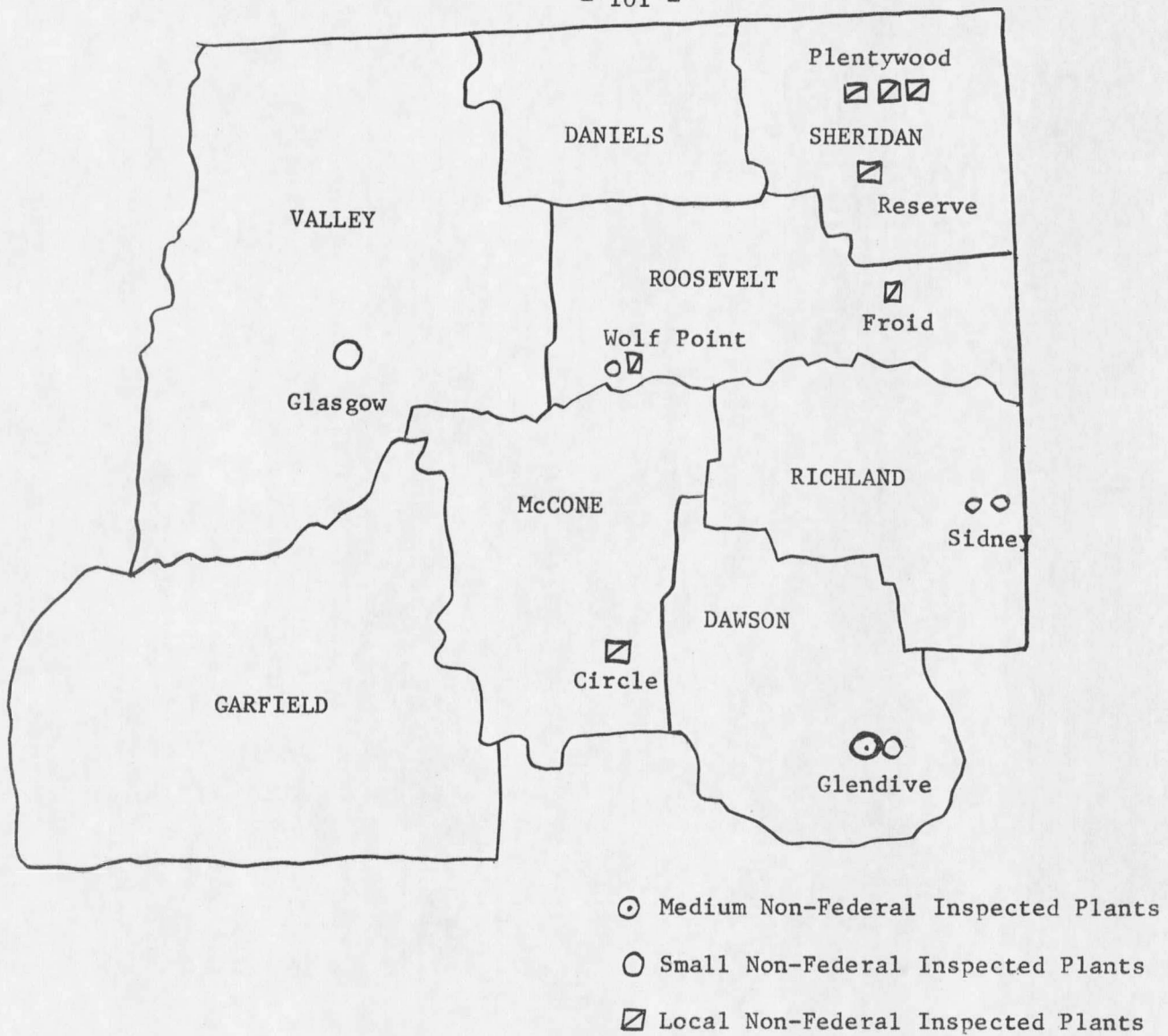


Figure 7. Location and size of meat packing plants in northeastern Montana, 1963. *

* Source: Montana Crop and Livestock Reporting Service, Helena, Montana

Market Potential for Increased Meat

The meat industry has experienced marked structural changes in which the retailer has emerged in a position of dominance over the market, while the influence of the packing industry has rapidly declined. The strength and bargaining power of the modern chain store, along with the decentralization of ownership and decreased size of packing firms have been the major contributing factors to these structural changes. This shift in power has made the packing industry one of the most competitive of this nation's industries.

A significant expansion of slaughtering in Northeastern Montana cannot be successfully carried out unless additional markets are developed. The present level of slaughter is sufficient to supply the needs of the area, while Montana, as a whole, has a surplus volume of meat slaughtered within its boundaries. Additional slaughter must be marketed outside the state. Firms expecting to enter these markets must meet the requirements necessary to qualify for federal inspection.

As the population expands, larger and larger quantities of meat will be needed. However, the eastern population centers are adequately serviced by the highly competitive Corn Belt packing industry. Montana slaughter must look for markets primarily to the West. During the years 1950-1960 the West led all other regions of the United States in population growth with a 38.9 percent increase, compared to 16.5 percent for the next most rapidly growing region. The larger part of this increase in the West,

6.1 million, took place in the Pacific Division, while the Mountain States gained 1.8 million or approximately one-fifth of the total gain for the region. The population growth of the West Coast states is shown in Table XXV along with that of Montana and the United States for purposes of comparison. The 1970 anticipated population growth is also included.

California's 5.1 million increase in population from 1950 to 1960 was the greatest of any state. This represented an increase of 48.5 percent, almost two and one-half times the national percentage increase of 18.5. Washington's rate of growth was slightly higher than the United State's average, while Oregon's was approximately 2 percent less. The total increase for the three states during the decade was 5.85 million, or an average annual increase of 585 thousand. This mass Westward movement of population has created a large and increasing demand for meat on the West Coast.

The projected population increase from 1960 to 1970 for these three West Coast states is 5.76 million, or an average of 576 thousand per year, (see Table XXV). What will be the meat requirements for this 5.76 million? To determine this the expected consumption of meat must also be considered. In 1960, the average annual per capita consumption of beef was 85.2 pounds and 66.0 pounds of pork. The per capita consumption of beef in the West has been found to be approximately 1.3 times the average for the entire United States. The per capita consumption of pork in the West, on the other hand, is only approximately 88 percent of the

TABLE XXV. POPULATION FOR WEST COAST STATES, MONTANA AND THE UNITED STATES, 1930-1960, WITH EXPECTED LEVELS FOR 1970.*

State	1930 (000)	1940 (000)	1950 (000)	1960 (000)	Increase 1950-1960 (000)	Percentage Change 1950-1960	1970 a/ (000)
California	5,677	6,907	10,586	15,717	5,131	48.5	20,696
Washington	1,563	1,736	2,379	2,853	474	19.9	3,251
Oregon	954	1,090	1,521	1,769	247	16.3	2,153
Montana	537	559	591	675	84	14.2	717
United States	123,203	132,165	151,326	179,323	27,997	18.5	219,500 b/

* Source: United States Department of Commerce, Bureau of the Census, 1960 Census of Population, Volume 1, Characteristics of the Population, Part A, Number of Inhabitants, U. S. Government Printing Office, Washington, D.C., 1961.

a/ Taken from "Income Trends in the U.S. Through 1975", Stanford Research Institute, December, 1957.

b/ Projection Series I, taken from "Illustrative Projections of the Population of the United States by Age and Sex - 1960 to 1980", Series P-25, No. 187, Current Population Reports, U. S. Department of Commerce, Washington 25, D.C., November 10, 1958, p. 2.

United States average. 28/ On this basis, the annual per capita consumption of beef and pork would figure out to be 110.8 and 58.1 pounds respectively. This adds up to a total consumption of 2.3 billion pounds of beef and 1.2 billion pounds of pork in these three states for 1960.

The per capita consumption of beef and veal in the United States has been estimated at 106 pounds for 1968. 29/ Assuming this rate of increase continues, the national per capita consumption of beef and veal will be approximately 110 pounds in 1970. Per capita consumption of pork decreased from 65.2 pounds in 1960 to 64.0 in 1962. Assuming this trend will continue, it would appear that an estimate of 60.0 pounds per capita consumption in 1970 would not be in serious error. If it is assumed that the per capita consumption ratio for the West and the United States remains the same as in 1960, then per capita consumption in the West will run approximately 143.0 pounds of beef and veal and 52.8 pounds of pork in 1970. Having considered both the population growth and the increased levels of consumption, we find that total consumption of beef and veal should be approximately 3.7 billion pounds in 1970, while total consumption of pork will run approximately 1.4 billion pounds for these three states. These figures indicate that by 1970 approximately 1.4 billion more pounds

28/ H. E. Breimyer and C. A. Kause, "Consumption Patterns for Meat", Bulletin No. 249, Agricultural Marketing Service, Department of Agriculture, May, 1958.

29/ The Farm Index, Economic Research Service, U. S. Department of Agriculture, March, 1964.

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of beef and 200 million more pounds of pork will be needed than in 1960.

Although large scale feeding has developed in these states, particularly California, it has not been sufficient to supply the demand of these expanding markets. Of the 2.23 billion pounds of beef consumed in California in 1963, approximately 51 percent came from California feedlots, 12 percent came from cattle shipped in from other states for slaughter in California, 8 percent came from culled breeding stock and grassfat cattle marketed from California ranchers and approximately 10 percent represents imports from overseas. 30/ This means that approximately 19 percent was supplied from sources outside the state in either carcass or processed forms.

Arizona has provided 78 percent of the cattle and calves shipped in for slaughter during the last three years, and is followed by Idaho which shipped in 9 percent. 31/ This study also indicates that California meat packers are bringing in fewer number of fed beef for slaughter, since at current freight rates it is generally cheaper to slaughter animals in the major feeding areas and ship carcasses rather than ship live animals to California for slaughter. The majority of this dressed beef has come from Colorado, Nebraska and Texas.

30/ John A. Hopkin and Robert C. Kramer, Cattle Feeding in California, Economics Research Department, Bank of American N.T. & S.A., February, 1965, p. 44.

31/ Ibid.

These West Coast markets should provide the best outlet for increased quantities of meat slaughtered both in Northeastern Montana and for the state as a whole. Large, efficient packers will be in a favorable position to compete for these markets and should be at no disadvantage relative to packers now successfully shipping to the West Coast from as far away as Nebraska, Colorado and Texas.

Plant and Operating Costs of Area Plants

Plant and operating cost data were not available for all the plants in the study area. However, such costs from area plants as were available, appeared to correspond closely to costs in the other areas of the state. A percentage breakdown of operating expenses of slaughter plants in the state by size group is presented in Table XXVI. Cost figures for federally-inspected plants are shown for reasons of comparison. Cost data is not available for the local butcher shop type plants.

The largest cost item for all sized plants is labor. This makes up approximately 55 percent of the cost for federally-inspected and medium sized plants, and approximately 44 percent for the small firms. ^{32/}Supplies and containers were the next most costly item for all sized plants. This was higher for the medium sized plants than for the other two groups.

Total labor costs per pound of output were lowest for the federally-inspected plants. (See Appendix Table VI). These plants, being large in size, tend to benefit from the economies of large volume production.

^{32/} Comparison of state costs with average U.S. plant costs indicate wages and salaries constitute a slightly smaller percentage of total costs for the whole industry than they did for Montana plants. (See Appendix Table V).

TABLE XXVI. PERCENTAGE BREAKDOWN OF OPERATING EXPENSES, BY SIZE GROUP, SELECTED MONTANA MEAT PACKERS, 1961.

Cost Item	Size of meat-packing plant		
	Federally-Inspected	Medium	Small
	Pct.	Pct.	Pct.
Wages and salaries	55.5	55.2	43.9
Supplies and containers	14.0	20.3	10.7
Utilities	3.8	3.9	7.3
Interest	3.9	0.1	2.9
Advertising and public relations	0.6	1.2	2.1
Transportation	4.3	1.3	4.5
Repairs and maintenance	1.8	1.3	3.5
Insurance	2.7	0.5	3.4
Depreciation	3.5	5.9	9.1
Social security	2.1	1.8	2.7
Hospitalization	1.1	0.7	0.9
Real estate taxes	1.3	2.3	1.6
Miscellaneous	5.4	5.5	7.4
Total	100.0	100.0	100.0

* Source: Charles H. Rust and Clive R. Harston, The Survival and Growth Potential of Small Meat Packing Businesses in Montana, Technical Bulletin 580, Montana Agricultural Experiment Station, Montana State College, Bozeman, Montana, July, 1963.

Production labor costs were less per pound of output for the small sized plants. This advantage seems to exist mainly as a result of the owner or manager working at different production type jobs, yet failing to properly charge these to production costs. In addition, wages are usually less in the small towns where these plants are located. Non-production labor costs, on the other hand, run higher for the small plants, indicating higher cost for such things as selling, delivery and clerical help. Providing added services may sharply increase these costs. Several small plants show high delivery costs from distributing small orders to widely scattered customers.

Fixed costs as a percent of total are shown in Figure 8. 33/ These fixed costs are primarily influenced by age of plant, location of the plant and the amount of financing required for construction and repairs. The fixed costs, as a percentage of total costs, averaged much higher for the small plants than for either the medium or federally-inspected plants.

On the other hand, average operating costs per pound of output decreased as volume of output increased. (See Figure 9) Percentage of capacity used rather than size seemed to be the important factor for the small to medium plants. The big change came with the increases in volume slaughtered at the federally-inspected level. Operating costs per pound of output were significantly less for these plants than for the two smaller sized groups.

33/ Included in these fixed costs are: (1) Interest on real estate and building loans, (2) insurance and buildings and equipment, (3) depreciation, and (4) real estate taxes.

The plants having greatest financial difficulty also had relatively high fixed costs. The likelihood of financial difficulty appears greatly increased when fixed costs move in excess of 15 percent of total operational costs over a prolonged period of time.

Transportation Costs

The structure of freight rates, both within the study area and to out-of-state markets, is of considerable importance in determining the feasibility of establishing additional slaughtering in Northeastern Montana. There has been much discussion as to the economies actually obtained by the supply-oriented packer and if they do, in fact, exist in Montana.

An investigation of transportation rates is necessary to see if packers in this area would have an advantage over their market-oriented competitors on the West Coast.

The majority of Montana's out-of-state shipments have customarily moved by truck. There has been considerable variation in truck rates on cattle and dressed meats, particularly on those moving to the West Coast. Meat packers in the area would face a rather flexible truck rate structure. There are also many trucks bringing produce to the states that are looking for a backhaul to the Coast which has added to the variation in truck rates. The truck rate on dressed meat to the West Coast has ranged from \$1.25 to \$2.00 per hundredweight, with the bulk of the shipment ranging between \$1.25 and \$1.60 per hundredweight. ^{34/} This does not

^{34/} C. H. Rust, op. cit., p. 82.

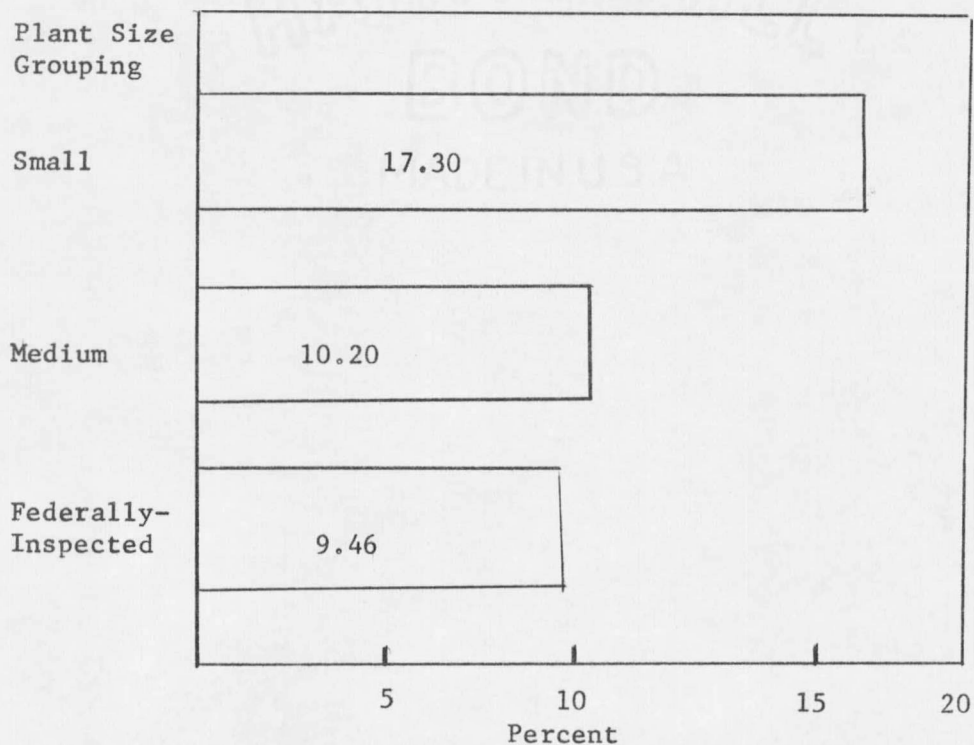


Figure 8. Percent fixed costs are of total costs, by size group, Montana Meat Packers, 1961. *

* Source: Charles H. Rust and Clive R. Harston, The Survival and Growth Potential of Small Meat Packing Businesses in Montana, Technical Bulletin 580, Montana Agricultural Experiment Station, Montana State College, Bozeman, July, 1963.

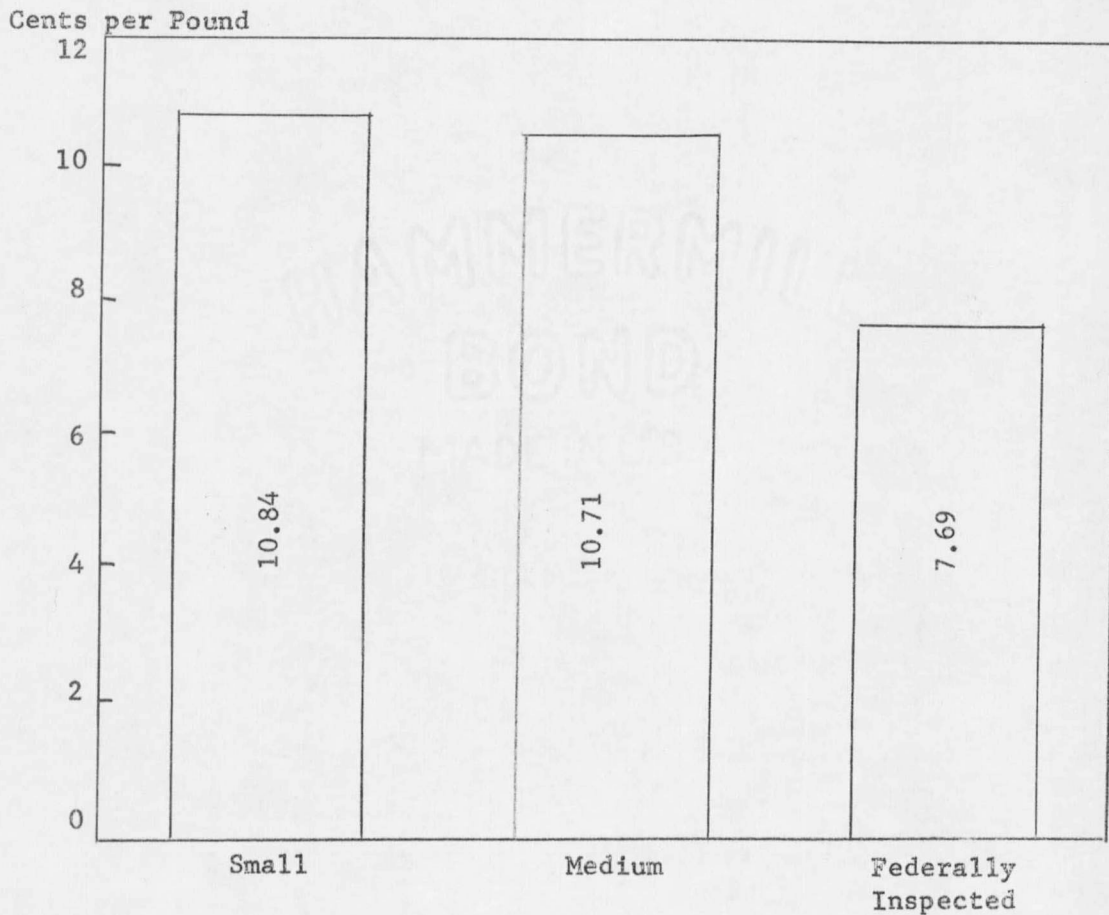


Figure 9. Average operational cost per pound of output, by size of plant, Montana Meat Packers, 1961. *

* Source: Charles H. Rust and Clive R. Harston, The Survival and Growth Potential of Small Meat Packing Businesses in Montana, Technical Bulletin 580, Montana Agricultural Experiment Station, Montana State College, Bozeman, July, 1963.

place the Montana packer at a particular competitive disadvantage in regards to freight rates.

Rust states that Montana packers have not felt that rail services have been adequate to meet their needs. ^{35/} Recent rate reductions, however, particularly in piggy-back rates, have greatly enhanced the transporting of fresh meats by rail, especially to the Seattle and Portland areas.

Tables XXVII and XXVIII present a comparison of live and dressed meat freight rates to various alternative market areas. Particular emphasis will be given to the expanding West Coast markets.

Inasmuch as the study area has no Federally inspected plants, it has not been able to ship any dressed meat out of the state. Since rail freight rates are determined on the basis of quantity and destination of shipments, the quoted rates for the study area are therefore higher than would actually be the case if a large federally-inspected plant were operating in the area. To make a meaningful comparison, we must then look at the rates for dressed meats going to the West Coast from Billings and Great Falls. Relatively favorable rates now exist on piggy-back shipments of 40,000 pounds minimum going to the Seattle and Portland areas. At \$1.00 per hundredweight on 40,000 pound minimum from both Great Falls and Billings, the freight on a 600 pound carcass would cost only \$6.00 to either Seattle or Portland, whereas charges for live shipment of 1,000 pound steer would

^{35/} Ibid.

TABLE XXVII. RAIL FREIGHT RATES ON FEEDER AND FAT CATTLE, FROM SIDNEY, BILLINGS AND GREAT FALLS TO SELECTED MARKETS, OCTOBER, 1963. * a/

Destination	Feeder Cattle From			Fat Cattle From		
	Sidney	Billings	Great Falls	Sidney	Billings	Gt. Falls
Spokane	\$1.09	\$.925	\$.80	\$1.275	\$1.09	\$.94
Portland	1.335	1.18	1.065	1.57	1.39	1.25
Seattle	1.335	1.18	1.065	1.57	1.39	1.25
San Francisco	1.68	1.50	1.42	1.98	1.78	1.67
Los Angeles	1.79	1.60	1.58	2.10	1.87	1.84
Sioux City	.93	1.12	1.20	1.10	1.32	1.40
Omaha	1.00	1.24	1.26	1.17	1.45	1.48
St. Paul	.89	1.03	1.23	1.03	1.22	1.43
Minneapolis	.89	1.03	1.23	1.03	1.22	1.43
Chicago	1.23	1.38	1.58	1.43	1.62	1.84

* Source: J. J. Heimes, Traffic Department, Great Northern Railway, Great Falls, Montana.

a/ Figures represent dollars per hundred pounds.

TABLE XXVIII. RAIL FREIGHT RATES FOR DRESSED MEATS, BY REFRIGERATED CAR AND PIGGY-BACK, FROM SIDNEY, BILLINGS AND GREAT FALLS TO SELECTED MARKETS, OCTOBER, 1963. * a/

Destination	Refrigerated Car From			Piggy-Back From		
	Sidney	Billings	Gt. Falls	Sidney	Billings	Gt. Falls
Spokane	21M-288	21M-232	21M-200	21M-290	21M-234	24M-124
Portland	21M-363	21M-243	21M-227	21M-341	15M-262 40M-100	15M-262 40M-100
Seattle	21M-352	21M-243	21M-227	21M-341	15M-262 40M-100	15M-252 40M-100
San Francisco	21M-439	21M-354	21M-346	<u>b/</u>	<u>b/</u>	30M-225
Los Angeles	21M-462	21M-354	21M-354	<u>b/</u>	<u>b/</u>	20M-325 30M-250
Sioux City	21M-222	21M-263 33M-258	21M-298 30M-295 33M-258	21M-244	21M-278	21M-336
Omaha	21M-241	21M-263 33M-258	21M-298 30M-295 33M-258	21M-244	21M-278	21M-336
St. Paul and Minneapolis	21M-210	21M-268 33M-258	21M-294 33M-258	21M-212	35M-150	30M-190 35M-165
Chicago	21M-279	21M-294 33M-258	21M-294 33M-258	21M-281	30M-245 35M-224	30M-260 35M-240

* Source: J. J. Heimes, Traffic Department, Great Northern Railway, Great Falls, Montana.

a/ Figures shown above indicate minimum weight requirement, and rates in cents per hundred pounds.

b/ No publications through TOFC Class or Commodity rates available.

run \$13.90 from Billings and \$12.50 from Great Falls.

The rail rate on fat cattle going to Seattle or Portland is \$1.57 per hundredweight from Sidney compared to \$1.39 per hundredweight from Billings, a difference of 13 percent. If we assume that a corresponding cost differential would be maintained in setting the new rate on dressed meat shipped out of Sidney, then the rate for piggy-back shipments of 40,000 pound minimum would run approximately \$1.13 per hundredweight. However, since it is not known at what level rates would be set, the following comparisons are based on a piggy-back rate of \$1.25 to allow for some margin of error in estimation. It does not appear that it would exceed this amount.

Comparative rates indicate that packers in the area would have a definite freight advantage over West Coast packers who are bringing cattle in from equal distances. The fat cattle rate of \$1.57 per hundredweight from Sidney to either Portland or Seattle would result in a total cost of \$15.70 per head for cattle averaging 1,000 pounds. If these cattle were slaughtered here and then the carcass beef shipped to either of the above mentioned markets, the total cost would be approximately \$7.50 (600 X \$1.25). If for some reason the rate for piggy-back shipments were set as high as \$1.50 per hundredweight, the transportation charge by rail would still be just \$9.00 per carcass compared to \$15.70 for the live animal. This favorable rate is presently available only on large shipments, but would enable a packer in the study area to compete very favorably for a portion of the expanding West Coast markets, particularly in the

Northwest.

In addition to the savings of at least \$6.00 per head in transportation costs realized by slaughtering the cattle here rather than shipping them live, there are additional advantages which tend to enhance the competitive position of the local packer. Cattle shipped live generally experience considerable tissue shrinkage which can add up to as much as \$10.00 to \$12.00 per head. Carcass shipments will shrink only approximately .5 percent compared to the 2 to 4 percent shrink for live animals. There is also no danger in bruising the meat while it is being transported, as is the case with live shipments.

One disadvantage, however, is the fact that much of the by-products would also have to be shipped out of the area, thus creating an additional cost. It would be small however, in comparison to the savings in freight previously cited.

Transportation costs, then, would not be particularly disadvantageous to the expansion of slaughtering in the study area. The packer here would have definite freight advantages over the West Coast packer who is having to go similar distances to purchase fat cattle.

Availability of Labor

The availability of sufficient unskilled and semi-skilled labor is very important in determining the feasibility of expanded slaughter. Numerous firms expanded into rural areas after World War II, hoping to take advantage of cheap labor. These lower wages were short-lived in most cases,

however, as labor unions became organized and the regular forces of competition came into play. This move to the country still continues. It is not the lower hourly wage rate, but rather the higher productivity of rural labor which has proven to be the principal advantage.

In the large cities a considerable amount of social prestige and relatively good wages are attached to white-collar jobs. As a result, many large firms, including meat packers, have been forced to employ primarily leftovers of the labor force.

In the rural area the situation is different. Less and less farm labor is required for expanding farm production. When farm work is available, it usually requires long, hard hours, yet is highly seasonal, and pays poorly. The few jobs that may be available in the small towns, such as retailing or service jobs, also pay poorly. An industry offering shorter, more regular hours and a better hourly wage is in a position to take their pick of the labor force available to them. Even if wage rates and working conditions are identical, there is still a vast difference in the manufacturing results achieved with leftovers and with the pick of the market. This difference has been measured and works out to be approximately 20 percent of the labor costs. 36/

36/ Richardson Wood, "Where to Put Your Plant", Readings in Economic Geography from Fortune, edited by Richard J. Ward and Lawrence A. Hoffman, Holt, Rinehart and Winston, New York, New York, 1961, pp. 112-117.

Hourly wage rates for the area are considerably below the national average. They are particularly favorable relative to West Coast rates where packers face the nation's highest labor wage structure. Local rates would no doubt increase some as a result of a unionized plant, but all indications are that they would still be less than the coastal wage rates of competitive packers. As a result of paying higher wages, they would be in a position to attract the pick of the local labor force.

The only foreseeable labor problem is that of top management. This being so essential to successful operation, the first and foremost requirement would then be the acquisition of the best manager possible. This individual is not available in the study area, nor likely even in the state. It must be understood that this type of management does not come cheaply. A new firm must be willing to pay the price necessary to get a qualified individual and can afford to settle for nothing less. Providing salary necessary to acquire a top manager may well prove to be one of the most economical expenditures made. This point cannot be too greatly emphasized.

In addition to the shortage of top management in the area, problems may also exist in acquiring the necessary skilled labor. It may be necessary to acquire a small number of skilled workers outside the area as well. The majority of the needed labor force can be supplied with local labor, however. Both the labor force and number of unemployed for the area are presented by county in Table XXIX. The total civilian labor force for the area was approximately 22,700 on April 1, 1960. Of this number, approximately 1500 were unemployed.

The Fort Peck Indian Reservation is located within the study area and is included in the figures given above. It has been estimated that there are approximately 460 males and 70 females on the reservation who are employable between the ages of 18 and 60. 37/ Approximately 90 of these are permanently employed, 250 are employed part of the time and the remaining 120 have no employment at all.

Marketing of Meat Slaughtered in the Area

Most slaughter plants in Northeastern Montana sell the bulk of their meat products within a 50 mile radius of their plant. The three principal exceptions to this are plants located at Glendive, Glasgow and Sidney. These three market over half of their meats at distances from 100 to 200 miles from their plants. These meats are delivered by truck.

The larger plants in the area sell approximately 60 percent of their meat products to independent grocers. Several of these plants are building up a good chain store trade as well as selling goodly amounts to restaurants in the area. Some of the local sized plants retail almost 100 percent of the meat they slaughter, while others sell most of their slaughter directly to individuals, hospitals, etc. The majority of these local sized plants sell and operate almost entirely within the small towns in which they are located.

37/ Overall Economic Development Plan, Progress Report for Fort Peck Reservation and Roosevelt County Redevelopment Area, June, 1963.

TABLE XXIX. CIVILIAN LABOR FORCE AND NUMBER OF UNEMPLOYED, BY COUNTY,
FOR NORTHEASTERN MONTANA, ON APRIL 1, 1940, 1950 AND 1960.*

County	1940		1950		1960	
	Labor Force	Number Unemployed	Labor Force	Number Unemployed	Labor Force	Number Unemployed
Daniels	1,803	207	1,461	60	1,335	50
Dawson	3,344	204	3,508	96	4,330	177
Garfield	1,061	63	920	42	813	31
McCone	1,431	171	1,339	36	1,214	47
Richland	3,884	496	3,812	232	3,602	281
Roosevelt	3,456	284	3,462	232	3,793	332
Sheridan	2,934	257	2,426	116	2,184	121
Valley	5,792	918	4,406	236	5,436	467
Totals	23,705	2,600	21,334	1,050	22,707	1,506

* Source: Montana-Counties-Manpower Guide Book, Unemployment Compensation Commission of Montana, Helena, Montana, 1962.

Most plants in the area are doing a significant amount of advertising. The most popular media are the local paper and radio, with several in the area now also advertising their products on television. No more than three plants in the area presently have their own brand name.

Distribution of By-Products.--There are only two rendering plants in the area, these being located at Glasgow and Sidney. Only approximately five plants in the area are making any attempt to market their by-products. The Glasgow packing plant is operating a successful rendering operation in conjunction with its slaughtering. Most of their rendered product is sold locally, with some tallow being shipped out-of-state. The other plants utilizing their by-products either sell them to the Sidney rendering plant or to the one located in Miles City, which is out of the area. The smaller plants have made little attempt to utilize their by-products.

Availability of Uniform Fed Cattle

Larger packers buying in the northeastern area indicate the lack of a stable supply of good quality uniform fed cattle. As mentioned in the previous chapter, the marketing of fed cattle in the area is highly seasonal. In addition, uniformity is a problem. More and more the demand is shifting to lighter, smaller carcasses and away from the heavier cattle, thus requiring weight limits to be lowered. Liveweight preferences for slaughter beef, as expressed by packers throughout the state, are shown in Table XXX. In order for packing firms to compete for large out-of-state markets, they must be able to guarantee a stable supply of a particular

weight and grade. To meet these needs, many packers are operating their own feedlots, (see Table XXXI). The relatively small sized plants presently located in the area do not have particular difficulty in acquiring the fed cattle needed for slaughter, although some do have their own feedlots.

New developments in Glasgow and Williston, North Dakota have important bearing on the feasibility of expanded slaughtering in the study area. The new plant at Glasgow is now under construction and is expected to be in operation by early spring of 1965. This new plant will have a kill capacity of 75 cattle per day and 150 hogs per week. Present plans are to kill only two days a week until increased markets are obtained and a greater number of fed cattle are available. A kill of approximately 25 to 50 cattle and 50 hogs per week is all that is anticipated at first. This new plant will have federal inspection and hopes to obtain some of the nearby air base trade, as well as later expanding to the West Coast market.

The packing plant at Williston, located only 20 miles to the east of the study area, has just recently changed ownership. This plant has increased its slaughter to approximately 75 head per day and could increase this number with some additional cooling space. They have in the past purchased approximately 50 percent of their cattle in Montana and are very interested in the expansion of cattle feeding in the area.

With increased slaughter at the Williston, North Dakota plant and

construction well underway on the new and larger plant at Glasgow, the present production of fed cattle is just not sufficient to supply the needs of an additional large new slaughtering plant in the area. On the other hand, feasibility of additional cattle feeding looks favorable for the area. Many people feel that if a large plant were built, feeding would expand automatically and the availability of fed cattle would be no problem. However, the excess capacity of most existing plants makes this questionable. Unless plans include feeding most of the animal's needed, it would be much wiser to wait until a constant supply of feeder cattle are available.

Attitudes of Local People Towards Increased Slaughter Facilities

Local people were interviewed to determine their attitudes towards the feasibility of expanded livestock slaughtering in the study area. Some were pessimistic and felt that a packing plant wouldn't have a chance of succeeding, while at the other extreme, a small number were strongly of the opinion that a large plant just simply could not fail in the area. Between these two extremes, a somewhat cautious attitude regarding the feasibility of present expansion prevailed. This attitude was based on several factors. Inadequate supplies of fed cattle was the reason most often cited. Others felt that the difficulty in attracting sufficient capital to construct and operate a large plant would be the greatest inhibiting factor. Also often mentioned was the area's relative inexperience in packing and the lack of available qualified management.

TABLE XXX. LIVEWEIGHT PREFERENCE FOR SLAUGHTER BEEF, MONTANA MEAT PACKERS, 1961. *

Size of Plant	Liveweight of Steers and Heifers		
	801 - 900	901 - 1000	1001 - 1100
	Number of Plants		
Federally-inspected	2	2	1
Medium	8	2	2
Small	12	3	1
Local	6	9	
Total	28	16	4

* Source: Charles H. Rust and Clive R. Harston, The Survival and Growth Potential of Small Meat Packing Businesses in Montana, Technical Bulletin 580, Montana Agricultural Experiment Station, Montana State College, Bozeman, July, 1963.

TABLE XXXI. FEEDLOTS OPERATED AND LIVESTOCK FED BY MEAT PACKERS AND CONTRACTS WITH OTHER FEEDERS, MONTANA, 1960. *

Size of Plant	Plants With Feedlots	Number of Beef Fed	Number of Hogs Fed	Number of Plants Having Contracts With Other Feeders
Federal-inspected	3	20,000		1
Medium	4	4,250	1,600	2
Small	15	1,225	1,405	1
Local	7	55	277	1
Total	29	25,530	3,282	5

* Source: Charles H. Rust and Clive R. Harston, The Survival and Growth Potential of Small Meat Packing Businesses in Montana, Technical Bulletin 580, Montana Agricultural Experiment Station, Montana State College, Bozeman, July, 1963.

Evaluation of Opportunities for Expansion of Slaughtering

Under present conditions it appears that slaughter plants in the area suffer no unique disadvantage due to location with respect to operating costs. In terms of labor, they appear to have an advantage. Advantages also exist for transporting of carcasses vs. live animals. The West Coast market for carcasses can be expected to expand and should be accessible to federally-inspected Montana packing plants with aggressive merchandising policies. However, any effort to expand packing facilities in the Northeast or in other areas of the state without a systematic plan to assure an adequate and timely supply of high quality slaughter livestock seems premature.

Steps a new plant might take to assure necessary supplies are contracting with existing and potential feeders to assure the necessary supplies or to build and operate its own feedlots.

The first would have several drawbacks. In order to provide an adequate supply of quality fed cattle, additional investment in feeding facilities would be required, as well as changes in feeding techniques and a break with the established seasonal pattern of feeding. The problems of working up a contract to achieve these goals without cancelling out whatever advantages might exist would be extremely difficult.

On the other hand, an integrated slaughter plant and feedlot could take full advantage of available feed and feeder cattle supplies.

Feeding and slaughter operations could be closely coordinated. Quality control should be no problem although both investment requirements and operating capital needs would increase.

The formation of a cooperative is a way for farmers in the area to achieve efficient integration of the feeding and slaughter stages. The use of conventional cooperative forms would have advantages in that the structures are well defined and a wide range of technical assistance is available through such agencies as state and federal agricultural extension services and the USDA. In addition, specialized financing services are available to qualified applicants through the Bank of Cooperatives of the Farm Credit Administration. Such an undertaking would be farmer-controlled and profits would accrue primarily to the agricultural communities.

Benefits of Expanded Slaughtering

The economy of Northeastern Montana would be greatly stimulated through the expansion of slaughtering in the area. Recognizing that the immediacy of feasible expansion is dependent upon the rate at which sufficient quantities of fed cattle are made available, attention will now be given to changes in area income resulting from such expansion.

The full impact of this expansion in slaughtering upon the economy of the area depends upon the flow of the increment. A measure of this flow is termed the "multiplier factor". This factor times the added increment to income would then represent the significant impact of a new packing plant upon the economy of the area.

An accurate measure of the multiplier is difficult to compute. In a closed economy where nothing is exported or imported, the multiplier would be $\frac{1}{1-C(1-t)}$ where C is marginal propensity to consume and t is the mar-

ginal tax rate. The total increase in income (ΔY) as a result of additional investment expenditure (I) would be given by the identity: $\Delta Y = \Delta I$.

$\frac{I}{1-C(1-t)}$. In an open economy, such as is present in both the area and

the state, the multiplier (and therefore also ΔY) will be smaller as a result of some leakage at each round of expenditure. If these leakages were a constant fraction (s), at each round of expenditure the multiplier would be $\frac{1}{1-C(1-t)(1-s)}$. The real life situation is far more complex

than this however. Few, if any of the possible leakages remain constant over any period of time, thus making it difficult to measure the effective multiplier component for a particular area of the state, or even for the state as a whole. For purposes of analysis, it will be assumed that the area multiplier is approximately two. Due to continuous leakage, the area multiplier is necessarily less than the state factor, which in turn is less than the national multiplier factor. Estimating the area factor at two appears to be sufficiently conservative as to not overstate the benefits received and yet realistic and meaningful.

In considering benefits that would be derived from an additional slaughtering facility, little attention will be given to the construction state. A goodly percentage of the initial expenditure would leave the area directly, since much of the needed equipment must be purchased

elsewhere. Inasmuch as the period of question and construction would normally be relatively short, and since slaughtering projects usually reach fruition reasonably soon, consideration will not be given to the benefits derived during the period, although they should not be forgotten or overlooked.

Particular attention will be given to the added payroll income generated through increased slaughtering, to the additional value added to the product, and their relationship with the multiplier factor.

If a new one-bed plant with a kill capacity of approximately 17 head of cattle per hour was constructed, the annual payroll would be approximately \$196,000. 38/ In addition to this amount, approximately another \$107,000 39/ would be added to the value of the product, making a total increase in income of approximately \$303,000. Assuming that the area multiplier is two, then added annual income accruing to the area would be approximately \$600,000.

In 1960, the average weekly slaughter of the state's three largest federally-inspected plants was approximately 250 head of cattle and 1,050 head of hogs, with the number of employees averaging approximately 125 for

38/ Samuel H. Logan and Gordon A. King, Economies of Scale on Beef Slaughter Plants, Giannini Foundation Research Report No. 20, California Agricultural Experiment Station, Giannini Foundation of Agricultural Economics, University of California, Berkeley, December, 1962.

39/ Ibid.

each of these plants. 40/ If a plant of this approximate size were constructed in Northeastern Montana, the benefits derived would exceed those in the previous case. This would provide added employment of about 125 employees and an addition of around \$560,000 to the area's payroll.

Approximately another \$375,000 would be added to the value of the product, making the total increase in income approximately \$935,000. Again assuming a multiplier factor of two, the additional income accruing from a similar operation would approximate \$1,870,000 annually.

It is assumed that because of unemployment and underemployment in both the area and the state, that the use of labor in increased slaughtering would not require any cutback of production in other sections of the economy. Previously underemployed persons would become more productive as a result of new slaughtering facilities.

Society gains in that the area and the state have increased their productive assets, from which will be derived both present and future benefits.

This opportunity for employment and increased income would mean different things to many people. To the small farmer it may mean a full time job and the end of a sub-standard level of living. To the unemployed, those being forced off the farm or the young high school graduate, it may mean a good job and an opportunity to stay in the area. To the livestock producer and feeder it affords an additional marketing alternative and may

40/ Charles H. Rust, unpublished survey data, Department of Agricultural Economics, Montana State College, Bozeman, Montana.

tend to slightly increase the prices he receives for his stock. It means an increased demand for goods and services, as there will be more money to be spent in the market place, be it for a new home, a new car or a better cut of meat at the grocery store.

The expected increase in income due to the multiplier action in the maturity stage of the productive asset would help sustain prosperity in the area, while the injection of added dollars into the economy would greatly aid in reducing the problems which presently exist. This would be particularly so in the immediate location of the plant.

The increased returns derived through an expansion of feeding would also be subject to the multiplier factor. Through increased feeding additional value would be added to both feed and cattle resources.

CHAPTER VI

COORDINATED COOPERATIVE LIVESTOCK FEEDING AND SLAUGHTERING

Opportunities for Coordinated Operation

In Chapter IV, capacity of slaughter facilities and market for fresh meat were noted as upper limits to expansion of cattle feeding in the Northeastern area. Chapter V showed that development of additional slaughter facilities was probably not warranted until more adequate year-around supplies of fed cattle were available. This does not preclude the possibility that both of these stages could be further developed simultaneously through vertical integration.

This Chapter will examine the feasibility of vertically integrated slaughter and feeding operations in the Northeastern area.

Problems Faced in Cooperative Slaughtering

A large percentage of cooperative packing plants in the past have failed. This emphasizes a need for thorough examination of relevant factors before any final decision to establish such packing operations is made. Particular emphasis should be given to those factors contributing most to the high mortality rate of the past.

The main reasons for failure of cooperative packing plants have recently been summarized as follows:

- (1) Lack of financial support;
- (2) unsound and high-cost promotion by interests other than farmers;
- (3) poor management;
- (4) lack of uniform supply of livestock;

- (5) lack of membership understanding;
- (6) paying too much for obsolete plants and equipment;
- (7) unfavorable freight rates due to poor location. 41/

Conditions facing the establishment of a cooperative packing plant within the study area at this time would be much different from those of earlier days. Farmers have developed more ability in managing large businesses and have begun to realize that successful business operation is dependent upon competent management and adequate financing.

Advantages Afforded Through Cooperative Slaughtering

Expansion of slaughtering in the study area is inhibited not only by an insufficient level of livestock feeding in the area, but also by a shortage of available long term capital and efficient management. The financing opportunities provided through the cooperative form of organization would aid greatly in solving the capital problem. The capital requirement must not be under-estimated, however. Many cooperative plants in the past have been badly underfinanced and as a result have either operated on an inefficient basis or failed completely. Sufficient members must be obtained to properly finance the undertaking. Large amounts of operating as well as investment capital would be needed particularly during the first few years.

A cooperative plant, on the other hand, would not automatically solve the management problem; in fact, it might tend to complicate it somewhat.

41/ R. L. Fox, Recent Developments in Farmer Cooperative Meat Packing and Processing, Information 18, Farmer Cooperative Service, USDA, Washington, D. C., September, 1961, p. 7.

Not only would a top level manager be needed, but one familiar with cooperative principles and practices as well. By virtue of its size, however, a large cooperative slaughter plant would be in a position to hire a top quality manager. The quality of management obtained, together with adequacy of financing would be the most important factors in determining the success or failure of cooperative packing in the area.

Recommended Size of Coordinated Cooperative Slaughtering and Feeding Facilities.

By coordinating the feedlot operation to meet the requirements of the slaughtering plant, the question as to proper size of plant becomes one of efficiency in terms of low unit costs rather than availability of fed cattle.

Achieving such economies requires use of up-to-date technology and operation at or near full capacity. On the other hand, the sparse farm population, the structure of attitudes that prevail in most Montana communities and the magnitude of the financing problem definitely limit the size of unit that can be developed in the area at the present time.

On this basis, a one-bed conventional-type slaughter plant with a kill-capacity up to 17 head of cattle per hour appears to be most suitable for the Northeast area under present conditions.

A recent California slaughter plant study presents the most detailed data available to the public on cattle slaughtering costs. 42/

42/ Samuel H. Logan and Gordon A. King, Economies of Scale in Beef Slaughter Plants, Giannini Foundation Research Report No. 20, California Agricultural Experiment Station, Giannini Foundation of Agricultural Economics, University of California, Berkeley, December, 1962.

This study concludes that conventional bed-type plants provide cost advantages over power rail dressing systems at slaughter levels below 50 head per hour or approximately 94,500 head annually.

The capacity per hour kill and lowest per head cost for the one-bed plant is at 17 head, or approximately 32,000 head annually, (see Table XXXII). To realize lower per head costs from the two-bed plant, the annual kill would have to exceed 50,000 head.

Building requirements and costs for conventional bed-type plants are presented in Table XXXIII. According to this California study, construction costs for the one-bed plant would run approximately \$150,000, for the two-bed plant approximately \$186,000 and for the three-bed plant, approximately \$258,000. In addition to the actual plant costs, there would also be corral construction costs and land costs for both the plant and corrals. Total corral and fencing costs were estimated to run approximately \$25,000, \$50,000 and \$69,000 for the one, two and three bed plants respectively. Land costs for both the building and corral areas were estimated at approximately \$8,600, \$15,700 and \$22,000 respectively for the one, two and three bed plants.

Corral requirements would be less under a system of coordinated feedlot and slaughter facilities than for separate facilities. Land costs would also be appreciably lower in the study area. A good site near one of the larger towns would run approximately \$1,000 per acre compared to the \$21,780 budgeted for the above study.

If we assume basic plant and corral construction costs would run approximately the same as those stated above and that two acres of land at \$1,000 per acre were used, then total capital investment would run approximately \$177,000 for a one-bed plant. This figure represents only a cattle slaughtering operation and does not consider associated operations such as rendering, curing hides, sausagemaking or breaking carcasses.

If operations were expanded, per head slaughtering costs could likely be lowered as a result of some joint use of facilities and management. Total costs, however, would increase as additional equipment, labor and other inputs would be required.

The annual output of a one-bed plant operating at full capacity would be approximately 32,000 head. Either two 5,000 head lots or one 10,000 head lot would be required if the coordinated feeding operation is relied upon for the majority of the plants needs.

Some cost advantages may be realized by the 10,000 head feedlot over two 5,000 head lots. These would result primarily from spreading the cost of top level management over greater numbers of cattle.

Total capital investment for the feeding operations would run approximately \$430,000 (see discussion, page). Add to this the \$177,000 for the slaughtering plant and total capital investment requirements for the coordinated operation figures out to be approximately \$607,000. Generating the interest and capital commitment for such an investment in the Northeastern area would be a major undertaking. In addition, increased costs of coordination of supplies of feeder cattle and feed stuffs, developing

TABLE XXXII. AVERAGE COSTS PER HEAD SLAUGHTERED IN BED-TYPE PLANTS OPERATING AT AND BELOW CAPACITY LEVELS. *

Annual Variable Costs								
Plants	Annual Output a/ Lbs.	Annual Fixed Cost b/ Dols.	Annual Labor Costs	Annual Misc. Costs	Total	Variable Cost/ Head	Total Annual Cost	Total Cost Per Head
<u>One-bed Plants</u>								
<u>Kill/hr.</u>								
10	18,900	101,166	94,676	48,881	143,557	7.60	244,723	12.95
12	22,680	101,166	107,504	54,293	161,797	7.13	262,963	11.59
15	28,224	101,166	127,857	62,233	190,090	6.74	291,256	10.32
17	32,004	101,166	134,497	67,646	202,143	6.32	303,309	9.48
<u>Two-bed Plants</u>								
<u>Kill/hr.</u>								
20	37,800	184,859	153,514	75,946	229,460	6.07	414,319	10.96
25	47,124	184,859	191,781	89,298	281,079	5.96	465,938	9.89
30	56,700	184,859	238,224	103,010	341,234	6.02	526,093	9.28
35	66,024	184,859	258,557	116,362	374,919	5.68	559,778	8.48
<u>Three-bed Plants</u>								
<u>Kill/hr.</u>								
30	56,700	260,804	250,209	103,010	353,219	6.23	614,023	10.83
35	66,024	260,804	277,355	116,362	393,717	5.96	654,521	9.91
40	75,600	260,804	329,530	130,075	459,605	6.08	720,409	9.53
45	84,924	260,804	349,258	143,427	492,685	5.80	753,489	8.87
50	94,500	260,804	376,511	157,140	533,651	5.65	794,455	8.41

* Source: Samuel H. Logan and Gordon A. King, Economies of Scale in Beef Slaughter Plant, Giannini Foundation Research Report No. 20, California Ag. Expt. Sta., Giannini Foundation of Ag Economics, University of California, Berkeley, December, 1962.

a/ Annual output is computed on basis of hourly kill multiplied by 7.5 hrs./day times 252 days a year.

b/ Annual fixed costs are the sum of building and equipment depreciation, taxes, insurance, interest, utilities and fixed labor expenses.

TABLE XXXIII. BUILDING REQUIREMENTS AND COSTS FOR CONVENTIONAL PLANTS. *

Building Area	Building Cost/Per Square Foot Dols.	Conventional Plants with					
		One-Bed		Two-Bed		Three-Bed	
		Floor Area Sq.Ft.	Total Cost Dols.	Floor Area Sq.Ft.	Total Cost Dols.	Floor Area Sq.Ft.	Total Area Sq.Ft.
Kill Floor	18.00-25	1,841	46,025	2,701	48,618	3,706	66,708
Chill and Offal Cooler	15.00-20	1,276	25,520	2,301	34,515	3,225	48,375
Sales Cooler	15.00-20	1,887	37,740	3,363	50,445	4,650	69,750
Office	10.00-12	1,020	12,240	1,900	19,000	2,536	25,360
Employee Dressing ^{a/} Equipment Clean-	6.00-10	b/		673	4,038	969	5,814
up ^{c/}	6.00-10	224	2,240	224	1,344	224	1,344
Refrigeration	6.00-10	500	5,000	304	1,824	800	4,800
Boiler	6.00-10			240	1,440	384	2,304
Dry Storage	6.00-10	552	5,520	200	1,200	286	1,716
Basement	6.00-10	524	5,240	1,080	6,480	1,546	9,276
Dock	15.00-20	224	4,480	720	10,800	840	12,600
Dock Apron	2.75- 4	560	2,240	960	2,640	1,120	3,080
Ramp	2.75- 4	900	3,600	900	3,600	1,800	7,200
Total		9,508	149,845	15,566	185,944	22,086	258,327

* Source: Samuel H. Logan and Gordon A. King, Economies of Scale in Beef Slaughter Plants, Giannini Foundation Res. Rep. No. 20, California Ag Expt. Sta., Giannini Foundation of Ag Economics, University of California, Berkeley, December, 1962.

^{a/} Based on 17 sq. ft. per union employee.

^{b/} Included in dry storage area.

^{c/} Constant over all the plant.

feeding practices and gaining access to markets at the early stages would increase capital needs.

It would, therefore, appear that a one-bed operation would be the most feasible size for a new slaughtering plant in the area.

Before constructing such a plant, however, investigation should be made as to changes that would be necessary for increasing plant size to a two-bed operation, if so desired at a later date. The burden of such expansion could be lightened through advance planning.

Coordinated Feeding Arrangements

The output of the coordinated cooperative feeding facilities would not only be determined by their capacity, but also by the length of time cattle are kept on feed. This, in turn, would be affected directly by the type or types of cooperative arrangements under which the feedlot operated.

Finishing members' cattle on a custom basis under a pooling arrangement would appear to be the most advantageous arrangement. A closely coordinated two-stage operation in which the individual farmers and ranchers put on the intermediate gains should work well. ^{43/} This would significantly increase the volume output of the cooperative feedlot, as these cattle would come into the feedlot for final finishing only. Under

^{43/} See "Coordination of Feeding Stages", pp. 81-84 of this report. A cooperative feedlot may well find it advantageous to not only employ one, but a combination of the suggested methods of coordinating the feeding stages.

such a program, these cattle may remain on feed no more than 90 to 120 days. On the basis of 120 days, maximum feedlot output would be approximately 30,000 head ($10,000 \times 360/120$). This would essentially supply the total needs of the one-bed plant.

If members chose to put cattle into the feedlot at lighter weights, then an average feeding period of 180 days may be more realistic. If this were the case, then maximum feedlot output would be approximately 20,000 head ($10,000 \times 360/180$). This would be approximately 12,000 head short of plant capacity. This deficit could be made up primarily of cow beef, for which there is a large local supply and an expanding West Coast market demand, or it could be drawn from both the present and future supply of fed cattle produced in the area.

Another method of operation would be to use the cooperative feedlots primarily for supplementing local supplies of fed cattle. Since feeding in the area is highly seasonal, the principal role of a coordinated cooperative feedlot under this plan of operation would be to assure the availability of year-around fed cattle supplies. Smaller capacity feedlot facilities would be required under this plan. However, a major disadvantage would be the high cost of less than capacity utilization of feedlot facilities that would exist during the normal one-lot-per-year feeding period in the area.

The cooperative feedlot may find it necessary to either directly purchase feeder cattle or custom feed non-member's cattle during certain periods if members do not make full use of feedlot facilities. The former

would require large amounts of additional capital, and for this reason may be the less desirable. On the other hand, the ability to do so may contribute greatly to the successful operation of a balanced feeding program.

Recommendations as to the Most Suitable Location
for a Coordinated Operation

Numerous factors usually influence the selection of a new plant site. In almost all cases, however, one or more of the following basic considerations play a major part in the final decision:

1. The availability of raw materials--including fuel, power and water;
2. proximity to markets; and
3. personnel considerations--including both the availability of labor and the preferences of management. 44/

On the basis of these criteria, Sidney appears to be the best location for a coordinated cooperative feeding and slaughtering operation. Sidney has a population of 6,000 and is the county-seat of Richland County. It is located in the center of the 60,000 acre lower Yellowstone Irrigation Project, just five miles west of the North Dakota border and 90 miles south of the Saskatchewan, Canada border.

In regards to the first consideration, the greatest concentration of cattle feeding in the area is along the lower Yellowstone River between

44/ Richardson Wood, "Where to Put Your Plant", Readings in Economic Geography from Fortune, edited by Richard J. Ward and Lawrence A. Hoffman, Holt, Rinehart and Winston, New York, 1961, pp. 112-117.

Glendive and Sidney. Recent statistics indicate that the heaviest concentration is within a 20-mile radius of Sidney. 45/ Feeders in this general area were among those indicating greatest interest in expanded feeding. It is therefore assumed that Sidney will remain in an advantageous position relative to concentrated feeding.

Sidney is also the site of the area's largest livestock auction. This would be highly advantageous, particularly in the purchasing of feeder cattle for the coordinated feeding operation and as a source for slaughter cows. The purchase of feeder cattle would be necessary during those periods when members' supplies ran short. The majority of the fat cattle purchased by the plant would probably be bought direct from the feeders in the immediate area.

In addition to being well located in terms of the supply of livestock, there are abundant supplies of fuel, power and water at Sidney. Located here is a 50,000 kilowatt lignite coal steam generated power plant. It was designed for future expansion to 200,000 kilowatts. This plant uses lignite from a reserve in Richland County estimated by the United States Geological Survey to be 21 billion tons. It has been estimated that the surrounding area has reserves of 600 to 900 billion tons. These are known as the Fort Union Formation and are the largest known coal reserves in the United States. In addition to this low cost steam generated power, there are abundant supplies of inexpensive hydro power.

45/ Livestock Survey--1962-63, Holly Sugar Company, Sidney, Montana

available. Natural gas is also available here.

The Yellowstone River assures an abundance of water for business and industrial expansion. There is also an abundant strata of groundwater--hard, semi-hard and soft. Large quantities of oil are also available, as Sidney is centrally located in the Williston Oil Basin.

The second consideration, that of proximity to markets, does not play a major role in determining the best packing plant location within the study area. A plant located here would be supply oriented rather than market oriented. Availability of adequate transportation to market is of vital importance however, and certainly must be considered. Sidney is served by the Great Northern and Northern Pacific railroads, both of which serve the West Coast as well as the Twin Cities area. Numerous trucking firms also serve the area, thus assuring adequate transportation facilities to market the increased slaughter.

The third consideration was that of personnel, or labor availability and productivity. A new packing plant in the Sidney area would be in an advantageous position to get essentially the top pick of the labor market. There are a number of small farmers and ranchers in the immediate area who are desirous of obtaining a full time job. Many of these now work at the local sugar factory during its beet run, but would like a job which could assure them of steady, year-around income. These are stable individuals and their employment would reduce the rate of labor turnover which so often proves to be a costly item. Many of the young people would also like to stay in the area if full time work were available.

Table XXXIV gives a breakdown and comparison of the population and labor force of Richland County for 1940-1960, while employment by occupation and industry is presented in Appendix Table VII. The population has increased only slightly during this 20-year period, going from 10,209 in 1940 to 10,504 in 1960. The percentage of persons under 14 years of age has increased during this period, thus bringing about a corresponding decrease in labor force numbers.

The rapid decrease in the number employed directly in agriculture is evident from this Table. In 1960, only 29.7 percent of the labor force were employed in agriculture compared to 41.0 percent in 1950 and 57.6 percent in 1940. The less efficient farmers and ranchers are gradually finding it inminent that they find employment elsewhere. Many of these would welcome the opportunity to work in a packing plant, thus being able to remain in the area.

As the above figures would indicate, unemployment has increased in Richland County since the war, going from 6.1 percent of the labor force in 1950 to 7.8 percent in 1960. In April of 1960, there were reported 281 persons unemployed in the county, of which 52 were women. Add to this relatively large number of unemployed the small farmers and ranchers who want a full time job, those who are leaving the farm, and the annual number of young people who have to leave the area to find work. This number would provide a surplus supply of available labor for the establishment of a coordinated cooperative feeding and slaughtering operation. Also, in addition to these individuals mentioned, there are some presently

employed who would desire to change to a better job if it were available. A new industry, such as a packing plant, would then be able to choose from a large number to fill its manpower needs.

General Feasibility of Coordinated Feeding and Slaughter in the
Northeast District and Other Areas of the State

On the basis of the foregoing analysis, the establishment of a coordinated cooperative feeding and slaughtering operation does appear feasible in Northeastern Montana.

The greatest limiting factor to successful establishment is the structure of attitudes that prevail both within the area and throughout the entire state. The major problem will be to overcome the preconceived notions many have regarding the cooperative form of organization. This will require an effective "selling" job on the part of those promoting the enterprise. The State Extension Service and others could also do much to improve the climate for cooperative development. The magnitude of capital required demands widespread interest and devoted membership support in such an undertaking.

Difficulties involved in acquiring top quality management and development of markets are factors that must also be resolved at the outset.

The Northeastern district would be the most suitable area in the state for a coordinated cooperative feeding and slaughter operation. The North-central district would appear the next best area. However, with large volume slaughter capacity available at Great Falls, it would appear the development of cooperative feeding alone, rather than a coordinated feeding

and slaughter operation would be the best plan at the present. This would likewise be the case in the Central district, as the Great Falls plants are having to go substantial distances to obtain a sufficient supply of fed cattle. The Southcentral district also has excess slaughter capacity. Further development of cooperative feeding in this area would likewise seem the most feasible plan for the immediate future. These areas, in the order mentioned, would probably be the best locations for establishment of coordinated operations. It appears, however, that the Northeastern district is the only area in which present establishment would be feasible.

SUMMARY AND CONCLUSIONS

In Chapter II, the opportunities for expanded cattle feeding in Montana were analyzed. Feeder cattle and basic feed supplies were found adequate for approximately an 800 percent increase in cattle feeding over present levels. To facilitate further analysis of specific factors that would inhibit significant feeding expansion, the Northeastern area of the state was selected for more detailed study.

Opportunities for expanded feeding in Northeastern Montana were analyzed in Chapter III. Sufficient barley is produced in the area to feed 2.5 times the number of beef calves annually produced and approximately 12 times the present number annually fed. In addition, only approximately 20 percent of the feeder cattle produced in the area are presently being fed locally. The lack of other factors, however, such as capital, management and markets were found major obstacles to significant expansion over present levels.

TABLE XXXIV. BREAKDOWN OF THE POPULATION AND LABOR FORCE IN RICHLAND COUNTY, 1940, 1950 AND 1960. *

Item	April 1960		April 1950		April 1940	% Change 1950-1960	
	Total	Women	Total	Women	Total	Total	Women
POPULATION AND LABOR FORCE:							
Total population	10,504	5,234	10,366	4,966	10,209	1	5
Persons 14 years & over <u>a/</u>	6,926	3,451	7,151	3,385	7,295	-3	2
Labor Force, Civil-ian	3,602	947	3,812	705	3,884	-6	34
Percent of population 14 years & over	52.0	27.4	53.3	20.8	53.2		
Unemployment	281	52	232	52	496	21	0
Percent unemployed	7.8	5.5	6.1	7.4	12.8		
Employment	3,321	895	3,580	653	3,100 ^{b/}	-7	37
Agricultural	986	21	1,467	38	1,787	-33	-45
Percent of total employment	29.7	2.3	41.0	5.8	57.6		
Nonagricultural	2,335	874	2,113	615	1,313	11	42

* Source: Montana-Counties-Manpower Guide Book, Unemployment Compensation Commission of Montana, Helena, Montana, 1962.

a/ Excludes Armed Forces.

b/ Excludes 288 persons on public emergency work.

Chapter IV noted that cooperative feeding endeavors provide a means to overcome most of these limitations. However, an upper level for profitable increased feeding is dictated by capacity of slaughter facilities in the area and market outlets.

In Chapter V, both the opportunities for expansion and the present level of slaughter within the study area were examined. While within-state markets are amply supplied by the existing industry, a growing out-of-state market is seen, particularly due to population expansion on the West Coast. Slaughter facilities in this area probably have no unique advantages to make for lower total costs than other areas. On the other hand, they possess no unique disadvantages either.

Independent expansion of slaughter facilities at this time does not appear warranted, however, until greater year-around supplies of fed cattle are available.

In short, expansion of feeding and slaughtering in the Northeastern district is inextricably intermingled. Significant expansion of feeding is inhibited by the lack of slaughter facilities, while at the same time, immediate expansion in slaughtering is hindered by the lack of year-around feeding in the area.

One means of solution to this problem would be simultaneous development through a coordinated feeding and slaughtering enterprise. Chapter VI analyzes the opportunities for a coordinated cooperative operation. On the basis of this analysis, development of a profitable coordinated cooperative feeding and slaughtering operation should be feasible in the North-

eastern district. However, the structure of attitudes that prevail is definitely a limiting factor to getting such an operation "off the ground". To overcome the preconceived notions many have regarding the cooperative form of operation may prove difficult. Widespread and devoted membership support is a must to supply the magnitude of capital required for success. Acquiring top level management and the development of markets may also prove difficult to resolve.

The best location for a coordinated feeding and slaughtering operation in the study area would appear to be at Sidney, in Richland County.

A one-bed conventional plant with annual slaughter capacity of approximately 32,000 head would seem to best fit the immediate needs of the area. A coordinated feeding operation of approximately 10,000 head capacity could essentially supply the total needs of the slaughtering plant. Less feedlot capacity would be required, however, if the plan were to feed only the number needed to supplement local supplies.

Total capital investment for the 10,000 head coordinated cooperative feeding operation and the one-bed plant would run approximately \$607,000. This figure includes only a cattle slaughtering operation. If operations were expanded to include hog slaughter, sausage making, hide curing, etc., then total costs would increase, although per head costs may be reduced. Expansion of operations would also provide for greater employment and an increased cash flow into the economy.

Due to excess slaughter capacity existing in most other areas of the state, the development of cooperative feeding alone rather than coordinated

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operations, would appear to be the most feasible plan in these areas at the present time.

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APPENDICES

APPENDIX TABLE I. CATTLE AND CALVES IN NORTHEASTERN MONTANA, BY COUNTY,
ON JANUARY 1, 1958-1964. *

County	Cattle and Calves on Farms and Ranches						
	1958	1959	1960	1961	1962	1963	1964
Daniels	15,200	12,300	12,500	14,400	14,100	16,600	20,300
Dawson	38,000	35,600	34,200	32,500	31,900	37,800	47,600
Garfield	45,900	44,600	44,400	43,100	37,700	48,000	57,500
McCone	28,900	25,100	26,700	28,000	30,000	34,700	43,000
Richland	36,800	34,700	35,700	36,800	35,700	42,300	51,200
Roosevelt	27,100	23,500	26,000	27,500	27,800	33,600	39,300
Sheridan	21,200	16,600	19,400	22,300	22,100	25,700	30,600
Valley	61,100	53,700	56,500	61,000	61,000	68,000	81,600
Total	274,200	246,100	255,400	265,600	260,300	306,700	371,100

* Source: Montana Agricultural Statistics, Volumes VIII - X, Helena, Montana.

APPENDIX TABLE II. TOTAL MOVEMENT OF CATTLE OUT OF COUNTY BY CLASSES, NORTHEASTERN MONTANA, 1962 AND 1964. *

County	Steers		Cows		Heifers		Bulls		Calves		Unclassified		Total	
	1962	1964	1962	1964	1962	1964	1962	1964	1962	1964	1962	1964	1962	1964
Daniels	687	1,244	1,393	1,546	610	1,100	212	279	6,221	6,992	33	--	9,156	11,161
Dawson	2,706	7,891	4,671	6,126	2,441	4,501	831	909	12,517	14,953	151	77	23,317	34,457
Garfield	4,404	11,124	3,410	3,663	1,244	4,780	1,249	863	11,500	10,309	40	233	21,847	30,972
McCone	1,413	4,720	3,103	4,887	772	2,622	530	845	11,890	11,939	78	195	17,786	25,208
Richland	8,763	17,696	7,789	6,292	7,761	11,029	905	1,266	10,723	10,537	11	--	35,952	46,820
Roosevelt	2,646	6,155	2,881	4,354	2,557	4,968	502	763	15,928	17,195	--	2	24,514	33,437
Sheridan	1,466	2,724	1,701	2,317	1,108	1,572	300	494	7,862	9,136	--	23	12,437	16,266
Valley	4,866	8,911	6,310	7,058	2,334	3,820	632	821	18,485	20,493	32	27	32,661	41,130
Northeastern District	26,953	60,465	31,258	36,243	18,827	34,392	5,161	6,240	95,126	101,554	345	557	177,670	239,451

* Source: Statistical Reporting Service, U. S. Department of Agriculture, Helena, Montana.

APPENDIX TABLE III. INVESTMENT REQUIREMENTS AND NON-FEED COSTS, FARM FEEDLOTS, GROUPED BY SIZE OF FEEDLOT, MONTANA, 1961. *

Characteristics	1	1A a/	1B b/	2	2A a/	2B b/	3	3A a/	3B b/	4	4A a/
Average number of cattle fed annually	45	90	90	120	175	175	240	640	640	450	1040
Average capacity of feedlot	90	90	90	175	175	175	320	320	320	520	520
Ratio of number fed to capacity	.50	1.0	1.0	.68	1.0	1.0	.75	2.0	2.0	.87	2.0
Number of days feedlot operated	210	210	210	220	220	220	210	365	365	275	365
Kind of cattle fed	Calves	Calves	Calves	Calves and yearlings	Calves	Calves	Calves and yearlings	Calves and yearlings	Calves and yearlings	Calves and yearlings	Yearlings
Investment per head in feedlot facilities	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Corrals, bunks, and feeders	15.78	7.89	7.89	7.89	5.41	5.41	7.29	2.73	2.73	5.63	2.44
Feed processing equipment	-----	-----	8.88	-----	-----	8.57	-----	-----	3.90	4.69	2.03
Automatic waterer	2.00	1.00	1.00	1.50	1.03	1.03	1.50	.56	.56	1.20	.52
Squeeze chute	5.96	2.98	2.98	2.28	1.56	1.56	1.12	.42	.42	.60	.26
Machinery and equipment	-----	-----	-----	22.53	15.46	15.45	24.29	9.11	9.11	14.18	6.14
Silo	-----	-----	-----	1.98	1.36	1.36	1.16	.44	.44	1.50	.65
Total	23.74	11.87	20.75	36.18	24.81	33.38	35.36	13.26	17.16	27.80	12.04
Non-feed costs per head	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Labor	-----	-----	-----	-----	-----	-----	1.37	1.37	-----	-----	.43
Death loss	2.46	1.23	1.23	1.73	1.18	1.18	1.20	1.19	1.19	1.08	1.08
Machinery repair and maintenance	1.56	.78	.96	1.67	1.14	1.31	.85	.62	.70	.77	.55
Gas and oil	1.71	1.30	1.30	1.83	1.54	1.54	1.46	1.00	1.00	.97	.67
Electricity	1.07	.53	.64	.43	.30	.35	.46	.17	.20	.31	.35
Veterinary and medicine	1.20	1.20	1.20	.75	.75	.75	1.37	1.38	1.38	.89	.89
Bedding	2.44	2.44	2.44	2.29	2.29	2.29	2.08	1.08	1.08	1.47	1.48
Marketing costs	.47	.47	.47	3.51	3.51	3.51	3.91	3.91	3.91	3.47	3.47
Depreciation	1.40	.70	1.23	2.53	1.73	2.25	2.33	.87	1.11	1.75	.76
Interest on equipment	.31	1.16	.69	.52	.35	.87	.37	.14	.38	.43	.19
Insurance	-----	-----	-----	-----	-----	-----	.17	.07	.07	.21	.09
Taxes	1.00	1.00	1.00	1.04	1.04	1.04	1.04	.50	.50	1.26	.62
Miscellaneous	.84	.59	.59	.84	.66	.66	1.14	.69	.69	.60	.44
Total	14.46	10.40	11.75	17.14	14.49	15.75	17.87	12.99	12.21	13.21	11.02

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*Source: Warren L. Trock, *Cattle Feeding in the Northern Great Plains*, Bulletin 576, Montana Agricultural Experiment Station, Montana State College, Bozeman, April, 1963, taken from an unpublished thesis by Robert Mueller, *Economics of Size in Farm Feedlots in Montana*, Agricultural Economics Department, Montana State College, Bozeman, Montana, 1962.

a/ Feedlot costs with increased level of utilization.

b/ Feedlot costs with added machinery and equipment.

APPENDIX TABLE IV. AVERAGE "PER FARM" AND "PER HEAD FED" VALUATION OF EQUIPMENT AND FACILITIES FOR FEEDING, BY SIZE OF FEEDING OPERATION IN THE YELLOWSTONE VALLEY, 1957. *

Valuation of:	Group I		Group II		Group III		Group IV		Group V	
	Per farm	Per head fed	Per farm	Per head fed	Per farm	Per head fed	Per farm	Per head fed	Per farm	Per head fed
	Dollars.									
Buildings, storage, sheds	351	9.75	928	13.26	1,458	8.84	2,427	9.55	4,311	9.25
Pens, yards, fences, corrals, chutes, troughs, mangers	1,129	31.36	1,452	20.74	1,863	11.29	2,847	11.21	4,632	9.94
Wells, pumps, tanks	114	3.17	210	3.00	307	1.86	503	1.98	654	1.40
Other equipment and machinery	775	21.53	1,028	14.68	1,911	11.58	3,200	12.60	3,972	8.52
Total equipment and facilities	2,369	65.81	3,618	51.68	5,539	33.57	8,977	35.34	13,569	29.11

* Source: Pius Weisgerber, Organization and Costs of Cattle Feeding in the Yellowstone Valley, Research Report No. 11, Agricultural Experiment Station, Montana State College, Bozeman, 1960.

APPENDIX TABLE V. OPERATING EXPENSES BREAKDOWN OF PARTICIPATING MEAT PACKING PLANTS BY COMPANY CLASSIFICATION, UNITED STATES, 1960. * a/

Cost Items	Size of Meat-Packing Companies				
	National	Regular	Sectional	Local	All
Wages and salaries	48.2	49.7	52.9	53.3	48.5
Supplies and containers	16.2	13.9	13.6	13.5	15.9
Transportation	11.0	7.4	6.5	4.2	10.5
Depreciation	2.5	3.0	4.1	4.4	2.6
Income Taxes	2.2	4.4	4.0	2.8	2.5
Other Taxes	11.1	0.9	1.2	1.3	1.1
Soc. Sec. taxes	1.6	1.5	1.7	1.7	1.6
Retirement program	1.1	1.1	0.8	0.6	1.1
Insurance program	1.6	1.4	1.1	1.0	1.6
Interest	0.8	0.6	0.6	0.6	0.7
Miscellaneous	13.7	16.1	13.5	16.6	13.9
Total	100.0	100.0	100.0	100.0	100.0

* Source: Charles H. Rust and Clive R. Harston, The Survival and Growth Potential of Small Meat-Packing Businesses in Montana, Technical Bulletin 580, Montana Agricultural Experiment Station, Montana State College, Bozeman, July, 1963.

a/ Data obtained from 102 cooperating meat-packing companies.

APPENDIX TABLE VI. COSTS PER POUND OF OUTPUT, TOTAL LABOR, PRODUCTION LABOR AND NON-PRODUCTION LABOR, WITH PERCENTAGE COMPARISONS, MONTANA MEAT PACKERS, BY SIZE GROUPS, 1961.*

Size of Plant	Total Labor Cost/# of Output Dollars	Labor Cost/# of Output Dollars	Non-product. labor cost/# of Output Dollars	Percent non-production labor cost is of total labor costs/# of Output Percent	Percent Production labor cost is of total labor cost/# of Output Percent
Feder-ally in-spected	.04226	.03560	.00666	15	85
Medium	.05391	.03749	.01642	30	70
Small	.05220	.03325	.01895	36	64
All <u>a/</u>	.04913	.03571	.01342	27	73

* Source: Charles H. Rust and Clive R. Harston, The Survival and Growth Potential of Small Meat Packing Businesses in Montana, Technical Bulletin 580, Montana Agricultural Experiment Station, Montana State College, Bozeman, July, 1963.

a/ Average cost of all plants combined (unweighted).

APPENDIX TABLE VII. EMPLOYMENT BY OCCUPATION AND INDUSTRY, RICHLAND COUNTY, 1950 AND 1960. *

Item	April 1960		April 1950		1950-1960 Percent Change	
	Total	Women	Total	Women	Total	Women
EMPLOYMENT BY OCCUPATION:						
Professional	630	214	509	146	24	47
Clerical and sales	618	346	443	212	40	63
Craftsmen, foremen & Kindred	369	0	405	2	-9	b/
Operatives & kindred	238	32	201	30	18	7
Household workers	71	71	68	66	4	8
Service except house- hold	244	193	243	130	0	48
Laborers except farm and mine	108	0	136	3	-21	b/
Farm occupations: a/ Farmers and farm managers	970	18	1,343	13	-28	38
Farm laborers	773	18	1,067	5	-28	260
Occupations not report- ed a/	197	0	276	8	-29	b/
	73	21	232	51	-69	-59
EMPLOYMENT BY INDUSTRY:						
Manufacturing	245	19	149	12	64	58
Food and kindred products	167	14	104	7	61	100
Printing and publish- ing	36	NA	9	3	300	b/
Other non-durable goods	20	5 b/	8	1	150	b/
Durable goods	22	0	28	1	-21	b/
Mining	19		7	0	171	b/
Construction	184	4	301	5	-39	-20
Transportation and Utilities	158	48	145	24	9	100
Trade	798	294	578	194	38	52
Wholesale trade	139	20	83	8	67	150
Retail trade	659	274	493	186	34	47
Finances, ins. and real estate	102	30	51	19	100	58
Services	643	416	645	296	0	41
Government	137	54	116	36	18	50
Industry not reported	49	9	121	29	-60	-69

* Source: Montana-Counties-Manpower Guide Book, Unemployment Compensation Commission of Montana, Helena, Montana, 1962.

a/ Unpaid family farm workers in 1940 and 1950 excluded from "Farm Occupations" and included in "Occupations not reported to be comparable with 1960.

b/ Numbers not comparable; percentages not meaningful.

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NAME AND ADDRESS

3-28-66 John Knight 1385 1st St

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11-8-69 Donald I
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