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Costs, Returns, and Profitability of the Beef Cow-Calf Enterprise in Southeastern Ohio by Systems of Management

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CONTENTS

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AGDEX 821/420

4-63-3.5M

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E. T. SHAUDYS AND J. H. SITTERLEY

INTRODUCTION

Southeastern Ohio farms generally have a rolling topography with soils that have been developed from unglaciated sandstone and shales. Approximately two-thirds of the total land area is in farms with the remaining one-third predominately in a non-farm forest. Of the land in farms about 30 percent is classified as cropland, 50 percent as permanent pasture and 20 percent as farmstead, forest and other uses.

Most of the land in the area was settled prior to 1840 as self-sufficient family farms. As agriculture in the United States became commercialized the number of farms in Southeastern Ohio declined and a more specialized type of farming evolved. Some farm consolidation has taken place but in 1960 only one farm in five had 180 acres or more of land and less than one farm in 50 had 500 acres or more.[1] For the past 100 years farms have been organized around a forage consuming livestock enterprise such as dual purpose cattle and sheep. Today the dual purpose cattle are unable to compete with high producing dairy animals or quality beef cows.

Widespread interest in soil conservation has resulted in an increased acreage being devoted to meadow crops and pasture. Profitable utilization of these meadows and pastures is of major importance. Many farmers do not have a favorable milk market or do not want to operate a dairy. As a result, considerable interest has developed in the beef cow-calf enterprise as a means of converting forage into a salable product. In recent years the quality of beef animals has been improved through breeding programs.

The increased demand for beef feeder calves and stocker animals has resulted in a rapid increase in beef cow numbers. In the 13 counties selected for study 23,627 beef cows were reported in 1950 compared

[1]Census of Agriculture 1959, Bureau of the Census, U. S. Department of Commerce.

[2]Census of Agriculture 1949 and 1959, Bureau of Census, U. S. Department of Commerce.

to 57,397 beef cows in 1960 or an increase of about 100 percent[2]. Income from the sale of beef animals ranked second and accounted for about one-forth of total farm income during 1960[3]. During the period 1949 to 1959 dairy cow numbers declined from 108,094 to 72,333 head.

Another indication of the increasing importance of the beef enterprise is found in the development and growth of the cooperative feeder calf sales. These sales were started in 1944 with 210 head of feeder calves being assembled, graded and sold through one auction. In 1954, farms in the area marketed 3,007 head and during 1960 more than 14,000 head of feeder calves were marketed through 15 cooperative auction sales[4].

REVIEW OF LITERATURE

Cost studies have demonstrated that commercial beef cow herds usually yield low returns. Production input cost and management are frequently cited as important factors affecting profit.

Blosser reported that beef cow herds could yield a profitable return with good management and improved practices on hill land. Ten years were required to build up a profitable cow-calf enterprise and over 500 acres of land was needed to develop an organization that would fully employ the available family labor[5].

Lanham and Butler reported that the cow-calf system is one alternative for realizing a more complete and profitable use of resources in the Piedmont area of South Carolina. Beef production was most profitable when handled as a supplementary enterprise[6].

Hartman and Routhe concluded the profitability of a beef cow herd under Minnesota conditions was relatively unfavorable. Large areas of untillable pasture are not ample justification for a beef herd and other alternatives are likely to be more profitable[7].

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[3]Smith, M. G., McCormick, F. B., Dockum, R., Krock, L., Kendall, J. R., and Houghton, E. E., Department of Agricultural Economics and Rural Sociology, Mimeograph Bulletin 325, Ohio Farm Income 1960.

[4]C. H. Ingraham "Ohio Demonstration Feeder Calf Sales, 1959," The Ohio State University, Agricultural Extension Service, Department of Agricultural Economics and Rural Sociology, Columbus, 1959.

[5]Blosser, R. H., "Economics of Improving Hill Land for Beef Production," Ohio Agricultural Experiment Station Research Bulletin 882, 1958.

[6]Lanham, W. J. and Butler, C. P., "Economic Analysis of Annual Adjustments in Developing a Beef Cattle Grain Farm in the Piedmont Area of South Carolina" South Carolina Agricultural Experiment Station Bulletin 459, 1958.

[7]Hartman, E. and Routhe, H., "Are Beef Herds Profitable?" Minnesota Farm Business Notes No. 380, University of Minnesota, 1957.

Tramel and Parvin found the average returns from the beef enterprise in Mississippi to be low. However, relatively high returns were obtained with better management. The following practices were cited as most important: quality of breeding animals, low feed costs, low grazing costs and herd health[8].

Wright in a Michigan study reported wide variations in net returns because of feed costs. Farmers with high net returns wintered cows on about 1,000 pounds less roughage and less expensive roughage than farmers with low net returns. The smaller feed cost did not adversely affect the calf crop produced[9].

Johnson concluded that herd size was perhaps the most important single factor affecting financial success in range cattle production in North Dakota. Although optimum size varied with family needs, a 100-cow ranch was considered minimal to provide the average family with an adequate living over a period of time[10].

Woods and Buddemier found that a small herd size was a serious limitation to the financial success of a farm organized with the cow-calf herd as the major livestock enterprise. More opportunities for profit may develop with larger size herds, but the amount of capital needed and a slow rate of turnover may impede the development of a cow herd by a low income farm operator[11].

WHY THE STUDY WAS MADE

This study was initiated to obtain information about the economic desirability of the beef cow-calf enterprise on farms in Southeastern Ohio. One objective was to compare systems of managing the enterprise and to determine the relative profitability of each. Securing input-output information about the beef cow-calf enterprise was a second objective.

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[8]Tramel, T. E. and Parvin, D. W., "An Economic Appraisal of Beef Production in Northeast and East Central Mississippi," Mississippi Agricultural Experiment Station Bulletin 497, 1953.

[9]Wright, K. T., "Beef Costs and Returns in Northeastern Michigan" Michigan State College, Agricultural Economics Department, Bulletin 489, 1951.

[10]Johnson, M. B., "Range Cattle Production in Western North Dakota" North Dakota Agricultural Experiment Station Bulletin 347, 1947.

[11]Woods, H. S. and Buddemeier, W. D., "Increasing Production and Earnings on Farms with Beef-Cow Herds in the Unglaciated Area of Southern Illinois" School of Agriculture, Southern Illinois University, Carbondale, 1959.

METHOD OF MAKING THE STUDY

A stratified random sample of 126 beef cow-calf herds was selected from 13 Southeastern Ohio counties with a large population of beef cows (Figure 1). Extension agents, farm planners for the soil conservation service, dealers and farmers were contacted to develop an inclusive list of herd owners. Individual herds were selected at random from the list until at least 30 usable records were obtained in each of the following size strata: 5 to 9 cows, 10 to 18 cows, 19 to 29 cows and 30 to 60 cows. An attempt was made to include herds with more than 60 cows. The number of herds with 60 or more cows was insufficient to be included in the study.

A three visit modified cost route was used to obtain the needed herd information during the year 1955. Beginning inventories were made as of January 1, 1955. Each farmer kept records on sales, purchases, births, deaths, animals slaughtered, feed and cash expenditures[12].

A second visit was made during the pasture season. Data was secured pertaining to how the herd was handled during the pasture season and the other information was brought up to date. Closing inventories were taken as of December 1955. Insofar as possible information was obtained in physical units as well as monetary values to permit the analysis of the profitability of the beef enterprise for price relationships other than those prevailing during the period of study.

FINDINGS

SYSTEMS OF MANAGING THE BEEF ENTERPRISE

Methods of handling the beef cows and more particularly the calves were categorized into four management systems. These systems were: (1) "feeder calves," (2) "fattening," (3) "dual purpose," and (4) "combination."

Feeder Calf System

Most of the calves were sold at weaning time in October and November as feeder calves on 36 farms. These calves were born in February or March and nursed until they were weaned and sold. They were sold to be finished on farms with more grain than was available on most Southeastern Ohio farms.

This system was found on farms that produce large amounts of forage, especially pasture, and limited quantities of grain. Limited amounts of labor and buildings are required for this system of production.

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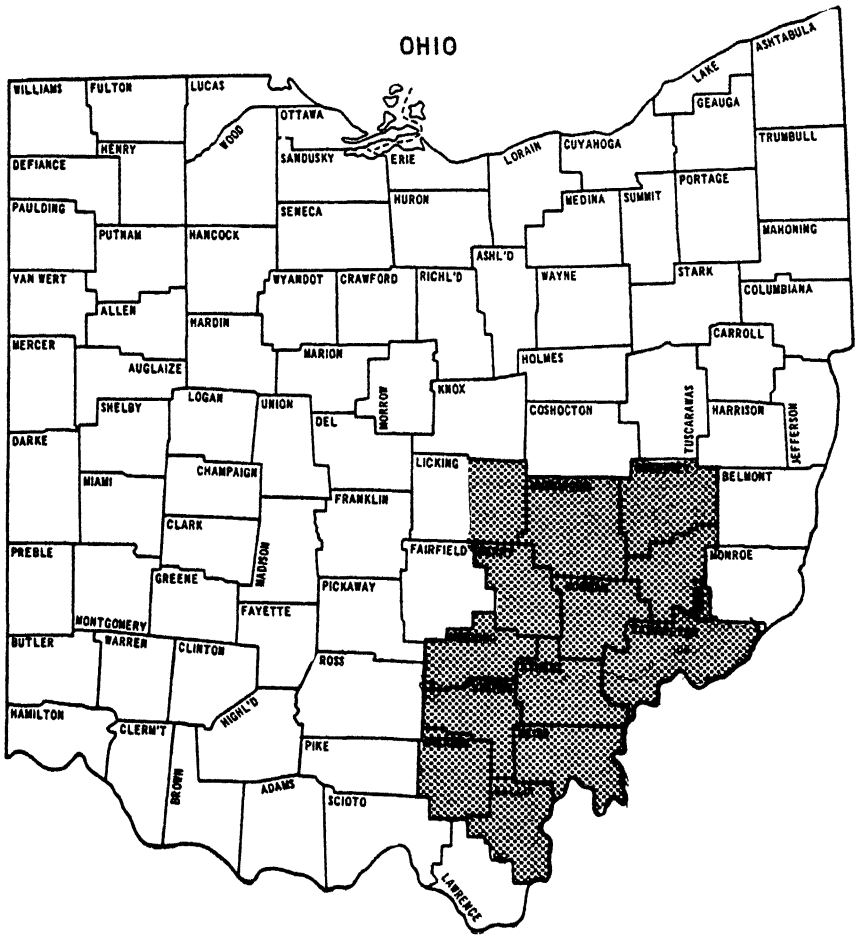
[12]Data was collected and summarized for 1954 and is reported in Ohio Agricultural Experiment Station Research Circular 45.

Fig. 1.—Location of 126 Beef Cow-Calf Herds, OHIO.



Fattening System

The 48 farmers using the fattening systems sold their calves as finished animals. Usually the cow herd was handled in the same manner as by farmers producing feeder calves. After weaning, some farmers dry lot fed their calves until ready for sale as finished cattle. Other farmers fed their calves a growing ration through the winter and then a light grain feed on pasture until midsummer. From midsummer on, the cattle were given a full short grain feed until offered for sale. Still other farmers grass fattened their cattle with a very small amount of grain.

More grain, labor, and buildings and less forage could be converted into salable beef with the fattening system than with the feeder calf system.

Dual Purpose System

The dual purpose system as used by 12 farmers was a carryover from the self-sufficient farming practiced in the past. Basically cows were of dairy ancestry and were bred to a beef bull. Both milk and calves were produced and sold. Calves were born during every month of the year and were sold at varying weights and degrees of finish.

Combination System

A mixture of methods was used on 30 of the farms. Some calves were sold at weaning time as feeder calves, others were wintered and sold as long yearlings and others were sold at finished weights. Farmers included in this system often varied the system of handling their herd from one year to the next. Typically, little attempt was made to confine calving to a particular period.

LAND USE BY MANAGEMENT SYSTEM

Farmers producing feeder calves had an average of 209 acres of land, while fattening system farms averaged 269 acres, dual purpose farms, 199 acres, and combination farms, 253 acres. Land use was more important than the total land area (Table 1).

Feeder calf farms averaged 46 acres of cropland which was 22 percent of the total farm area. About 30 percent of the total farm area was cropped on the fattening, dual purpose and combination system farms. A heavy forage rotation was used on most farms. However, only a small percent of the rotation meadows were used for pasture. Rather, they were harvested and stored for winter feed.

Permanent pasture comprised 49 percent of the land area of fattening system farms and 59 percent of the feeder calf farms. Also about twice as much of the permanent pasture acreage had received treatment on the fattening as on the feeder calf farms. Generally, feeder calf farms had a rougher topography with relatively fewer acres of cropland and more pasture than did the fattening system farms. Although feeder calf farms had about the same acreage of permanent pasture as the fattening system farms, feeder calf farm land had received less treatment and was less productive.

LABOR AVAILABILITY BY MANAGEMENT SYSTEMS

Available family and operator labor ranged from 1.3 man equivalents on feeder calf to 1.8 man equivalents on dual purpose farms. Fattening and combination system farms each had 1.6 man equivalents of labor available.

TABLE 1.—Land Use Per Farm by System of Beef Herd Management, 126 Southeastern Ohio Farms, 1955, (Acres Per Farm).

Land Use	System			
	Feeder Calf	Fattening	Dual Purpose	Combination
Number of farms	36	48	12	30
Cropland				
corn	8	19	15	11
small grain	5	17	13	11
silage	2	9	1	3
other[1]	1	3	2	7
meadow	30	33	34	41
Total	46	81	65	73
Permanent pasture				
treated	27	55	36	57
untreated	80	48	46	62
woods	16	28	19	17
Total	123	131	101	136
Farmstead, woods not pastured and waste	40	57	33	44
Total	209	269	199	253

[1]Other crops, idle land and land rented to others.

Off farm employment was an important source of income on many of the 126 farms. One-third of the operators on the fattening system farms worked off of the farm 500 to 2000 hours annually. About one-half of the feeder calf, dual purpose and combination system farm operators worked 500 to 2000 hours per year at some off farm employment. More labor was employed off of the farm than was used for the beef enterprise on all except the fattening system farms.

Even though off farm employment was a major source of income for family living the beef enterprise was usually the most important source of farm income. Labor available for other work amounted to one-half or more of the total labor and was more than adequate for the other farm work.

Undoubtably some farm operators could have used additional labor during critical peak periods. However, on the typical farm the available labor force was underemployed during part or all of the year.

TABLE 2.—Hours of Labor Available and Used Annually Per Farm for Selected Activities by Systems of Management, 126 Southeastern Ohio Farms, 1955, (In Man Equivalent Hours).

Activity	System			
	Feeder calf	Fattening	Dual purpose	Combination
Number of farms	36	48	12	30
Hours of labor				
beef enterprise	549	736	750	712
off farm work	845	519	1357	839
available for other work	2133	2850	2643	2620
Total available	3527	4105	4750	4171

LIVESTOCK ON FARMS BY MANAGEMENT SYSTEM

Beef was the major livestock species found on most farms. Other livestock consisted of dairy, sheep and swine with some horses, mules and poultry.

Combination system farms averaged 26 beef cows, fattening farms 24, feeder calf 20, and dual purpose system farms 19 dairy-beef cows. Basically only the breeding animals were found on the feeder calf system farms at the time the January inventory was taken. Typically the calves had not been dropped as yet and only stragglers or early calves were found on the feeder calf system farms during January. On the other farms (especially the fattening system farms) the calves were being grown or finished for market and were included in the January inventory.

The feeder calf and fattening system farms had more other livestock than either the dual purpose or combination system farms. In terms of animal units (1000 pounds of livestock), dairy and sheep were equally important on these farms. Other species of livestock accounted for about one-third of the total animal units on the feeder calf system farms, one-half of the total animal units on fattening system farms and one-fifth of the total animal units on the dual purpose and combination system farms.

COSTS AND RETURNS FOR THE BEEF ENTERPRISE

Prices actually paid for items purchased during the year and the current replacement costs of resources already owned were used to determine production costs. Thus, cost of production, as presented,

would be the annual cost a farmer just starting in production would have to meet.

Production costs were divided into variable or out of pocket and fixed or overhead costs. Farmers are much aware of variable costs because they must be paid during the production cycle. Market prices paid for these inputs were used in this study.

Fixed cost as presented in this study reflects the costs that would be incurred if the input had to be acquired during the production year. The fact that some operators did not meet total cost of production, as determined, does not mean that they will be forced out of production. Production can and will be continued as long as these fixed assets are available to use or if they can be replaced with an asset of satisfactory utility at a lower cost that can be met. For example, many of the farmers used existing building space which could not be paid for at current prices if it had to be replaced with structures of similar design. However, it would be possible to handle the beef enterprise with less shelter than was actually used or to construct satisfactory lower cost shelter.

TABLE 3.—Numbers of Beef Animals and Other Livestock by System of Management, 126 Southeastern Ohio Farms (Beginning Inventory, January 1, 1955).

	System			
Livestock	**Feeder calf**	**Fattening**	**Dual Purpose**	**Combination**
Number of farms	36	48	12	30
Beef				
cows	20	24	19	26
heifers	1	4	1	2
steers	1	6	5	3
calves 6 mo. - 1 yr.	3	15	10	13
calves under 6 mos.	2	4	3	3
bulls	1	1	1	1
Total	28	54	39	48
Other livestock				
dairy	6	6	2	4
sheep	25	31	10	16
swine	15	22	7	14
horses and mules	1	1	1	1
poultry	121	96	146	125

This method of costing was used to permit all of the farms to be placed on a comparable basis. In addition it demonstrates the cost of production that would have to be paid by a farm operator currently starting production and using typical practices and equipment.

Returns from items sold were valued at the actual price received. Credits for animals slaughtered and milk consumed by the family were valued at the farm sale price. Manure nutrients were valued in terms of commercial fertilizer.

Costs and returns for the years 1955 and 1960 were determined and are presented in Table 4 (See appendix for physical inputs and outputs). The average farmer using any of the systems studied failed to meet all costs. However, the average farmer (except those using the combination system) did receive a net return over cash costs.

Considerable variation in production costs was found among the four systems. The fattening system farmers used more production inputs per cow but received the highest gross income. Feeder calf system farmers had both lower total cost and gross returns but received slightly more return over cash cost per cow than fattening system farmers. While the returns over the cash costs were comparable for the feeder calf and fattening system farms, the inputs used in production were quite different. The fattening system farmers marketed more feed, pasture and labor per cow than the feeder calf producers.

Returns over cash cost for the entire beef enterprise may be more meaningful to a farm operator than the cost per cow or total cost of production. The beef enterprise may be economically desirable on the farm even though the total cost of labor, pasture and buildings is not fully paid. Based on the costs and returns, as used in this study, 15 percent of the farmers covered all production costs including pasture, labor and buildings. Very few of the farmers failed to at least meet their cash costs of production. Most farm operators covered all of their cash costs and had some income available to pay for the use of pasture, labor and buildings. Usually the farm operator would get little if any, return from these resource inputs if the beef cow-calf enterprise were not on the farm.

At the 1955 price level the average feeder calf producer earned $273 for the use of his labor, pasture and buildings. This return was increased to $519 per farm at the 1960 price level. Fattening system farm operations returned $292 per farm in 1955 compared to $577 in 1960. Both the feeder calf and fattening system enterprises returned

TABLE 4.—Costs and Returns Per Beef Cow, by Systems of Management, 126 Southeastern Ohio Farms, 1955 and 1960.*

Items	System							
	Feeder Calf		Fattening		Dual Purpose		Combination	
	1955	1960	1955	1960	1955	1960	1955	1960
Costs (variable)								
grain	$ 5.34	$ 4.52	$38.99	$34.36	$30.86	$25.80	$15.98	$12.83
hay	52.83	53.32	66.69	67.37	57.04	57.56	52.46	52.98
silage	2.17	1.86	15.10	13.90	1.65	1.42	8.68	8.53
Total feed	$60.34	$59.70	$120.78	$115.63	$89.55	$84.78	$77.12	$74.34
int., ins. taxes[1]	$10.66	$13.02	$18.16	$22.17	$13.95	$17.03	$14.58	$17.80
bedding	2.30	2.30	2.92	2.92	3.09	3.09	2.23	2.23
marketing	3.08	4.74	2.94	3.69	3.22	3.93	3.14	3.64
veterinary	1.33	1.33	1.22	1.22	1.29	1.29	1.17	1.17
miscellaneous	2.40	2.40	2.96	2.96	2.29	2.29	2.27	2.27
Total cash costs	$80.11	$83.49	$148.98	$148.59	$113.39	$112.41	$100.51	$101.45
Costs (fixed)								
pasture	$16.35	$20.78	$20.07	$21.67	$17.96	$20.78	$19.44	$21.13
labor	16.88	16.88	22.89	22.89	30.31	30.31	19.92	19.92
buildings	4.78	5.22	5.88	6.42	4.46	4.87	5 05	5.51
Total fixed costs[2]	$38.01	$42.88	$48.84	$50.98	$52.37	$55.96	$44.41	$46.56
Total all costs	$118.12	$126.37	$197.82	$199.57	$166.12	$168.37	$144.92	$148.01
Returns								
sale and slaughter	$83.14	$99.41	$137,76	$149.59	$99.40	$110.15	$114.31	$137.12
manure credit	8.36	6.57	14.19	11.14	10.92	8 58	11.03	8 66
milk	.65	.70	1.14	1.23	33.46	35.97	2.37	2.55
Total Return	$92.15	$106.68	$153.09	$161.96	$143.78	$154.70	$127.71	$148.33
Inventory change	+.98	$+1.20	$+8.07	$+9.85	$—2.43	$—2.97	$—34.27	$—41.84
Return over all costs[3]	$—24.99	$—18.49	$—36.66	$—27.76	$—24.77	$—16.64	$—51.48	$—41.52
Return over cash costs[3]	13.02	$24.39	$12.18	$23.22	$27.96	$39.32	$—7.07	$5.04

*See appendix for physical inputs and outputs.

[1]Interest, insurance and taxes on beginning inventory value of the beef herd.

[2]Real estate taxes, interest and insurance are included as part of the fixed cost.

[3]Adjusted for inventory change.

Note: 1955 costs and returns are those as reported on the sample farms; 1960 costs and returns were derived by multiplying physical quantities by 1960 prices.

TABLE 5.—Return Over Cash Cost Per Herd by System of Management on 126 Southeastern Ohio Farms, 1955 and 1960.

Item	System			
	Feeder calf	Fattening	Dual Purpose	Combination
Number of farms	36	48	12	30
Cows per herd[1]	21	24	18	26
Returns over cash cost:				
per cow				
1955	$ 13 02	$ 12.18	$ 27.96	$ —7 07
1960	24.39	23.22	39.32	5.04
per herd				
1955	$273.45	$292.32	$503.38	$—183 82
1960	519.19	557.28	707.76	131.04

[1]Cows and heifers eligible to calve during the year.

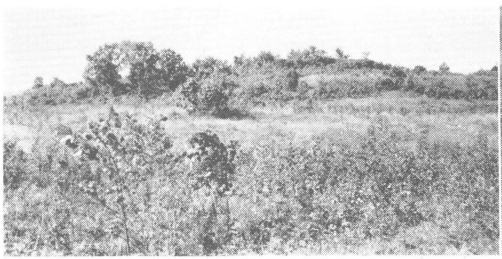
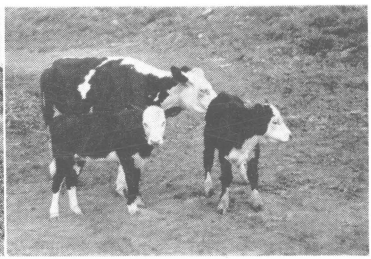
nearly the same amount over cash costs. However, the fattening system of production did require more labor, pasture and buildings than the feeder calf system.

If all of the returns above cash costs were credited to labor, the feeder calf operators would have received 54 cents per hour in 1955 and $1.08 per hour in 1960. Fattening system operators would have received 36 cents per hour during 1955 and 64 cents per hour during 1960.

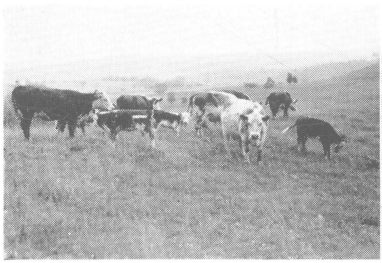
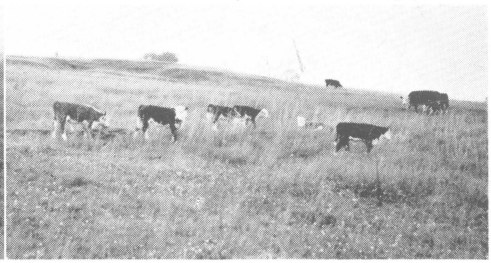
During both years the dual purpose system herds did yield a higher return over cash cost than any of the other systems. Considerably more labor and a more demanding type of labor was required to handle this system. Less advantage was evidenced for 1960 than for 1955 which is consistant with the trend of the production system. Few farmers can afford or want to expend the added effort required to handle the dual purpose system as compared to the feeder calf or fattening system of production. The combination system was economically less advantageous than any of the other systems.

VARIATION IN INPUTS AND PRODUCTION AMONG FEEDER CALF AND FATTENING SYSTEM FARMS

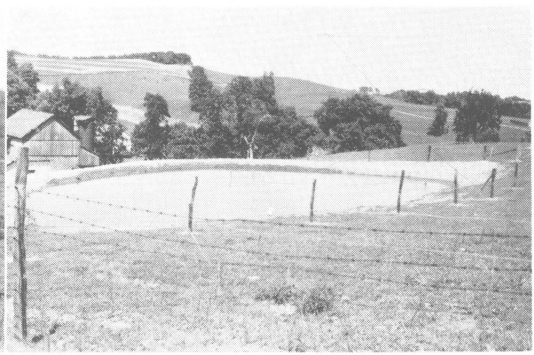
Mean, median and the quartile range of selected factors were determined for feeder calf and fattening system farms. The average of all values is expressed as the mean. The farms were arrayed for each of the values shown. The middle value of the array is expressed as the median. The inter-quartile range excludes one-fourth of the farms having a lower value and one-fourth of the farms having a higher

Pastures must be clipped and fertilized for profitable beef production. A high calving percentage is also vital for a profitable feeder calf enterprise.

Beef cows do an excellent job of converting forage into meat on this Noble County farm, left. Calves such as these are ready to go on feed after a season on pasture, right.

A cow and her calf form the backbone of the beef enterprise in Southeastern Ohio. Rolling land combined with a good source of water have made this Jackson County farm ideally suited for a cow-calf operation, right.

TABLE 6.—Mean, Median and the Quartile Range of Selected Production Factors by Two Systems of Management, 84 Southeastern Ohio Farms 1955.[1]

Factor	36 Feeder Calf Farms			48 Fattening Farms		
	Mean	Median	Inter-Quartile range[2]	Mean	Median	Inter-Quartile range[2]
Size						
Number of cows	20	18	12 - 26	24	18	11 - 32
Acres per farm	209	230	156 - 299	270	229	142 - 380
Inputs per cow						
Pound of grain	248	122	38 - 294	2012	1840	1160 - 2554
Pound of hay[3]	4618	5098	4488 - 6051	6934	6398	5800 - 8766
Hours of labor	24	27	15 - 38	34	34	25 - 46
Acres of pasture	4.1	4.8	3.- 7.	4.4	4.3	2.9 - 5.6
Sq. ft. of blgs.	94	91	74 - 133	124	135	97 - 176
Outputs per cow						
Pound of beef	476	482	408 - 504	714	724	631 - 830
% Calves weaned[4]	88	88	82 - 95	81	84	70 - 94
Aver. wt. sold	437	434	431 - 476	830	845	778 - 936
Price rec. / cwt.[5]	$19.49	$19.52	$18.50 - $20.65	$21.34	$20.60	$18.43 - $21.53
Importance of beef enterprise						
% beef of farm income	49	40	22 - 82	45	36	27 - 65
% labor use for beef	14	14	8 - 17	20	14	10 - 25

[1]For a more detailed breakdown of input and output factors see appendix.

[2]Extremes for middle half of range.

[3]All harvested forage in hay equivalents.

[4]Calves weaned divided by number of mature females 2 years old or more.

[5]Except cows and bulls.

value. Extreme values for the remaining middle half are expressed as the inter-quartile range and demonstrates the variations among farms. Some farmers achieved high outputs with moderate or low inputs and were profitable producers. Others used more inputs but achieved low physical output and financial returns.

Median herd sizes and farm acreages were quite similar on both the feeder calf and fattening system farms. However, the fattening system farms displayed more variation.

Feed inputs comprised two-thirds to three-fourths of the total beef production cost and can easily mean the difference between profit or loss. Grain fed per cow varied greatly among farms. The high value of the inter-quartile range for grain input was 7 times greater than the low on feeder calf system farms and more than twice as great on the

fattening system farms. Less variation was found in the amount of harvested forages fed with the high input farmers feeding about 50 percent more than the low on both feeder calf and fattening system farms.

The feed inputs of these two systems reflect the basic farm operation and conform with the land use capability. Fattening system farmers fed about one ton more harvested hay equivalents of forage and 7 to 8 times as much grain per cow as the feeder calf system farmers. Less variation was found for the acreage of pasture used per cow. However, more animal units were pastured per acre on fattening system farms and more pasture improvement treatments were applied.

A relatively small amount of the total labor available was utilized by the beef enterprise under all systems of management. Typically the fattening system farmers used 7 to 10 more hours of labor per cow than feeder calf system operators . Winter chore labor accounts for about 60 percent of the total input. Some operators were able to handle the beef enterprise with 15 hours of labor per cow for a feeder calf system and 25 hours per cow for a fattening system. While a small labor input is desirable it must be realized that part of this labor had no alternative employment. Operators were generally interested in returns to the entire farm. Although labor was charged at 70 cents per hour most farmers were interested in the residual return for the labor employed.

The situation concerning buildings was similar to that with labor. The buildings that existed on the farm were utilized. However, many farm operators utilized more building space than was actually needed because it happened to be available.

Output variations were not as extreme as inputs but did have an important effect on income. Percent of calf crop was lower and exhibited more variation on fattening system farms than on feeder calf farms. The beef enterprise provided more of the total farm income on feeder calf than on fattening system farms but used slightly less of the total labor available.

SELECTED MANAGEMENT FACTORS BY FEEDER CALF AND FATTENING SYSTEMS OF MANAGEMENT

Quality of Breeding Animals

Beef animals in southeastern Ohio have evolved from a dual purpose animal through breeding and with the importation of higher quality stock. Fattening system farm operators had probably improved the beef quality of their stock more than feeder calf system operators as indicated by the relative number of purebred as compared

TABLE 7.—Quality of Beef Cows by Two Systems of Management, 84 Southeastern Ohio Farms, 1955, (Percent of Cows).

Item	System	
	Feeder calf	Fattening
Number of farms	36	48
Quality		
Pure bred	19	26
Grade beef	71	65
Dairy	7	5
Dual purpose	3	4
Total	100	100

to grade cows in the herd. Herds in both systems contained some dairy and dual purpose cows. However, little milk was produced for home use or sale from these cows.

Source and Rate of Replacement

Most of the replacement cows were raised on the farm or were purchased from local sources. Usually purchased cows were reported to be as good as or of better quality than home raised replacements. Only 8 of 70 cows purchased for replacements by the 36 feeder calf system farm operators were from western sources. All of the fattening system replacements were either raised or purchased locally.

The rate of replacement in 1955 indicated that the average cow was kept in the herd about 10 years. Feeder calf system farmers reported a slightly lower replacement rate than fattening system operators.

TABLE 8.—Source and Rate of Replacement by Two Systems of Management, 84 Southeastern Ohio Farms, 1955.

Item	System			
	Feeder Calf		Fattening	
	Number	Percent	Number	Percent
Number of farms	36	——	48	——
Total number of cows	742	100	1136	100
Source of replacement				
Raised	31	4	100	9
Purchased locally	31	4	20	2
Purchase western	8	1	——	——
Total replacement	70	9	120	11

TABLE 9.—Death Losses Per 100 Cows by Class, Two Systems of Management, 84 Southeastern Ohio Farms, 1955.

Class	System	
	Feeder Calf	Fattening
Calves		
At birth	2.8	3.1
Birth to weaning	3.7	3.9
Weaning to market	.1	.4
Total	6.6	7.4
Cows and bulls	.8	1.5
Total all animals	7.4	8.9

Death Losses

Livestock producers expect to lose some animals over a period of years. A few farmers did not lose any beef animals during the year of the study. Fattening system farmers experienced more death losses for all classes than feeder calf system farmers.

Potential income from the beef enterprise was lowered by the death of any animal in the herd. Most deaths occured at birth and during the first week following birth. Based on another phase of this study these losses can be economically reduced by regular and careful checking of the herd during and following calving[13].

[13]Armstrong, D. L. and Shaudys, E. T., "Profitability of Practices Affecting the Calf Crop of Beef Herds," Ohio Agricultural Experiment Station Research Circular 103, 1961, Wooster.

TABLE 10.—Causes of Death Per 100 Cows by Class, 126 Southeastern Ohio Farms, 1955.

Causes of Death	Class		
	Calves - Birth to Weaning	Cow, Bulls, Replacements, and Weaned Calves	Total
At Birth	3.2	.3	3.5
Scours	.4	—	.4
Accident	.9	.4	1.3
Pneumonia	.8	.2	1.0
Blackleg	.2	.1	.3
Unknown	1.1	.6	1.7
Total	6.6	1.6	8.2

Effect of Herd Size on Labor

A definite relationship between herd size and labor used per cow was found to exist. Feeder calf system herds ranged from 5 to 40 cows with an average of 20 cows. Operators with five cow herds tended to use 40 hours of labor per cow, while 20 cow herds used 27 hours per cow, 30 cow herds 21 hours per cow and 40 cow herds 17 hours per cow annually.

Fattening system herds ranged from 5 to 60 cows with an average of 24 cows. Labor used per cow annually on these 48 farms averaged 34 hours and ranged from 10 to 66 hours. Farmers with 5 cow herds used an average of 42 hours per cow, farmers with 20 cow herds used 37 hours per cow, farmers with 40 cow herds used 31 hours per cow and farmers with 60 cow herds used 25 hours per cow.

Some operators with small herds cared for their animals with less labor per cow than operators with large herds. Part of this variation was attributed to the availability of the labor and the relative importance of the beef enterprise as an income producer. Methods of feeding and caring for the herd were reflected in the labor required. Farmers feeding large amounts of harvested feeds used more labor than when smaller quantities of harvested feeds were fed.

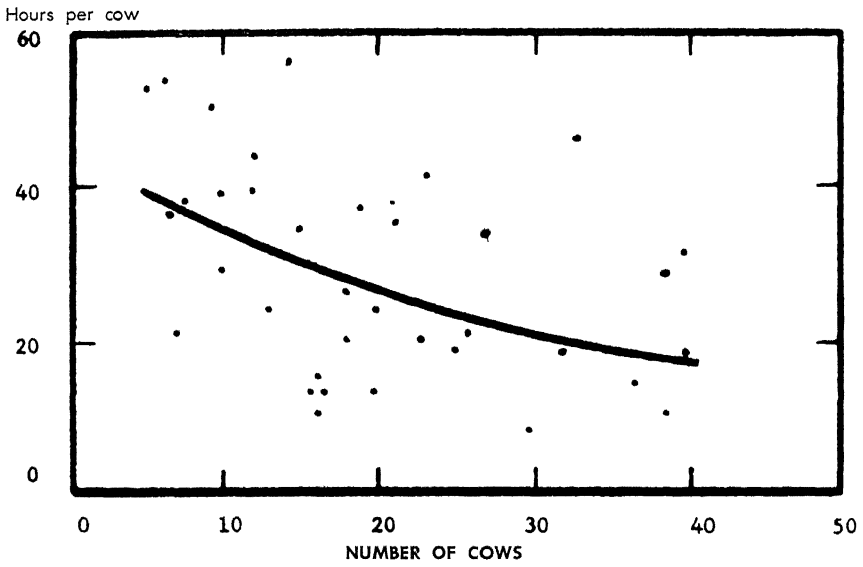
FACTORS RELATED TO INCOME BY SYTEMS OF MANAGEMENT

Selected factors for feeder calf and fattening system herds were compared with net income to determine if a relationship existed. Farm records for each of these systems were arrayed on the basis of income and divided into quartiles. Analysis of variance was used to determine if the differences for each factor were statistically significant.

The 9 farmers in the high income quartile using a feeder calf system of production had an average net return per cow of $3.27 above all costs of production including labor. Operators in the second, third and fourth quartile groups failed to meet all costs of production by $5.90, $11.70 and $19.70 per cow respectively. High income producers used fewer inputs and received more output per cow than producers in the other quartile groups.

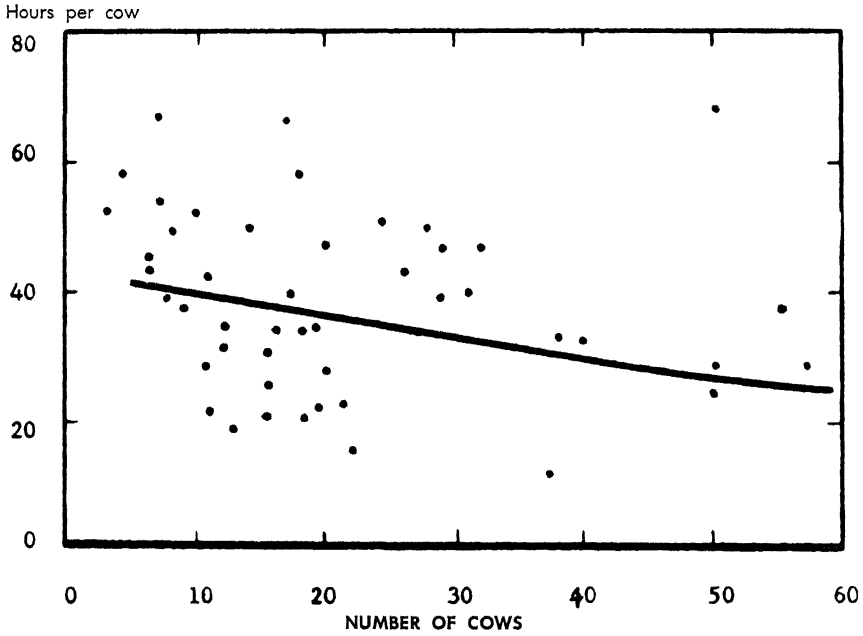
More than $30 more feed was fed per cow on the low than on the high income farms. This difference was a highly significant factor affecting net income. The high income quartile farms had larger herds and lower labor costs per cow than other farms included in the sample. Other costs which include interest, taxes, insurance, veterinary,marketing and buildings, were significantly related to net income. These costs

Fig. 2.—Hours of Labor Used Per Cow, By Size of Herd, on 36 Southeastern Ohio Farms Producing Feeder Calves, 1955.

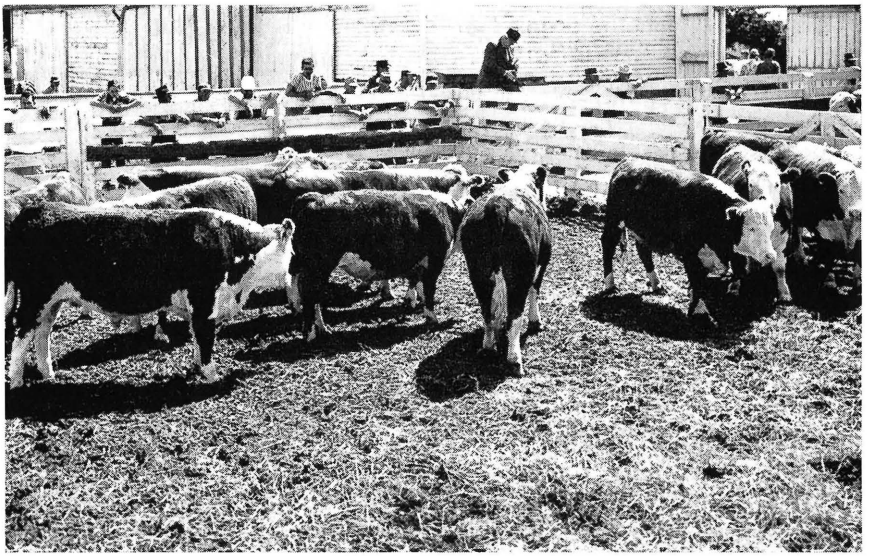


Estimating equation $Y = 45.116 - 1.067\,X + .00888\,X^2$
Standard deviation of $Y = 11.286$ $r = .52146$

Fig. 3.—Hours of Labor Per Cow, By Size of Herd, on 48 Southeastern Ohio Cow-Calf Farms Producing Finished Cattle, 1955.



Estimating equation $Y = 43.452 - .3194\,X + .000284\,X^2$
Standard deviation of $Y = 13.9$ $r = .3888$



After weaning, fattening system farmers fed their calves until finished for market.

averaged from $3.66 to $7.38 less per cow on the high income quartile farms than on the farms included in the other income quartiles.

On the output side the most important difference relating to net income was found in the pounds of beef produced per cow. Along with this and related to it was the percent of calf crop. Difference in price received per hundredweight of beef sold was significant and amounted to several dollars of income per cow. High income farmers produced 134 pounds more beef per cow and received $3.17 more per 100 pounds sold. The net income earned per cow was $22.97 higher on high income quartile farms than on low income quartile farms.

The fattening system farm records were also arrayed and divided into net income quartiles. As with the feeder calf system farms, only the herds in the high income quartile had a return above all costs of production. Net profit per cow was $2.13 for the high income quartile farms while farms in the other quartiles failed to cover all costs.

Number of cows in the herd, hours of labor per cow, pounds of beef produced per cow and percent of calves weaned differed significantly among income quartile groups. Beef produced per cow varied from 601 pounds on low income quartile farms to 857 pounds on high

TABLE 11.—Selected Factors Affecting the Profitability of Feeder Calf Production on 36 Southeastern Ohio Farms, 1955.[1]

Factor	Average Per Farm by Income Quartile			
	High 1	2	3	4 Low
Net return per cow*	+$ 3 27	—$ 5 90	—$ 11 71	—$ 19 70
Cows in herd°	27 5	18 3	21 8	14 8
Feed per cow*	$ 61 12	$ 79 58	$ 89 14	$ 92 78
Labor per cow°	$ 9 70	$ 25 95	$ 21 49	$ 22 05
Other costs per cow**	$ 22 01	$ 25 67	$ 28 77	$ 29 39
Buildings per cow (sq ft)*	64	102	101	142
Beef produced per cow*	522	504	440	388
Sale price per cwt ***	$ 19 04	$ 17 67	$ 17 64	$ 15 87
Percent calves weaned*	93	95	87	74
percent calves born° (February May)	91	70	69	74

*Significant at 01 level

**Significant at 05 level

***Significant at 10 level

°Not significant i e differences could be from chance alone

[1]See appendix Table 23 for standard deviation of means

Note Analysis of variance was used to test differences between quartile grouping.

TABLE 12.—Selected Factors Affecting the Profitability of the Fattening System on 48 Southeastern Ohio Farms, 1955[1]

Factor	Average Per Farm By Income Quartile			
	High 1	2	3	4 Low
Net return per cow*	+$ 2 13	—$ 3 67	—$ 7 35	—$ 15 51
Cows in herd**	35 3	22 9	20 5	16 0
Feed per cow°	$130 02	$138 56	$144 57	$146 89
Labor per cow**	$ 22 24	$ 21 30	$ 25 59	$ 31 49
Other costs per cow°	$ 37 19	$ 35 02	$ 38 91	$ 41 60
Buildings per cow (sq ft)°	149	148	186	161
Beef produced per cow*	857	797	738	601
Sale price per cwt °	$ 19 77	$ 19 04	$ 18 51	$ 18 11
Percent calves weaned*	85	76	79	80
Percent calves born° (February May)	77	63	68	55

Note Analysis of variance was used to test differences between quartile groupings

*Significant at 01 level

**Significant at 05 level

°Not significant—difference could be from chance alone

[1]See appendix Table 24 for standard deviation of means

TABLE 13.—Coefficients of Selected Factors Related to Net Income Per Cow by Two Systems of Management, Southeastern Ohio, Farms, 1955.

Factor	Feeder Calf			Fattening		
	Regression	Beta	Correlations	Regression	Beta	Correlations
Number of cows	.0178	.0019	.3422	.0347	.0037	.4407
Pounds produced per cow	.8419**	.1725	.7301	.6165**	.1602	.5688
Price received per cwt.	.3673**	.1289	.4302	.2133**	.0820	.1043
Feed cost per cow	—.2238**	—.0508	—.3308	—.3701**	—.0937	—.2316
Labor cost per cow	—.0845**	—.0092	—.4040	—.0875**	—.0126	—.3298
Other cost per cow	—.2189**	—.0638	—.4271	—.0943***	—.0228	—.3081

**Significant at the .05 probability level.
***Significant at the .10 probability level.

Explained variance for 36 feeder calf farms was .8897 and for the 48 fattening systems farms was .8054.

The regression estimating equation was $y = aX_1^{b1} X_2^{b2} X_3^{b3} X_4^{b4} X_5^{b5} X_6^{b6}$.

Explanatory Note: Regression coefficients show the effect the change in a unit of the independent variable had on net income when all other factors were held at their means. Beta values show the relative importance of independent variables and partial correlations coefficients measure the relationships of independent to the dependent variable.

income farms while percentages of calves weaned varied from 80 to 85 percent. As with the feeder calf farms this difference of 256 pounds per cow did have an important effect on the profitability of the enterprise.

The variations within the quartile grouping for feed, labor, other costs, buildings and sale prices were greater than the variation among the quartiles. Consequently the variation among the quartile groupings was not statistically significant.

Multiple regression analysis was used to determine the relative importance selected factors had on net income. Pounds of beef produced per cow was found to have the most important effect on net income of any of the factors selected on both the feeder calf and fattening system farms (see beta, Table 13). Number of cows in the herd and labor cost per cow ranked least important for both systems of management. Production per cow, price received per hundredweight, feed cost and overhead costs were all important factors related to net income.

RECOMMENDATIONS

A farm operator is limited in the quantity and quality of available resources. Optimum use of available resources requires that limited resources be distributed so that the last input unit employed yields the same rate of return from each activity. Any other allocation will result in something less than the maximum farm income.

Returns produced by the last input unit added (marginal value productivities) were computed to determine the possibility for increasing returns for selected resource inputs. Estimates of marginal value productivities can be used in deciding how much of a resource input to use for optimum beef production.

Both inputs and returns were expressed in monetary units. A marginal value product of more than $1 indicates that more income could have been earned by using more of the input (See Table 14). Conversely a return of less than $1 indicates that more net income could have been earned if fewer units of input had been used. As more units of input are used the marginal value productivities tend to decline, these values indicate the directions and magnitude of adjustment needed for optimum production.

TABLE 14.—Means and Marginal Value Productivities of Resources for Two Systems of Beef Production, Southeastern Ohio, 1955.

Item	System			
	Feeder Calf		Fattening	
	Mean	MVP[1]	Mean	MVP[1]
Harvested feed	$1244	$1.27*	$2856	$ .75*
Pasture	337	—.42°	475	.29°
Labor	377	—.42°	542	.98*
Overhead costs	501	1.17*	807	1.63*

[1]Marginal value productivities were derived using a Cobb-Douglas type function. The functions used were: $y =$ annual gross income, $x_1 =$ annual value of harvested feed, $x_2 =$ annual value of pasture, $x_3 =$ annual value of labor, $x_4 =$ annual overhead costs.

Feeder calf system $y = 1.247X_1^{.8479} X_2^{-.0736} X_3^{-.0839} X_4^{.3502}$

Fattening system $y = 1.042X_1^{.5618} X_2^{.0348} X_3^{.1482} X_4^{.3844}$

Elasticity sumed to 1.0379 for feeder calf and 1.1297 for fattening system farms indicating silghtly increasing returns to scale. Explained variance (R^2) was .8343 for feeder calf and .948 for fattening system farms.

*Significant at .05 probability level.

°Not significant.

Based on an analysis of marginal value productivities the average feeder calf system operator could have increased his net income by increasing the number of cows in the herd and by producing or purchasing additional feed for them. Surplus or ineffectively used summer pasture and labor were available and could be utilized by maintaining more cows on a high proportion of the farms. According to the farmers in the study, pastures tended to be stocked for the low carrying capacity month in the most unfavorable production year. During the rest of the pasture season the carrying capacity exceeded the need. Supplemental feeding would be necessary for short periods of time and during an occasional dry year, but this added cost would be more than offset by the gain realized from a more complete use of the available fixed inputs on these farms.

The average feeder calf producer by adding one more dollar's worth of overhead costs (primarily a reflection of increasing the investment in cows) and one more dollar's worth of harvested feed would have increased his income $1.27 and $1.17 respectively. Increasing feed inputs without expanding cow numbers would do little to improve income. Purchased or home produced harvested feeds were needed to winter more cows and to supplement the existing pasture.

Analysis of the marginal value productivities on the fattening system farms disclosed a different situation. Labor inputs were being used at near the breakeven point (each $1 of labor input earned $.98 return). Harvested feed inputs were pushed beyond the desirable level with each $1 worth of feed fed earning only $.75. Returns were found to exceed input cost only in the case of other costs. This indicates that the greatest possibility for improving income can be found by getting more production from the feed value now fed and not by using more feed as was the case on the feeder calf system farms.

Other costs include interest, taxes, insurance, veterinary, buildings and marketing and would be increased by adding more cows to the herd. Increasing cow numbers would permit existing pastures, labor and fixed building facilities to be used more effectively.

Although the labor input on the average farm was only slightly beyond the breakeven point most farmers were not fully utilizing their available labor supply and could handle the expansion in the herd as indicated by the analysis as a way to increase net income.

SUMMARY AND CONCLUSIONS

Land capability in southeastern Ohio makes it necessary to devote a high proportion of the area to forage crop production if the soil is to be maintained. Typically a farm in this area has one-third of the total acreage in crops, one-half in permanent pasture and one-fifth in woods, farmstead and roads. Most farm operators have more labor available than can be fully utilized.

Four systems of managing the beef cow-calf enterprise, feeder calf, fattening, dual purpose and combination, were found on the 126 farms included in this study. The system of management tended to be related to land capability. Farm operators handled the beef enterprise to advantageously market the feeds produced on their farms.

About 15 percent of the farmers had a profit above all costs and practically all had a return above cash costs of operation. Some operators in each of the management systems made a profit.

Harvested feeds and cash costs of production accounted for about 70 percent of total production costs. Grain, hay and silage comprised 45 to 65 percent of total costs depending on the system of production used. Pasture, labor and buildings represented 25 to 30 percent of total costs.

Sales and slaughter of beef comprised 90 percent of the beef enterprise income. Manure and milk credits accounted for the rest of the income.

The ability to utilize effectively the resources available was more important than the system of handling the enterprise. Farm operators achieving a high production of beef per cow, and a good calf crop while holding feed, labor and overhead cost down earned a profit. Feeder calf system farmers could earn more profit by using more farm produced or purchased feeds to permit more cows to be carried during the winter and to make more complete use of available pasture and labor. Fattening system operators could increase profit by adding cows to consume the existing feed, pasture and labor already available on the farm.

APPENDIX

PRICES AND METHODS USED TO COMPUTE COSTS

Feeds and Bedding

Daily amounts of feeds fed to the beef herd reported by each cooperating farmer were totaled for the year. The total amount of feed was checked with the quantity available for feeding to the beef enterprise. This was done by subtracting the amount of feeds sold, or fed to other types of livestock from that produced and purchased.

Farm produced feeds were valued at the price that could have been received at the farm during the season fed. Purchased feeds were valued at the price paid. Prices used for 1955 averaged : corn, $1.24 per bushel; oats, $.66 per bushel; barley. $.99 per bushel; alfalfa hay, $24.10 per ton; clover timothy hay, $20.60 per ton; corn silage, $10.65 per ton; grass silage, $8.25 per ton; straw, $8.80 per ton; corn fodder, $8.00 per ton;and beef supplement, $4.41 per hundredweight. Feed grinding was charged at 15 cents per hundred.

The charge for pasture includes an annual charge for fence, lime and fertilizer applied, clipping that was done and tax and interest on the land value. Value of pasture land was computed for each county based on census value of the land and the proportion of total land in farms used for cropland, pasture, farmstead, woods and waste.

Labor

The rate charged per hour of labor used included the wages paid, the rental value of the furnished house and other farm perquisites such as meat, milk, eggs, garden and fuel. This amounted to 70 cents per hour. Labor included all work required to directly care for the beef enterprise. Some of the labor activities were feeding, feed preparation, cleaning and bedding, doctoring, salting, marketing, moving, sorting, checking cattle, castrating, dehorning and vaccination. Labor for crop production or labor for jobs not directly related to beef production was not included.

Hours of labor spent by women and children were reduced to the time required by a man to do the same job (man equivalents) and charged at the 70 cent per hour rate.

Buildings

Square feet of building space used by the beef enterprise was obtained from each farm operator. Annual shelter cost was determined by calculating the cost of constructing a pole type building of equal or greater utility than those found on the farms. Only the square feet of floor space used by the beef animals was charged to the enterprise. Annual building costs included: depreciation, taxes, insurance, interest and repairs. Annual building costs ranged from 6.8 cents per square foot for a structure with less than 1000 square feet of floor space to 4.2 cents per square foot for a structure with more than 5000 square feet of floor space.

Other Costs

Interest was charged at 5 percent on the beginning value of the beef herd. Veterinary, salt, and minerals, breeding fees, dues and

marketing costs were those reported by the farm operator. The annual charge for equipment consisted of depreciation, repairs, taxes, insurance and interest on the beginning inventory value of the asset. Taxes were charged at personal property rates and insurance at 35 cents per $100 of valuation.

Credits

Manure produced by the beef herd during the winter was credited at the nutrient value less the cost of hauling and spreading. One-half of the manure was assumed to be produced under cover and the other half in an open lot. The net credit to the herd was $1.40 per ton.

Manure produced on pasture was neither credited to the beef enterprise nor charged to the pasture.

Milk produced by the beef animals either for sale or home use was valued and credited to the enterprise at the price received for milk actually sold.

TABLE 15.—Pounds of Harvested Feed Used Per Beef Cow for the Enterprise by System of Management, 126 Southeastern Ohio Farms, 1955.

Pounds fed	System of Management			
	Feeder Calf	Fattening	Dual Purpose	Combination
Feed grains				
Corn (ground ear)	210	1726	1335	681
Oats	7	96	29	28
Molasses and Supplement	17	121	95	39
Barley	6	67	51	12
Other	8	2	4	4
Total	248	2012	1514	764
Forage				
Hay	4240	5746	4860	4496
Grass silage	133	2095	——	1049
Corn silage	305	1194	307	936
Stover	232	92	278	143
Total (forage in hay equivalent)[1]	4618	6934	5240	5301
Bedding	656	631	640	506

[1]Silage converted into hay equivalent (3 pounds of silage equals 1 pound of hay).

TABLE 16.—Acres of Pasture, Cropland and Square Feet of Buildings Used Per Beef Cow by System of Management, 126 Southeastern Ohio Farms, 1955.

Acres per cow	System of Management			
	Feeder Calf	Fattening	Dual Purpose	Combination
Number of farms	36	48	12	30
Permanent pasture				
Treated	.9	1.9	1.5	1.7
Untreated	2.7	1.6	1.9	1.9
Woods	.5	.9	.8	.6
Total	4.1	4.4	4.2	4.2
Harvested cropland	1.6	2.6	2.8	2.3
Total farm area	7.0	8.8	8.6	7.8
Building space (sq. ft./cow)	94	124	82	105

TABLE 17.—Hours of Labor Used per Beef Cow, by System of Management, 126 Southeastern Ohio Farms, 1955.

Job	System of Management			
	Feeder Calf	Fattening	Dual Purpose	Combination
Days winter	165	178	172	167
Days summer	200	186	193	198
Hours				
Winter chores	13.02	18.62	21.96	15.68
Summer chores	.67	2.96	8.19	1.36
Total chores	13.69	21.58	30.15	17.04
Feed handling	.73	1.90	2.62	1.17
Manure, clean and bed	2.80	3.43	4.80	2.66
Breeding	.17	.16	.22	.10
Calving	.98	1.12	1.07	1.54
Check and salt	2.97	2.11	2.06	2.93
Dehorn and castrate	.24	.30	.39	.36
Market	1.74	2.06	1.44	1.92
Vet. and vac.	.59	.79	.37	.42
Other	.24	.30	.25	.32
Total hours of labor	24.14	33.75	43.37	28.46

TABLE 18.—Production Per Beef Cow by System of Management 126 Southeastern Ohio Farms, 1955.

Item	System of Management			
	Feeder Calf	Fattening	Dual Purpose	Combination
Number of farms	36	48	12	30
Cows per farm	21	24	18	26
Sales (pounds)	455	687	510	653
Slaughter (pounds)	21	27	30	21
Manure (tons)[1]	5.9	10 1	7.8	7.8
Milk (pounds)	25	41	777	79

[1]Manure produced on pasture not included.

TABLE 19.—Beginning Inventory Per Farm, by Class and System of Management 126 Southeastern Ohio Farms, 1955.

Per Farm	Feeder Calves			Fattening			Dual Purpose			Combination		
	No.	Wt.	Value	No.	Wt.	Value	No.	Wt.	Value	No.	Wt.	Value
Bulls	1.0	1219	$ 207	1.4	1506	$ 256	.9	938	$ 138	1.2	1342	$ 224
Cows	19.7	18512	2915	23.5	23610	3681	18.6	16429	2351	25.9	25420	3962
Heifers	1.3	849	156	4.3	3144	586	1.2	812	132	2.1	1423	270
Steers	0.5	382	76	6.0	4842	953	4.6	3529	640	3.1	2237	425
Calves (6 mo. - 1 yr.)	3.2	1489	289	15.0	7190	1420	10.0	3768	681	13.4	6306	1248
Calves (under 6 mo.)	1.9	420	85	3.5	1006	198	2.9	540	97	2.7	708	139
Total	27.6	22871	$3728	53.7	41298	$7094	38.2	26016	$4039	48.4	37436	$6269

TABLE 20.—Beef Purchases Per Farm, by Class and System of Management, 126 Southeastern Ohio Farms, 1955.

Per Farm	Feeder Calves			Fattening			Dual Purpose			Combination		
	No.	Wt.	Value	No.	Wt.	Value	No.	Wt.	Value	No.	Wt.	Value
Bulls	.3	282	$ 68	.4	278	$ 72	.4	390	$114	.3	221	$ 53
Cows	1.1	1035	142	.3	292	41	.3	338	38	.2	154	17
Heifers	.1	36	4	1.2	816	206	.2	192	41	.1	50	5
Steers	.0	18	2	.8	578	102	.0	26	6	.1	58	8
Calves (6 mo. - 1 yr.)	.1	23	4	1.2	586	121	.8	356	91	.3	167	39
Calves (under 6 mo.)	.4	117	23	.3	38	8	.3	32	7	1.2	171	28
Total	2.0	1511	$243	4.2	2588	$550	2.0	1334	$297	2.2	821	$150

TABLE 21.—Slaughter and Sales Per Farm, by Class and System of Management, 126 Southeastern Ohio Farms, 1955.

Per Farm	Feeder Calves			Fattening			Dual Purpose			Combination		
	No.	Wt.	Value	No.	Wt.	Value	No.	Wt.	Value	No.	Wt.	Value
Bulls	.6	611	$ 94	.9	807	$ 163	.7	721	$ 119	.8	580	$ 91
Cows	2.1	2075	249	2.3	2334	283	4.3	4373	555	1.0	1021	112
Heifers	.6	339	63	4.8	3724	731	3.1	1815	383	1.8	1274	232
Steers	.4	75	50	9.6	8733	1911	5.2	3684	708	4.6	4089	869
Calves (6 mo. - 1 yr.)	13.2	5975	1187	1.1	632	135	12.2	5894	1088	3.7	1662	302
Calves (under 6 mo.)	1.2	344	71	.4	104	38	1.7	575	123	3.7	773	216
Total	18.1	9449	$1714	19.1	16334	$3261	27.2	17062	$2976	15.6	9399	$1822

TABLE 22.—Closing Inventory Per Farm by Class and System of Management, 126 Southeastern Ohio Farms, 1955.

Per Farm	Feeder Calves			Fattening			Dual Purpose			Combination		
	No.	Wt.	Value	No.	Wt.	Value	No.	Wt.	Value	No.	Wt.	Value
Bulls	1.0	1127	$ 212	1.2	1303	$ 239	1.0	986	$ 159	1.1	1301	$ 256
Cows	19.5	18255	2882	23.4	23522	3657	17.8	15713	2249	23.4	22923	3575
Heifers	1.9	1329	245	5.2	4283	813	3.4	2111	354	2.6	1835	351
Steers	1.5	924	182	9.4	8215	1588	5.1	3394	639	3.1	1959	361
Calves (6 mo. - 1 yr.)	4.2	2098	420	17.2	8415	1679	6.7	2661	498	10.3	4358	871
Calves (under 6 mo.)	1.1	267	50	2.8	919	179	6.0	1400	246	4.0	1349	265
Total	29.2	24000	$3991	59.2	46657	$8155	40.0	27266	$4145	44.5	33725	$5679

TABLE 23.—Selected Factors Affecting the Profitability of Feeder Calf Production on 36 Southeastern Ohio Farms.

	Standard Deviations by Income Quartile[1]			
Factor	**1**	**2**	**3**	**4**
Net returns per cow	$ 1.75	$ 2.20	$ 2.03	$ 6.23
Cows in herd	15.7	8.8	11.6	10 3
Feed per cow	$11.01	$14.95	$10.70	$18 89
Labor per cow	$ 3.07	$10.31	$ 7.62	$ 7.56
Other costs per cow	$ 3.60	$ 4.70	$ 5.16	$ 6.25
Buildings per cow (sq. ft.)	37	42	30	55
Beef produced per cow	48	84	54	101
Sale price per cwt.	$ 2.08	$ 2.27	$ 1.79	$ 2.50
Percent calves weaned	10	14	6	11
Percent calves born (February-May)	15	16	24	25

[1]Means presented in Table 11.

TABLE 24.—Selected Factors Affecting the Profitability of the Fattening System on 48 Southeastern Ohio Farms.

	Standard Deviations by Income Quartile[1]			
Factor	**1**	**2**	**3**	**4**
Net returns per cow	$ 3.33	$ 1.10	$ 1.75	$ 4.57
Cows in herd	12.8	15.9	16.37	12.5
Feed per cow	$40.25	$27.85	$28.41	$35.47
Labor per cow	$10.00	$ 6.78	$ 9.38	$ 8.22
Other costs per cow	$13.22	$ 8.48	$16.59	$14.39
Buildings per cow (sq. ft.)	95	64	219	132
Beef produced per cow	201	126	134	125
Sale price per cwt.	$ 3.22	$ 2.36	$ 2.52	$ 3.81
Percent calves weaned	8	20	19	20
Percent calves born (February-May)	18	34	22	26

[1]Means presented in Table 12.

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