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SPECIALIZED BEEF COW OPERATIONS IN NORTHERN MINNESOTA

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INTRODUCTION

Many farmers in northern Minnesota have added beef cow herds as an enterprise on their farms. Some have shifted or are in the process of shifting from dairy to beef in an attempt to lower farm labor requirements. Others who have relatively poor soils are attempting to build a farming program around a herd of beef cows and the raising of roughages. Others are primarily grain farmers and maintain beef cows to harvest roughages from their non-tillable land.

This report summarizes 1971 business records from 46 farmers in northern Minnesota who maintain beef cow herds. Farm records were supplied by the area vocational-technical schools in Thief River Falls and Duluth. The records are divided into three groups--farms that sell beef calves, farms that feed out the calves before selling, and farms that maintain a dairy enterprise in addition to beef cows. The purpose of this publication is to present data in regard to capital managed, costs and returns, and some crop and livestock

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* The work of Janet B. Otis in preparation of the tables and in typing the manuscript is appreciated.

information for each of the three groups of farms mentioned above.

The records included in this report are for only one calendar year and reflect costs and returns resulting from the combination of general price levels and climate conditions which existed in 1971. When combined with data from other sources and from other years, one can secure a general idea of the relative profitableness of the beef cow enterprise.

CAPITAL MANAGED AND EARNINGS

Capital managed per farm was large for the two groups of farms on which beef cattle were the only livestock maintained (table 1). All of the farm assets are listed at approximate market values except for real estate. Land and building values have not been corrected for the general inflation in prices which has occured after many of these farms were purchased.

Table 1. Capital Managed on Beef Cow Operations in Northern Minnesota, 1971

Item	Beef cows, sell calves		Beef cows, feed out calves		Beef cows, dairy cattle	
Number of farms	22		14		10	
Acres per farm	846		1018		454	
Tillable acres per farm	642		854		290	
Number of beef cows	66		80		38	
	Jan. 1	Dec. 31	Jan. 1	Dec. 31	Jan. 1	Dec. 31
Dairy cattle	$ -	$ -	$ -	$ -	$ 8143	$ 9142
Beef cattle	19833	22740	34132	40998	13282	12630
Other livestock	-	-	-	232	160	87
Crops, seed, feed	10600	14568	13119	17604	4398	5179
Auto and truck	2158	2460	1880	1977	1006	1310
Truck and machinery	11543	12273	17314	19019	6881	7903
Livestock equipment	173	351	687	638	1753	2114
Land	58182	58182	80205	80205	24287	24287
Farm buildings*	9500	9611	12080	13585	7970	8096
Total capital managed	$111989	$120185	$159417	$174258	$67880	$70748

* Not including value of farm dwelling.

Specialized beef operations show a considerable increase in total capital managed from the beginning to the end of the year. Increases in the value of beef cattle are probably due to a combination of higher prices at the end of the year and an increase in the size of the enterprise. The increase in the value of crops on hand is largely due to higher average yields during 1971 as compared to 1970.

Cash receipts, expense and earnings are shown in table 2. Average labor earnings received by farmers were relatively high for beef cow operations in 1971 as compared to the returns received during 1970.[1] Labor earnings is the amount that would be left as a salary to the farm operator if he paid wages to other members of the family who worked on the farm and paid a charge for the use of capital at the rate of six percent. Sale of crops is a substantial portion of total sales on farms which maintain beef cattle as the only livestock enterprise. Farms with both dairy and beef cattle feed most of the crops raised and, in addition, buy feed. One-half of the farmers who fed calves to market weight also purchased additional calves for their feed lot. This resulted in a relatively high expense as compared to the other groups of farms included in this study.

Receipts, expenses and earnings on a per cow basis are shown in table 3 for the two classifications of farms that maintain beef cows as the only livestock enterprise. Farmers who fed out calves to market weight had higher gross income and higher expenses than farmers who sold calves at weaning time. The net difference in labor earnings per cow was $46, with a large proportion of this due to the feeding of calves to market weights.

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1. See Nodland, Truman R., "Specialized Beef Cow Operations in Northern Minnesota, 1970," University of Minnesota Department of Agricultural and Applied Economics Report R71-9, November 1971, and Bennett, Myron, "Beef Cows-Stocker Calves," University of Missouri Department of Agricultural Economics Report FM71-7, September 1971.

Table 2. Earnings, Cash Statement, Beef Cow Operations in Northern Minnesota, 1971

Item	Beef cows, sell calves	Beef cows, feed out calves	Beef cows, dairy cattle
RECEIPTS			
Dairy cattle sold	$ -	$ -	$ 2154
Dairy products sold	-	-	10942
Beef cattle sold	8802	20510	6075
Other livestock sold	12	736	142
Crops sold	15235	18485	1887
Work off the farm	318	818	447
Miscellaneous farm income*	4111	6022	1218
Total sales	$28478	$46571	$22865
Increase in farm capital	8196	14841	2868
Family living from the farm	322	283	690
Total receipts	$36996	$61695	$26423
EXPENSES			
Dairy cattle bought	$ -	$ -	$ 712
Beef cattle bought	969	5826**	198
Other livestock bought	25	248	6
Miscellaneous livestock expense	276	422	630
Feed bought	1057	1625	2654
Fertilizers	3097	3783	911
Other crop expense	2705	3200	672
Custom work hired	1060	1087	1020
Gas, oil, grease bought	1843	2250	1101
Repair of auto, tractor, machinery	2055	3076	1239
Repair of real estate	402	934	359
Repair of livestock equipment	51	60	74
Wages of hired labor	1200	2093	872
Electricity expense	179	308	326
Real estate taxes	1485	2295	690
General farm expense	518	702	506
Total cash operating expenses	$16922	$27909	$11970
New power and machinery	2941	6125	2971
New livestock equipment	219	181	621
New buildings	759	2715	583
Total purchases	$20841	$36930	$16145
Interest on capital managed at 6%	6965	10010	4158
Unpaid family labor	1043	1242	720
Board for hired labor	79	118	126
Total expenses	$28928	$48300	$21149
Labor earnings	$ 8068	$13395	$ 5274

* Includes income from feed grain program.
** Seven farmers purchased some calves.

Table 3. Cash Statement on a Per Cow Basis for Beef Cow Operations in Northern Minnesota, 1971

Item	Beef cows, sell calves	Beef cows, feed out calves
RECEIPTS		
Beef cattle sold	$ 133	$ 258
Other livestock sold	-	9
Crops sold	231	231
Work off the farm	5	10
Miscellaneous farm income	62	76
Total sales	$ 431	$ 584
Increase in farm capital	124	186
Family living from the farm	5	4
Total receipts	$ 560	$ 774
EXPENSES		
Beef cattle bought	$ 15	$ 75
Other livestock bought	-	3
Miscellaneous livestock expense	4	5
Feed bought	16	20
Fertilizers bought	47	48
Other crop expense	41	40
Custom work hired	16	14
Gas, oil, grease bought	28	28
Repair of auto, tractor, machinery	31	38
Repair of real estate	6	12
Repair of livestock equipment	1	1
Wages of hired labor	18	27
Electricity expense	3	3
Real estate taxes	22	28
General farm expense	8	9
Total cash operating expenses	$ 256	$ 351
New power and machinery	45	76
New livestock equipment	3	2
New buildings	11	34
Total purchases	$ 315	$ 463
Interest on capital managed	106	125
Unpaid family labor	16	16
Board for hired labor	1	2
Total expenses	$ 438	$ 606
Labor earnings	$ 122	$ 168

The data in table 4 show earnings on an enterprise basis. Instead of stressing purchases and sales, the enterprise basis stresses net value produced and net expenses.[1] In return from crops, credit is given to crops for feed raised on the farm and consumed by livestock. Return over feed represents value added by livestock or, in two of the groups of farms, it represents value added by beef cattle. Crops are a substantial source of income in the three groups of farms.

The enterprise statement is shown on a per cow basis in table 5 for two of the groups of farms with only beef cattle. Feeding out the calves added $87 in return over feed cost per cow. Farmers who fed out the calves had 10.7 acres of tillable land per beef cow compared to 9.9 acres of tillable land per cow for those farms selling calves. Some of the difference in receipts was due to greater income from crops for farmers feeding out calves as well as from feeding the calves to market weight. Larger receipts on the part of farmers who fed out calves was offset somewhat by greater expenses.

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1. For a discussion of the method of calculation, see Nodland, Truman R., "Know Your Farm Business," University of Minnesota Agricultural Extension Service Extension Service Pamphlet 138, Revised 1971.

Table 4. Earnings, Enterprise Basis, on Beef Cow Operations in Northern Minnesota, 1971

Item	Beef cows, sell calves	Beef cows, feed out calves	Beef cows, dairy cattle
RECEIPTS AND NET INCREASES			
All dairy cattle	$ -	$ -	$14267
Beef cow herd	10918	11187	5347
Feeder cattle	90	10627	-
Other livestock	14	740	87
Total livestock	$11022	$22554	$19701
Value of feed fed	6120	9792	10238
Return over feed	$ 4902	$12762	$ 9463
Crops, seed, feed	18493	24153	8332
Income from labor off farm & misc. income*	3930	5560	1496
Total receipts	$27325	$42475	$19291
EXPENSES AND NET DECREASES			
Truck and auto	$ 1550	$ 1990	$ 1273
Electricity expense	179	309	326
Tractors and crop machinery	4591	7258	3269
Livestock equipment	96	290	346
Buildings and real estate improvements	1050	2144	817
Miscellaneous livestock expense	276	422	630
Labor**	2547	3660	2002
Real estate taxes	1485	2294	690
General farm expense	518	703	506
Interest on capital managed	6965	10010	4158
Total expenses	$19257	$29080	$14017
Labor earnings	$ 8068	$13395	$ 5274

* Includes income from feed grain program.

** Includes wages paid and value of board to hired labor, unpaid family labor, and a part of the payment for custom work hired.

Table 5. Enterprise Statement on a Per Cow Basis for Beef Cow Operations in Northern Minnesota, 1971

Item	Beef cows, sell calves	Beef cows, feed out calves
RECEIPTS AND NET INCREASES		
Beef cow herd	$ 166	$ 140
Feeder cattle	1	134
Other livestock	-	10
Total livestock	$ 167	$ 284
Value of feed fed	93	123
Return over feed	$ 74	$ 161
Crops, seed, feed	280	301
Income from labor off farm & misc. farm income	60	69
Total receipts	$ 414	$ 531
EXPENSES AND NET DECREASES		
Truck and auto	$ 23	$ 25
Electricity expense	3	3
Tractors and crop machinery	70	91
Livestock equipment	1	4
Buildings and real estate improvements	16	27
Miscellaneous livestock expense	4	5
Labor	39	46
Real estate taxes	22	28
General farm expense	8	9
Interest on capital managed	106	125
Total expenses	$ 292	$ 363
Labor earnings	$ 122	$ 168

LAND USE AND CROP YIELDS

A large proportion of the tillable land was devoted to small grains, pasture, hay and silage crops (table 6). In addition, most farms had a large acreage in non-tillable pasture. Oats, barley, wheat, and income from land placed in the government program was the source of cash income from crops. Few farmers raised corn or soybeans for grain.

Average crop yields were relatively high in 1971 (table 7). Average yields of wheat were more than 40 bushels per acre and barley yields were more than 50 bushels per acre.

Table 6. Acres Farmed, Beef Cow Operations, Northern Minnesota, 1971

Item	Beef cows, sell calves	Beef cows, feed out calves	Beef cows, dairy cattle
Wheat	97	113	9
Oats for grain	132	126	51
Barley	47	108	4
Rye	25	39	18
Other small grain	18	62	-
Total small grain	319	448	82
Corn for grain	21	31	11
Corn silage	11	41	27
Other cultivated crops	13	20	8
Total cultivated crops	45	92	46
Alfalfa hay	76	155	27
Other legumes for hay	44	1	62
Other hay and grass seed	37	17	39
Total tillable land in hay	157	173	128
Total tillable pasture	75	91	28
Tillable land not cropped*	46	50	6
Total tillable land	642	854	290
Non-tillable pasture	126	82	94
Timber, waste, roads, farmstead	78	82	70
Total acres farmed	846	1018	454
Percent land tillable	76	84	64

* Including government program.

Table 7. Crop Yields per Acre on Farms with Beef Cow Operations, Northern Minnesota, 1971

Item	Beef cows, sell calves	Beef cows, feed out calves	Beef cows, dairy cattle
Wheat, bu.	41.8	49.9	*
Oats for grain, bu.	77.9	68.2	49.6
Barley, bu.	53.8	63.8	*
Rye, bu.	45.0	46.2	*
Corn for grain, bu.	*	59.9	56.9
Corn silage, tons	10.0	10.2	7.2
Alfalfa hay, tons	2.4	2.3	2.4

* Less than four cases.

RETURNS FROM LIVESTOCK

Costs and returns from beef cows are shown in table 8 and similar data for feeder cattle and for dairy cattle are shown in tables 9 and 10. Returns from all classes of livestock were relatively high. The return over feed cost and the return for $100 of feed give an indication of the success of each livestock enterprise, since feed is the largest single item of expense in livestock production. Return over feed is the amount available to the farmer to pay for labor, housing, equipment, power, interest and miscellaneous cash costs.

Table 8. Feed Costs and Returns from Beef Cows, Northern Minnesota, 1971

Item	Beef cows, sell calves	Beef cows, feed out calves	Beef cows, dairy cattle
Average number of beef cows	66	80	38
Average number of calves and replacements	56	46	34
Total value produced per cow	$162.64	$140.40*	$141.45
Feed cost per cow:			
Concentrates	$ 13.03	$ 4.59	$ 11.34
Roughages	65.04	50.94	68.19
Pasture	9.66	9.97	10.16
Total feed cost	$ 87.73	$ 65.50	$ 89.69
Return above feed cost per cow	$ 74.91	$ 74.90	$ 51.76
Return for $100 feed	$185	$215	$158
Miscellaneous costs per cow**	$ 6.65	$ 3.96	$ 6.64
Feed per cow, lbs.:			
Concentrates	587	230	718
Hay	7026	5526	6011
Silage	2176	3285	4347
Total pounds of beef produced	34661	33362	21846
Average pounds of beef produced per cow	521	418	579
Price per cwt. of all cattle sold	$32.24	$22.04	$32.22
Average weight per head sold	567	1055	557
Percent death loss	2.8	2.7	4.7
Percent calf crop	90	95	91

* Includes value of calves at the time of transfer to the feed lot.

** Includes beef herd share of miscellaneous livestock expense, veterinary expense, and custom work hired.

Table 9. Feed Costs and Returns from Feeder Cattle, Northern Minnesota, 1971

Item	Beef cows, feed out calves
Pounds of beef produced	32018
Average number of head	74
Net increase in value per cwt. produced	$34.42
Feed cost per cwt. produced:	
Concentrates	$ 9.24
Roughages	6.31
Pasture	.27
Total feed cost	$15.82
Return above feed cost	$18.60
Return per $100 of feed	$220
Feed per cwt. beef produced, pounds:	
Grain	428
Commercial feed	16
Hay	476
Silage	957
Price paid per cwt. feeders bought	$36.29
Price received per cwt. feeders sold	$33.22
Average weight per head sold	797

There was considerable variation among the three types of farms in the value produced, feed costs, and return over feed cost per beef cow. Farmers who fed out the calves probably transferred the calves to the feed lot at a light weight, since only 418 pounds of gain in weight was produced per cow. Farmers who sold calves as feeders, on the other hand, produced over 500 pounds gain in weight per cow.

The price received per cwt. of cattle sold and the average weight per head sold includes cull cows as well as calves. The sale price is low and the average weight per head sold is high for farms that fed out the calves, since only cull cows are sold. Value of calves transferred to a feed lot is included in the net increase in value but only animals that were sold are included in the price received per cwt. feeders sold.

Table 10. Factors of Costs and Returns from All Dairy Cattle, 1971*

Item	Average of 10 herds
Pounds of milk per cow	10423
Percent butterfat in milk	3.6
Pounds of butterfat per cow	373
Price received per pound of butterfat sold	$1.35
Price received per cwt. milk sold	$4.84
Value of produce per cow:	
Dairy products	$507.94
Net increase in value of cows	145.94
Total value produced	$653.88
Total feed cost per cow	$318.27
Return above feed cost per cow	$335.61
Returns for $100 of feed	$205
Feeds per cow, pounds:	
Total concentrates	5787
Total hay	11131
Total silage	9505
Miscellaneous costs per cow**	$53.82
Number of cows	21
Number of other dairy cattle	19

* Includes entire dairy herd.
** Veterinary, custom work hired and other miscellaneous expenses.

The cattle fattening enterprise involved high roughage rations (table 9). The amount of concentrates fed per 100 pounds gain in weight was lower and roughage consumption was higher than is typical for southern Minnesota feeders.[1] Average weight per head sold was about 800 pounds. It is likely that some of these cattle were purchased by other cattle feeders for feeding to heavier weights.

L. Miller, Barbara B. and T. R. Nodland, "Costs and Return from Feeding Cattle, 1970-1971." University of Minnesota Department of Agricultural and Applied Economics Information Report R72-2, May 1972.

Farmers who maintained dairy as well as beef cows averaged 31 dairy cows per farm in addition to 38 beef cows. They received an average of $205 return per $100 of feed consumed by dairy cattle (table 10). Feeding cattle and some of the beef cow herds yielded approximately the same return per $100 of feed consumed in 1971. Normally, beef cattle yield a smaller return per $100 of feed than dairy cows because of the smaller amounts of labor, buildings, and equipment usually associated with beef cattle, which makes feed a larger proportion of total costs.

SUMMARY

A summary of earnings, resources used and other factors is presented in table 11. If $7000 is deducted as an assumed wage for the farm operator, the rate earned on farm capital is 6.9 percent and 9.8 percent on the crop-beef cow farms. Farmers with both a dairy enterprise and a beef cow enterprise earned 3.5 percent on their capital managed.

Farm resources used in terms of acres or capital managed are large on farms with beef cows as the only livestock enterprise. Many of the farmers included in this study are crop farmers who use beef cows to harvest grass on non-tillable land. In other cases, roughages are the primary crop which can be grown because of type of soil, topography, etc.

Crops are a major source of income when credit is given to crops for feed raised on the farm and consumed by livestock. Only on farms maintaining dairy cattle does the income from livestock approach 50 percent of the gross income.

These farms are family operations with an average of less than two workers per farm, including family as well as hired labor. Few farms exceeded 500 total work units in size.

Table 11. Earnings, Resources Used, and Size of Business on Beef Cow Operations in Northern Minnesota, 1971

Item	Beef cows, sell calves	Beef cows, feed out calves	Beef cows, dairy cattle
Earnings			
1. Net cash income	$ 7637	$ 9641	$ 6720
2. Labor earnings	$ 8068	$13395	$ 5274
3. Interest on capital managed	6965	10010	4158
4. Return to operator's labor and capital	$15033	$23405	$ 9432
5. Estimated wage for operator	7000	7000	7000
6. Return to capital managed	$ 8033	$16405	$ 2432
7. Rate earned on capital managed	6.9	9.8	3.5
Land			
8. Total acres	846	1018	454
9. Tillable acres	642	854	290
Labor			
10. Number of workers	1.5	1.8	1.4
11. Work units per worker	199	273	255
Capital			
12. Total capital managed	$116087	$166838	$69314
13. Capital managed per worker	77391	92688	49510
Size of business			
14. Total work units	299	491	357
15. Total farm sales	$28478	$46571	$22865
Beef cows			
16. Number of beef cows	66	80	38
17. Return for $100 feed	$185	$215	$158
18. Pounds of beef produced per cow	521	418	579
Source of gross income			
19. Percent from livestock	17.9	30.0	49.1
20. Percent from crops	67.7	56.9	43.2
21. Percent from miscellaneous sources	14.4	13.1	7.7
Expenses			
22. Fertilizer expense per crop acre*	$5.94	$5.31	$3.56
23. Tractor and crop machinery expense per crop acre	$8.81	$10.18	$12.77
24. Power, machinery, equipment and building expense per work unit	$24.97	$24.22	$16.89

* Acres in small grains, cultivated crops, hay and grass seed.