



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.

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AND SLAUGHTERING IN MONTANA

197

by

ELROY C. McDERMOTT

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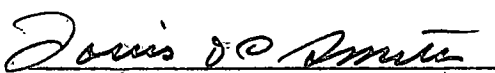
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The author assumes sole responsibility for any errors or omissions that may be contained herein.

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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. <sup>1/</sup> 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.

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<sup>1/</sup> 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,<sup>2/</sup>

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<sup>2/</sup> 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











































































































































































































































































































































