



Marketing practices and potential impact of hay processing on the Montana hay market
by Clynn G Phillips

A thesis submitted to the Graduate fulfillment of the requirements Faculty in partial for the degree of
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Abstract:

This research study was initiated to make an examination of the general hay market in Montana. Attention was given to the marketing practices of hay buyers and sellers, efficiency of the present market structure with respect to grading, distribution and other price considerations, and finally, the impact of recent developments in hay processing on the Montana hay market.

The "Montana hay market" is characterized by many small, local market areas. Hay, because of its high bulk-low value nature, is limited to a rather small geographic area and to a relatively few potential buyers and sellers. There are three major hay user groups--dairymen, ranchers, and feedlot operators—in Montana and they each tend to value hay for different nutritional aspects. Type of hay and cutting preferred, seasonality of market transactions, and other characteristics of a particular market are related to the dominate hay user group in the area.

As a means of evaluating the performance of the existing market structure for hay, the efficiency criterion of the perfectly competitive marketing system was adopted. Three major obstacles to the achievement of this standard of performance were noted. The first obstacle is posed by the limiting physical characteristics of the typical Montana hay market.

The second obstacle is the general apathy of Montana hay market. The second obstacle is the general apathy of Montana feeders to quality and other productive aspects of hay. The third problem arises out of the lack of reliable and current hay market information. Until these problems are overcome, the efficiency of the Montana hay market will probably be below the idea standard postulated.

Interest in hay processing has grown in recent years. Potential for processing of dehydrated alfalfa meal, sun-cured alfalfa meal and alfalfa wafers in Montana was analyzed. It was determined that Montana could compete only on the home market. The potential for sun-cured alfalfa depends heavily on developments in the export market. The freight-rate structure is instrumental in determining what Montana firms are able to compete on this market. The hay watering machine is the center of much attention as a method of processing hay. Length of the harvest season and volume of output are critical factors in the potential impact of this technique for Montana.

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CLYNN G. PHILLIPS

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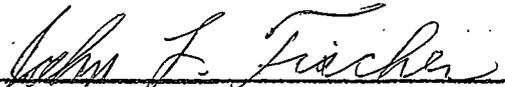
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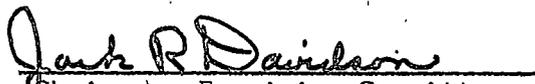
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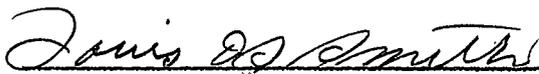
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ABSTRACT

This research study was initiated to make an examination of the general hay market in Montana. Attention was given to the marketing practices of hay buyers and sellers, efficiency of the present market structure with respect to grading, distribution and other price considerations, and finally, the impact of recent developments in hay processing on the Montana hay market.

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As a means of evaluating the performance of the existing market structure for hay, the efficiency criterion of the perfectly competitive marketing system was adopted. Three major obstacles to the achievement of this standard of performance were noted. The first obstacle is posed by the limiting physical characteristics of the typical Montana hay market. The second obstacle is the general apathy of Montana hay market. The second obstacle is the general apathy of Montana feeders to quality and other productive aspects of hay. The third problem arises out of the lack of reliable and current hay market information. Until these problems are overcome, the efficiency of the Montana hay market will probably be below the idea standard postulated.

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CHAPTER I

INTRODUCTION

Hay production and utilization play an important role in the agriculture economy of Montana. Hay is a major feed input in the state's livestock industry and ranks second only to wheat as a harvested crop in terms of value of production. However, only a small percentage of the total annual production enters formal market channels each year. The hay market in Montana lacks many of the characteristics that are thought essential for efficient marketing. There is little known about the mechanism and methods of pricing hay. There is a general lack of knowledge in regards to the marketing practices of hay buyers and sellers and other aspects which effect the size, location, nature and overall efficiency of the hay markets.

The general price-cost squeeze that has characterized agriculture since the early 1950's has caused farmers and ranchers to seek increased efficiencies on all fronts in order that they might maintain their relative competitive position. This study was initiated to describe hay marketing practices in Montana to identify major problem areas, and to make recommendations for improvement where practical.

Historical Perspective

Settlement of Montana had its beginning in the western portion of the state. Fur trappers, missionaries and traders were the first white inhabitants of the Montana territory. Later, discovery of gold at Benetsee Creek (now Gold Creek) west of Deer Lodge Valley created a gold rush of

minor importance which eventually led to a more permanent and complete settlement. Major gold discoveries at Grasshopper Creek in 1862, Alder Gulch in 1863 and Last Chance Gulch in 1864 provided new impetus to the influx of settlers.

Concurrent with the development of most major gold fields was the establishment of necessary trade and service facilities ranging from blacksmith to bartender. Among this list of necessary services, and with high priority, was that of a butcher. The hard working miner wanted meat as a major part of his diet. He seldom had time to hunt game even when it was plentiful. Butcher shops often displayed wild game but most of the miners preferred beef. ^{1/}

Conrad Kohrs, the beneficiary of a butcher shop as a result of the differences his employer had with Montana's famous outlaw-sheriff Henry Plummer, became one of Montana's early cattlemen. In order to meet the demand for meat at his butcher shops in Bannock, Virginia City and Last Chance Gulch, Kohrs began trailing cattle from the Bitterroot, Utah and Oregon. It wasn't long until he and his partner were trading cattle on a sizable scale. To accompany their activities they purchased the Racetrack Ranch in Deer Lodge Valley and later bought out the Johnny Grant ranch

^{1/} Robert H. Fletcher, Free Grass to Fences, The Montana Cattle Range Story, (New York, New York; University Publishers Incorporated, 1960) p. 18.

and its cattle near the present site of the city of Deer Lodge. In much the same manner and for about the same purpose, the herds of other famous Western Montana cattlemen had their origin at this time. The "outfits" of Poindexter and Orr, D. A. G. Flowerree, Robert S. Ford, and Nelson Story are a few of the noted cattlemen who had their beginning in this era of Montana's history. 2/

The cattle industry in central and eastern Montana didn't develop until about 1880. The resistance of hostile Indians to whites settling on their hunting grounds was usually sufficient to keep any thoughtful person with a desire to live out of this area. However, the massacre of Custer's Army in 1876 and the subsequent breakdown of Indian defenses opened up the area to the settlement of whites. Another inhabiting factor was the expansion of the cattle industry over the Great Plains. It had its origin in Texas and gradually proceeded north as demand for western beef increased. Montana, in a sense, had to wait until stocking of the Plains areas to the south was completed before need for her fertile Plains was felt. When the need did arise, it was deterred by the hostile Indians until sufficient pressure was applied to military personnel and action taken to remove the Indian threat.

By 1879, the setting was right for Montana's "beef bonanza". The "boundless, gateless, fenceless pastures" of the public domain, once

2/ Robert E. Fletcher, Ibid., p. 20.

inhabited by buffalo were quickly being replaced with cattle. Railroad and steamboat records give some inkling of what happened during this period. In 1876, 80,000 buffalo hides were shipped down the Missouri River from Fort Benton; in 1881, 50,000 hides went east via the Northern Pacific Railway. In 1882, some 5,000 riflemen and skinners went to work on the northern buffalo herds and 200,000 hides were shipped out on the Northern Pacific. Rail shipments dropped to 40,000 in 1883 and a mere 300 in 1884, with no shipments reported leaving from Fort Benton. ^{3/}

Vast fortunes were being accumulated by cattlemen from Montana to Texas. Grass on the public domain was free for the taking. Almost anyone who could put enough money together to get a herd of cattle was assured a profit. The only expenses were those for a limited number of cowboys, the needed riding stock and a branding iron. If a degree of permanence was sought, there was the added expense of building a log cabin and a few simple corrals. The price of beef was high and continued to rise throughout most of the period as the demand for cattle to stock the northern plains region competed strongly with eastern slaughter markets.

Magazines and journals carried an increasing number of articles and letters publicizing the romance and riches of western cattlemen. An example of such is an article appearing in the Breeder's Gazette, September 27, 1883

^{3/} Robert E. Fletcher, Ibid., p. 41.

entitled "How Cattlemen Grow Rich."

"A good sized steer," it reads, "when it is fit for the butcher market will bring \$45 to \$60. The same animal at its birth was worth but \$5. He has run on the Plains and cropped the grass from the public domain for four or five years, and now, with scarcely any expense to its owner, is worth \$40 more than when he started on his pilgrimage. A thousand of these animals are kept nearly as cheaply as a single one, so with a thousand as a starter and with an investment of but \$5,000 in the start, in four years the stock raiser had made from \$40,000 to \$45,000. Allow \$5,000 for his current expenses and he is still making \$35,000 and even \$45,000 for a net profit. That is all there is of the problem and that is why our cattlemen grow rich." 4/

The result of such publicity, and a natural one indeed, was the on-rush of men and capital in search of huge fortunes. As Osgood states, "From 1880-1885, the demand for stock cattle on the northern ranges reached to the extreme limits of the available supply." 5/ There is no way of knowing just how many cattle were brought into Montana during this period, but official estimates place the number of cattle in Montana territory in 1880 at 274,316. By 1886 this figure had increased to 663,716. 6/

The flow of capital to the High Plains rapidly brought the number of cattle up to the carrying capacity of the ranges. Considering the fact that weather conditions had been very favorable since 1881, the ranges were

4/ "How Cattlemen Grow Rich", Breeder's Gazette, IV, September 27, 1883 as quoted in Ernest S. Osgood, The Day of the Cattleman, (Minneapolis, Minnesota; The University of Minnesota Press, 1929), p.88.

5/ Ernest S. Osgood, Ibid., p. 89.

6/ Merrill G. Burlingame, The Montana Frontier, (Helena, Montana; State Publishing Company, 1942), p. 283.

probably far overstocked for normal years. As signs of overcrowding became apparent to the more astute ranchers, they began taking action to protect their interests. By selective purchases of railroad land they were not only able to bring under their control a large amount of private land, but they could enclose large tracks of public domain which they were also able to control. The homesteading of land around key water holes and the lush meadow lands along creek bottoms by both rancher and "homesteader" was also being used to control the rangelands. Through these methods the rancher could, for the most part, keep neighboring herds off his own ranges. But he was not entirely protected for he was still vulnerable to the whims of mother nature. In a final attempt to insure himself against loss, the Plains rancher began putting up hay for emergency feed supplies during the winter; a practice ranchers in western Montana had been following for some time.

If there was still doubt in 1886 about the necessity of having a winter feed supply, it was completely removed by the winter of that year. The winter of 1885-86 had been open and warm. It was followed by a hot and dry summer, and as a result, the cattle went into the following fall in very poor condition. To make matters worse, the price of cattle at eastern markets had taken a severe drop and cattlemen were inclined to hold their cattle off the market.

The first severe snowstorm hit the ranges in late November of 1886. It was accompanied by sub-zero temperatures and a cutting wind. The snow was so deep in many areas that the cattle could not dig down to the grass. Those ranchers who had hay, fed all they could, the rest prayed for a chinook. It finally came the latter part of December. By this time winter had already taken a severe toll on the unacclimated "pilgrim" cattle from the East and Midwest. The worst was yet to come however. On January 9, 1887, a new storm moved across the Plains area leaving 16 inches of snow. As if this was not enough, after a slight moderation in temperatures during the latter part of the month, new storms hit in February. 7/

Spring came with a warm chinook in March and cattlemen rode out to face their reckoning. Osgood writes, "The sight of the ranges in the spring of 1887 was never forgotten. Dead were piled in the coulees. Poor emaciated remnants of great herds wandered about with frozen ears, tails, feet, and legs, so weak they were scarcely able to move." 8/

Amount of the total loss was never known for sure. It was estimated at 40 to 60 percent for the entire state. Individual losses, however, ranged as high as 90 percent. 9/ Assessment roles for the state listed

7/ Donald H. Welsh, Pierre Wibaux, Cattle King, Master's thesis, Montana State University, Missoula, 1950, p. 29.

8/ Ernest S. Osgood, op. cit., p. 221.

9/ Donald H. Welsh, op. cit., p. 31.

663,716 head of cattle in 1886. In 1887, they listed only 471,171 head, but this was not a true picture because it does not include calves born after the assessment date and cattle shipped or trailed into the territory during the summer of 1886. 10/

Regardless of the actual loss, the winter of 1886-87 marked the end of an era in cattle operations. The financial losses incurred were so heavy that what eastern money was not wiped out, in a majority of cases, was withdrawn as fast as possible. The speculative fervor that encouraged the building of vast cattle empires was gone. The open range or "free grass" operation was supplanted by an operation with a permanent ranch headquarters and fences ranges. Finally, the winter losses of 1886-87 had the effect of shifting cattle operation from one depending entirely on mother nature for summer and winter feed to an operation where hay and other winter feeds were stocked for use in adverse weather.

Ranchers in the western portion of the state had been putting up hay right from the beginning of their cattle operations. As a result, winter losses were minimized. The total loss in numbers of cattle during the winter of 1886-87 in the Big Hole Basin was estimated to be only about 1 percent. Just when haying got started on a large scale is not known. Robert Ford, one of Montana's foremost pioneer builders, legislators, and cattlemen got his start in Montana as foreman of a haying crew which had

10/ Merrill G. Burlingame, op. cit., p. 284.

contracted to put up hay for cavalry troops stationed at Cow Island. Bill Ennis, Madison Valley pioneer, got his start in Montana by selling wild hay, butter and eggs to the mining camps across the hill. The Big Hole Basin was reported to have been one vast hay field during the summer of 1886, and hay sold for \$8 per ton in the fall. By February of 1887, the price had skyrocketed to \$30 per ton. 11/

The central and eastern regions, unfortunately didn't get such an early start. Some provisions were being made in the early 1880's, however.

Pierre Wibaux and partner were reported by The Glendive Times, July 14, 1883, to have contracted for 160 tons to be put up on their ranch. 12/ This, no doubt, was an exception rather than the rule for this area of Montana. In 1882, the acreage of all tame hay amounted to 16,000 acres. It had risen to 31,000 acres in 1886, 80,000 acres four years later and had increased to 305,000 acres in 1900. 13/

Hay production in Montana has experienced a continuous rise between 1910 and 1950, Table I. It first reached two million acres in 1927 where it remained until about 1932 when acreage was cut to approximately 1,750,000 acres. Production again went up over two million acres in 1942 and has since

11/ Robert H. Fletcher, op. cit., p. 89.

12/ The Glendive Times, July 14, 1883, as quoted in Donald H. Welsh, op. cit., p. 32.

13/ Montana Agricultural Statistics, Montana Department of Agriculture and United States Department of Agriculture, Agricultural Marketing Service cooperating, Helena, December, 1946.

remained between 2.0 and 2.6 million acres. Since its introduction into the state around 1880, alfalfa has grown in importance. In 1961, it accounted for approximately 64 percent of the total production. Wild hay production amounted to 14 percent followed by clover-timothy hay at 13 percent, grain hay at 6 percent and the remaining 3 percent was from other tame forage crops.

TABLE I. ALL HAY IN MONTANA, ACREAGE, PRODUCTION, PRICE, TOTAL VALUE, VALUE PER ACRE. *

Year	Acres Harvested	Production Yield/acre	Total	Price per ton sold	Value of Production	Value per Acre
	Acres (000)	Tons	Tons	Dollars	Dollars	Dollars
1910	1,125	1.14	1,283	12.20	15,653	13.91
1920	1,738	1.32	2,293	11.23	25,755	14.82
1930	2,193	.98	2,148	10.86	23,330	6.08
1940	1,780	1.16	2,070	5.04	10,433	5.86
1950	2,432	1.12	2,730	24.20	66,066	27.17
1960	2,207	1.31	2,900	24.60	71,340	32.32

* Source: Montana Agricultural Statistics, Montana Department of Agriculture, United States Department of Agriculture, Agricultural Marketing Service cooperating, December, 1946 and December, 1962.

General Hay Market Characteristics

Alfalfa is produced in the irrigated valleys of the western mountainous region and on the irrigated river bottom lands in the Plains area. Leading counties in alfalfa production have traditionally been Gallatin, Madison, Cascade, Carbon, Park, Blaine and Lake. Wild hay production is centered in mountain meadows of western Montana. Beaverhead County leads all other

counties and accounts for approximately one third of the state's production. Powell and Madison counties are relatively large producers of wild hay also.

The gross value of Montana's hay crop has averaged better than 60 million dollars in the past few years. In some areas of the state, forage is the only possible crop that can be grown under the existing soil and climatic conditions. In other areas, hay is produced from forage crops, especially alfalfa, grown in rotation with other farm crops. And in "good hay years" it will be cut from heavy grass areas in eastern and central Montana. Hay is not a primary cash crop in Montana since only about 13 percent enters the market each year. An indication of the amount of hay produced for market in each county can be seen in Figure 1.

Although reliable production figures are available through the state statistician's office, there are no data collected on the consumption of hay on a county basis. Without some knowledge of consumption or the demand for hay it is difficult to visualize the market for Montana hay. Surplus or deficit areas and the resultant flow of traffic will depend on the supply-demand balance for the state as well as each particular county. In previous work at Montana State College these consumption figures were estimated and hay livestock balances derived. ^{14/} Livestock numbers reported in the 1945, 1950, 1955 and 1959 Census of Agriculture Reports

^{14/} Raymond C. Stack, "Marketing Montana Hay", Master's thesis, Department of Agricultural Economics, Montana State College, Bozeman, 1960.

for each county were multiplied by appropriate hay requirements for each class of livestock and a total consumption figure for each of the respective counties was ascertained. From these consumption data and the appropriate production data, Stack was able to derive supply-demand balances. The results of his work are Presented in Table II and Figures 2 and 3.

The hay-livestock balance for any given county depends upon several factors. Weather conditions, livestock numbers, size of hay stocks and condition of the range are instrumental in determining whether a county has a deficit or surplus quantity of hay. In some years these factors may cause a county to be on one side of the ledger and on the other side in other years. In other years they seem only to affect the degree of deficit or surplus. In normal years, however, Montana is considered a deficit hay area as Stack's work indicates. With one possible exception, which will be discussed later, the county balances he derived seem to be representative of normal years.

The Research Problem

The market structure for hay in Montana is characterized by small local markets. These markets lack the formal organization of other commodity markets and have not been able to provide the facilities and services normally available at more advanced markets. In general, trading is carried out in an atmosphere lacking relevant information on current market conditions and under the burden of a poor communications system.

