The Cow-Calf Enterprise

Its Place On Gooding County Farms

E. F. KOESTER AND R. V. WITHERS

BULLETIN 510
JULY 1969

AGRICULTURAL EXTENSION SERVICE

UNIVERSITY OF IDAHO
College of Agriculture

ABOUT THE AUTHORS:

E. F. Koester is Gooding County Extension Agricultural Agent.

R. V. Withers is Associate Professor of Agricultural Economics at the University of Idaho.

The Cow-Calf Enterprise
Its Place on Gooding County Farms

E. F. KOESTER AND R. V. WITHERS

Introduction

Cattle enterprises, including the cow-calf operation, have been increasing in Gooding County for many years. Between the Agricultural Census years of 1949 and 1964 cattle numbers more than doubled in the county.

Feed grain and forage production have been expanding along with cattle numbers (Table 1). At the same time, cultivated field crops have generally been declining in importance. (Other important characteristics of Gooding County agriculture are given in the appendix, Table 8.)

Many farmers in the area have been considering whether there is a place for the cow-calf operation on an irrigated farm and how this enterprise would compare with the alternatives available. Rising machinery and labor costs have encouraged an adjustment of farm businesses.

Questions relating to the economic feasibility of the cow-calf operation were the basis of a survey made in 1966. The study objectives centered around the cow-calf enterprise and how it fit into the general farm organization. Associated problems centered around availability of irrigation water for pasture and enterprises existing on farms with the cow-calf enterprise. The net objective was to provide economic data that may be of value to farm operators in organizing and managing their farms.

Characteristics of the Area and the Farms

The physical makeup of Gooding County varies widely. It is located in a transitional area between a range of mountains and the Snake River Plain. Over half (65 percent) of the county's 462,080 acres are in farms. The remainder is mostly public range land. The average annual precipitation is about nine inches and is quite variable. No significant crop

growth is possible without irrigation. Unirrigated rangeland is primarily spring and fall grazed. The frost free period extends about 110 to 120 days, from May to September. With irrigation, a variety of crops can be grown where soil conditions permit. However, topography often limits field size to small, inefficient areas.

TABLE 1.—Acreages of Major Crops and Numbers of Livestock, Gooding County, Idaho.

Crop or type of Livestock	Unit	1949	1954	1959	1964
Beans	Acres	10,898	11,101	7,427	4,613
Corn	Acres	1,268	3,481	5,656	6,639
Alfalfa	Acres	23,737	27,629	27,941	34,476
Mixed Grain	Acres	3,012	4,955	7,453	6,516
Spring Wheat	Acres	8,573	8,921	8,284	7,505
Sugar Beets	Acres	843	1,398	1,257	1,602
Potatoes	Acres	2,783	1,404	651	807
Cattle and Calves	Number	30,324	47,642	49,734	64,138
Sheep	Number	102,014	57,987	47,717	47,221
Dairy Cows	Number	6,594	8,178	7,598	7,344
Hogs and Pigs	Number	4,920	3,064	4,618	2,155

Source: Agricultural Census

Rough topography and lack of soil uniformity largely determine the choice of farm enterprises. Many kinds of modern machinery do not operate well where there are frequent rock outcroppings, small fields, and unlevel terrain. Without livestock, much of this land would not be used. Consequently, the cow-calf enterprise has gained favor with many farm operators in the area.

The possibility of grazing sheep on these lands should not be ruled out. However, the study survey did not consider the sheep enterprise. Sheep numbers have declined significantly in Gooding County (Table 1).

A typical farm in the area studied had some land in crops and some untillable land in permanent pasture and hay. The pasture land was irrigated where topography and water supply permitted.

Some of the land had been in continuous permanent pasture for twenty years or more as a means of preventing erosion related to topographic and soil conditions. It was also common to pasture rough areas, ditch banks, and other odd areas too small for machine operation.

Crop acreage was limited on some farms by an inadequate supply of irrigation water, especially during the peak use period between July 1 and August 15. Where such shortages occurred, the farm operator normally deprived hay and pasture land in order to adequately irrigate his cash crops. It was generally believed that economic loss to hay and pasture from this practice was much less than would have occurred had cash crops been deprived of water.

Farmers Provide Data

The main source of information used in this study was a hand picked sample of 22 farmers scattered throughout Gooding County. These farms were believed to be representative of farms with cow-calf operations in Gooding County. They included a wide enough variety of conditions to provide a good cross-section.

Extension personnel personally visited each farmer on different occasions during the fall and winter of 1966-67. Each farmer gave physical output, input and cost information for each of his farm enterprises. Thus data for real farm situations were collected and used as the basis for calculations and analyses.

Yield and the income factors per acre for these farms are shown in Table 2. These may be slightly above 1966 Gooding County averages since farmers interviewed were judged to be better than average farmers in the area. The "Return to Management" represents the return per acre after all expense and cost items except management have been deducted. Alfalfa and pasture are entered at zero return because they were fed to the cow-calf enterprise. Thus any actual return to alfalfa and pastures will appear as a reduced cost to the cow-calf enterprise. Another way to look at it is that pasture and hay were provided to the livestock enterprise for the cost of producing them. Table 2 also shows production costs for these crops.

Table 2.—Production Costs and Returns per Acre for Selected Crops, Gooding County, 1966.

Item	Crop					
	Alfalfa	Wheat	Mixed grain	Grain corn	Silage corn[3]	Dry beans
Variable cost	—	$43.36	$39.26	$50.40	$37.90	$54.43
Fixed equipment cost	—	8.65	8.65	8.39	8.39	17.41
Overhead	—	26.00	26.00	26.00	26.00	26.00
Total cost	$84.48	78.11	73.91	84.79	72.29	97.84
Yield	4 Tons	60 bu.	36 cwt.	80 bu.	17 T.	17 cwt.
Price[1]	$21.12[2]	$ 1.51	$ 2.10	$ 1.225	$ 5.00	$ 6.00
Total returns	84.48	90.80	75.60	98.00	85.00	102.00
Return to management	0[2]	12.69	1.69	13.21	12.71	4.16

[1]Average price per unit is an average of prices for the previous five years.
[2]The price for alfalfa hay was not determined but was given as equal to the cost of production. The hay was fed on the farm so the livestock enterprise was charged for the cost of producing the hay.
[3]Considered as a cash crop which could be sold or fed.

Results of the Survey

Characteristics of Farms Studied

The farms studied averaged 282 acres of which 124 acres were irrigated pasture. The estimated land value averaged $293 per acre. Pasture land was valued at $227 per acre, indicating lower productivity potential on land used for this purpose.

Cows were pastured an average of 169 days during the season. The longest pasture period reported was 233 days and the shortest was 123 days.

Pastures were irrigated an average of 15 times during the season, ranging from a high of 25 irrigations to a low of 4 irrigations. Half the farm operators controlled pasture weeds. They spent an average of $26.33 per farm in doing so. Fifty-nine percent of the farmers clipped their pastures and spread droppings. Each farmer spent an average of 40 hours repairing pasture fences during the season. Most of the pastures were rotated and contained some combination of the following plants: alfalfa, bluegrass, ladino clover, brome grass, orchard grass, alta fescue. Usually the farmers used their pasture 10 years or more before being reseeded.

Table 3 gives a breakdown of costs on irrigated pastures.

The farms averaged 109 cows with an average of $183 each. This value would vary over time as the market price for cattle changed. The average bull value was $423 each.

The farmers surveyed reported a calving percent of 94, which was quite high. Reasons for the high percentage were assumed to be as follows:

1. Favorable weather during and following calving.
2. Close attention to cows during calving, which was possible because of the small herd size.
3. Many of the herds studied were pregnancy tested and culled.

Calving percentage and death loss would vary considerably from year to year.

TABLE 3.—Average Irrigated Pasture Production Costs per Acre for Sample Farms, Gooding County, 1966.

Fixed Costs:		
Interest	($227 @ 5%)	$11.35
Taxes		1.94
Water Assessment		3.55
	Sub Total	$16.84
Variable Costs:		
Labor Irrigating	6.2 hr. @ 1.50	
Other*	1.2 hr. @ 1.50	
	7.4 hr. @ 1.50	$11.10
Stand establishment (annual share)		1.00
Weed spray		.07
Machinery cost		1.77
Fertilizer		7.54
Miscellaneous (fencing, etc.)		1.20
Total Pasture Cost		$39.52

*Includes fencing, harrowing, clipping, fertilizing and spraying.

Calves averaged 515 pounds when sold, which appears on the heavy side. However, farmers kept many of these calves on the farm for

a period of one to several months after weaning. The 515 pounds should be considered the average selling weight, but not the weaning weight. Feed supply and market conditions helped to decide the selling date for the calves.

In addition to the land and livestock, the study farms averaged $8526 worth of machinery and equipment. This modest machinery investment resulted from the nature of the farm. Since most enterprises were rather small, operators frequently used old and depreciated machines, neighbors often shared equipment, operators sometimes used custom operations, and minimum diversification required less machinery investment.

Irrigation was a problem on most farms due to the unlevel terrain and small fields. Also the supply of irrigation water available was restrictive during the peak requirement period during July and August. Hay and pasture land were not adequately irrigated during this period resulting in considerable lower yields than would have been possible if sufficient water had been available.

Production Costs for the Cow-Calf Enterprise

In addition to obtaining production costs for crops produced, the survey also obtained costs and returns for the cow-calf enterprises (Table 4).

Feed, consisting essentially of pasture, hay and grain, totaled $83.85 per cow-calf unit and was by far the largest item of cost. Hay and pasture were both figured at actual production cost rather than market price.

Total cost per cow-calf unit was $127.38. Gross income came to $133.90 at the five-year price, leaving a return to management of $6.52 per cow-calf unit. Total return to management for the cow-calf enterprise with an average of 109 cows would have been $710.68. In addition to this, the farmer was assumed to have received a return on his investment plus a return of $1.50 per hour of labor performed by himself. Even so, these figures indicate the narrow margin on which the farm was operated. A slight decrease in price received or a rise in costs could have easily meant a negative return to management.

Enterprise Combinations for the 300-Acre Farm

Data from the 22 sample farms were used as a basis for budgeting costs and returns for a typical 300-acre farm. Although the average sample farm was slightly smaller, 300 acres was chosen for analysis purposes because this was thought to be about all the land a farmer and his family could reasonably handle under existing conditions without hiring a substantial amount of extra labor. Hopefully, the following analysis of a 300-acre farm will serve as a point of reference for individuals with similar type farms. By comparing these figures with those for his own farm, a farmer may be able to determine which of his own enterprises are weaker or stronger.

TABLE 4.—Average Production Costs and Returns per Cow-Calf Unit for 22 Farms in Gooding County, 1966.

Feed:		
Hay (3346 lb. @ 21.12 per ton)	$35.33	
Pasture (per cow-calf unit)	39.52	
Other (mostly grain)	9.00	
Total feed per cow-calf unit		$83.85
Interest on investment per cow ($183 @ 6.5 percent)		11.90
Annual depreciation per cow		6.00
Breeding cost (average bull cost)		6.00
Death loss (2.47 percent x $183)[1]		4.52
Tax on cow		2.40
Labor per cow-calf unit (3.7 hr. x $1.50)		5.55
Veterinary and salt		2.06
Replacement calves purchased (6 percent x $25)[2]		2.10
Miscellaneous cost (hauling, saddle horse, etc.)		3.00
		$127.38
Gross income (515 lb. calf @ .26)		133.90
Return to management		$ 6.52

[1]Death loss is the average number of animals that died during the year. It is figured on a cost per cow so that the average cost per cow-calf unit can be determined.

[2]Calving percentage was 94 percent. This calculation assumes that replacements were purchased to make up for the remaining 6 percent. These were put on cows that lost their calves or in some cases one cow fed two calves.

Several restrictions and assumptions were necessary so that the typical farm would approximate a realistic situation. Restrictions would vary from this for any particular farm, depending on amount of tillable cropland, availability of irrigation water and personal preferences.

The following restrictions and assumptions were established for the reference farm:

1. That no more than 200 cows could be supported by the farm. The assumption was that it took 1.5 acres of pasture and feed to support one cow-calf unit for a year.
2. Most of the labor required would be provided by the farm operator and his family. About 2960 hours would be needed if 200 cows were kept. This averages 57 hours per week, although more would be required some weeks and less others.
3. The efficiency of irrigation water use was set at 50 percent, which was probably on the high side. Irrigation water was assumed to be in short supply during the midsummer. This restricted feed growth during this period.
4. Corn silage was restricted to 20 acres because of possible marketing problems.
5. Wheat was restricted to 20 acres assuming compliance with acreage allotments.
6. Mixed grain was restricted to not more than 40 acres and a minimum of 20 acres was set. Twenty acres of grain were needed as a nurse crop for alfalfa and pasture.

7. Corn for grain was limited to 40 acres for rotational reasons and because of high irrigation water requirements. The possibility of late and early frosts was another reason to limit the acreage of corn.
8. Because of erosion problems in the area it was assumed that at least half of the farm should be in pasture and hay all of the time.
9. Prices used for income calculations were the average for the previous five years.
10. Equipment used on the farm was mostly old and heavily depreciated. No grain harvester was kept on the farm: custom hiring was deemed more economical. Total farm investment varied, depending on the number of cows kept on the farm.

Sugar beets and potatoes were not included in the enterprise mix because they are grown very little in the county. Soil and topography do not lend themselves to production of these crops.

Returns to management from several different enterprise combinations were calculated by means of linear programming. This type of analysis determines optimum solutions mathematically. The optimum profit solution is subject to the restrictions and assumptions applied to the problem.

The first analysis assumed that optimum irrigation water would be used on all crops, including hay and pasture. This solution, shown in Table 5, was rejected because it was unrealistic. Even though water was limited, the farmer would still try to use all of his land.

In the following solutions, the irrigation assumption was changed to allow cash crops sufficient water. Water was withheld from hay and pasture during July and early August when other crops reached peak requirements. This made utilization of all land possible, but hay and pasture yields were reduced while yields of other crops were held at normal levels. The optimum return to management with this combination of enterprises was $1,774.44 (Table 6). In this solution to the problem, corn and wheat came in at the maximum because they were most profitable. Mixed grain came in because the restrictions required a minimum of 20 acres. The remaining acres provided hay and pasture for the cow-calf enterprise.

TABLE 5.—Optimum Returns to Management with Irrigation Water Restrictions.

Enterprise	No. of units	Return to Management per unit	Return to Management per enterprise
Cow-calf*	100	$ 6.52	$ 652.00
Mixed grain	20 acres	1.69	33.80
Wheat	20 acres	12.69	253.80
Corn for grain	32.35	13.21	427.34
Total Return to Management			$1366.94

*One cow-calf unit requires 1.5 acres for pasture and feed.

TABLE 6.—Enterprise Combination Giving Optimum Return to Management with Assumptions Given.

Enterprise	No. of units	Return to Management per unit	Return to Management per enterprise
Cow-calf	147	$ 6.52	$ 958.44
Corn for grain	40 acres	13.21	528.40
Wheat	20 acres	12.69	253.80
Mixed grain	20 acres	1.69	33.80
Total Return to Management			$1774.44

If more suitable cropland had been available, a better solution would be possible by reducing the number of cows and increasing acres of the more profitable crops. Table 7 illustrates how this could affect the return to management. It should be emphasized, however, that this and better solutions would not be possible unless some of the basic restrictions and assumptions were relaxed.

Several important factors relating to best enterprise combinations on the farms studied become apparent while studying the above tables. First, any conditions existing on an actual farm that differ from any of the basic assumptions would change the optimum solution for that farm. Table 7 illustrates the effects of more tillable land. A similar result could occur if more irrigation water could be supplied to the farm by using waste water, drilling a well, or some other means. Changes in the wheat allotment program could also be a factor. The prices of inputs and outputs also could change the solution. A substantial increase or decrease in cattle prices could alter the whole enterprise mix. Likewise, a major change in production costs for any or all of the enterprises would change the solution.

TABLE 7.—Enterprise Combination Giving Optimum Return to Management with More Tillable Land.

Enterprise	No. of units	Return to Management per unit	Return to Management per enterprise
Cow-calf	136 head	$ 6.52	$ 886.72
Mixed grain	20 acres	1.69	33.80
Wheat	20 acres	12.60	253.80
Corn grain	40 acres	13.21	528.40
Corn silage	20 acres	12.71	254.20
Total Return to Management			$1956.92

The above tables indicate return to management, which is the amount remaining after paying all other costs including the operator's labor and interest on his investment. Return to management per cow-calf unit was determined to be $6.52. However, if the operator owned all of his land, equipment, and cattle, and did all of his own labor, he could realize as much as $44 per cow-calf unit. This would represent return to labor, investment, and management. The $44 would be reduced to the extent that labor was hired or that debt existed on any of the land or capital.

Summary

Considerable interest has been shown in recent years concerning cow-calf operation on average to marginal lands in the irrigated areas of Gooding County. This interest inspired study of a sample of farms in the County to determine the economic feasibility of various crop combinations with beef cattle on irrigated pasture.

Data from 22 cooperating farm and ranch operators were collected for the 1966 crop year. These were analyzed to determine the financial return for various enterprise combinations. All enterprises studied showed modest returns to management after costs were deducted, ranging from $1.69 per acre for mixed grain to $13.21 for grain corn. The cow-calf enterprise returned $4.35 per acre, or $6.52 per cow-calf unit. Approximately 1.5 acres were needed to support a cow-calf unit for the year. Costs were based on the 1966 survey and prices were average prices for the previous five-year period.

A representative 300-acre farm was analyzed in an effort to determine the optimum economic return with the best possible enterprise combination with typical land, irrigation water, and rotation restrictions. Irrigation water was in short supply, which limited productivity. This limited productivity was particularly true on hay and pasture lands, since these crops were deprived of water when a shortage occurred.

The topography of the land was rather rolling, and easily eroded, this made frequent cultivation unfeasible. For this reason, pasture and hay were raised on much of the farm.

Assuming typical conditions, return to management was highest with 147 cow-calf units, 40 acres of corn for grain, 20 acres of wheat, and 20 acres of mixed grain. Even at optimum, the return to management was a modest $1774. Small changes in cost, price, or conditions could significantly change the return to management, indicating the fine economic balance under which these farms were operated.

While the cow-calf operation was not highly profitable in Gooding County, land and climatic conditions suggest that livestock grazing and feed raising will continue to be important activities in the future.

APPENDIX

TABLE 8.—Selected Agricultural Statistics for Gooding County 1959-1964.

	1964	1959
Approximate acres in land area	462,080	462,080
Proportion in farms	64.9%	59.6%
Acres in farms	299,940	275,217
Average size of farm	335.1	301.8
Value of land and buildings per farm	$47,849	$38,162
Farms by type		
Dairy	230	205
Livestock other than poultry and dairy	238	226
General	167	192
Miscellaneous and unclassified	178	115
All farm products sold		
Average per farm	$13,691	$10,980
All crops sold	$2,875,075	$3,124,851
All livestock and livestock products sold	$9,375,648	$7,075,595
Livestock and livestock products sold (Other than poultry and dairy)	$6,880,880	$5,240,293
All farm products sold	$12,253,574	$10,200,446

Land Use Practices

	1964 acres	1959 acres
Cropland harvested	68,976	67,376
Cropland used only for pasture	19,533	26,247
Improved pasture	15,142	10,182
Irrigated land in farms	91,992	89,407
Corn for all purposes	6,500	5,656
Wheat	7,322	10,234
Mixed grains	6,516	N.A.
Alfalfa	34,476	27,941
Dry field and seed beans	4,577	7,427
Potatoes	792	651
Sugar beets for sugar	1,598	1,257

Livestock Numbers

	1964	1959
Cattle and calves	64,138	49,734
Cows including heifers that have calved	27,614	18,190
Heifers and heifer calves	17,285	16,487
Steers and bulls including calves	19,239	15,057
Milk cows	7,344	7,598
Sheep and lambs	47,221	47,717

Source: 1964 United States Census of Agriculture (U.S. Department of Commerce, Bureau of the Census, Washington, D.C.)

Published and Distributed in Furtherance of the Acts of May 8 and June 30, 1914, by the University of Idaho Agricultural Extension Service, James E. Kraus, Director; and the U.S. Department of Agriculture, Cooperating.

2M-7-69