

Study Your Farm's
ECONOMIC POTENTIAL
for BEEF COWS



SB 827 Feb., 1965
University of Missouri
Agricultural Experiment Station

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ACKNOWLEDGEMENTS

The authors wish to acknowledge contributions made by Frank Miller and Robert Finley, Department of Agricultural Economics; and Melvin Bradley, Department of Animal Husbandry in the preparation of this bulletin.

ECONOMIC POTENTIAL

for

BEEF COWS

*Should I include a cow herd on my farm?
Could I increase my profit by expanding or reducing my
cow herd?*

These are perplexing questions that face most Missouri farm operators at some time or another. To make these big decisions wisely, we need to gather information on a number of subjects. This bulletin provides some information on factors which influence the choice of a beef cow enterprise, and furnishes a method of analyzing its contribution to the farm business. Planning forms are included in the appendix for use by farmers and those who advise them in making such analyses.

Guiding figures are based on farm record studies. The figures are not as accurate as we would like but are the best available at present. Better guides will evolve as the Missouri Beef Cattle Panel* studies continue.

Categories of information which need to be considered in decisions on a beef cow herd are indicated by the following questions:

1. *Where do beef cows fit on Missouri farms . . . under what conditions have they been yielding suitable income?*
2. *What are the trends and future prospects for beef cow herds?*
3. *What resources does my farm have to work with—land, labor, buildings, livestock, equipment? Are these suitable for a beef cow enterprise? If so, what kind?*
4. *What are the capital investment requirements for the herd?*
5. *How much can a beef cow herd contribute to the goals and income needs of my family?*

Useful information in answering these questions is included in following sections.

*A Farm Business Research Panel for Beef Cow Systems was organized in Missouri in 1963 to provide some of this information. This work is being done cooperatively with beef cow owners in a 17-county area. The objective of the research is to determine the conditions under which beef cows may be most profitable.

BY EDWARD R. WIGGINS AND ALBERT R. HAGAN

The Place of Beef Cow Herds in Missouri

One question farm managers face regarding beef herds is the general one:

Should farmers in this region strive for a share of the beef cow industry?

To answer this question we need to study the situation and trends for beef cows to decide whether the future looks favorable for the industry as a whole. Then we will need to consider how much profit cows are likely to yield in comparison with other possible enterprises on our individual farms.

Situation and Trends

Beef cow numbers have been expanding in both the state and nation, but numbers in Missouri have expanded

at a more rapid rate, advancing 43.4 percent compared to 31.5 percent for the nation between 1958 and 1964. The Missouri total of 1,396,000 beef cows two years old or older in 1964 was the state's record high. The state now ranks sixth in number of beef cows. (See Fig. 2 and Appendix Tables I and II for further comparison with other states and the nation.)

Figure 1 shows the number of beef cows two years old and older on Missouri farms from 1940 to 1964. The crests of the bars show that beef cows follow a relatively regular cycle. Peaks occurred in 1944 and 1954. Numbers have been increasing for the past six years, resulting in a longer build-up than in any previous cattle cycle.

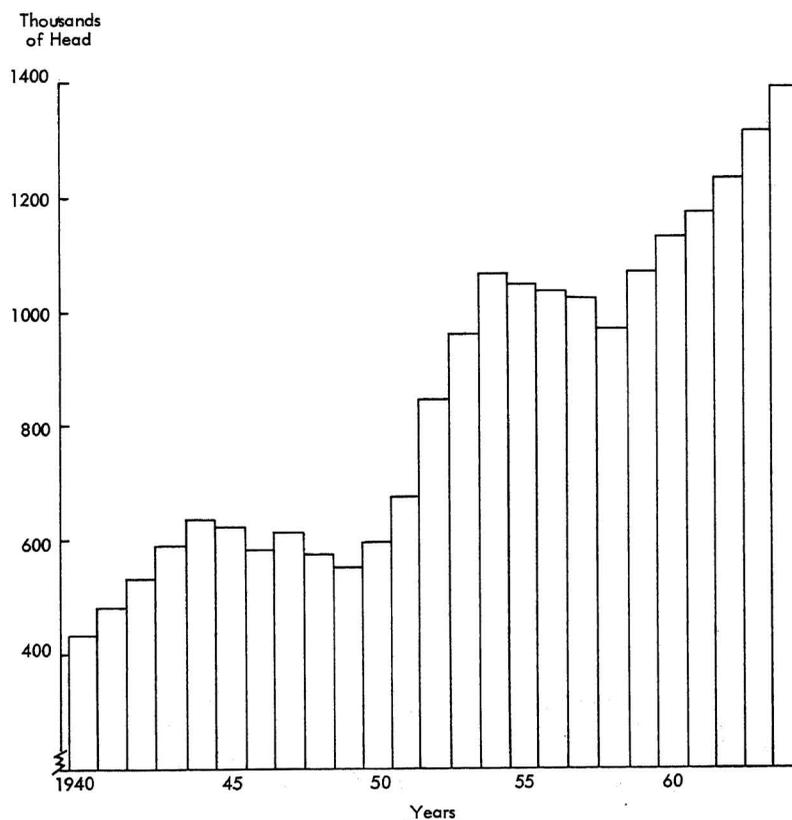


Fig. 1—Beef cows, two years old and older on Missouri farms, 1940-1964. (United States Department of Agriculture, Agricultural Marketing Service, Crop Reporting Board, Livestock and Poultry Inventories January 1 By States, Statistical Bulletins 177 and 278.)

Currently, beef cow numbers are at an all-time high. During the next two or three years, declining cow numbers may bring the supply of beef more nearly in line with demands as the cycle turns down, but over the long run more beef cows will be needed to provide feeder cattle and fed beef for an expanding population.

Thus a long-run need for more cows is forecast. But whether our Missouri farmers will want to continue supplying a greater portion of this expanding need depends on how the beef cow enterprise fits individual Missouri farms and how well they can compete with other regions (especially southern and western states) in calf production.

Expansion seems most likely in areas where non-crop

open pasture land can be profitably improved to increase carrying capacity; where the production of silage and hay can be increased to good advantage; where crop residues are plentiful for sustaining a cow herd at relatively low feed costs; where cattle feeding areas are close at hand; and where adequate marketing facilities are available for feeder cattle. Missouri has the market facilities and is in the midst of the Corn Belt feeding area. Many farms have the other condition described.

Cost studies conducted in a number of states in the Mid-West have demonstrated that commercial cow herds usually yield low returns and, except where farms have forage and roughage that would be wasted without them, other enterprises are more profitable.

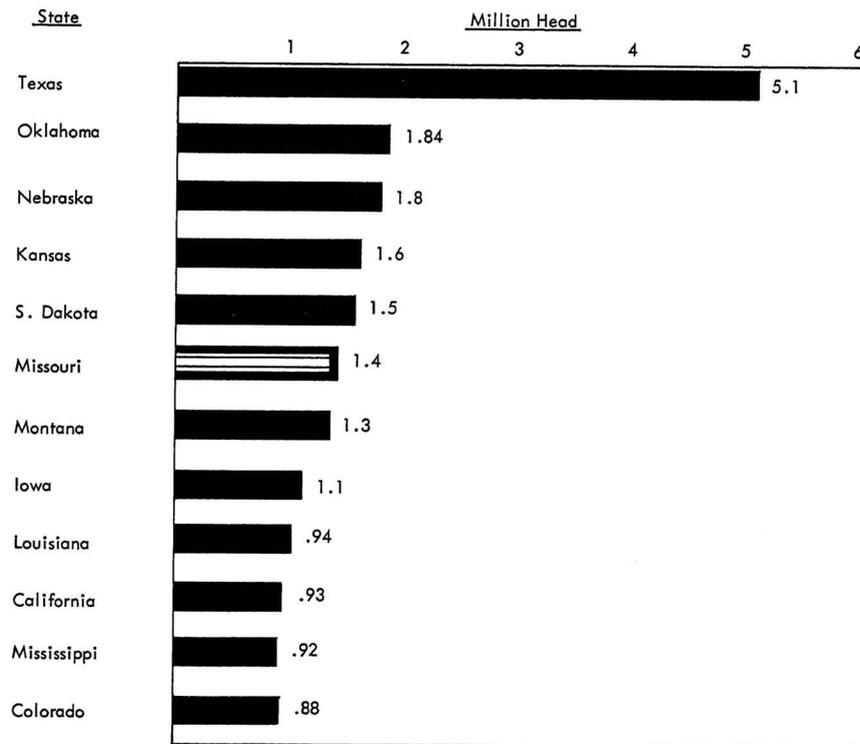


Fig. 2—Missouri ranks sixth among 12 leading states in the number of beef cows two years old and older, on January 1, 1964. (United States Department of Agriculture, Agricultural Marketing Service, Crop Reporting Board, Livestock and Poultry Inventory January 1, Feb., 1964.)



Beef cows can be the major livestock enterprise on large acreages best adapted to pasture and hay.

For example, in a study of 126 beef cow farms in southeastern Ohio in 1963, only 15 percent of the operators had a profit above total costs, though nearly all had profit above cash costs.¹ Among 141 livestock farms enrolled in the Michigan Mail-In Account Project for 1961, farms with beef cow herds as the major enterprise had the lowest return on investment compared with beef-feeding, beef-hog, hog, and mixed livestock farms.²

The 1962 Nebraska Farm Management Record Project showed that farms where the major income was from beef raising received a lower return on investment (6.1 percent) than beef-hog, dairy, and beef-feeding farms.³

In the 1962 summary of records of farms enrolled in the Missouri farm record mail-in service, farms with beef cows as the major livestock enterprise had the lowest percent return to capital and management, compared with grain, grain-hog, hog, grain-beef, grain-dairy, dairy, and general farms.⁴

One Minnesota study indicated that chances of profit from beef cow herds in that state were relatively unfavorable. Even large areas of untillable pasture were not ample justification for a beef herd there as other alternatives appeared more profitable.⁵

Of course, management ability made a big difference in profit on individual farms. In the southeastern Ohio study, harvested feeds and cash costs accounted for around 70 percent of the production costs. Farm operators who achieved high production of beef per cow and a good calf crop while holding feed, labor, and overhead costs lower than the average came out with the profits.

The importance of good calving rates was brought out by another Ohio study. Records on 100 commercial herds in the western part of the state indicated that a return above all costs could not be expected with a calving rate below 88 percent.⁶

¹Shaudys, E. T. and Sitterley, J. H., *Costs, Returns, and Profitability of Beef Cow-Calf Enterprise in Southeastern Ohio by Systems of Management*, Ohio Agr. Experiment Station, Research Bulletin 937, 1963.

²Kyle, L., *Livestock Farming Today, What It Costs, How It Pays*, Michigan State University, Agricultural Economics 909, 1962.

³Brown, D., *Nebraska Farm Management Summary and Analysis Report 1962*, E. C. 63-820.

⁴Bebermeyer, P., *1962 Missouri Farm Business Summary*, University of Missouri, Extension Service, 1963.

⁵Hartmann, E. and Routhe, H., *Are Beef Herds Profitable?*, Minnesota Farm Business Notes Number 380, University of Minnesota, 1957.

⁶Armstrong, D. L. and Shaudys, E. T., *Profitability of Practices Affecting the Calf Crop of Beef Herds*, Ohio Agr. Experiment Station Research Circular 103, 1961. (Their study suggested the most important management practices affecting calving percentages were number of cows per bull, labor spent checking the herd during calving, and percentage of first calf heifers in the herd. Time of calving, length of calving season, housing, and feeding did not seem to affect calving percentage, though they affected profit.)



Beef cows can be a profitable secondary enterprise on many farms, using land not adapted for more intensive use.

Detailed cow herd records kept from 1956 to 1959 in an Indiana study showed a wide variation in profits during the cattle cycle as prices of feeder cattle changed. The report on this study concluded:

“Over the cycle, a beef herd will show a profit under average weaning weights, calving percentages and costs of production. Profits were greater if high calving percentages and weaning weights were achieved. When pasture was used to a maximal extent, costs of wintering were reduced. The quality of winter forage needs to be only good enough to meet nutritional needs. Concentrates are not needed for beef cows except to supplement poor forage. Improved production and management can make beef herds even more profitable in southern Indiana.”⁷

A study in Mississippi also showed that returns were generally low from the beef cow enterprise but that relatively high returns were obtained with better management. Practices cited as most important were use of good quality breeding animals, low feed costs, low grazing costs, and maintaining herd health.”⁸

⁷Jansen, M. R., *Beef Cow Herd Costs and Returns in Southern Indiana*, Purdue Agr. Experiment Station, Research Bulletin 725, 1961.

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

That more opportunities for cost reduction and profit are open to large herds than to small herds was a conclusion reached in an Illinois study . . . and low income farmers were hampered in trying to develop a large herd by the amount of capital needed and slow rate of turnover.”⁹

Where Do Beef Cows Fit on Missouri Farms?

Beef cows will add to farm and family income on farms where they are suited. The challenge for the farm operator is to determine the circumstances in which beef cows will provide a higher return for available resources than will other crop and livestock enterprises.

In Missouri, beef cows may be the *major* livestock enterprise on large farm units, or on smaller units where income needs are less. They may be an appropriate *secondary* enterprise on both large and small farms when kept in combination with other livestock or crop enterprises such as hogs, beef feeding, dairying, and row crops. Concentrations of beef cows are found in some areas of the state because a high proportion of the land is best suited for pasture and hay. But, a high proportion of

⁹Woods, H. S. and Buddemeir, 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.



A portion of the beef cow's feed requirements can be obtained by utilizing crop residues that have little or no opportunity cost.

farms in all areas have some land that cannot be used profitably for row crops. Beef cows offer an alternative use for the production from this land. They must be able to compete economically with other forage consuming livestock in converting this production into meat or milk.

Observations indicate that beef cows may add to net farm income under three general situations.

1. Beef Cows as a Major Enterprise on Large Farm Units

The rolling hills of North Missouri and the Ozark section contain many farm units large enough to support beef cows as the major livestock enterprise. Many of these farms contain 500 to 1,200 acres. Much of this land is not adapted to row crops but does produce an abundance of pasture and hay. These farms can supply feed for 50 to 200 cows. Selling calves in the fall as feeders is the main system followed. However, on some farms where corn silage and limited amounts of grain can be produced, calves are weaned and sold as baby beefs or feeders after a 90-150 day feeding period. This procedure usually increases farm income.

When beef cows are the major source of income, capital investments in machinery and equipment must be kept to a minimum if the operation is to be profitable.

Cash operating expenses also must be kept low as the gross returns from a beef cow enterprise, as pointed out earlier, are low in comparison with those from hogs or dairy cows. A 200-cow unit selling feeder calves should gross \$19,000 to \$20,000 annually under 1960-1964 price conditions. This is based on information contained in the Missouri Farm Business Planning Guide, B. F. 6103. This gross income is assuming a 90 percent calf crop, weaning weights of 450 pounds and 16 percent of the cow herd replaced each year.

Assuming no other source of income, cash farm operating expenses, servicing of debts, depreciation on livestock and equipment, family living, and interest on the total capital investment must be paid from the gross income of the 200-cow unit. Cash farm operating expenses including depreciation will likely take 70-75 percent of the gross income or about \$14,000. This leaves a little over \$5,000 for family living, principal payments on debts, the operator's labor, and interest on the total capital invested in the farm business.

The findings of a 1959 Montana study are in close agreement with these figures. Their ranch survey data indicated: "30.93 acres were required per animal unit; 70 percent of the total herd was breeding cows; cash operating expenses were about \$38 per animal unit; and 300

animal units (about 200 breeding cows) would be required to return \$5,000 cash for labor and management under 1959 prices."¹⁰

2. *Beef Cows as a Major Enterprise on Small Part-Time Farm Units*

Beef cows can be a major enterprise on a small farm if farm income needs are low. Many farmers with full-time, "off-farm" jobs can care for a beef herd easier than other enterprises which require more labor. Part of the increase in beef cow numbers in this state is occurring on farms where the operators are working off the farm.

Some operators who become eligible for Social Security and other retirement benefits continue to live on the farm. Beef cows may fit their needs for farming less intensively and reducing the labor load. Some operators prefer to use their land for pasture and hay for beef cows rather than rent it to neighbors for crop production.

3. *Beef Cows as a Secondary Enterprise*

The majority of the beef cow herds on Missouri farms are secondary or minor enterprises. Other enterprises such as hogs, beef feeding, dairying, or crop production offer greater income opportunity for utilizing most of the land, labor, and capital on both large and small farms.

Even on farms containing a high proportion of cropland used to produce grain for livestock feeding, a small beef herd can be a profitable secondary enterprise. Each farm usually contains some land that cannot be used profitably for row crops, even with water management and soil fertility improvements. This acreage, however large or small, can be utilized by beef cows.

The number of cows should be limited to the carrying capacity of the acreage where the greatest return is from pasture and hay. Part of the pasture and roughage requirements can be met by utilizing stalks, stubble fields, and other crop residues from harvested cropland.

If the cow herd is increased beyond the carrying capacity of the land best suited for pasture and hay, additional roughage may need to be purchased or grown on cropland that is capable of producing higher income crops such as corn, soybeans, and wheat. Farm income usually declines as cropland is seeded to grass for an expanding beef herd. Where a grazing and finishing system for steers or heifers offers possibilities they may offer a higher return from the pasture land and crop residues than beef cows.

There are many small farms in Missouri where beef cows are suited for a secondary enterprise. They can be teamed up with enterprises requiring much labor, such as market hogs or feeder pig production, broilers, tur-

keys, a laying flock, feedlot operations, or specialty crops. Beef cows can use land not needed or adapted to any of these other enterprises.

The Indiana study cited previously reached similar conclusions regarding the place of cow herds on Indiana farms:

"Beef cows can add to farm income on those farms where they are suited. Three types of farms are adapted to beef cow herds. One type is the large rolling-to-hilly farm that produces an abundance of pasture and harvested forage. These farms may specialize in feeder calves. If part of these large farms is suitable for producing grain, a cattle-fattening operation may be profitably incorporated in the business. Beef cow herds are adaptable to the small farm whose operator has full time employment off the farm, especially if available labor is limited. Beef cows also fit on farms whose operator is eligible for retirement and wishes to reduce the work load. Beef cows have a place on farms that produce grain. Their justification here lies in their providing a market for stalk, stubble, pasture and roughages that would not be used if the cow herd was not kept. Cow herds on these farms should be limited to the amount of relatively cheap pasture and roughage available."⁷ (See footnote on page 5)

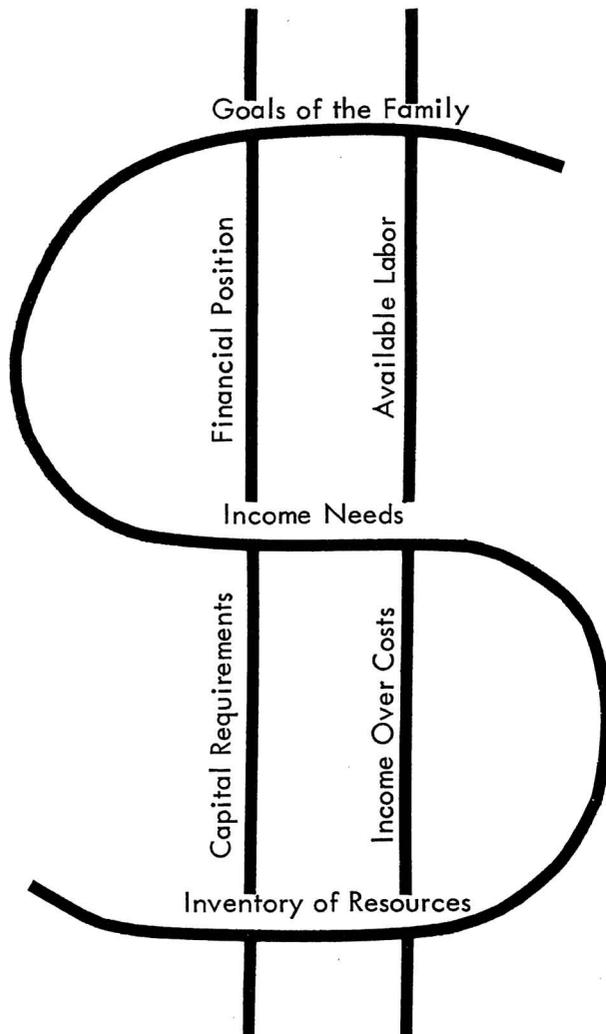
In short, the picture seems like this: Opportunity for more beef cow enterprises will exist in the future. Such enterprises bring low per unit returns. But Missouri has considerable acreages of land suited only to pasture and we produce much by-product forage such as crop residues that would go to waste without enterprises such as the cow herd to use them. Good management to obtain high calving rates and a high number of pounds of beef production per cow while maintaining low capital operating expenses will greatly increase returns.

Opinions differ among producers, researchers, and others as to the reason for continuous expansion in beef cow numbers in Missouri but the following factors appear to have influenced the increase in the past and will likely continue to operate in the future:

1. A record demand due to consumer preference for beef, expanding population, and increased per capita incomes.
2. Nearness to cattle feeding areas and the increased demand for Missouri feeder cattle.
3. Increased carrying capacity of crop and pasture land by use of plant food and improved cultural and management practices.
4. Declining dairy cow numbers.
5. Increased size of farm units, offering possibilities for more beef cows.
6. More part-time farmers who need enterprises with low labor requirements.
7. An increasing number of part-retirement farms with very little labor available for more intensive enterprises.

¹⁰Wheeler, R. O., and McConnen, R. J., *Organization, Cost, and Returns from Commercial Family-Operated Cattle Ranches*, Montana Agr. Experiment Station, Bulletin 557, 1961.

Making the Decision on Your Farm



All factors on the \$ sign are important in determining the place of beef cows on a farm.

Many factors should be analyzed carefully as you consider the place of beef cows on your farm. These factors include resources on hand, capital requirements, expected income above costs, and family goals and needs.

Each of these factors will be discussed briefly and the forms in the appendix can be used for evaluating the potential for beef cow enterprises on your farm.

RESOURCE CONSIDERATIONS

Many resources are available in every farm business. They include land, buildings, livestock, machinery, equipment, and labor. Before the best use of these resources can be determined, it is necessary to know the kind and quantity available and the financial position of the family.

Land

Farm operators who consider beef cows must analyze carefully all of the land resources. They need to determine the following: total acres available; acres that are suitable for intensive land use or would be with proper soil treatment and mechanical controls, such as terraces; acres suitable only for permanent pasture and forage production; acres that should stay in timber production; and, finally, the acreage in farmstead, roads, and other non-productive uses. On land suitable for intensive row crops, such crops will yield highest returns. Beef cow numbers should be based on the acreage where the highest return is from pasture and forage production (if maximizing income is an important family goal.)

Buildings and Improvements

Investments in buildings for beef cows must be kept low. Some farms are over-improved for this enterprise. The operator who is considering beef cows should determine the present value of buildings and their best use. For example, if a building can be used to finish hogs or to provide winter protection for beef cows, hogs may be more profitable.

Livestock

The types of livestock presently on the farm should be considered. Increasing numbers or improving efficiency

of those already on the farm may be a quicker way to increase income than by adding another enterprise. However, if other livestock enterprises are not utilizing all available pasture, crop residues and other roughage, beef cows can be considered as one alternative for increasing income.

Machinery and Equipment

Many farms have sizeable investments in machinery for crop production. If part of the cropland is seeded to pasture or hay for beef cows, machinery cost per acre of the remaining cropland may be increased. This is because the fixed or ownership costs will remain the same and must be distributed over fewer acres. This fact raises two important questions: Will the addition of beef cows and associated land use make as efficient use of present machinery and equipment as other kinds of livestock and more intensive land use? Can the investment in machinery be reduced by selling items not needed or by not replacing machinery as it wears out?

Financial Position

The present financial position (net worth) should be determined before making any changes in the farm business. Records should be kept in sufficient detail to show the net worth at the end of each year. Net worth is determined by listing all assets (what is owned) and placing a value on them and deducting all liabilities (what is owed).

Net worth and debt obligations should be considered carefully if beef cows are to be added to the farm business. Is the money available or will it be borrowed? What is the "repayment ability" of the cow herd? What will be the financial position if beef prices decline or if returns are reduced because of a small calf crop? Each farm family must determine the best way and manage financial resources to provide the income needed.

Labor Resources

The total labor available for the farm business should be considered in choosing livestock enterprises.

For maximum income, enterprises which offer the greatest return per hour of labor and which utilize labor most fully throughout the year should be selected.

In situations where a reduction in the work load is desirable, enterprises with a low demand for labor should be considered. Beef cows often fit these conditions since labor needs per cow are relatively low. Furthermore, much of the labor is needed during the winter when a surplus may be available. The farm operator must decide whether beef cows or some other enterprise will provide highest returns. A knowledge of the labor requirements is useful in making the decision. Recent records from beef cow owners indicate that former estimates of hours required in caring for beef herds are now too high. Recent records from cow owners in Missouri, Kansas, and Indiana show that 5 to 10 hours are spent per cow per year.

In a special beef cow labor study in Cooper County, Mo. in 1961-62, ten cow owners reported that 7.6 hours of labor per cow were required during the year. The first year's results from the Farm Business Research Panel for Beef Cow Herds substantiated this and data from the other studies. Herds of 132 panel members had an average annual requirement of 6 hours per cow in 1963. Additional details are shown in Appendix Table III.

CAPITAL REQUIREMENTS

Many producers regard the cost of the cow as the only investment necessary. However, other investments should be considered. Total investments per cow unit include: the value of the cow; a portion of the bull investment; a share of the replacements; the value of land used for pasture and hay; and the present value of buildings and equipment used by the cow herd. The investment required and the probable rate of return should be compared with probable returns of other enterprises.

The capital investment required for a beef cow enterprise can be determined by using Form B or D in the Appendix. The example illustrates a typical investment in a beef cow enterprise.

EXPECTED INCOME ABOVE COSTS

By careful budgeting, you can figure all costs and returns. This will enable you to compute both the return above variable or cash costs and the returns above all costs of production. The expected return on the cow herd investment can be compared with that of other enterprises.

Factors to consider in computing expected gross returns include: likely percent calf crop; anticipated weaning weights; quality of calves; estimated price at weaning time; rate of cow replacement; and expected market price of replacement cows. A high percent calf crop and good weaning weights are essential for profit in a beef cow enterprise. Keeping a cow that does not raise a calf cost about as much as keeping one that does.

Figure 3 illustrates the expected returns above variable costs with different calving rates and weaning weights. A 90 percent calf crop and weaning weights of 450 pounds provide \$19.75 return per cow above variable costs. Returns go up to \$28.07 on the same weight of calf with 100 percent calf crop. A 90 percent calving rate with 500-pound calves will return \$28.07 above variable costs. Further examples are shown in Appendix Table IV. Thus, beef cow income can be increased substantially

by using practices which result in a high percent calf crop and weaning weights above 450 pounds.

The annual costs of maintaining a beef cow unit are more difficult to calculate. There is a tendency to overlook part of the costs. Some cattlemen consider only the cost of hay and protein required for wintering the herd. They look upon returns above these items as net profit or returns for their labor and capital. Some even disregard the value of feed because it is raised.

A more appropriate method should be used to arrive at income above cost. Costs should be separated into two groups, *variable* and *fixed*. Variable costs are associated with the volume of business and include: pasture and other feed; veterinary expenses; bull costs; marketing charges; and taxes, insurance, and interest on the cow investment. Fixed costs occur regardless of the amount produced. Fixed costs chargeable to the cow herd include the labor of the farm operator, insurance, depreciation, taxes, and repairs on buildings and equipment.

Once these costs are determined, the manager has the information needed to make his decisions. He can determine whether or not the expected gross returns will pay the variable costs only, will cover all variable costs and a portion of the fixed costs, or will pay all costs. For

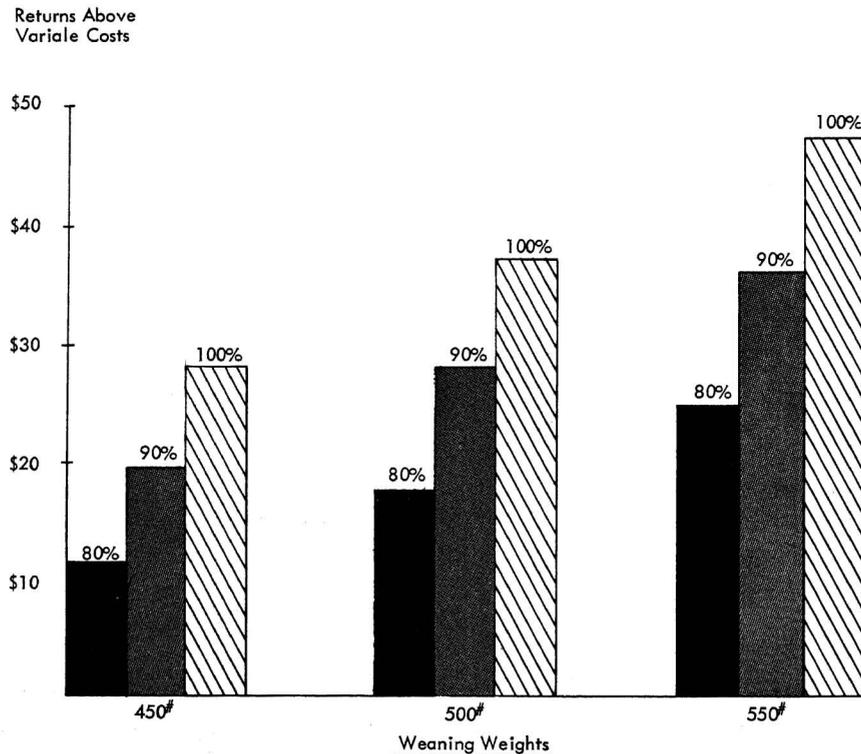


Fig 3—Returns above variable costs with changes in weaning weights and percent calf crop. Refer to Appendix Table IV for additional information.

short periods of time, production may be continued if only variable costs can be paid. Over a long period of time, the beef cow enterprise must pay both variable and fixed costs of production in order to realize a profit.

Form C in the appendix can serve as a guide for determining the advisability of adding a beef cow enterprise or of enlarging an existing herd. Each farm operator should use his own data based on existing conditions.

Placing an "Opportunity Cost" Value on Pasture and Roughage.

All resources used by beef cows have costs that must be considered in evaluating the enterprise. Fixed and variable costs already have been discussed. Another important economic cost concept is often referred to as the *opportunity cost*. According to this concept, the cost of any resource used in an enterprise is determined by the income it would earn in its best alternative use. In accordance with this principle, any resource which has no alternative economic use has an opportunity cost of zero.

This principle may have special application in determining the cost of forage used by beef cows. They may provide a market for stalk fields, stubble, native pasture, and other roughage which can not be marketed in any other way. Therefore, such roughages have no opportunity cost and should not be charged against the beef cow enterprise. However, in many instances, a zero value may not be realistic, because these roughages could earn a cash rent. So the opportunity cost (cash rental value of the roughage) should be charged.

Corn stalk fields, for example, may provide pasture equal to 0.25 tons of hay equivalent per acre. Four acres would provide one ton of hay equivalent as pasture. A mature beef cow will consume as pasture about 0.33 tons of hay equivalent per month. Thus for a three-month period in the fall, about one ton of hay equivalent would be required for a mature cow. As previously stated, four acres of corn stalks could provide this one ton of hay equivalent, assuming adequate supplement is provided. If the hay equivalent as pasture is \$9 per ton, this replacement value could determine the cost to the cow herd. However, if the stalk fields cannot provide cash income in any other way, no charge should be made against the cow herd.

If the stalk field *can* be rented for \$1 per acre, this would represent a potential income of \$4 per ton of hay equivalent from the stalk fields. In this case, the cow enterprise should be charged at the rate of \$4 per ton of hay equivalent. Likewise, if steers can be purchased to utilize the stalks and will return \$6 per ton hay equivalent, the cow enterprise should be charged at the \$6 rate.

This same principle should be used as a guide in evaluating the cost per ton of hay equivalent from permanent pasture land which cannot be used for other roughage or grain production. The charge per ton of hay equivalent used by the cow enterprise should be determined either by the cash rental value or by the highest return which might be realized from using the field for some other livestock enterprise.

Further application of this principle may indicate the danger of expanding the cow herd to a size which requires the use of productive cropland for pasture. For example, if one acre of cropland can produce 60 bushels of corn at a net return of \$30 per acre, the cow enterprise should be charged the opportunity cost (\$30 per acre) for keeping the land in grass.

Thus it is apparent that the opportunity cost principle should influence the decision to add a beef cow enterprise or to expand an existing herd. It is a major consideration if the primary goal of the farm operator is to maximize returns from the use of all resources. In some situations, however, other goals such as minimizing risk and uncertainty, may take precedence over income maximization.

PERSONAL CONSIDERATIONS

Goals of the Family

All families have goals or objectives they want to accomplish. They may be either short or long-time goals when measured in terms of achievement. The family may want to pay off the farm debt, to provide an education for the children, or to help a son get started in farming. Many goals change after children become established. At this stage in life, income needs may be less and desire for more leisure time may take precedence over other goals. Goals vary with families and with time. Thus, family goals or objectives should be primary factors in determining the place of beef cows in farming operations.

Income Needs of the Family

Farm families should determine their total income needs for the current year and for several years ahead. Income needs will have a great influence on how intensively or extensively the farm should be operated. In determining yearly income needs, family living costs, servicing of debts, and farm operating expenses, must be considered. Many families have non-farm sources of income available each year. The difference between total income needs and income available from off-farm sources indicates the amount needed from the farm business. If most of the total income needs must be derived from the farm business, it is very important to use available land, labor, and capital most efficiently.

Appendix

APPENDIX TABLE I

BEEF COWS: TWO YEARS AND OLDER ON MISSOURI FARMS 1940 to 1964*

January 1	1,000 Head	January 1	1,000 Head
1940	429	1952	856
1941	476	1953	961
1942	524	1954	1,065
1943	587	1955	1,056
1944	625	1956	1,039
1945	620	1957	1,027
1946	582	1958	971
1947	610	1959	1,073
1948	574	1960	1,135
1949	559	1961	1,169
1950	594	1962	1,240
1951	670	1963	1,332
		1964	1,396

*United States Department of Agriculture, Agricultural Marketing Service, Crop Reporting Board, Livestock and Poultry Inventories January 1 By States, Statistical Bulletins 177 and 278.

APPENDIX TABLE II

MISSOURI RANKS SIXTH, IN THE NUMBER OF BEEF COWS,
TWO YEARS AND OLDER, 1964-1960*

Rank	State	1,000 Head				
		1964	1963	1962	1961	1960
1	Texas	5,170	4,910	4,496	4,374	4,206
2	Oklahoma	1,839	1,708	1,622	1,490	1,390
3	Nebraska	1,801	1,626	1,569	1,519	1,499
4	Kansas	1,549	1,504	1,383	1,245	1,195
5	S. Dakota	1,526	1,399	1,327	1,288	1,250
6	Missouri	1,396	1,332	1,240	1,169	1,135
7	Montana	1,307	1,210	1,126	1,116	1,114
8	Iowa	1,145	1,079	1,028	1,008	993
9	Louisiana	936	860	851	834	804
10	California	927	894	858	851	853
11	Mississippi	923	879	838	810	808
12	Colorado	887	855	803	784	761
13	N. Dakota	834	742	694	680	648
14	Florida	796	821	713	699	741
15	Illinois	751	743	695	681	668
	United States (48 states)	31,697	29,893	28,231	27,028	26,344

*United States Department of Agriculture, Agricultural Marketing Service, Crop Reporting Board, Livestock and Poultry Inventory January 1, February 1964.

APPENDIX TABLE III
LABOR REQUIREMENTS FOR BEEF COW HERDS AS REPORTED BY FARMERS*

State	Year	Number of Herds Involved	Hours Per Cow Per Year
Missouri			
Cooper County Study	1961-62	10	7.6
Beef Cow Research Panel	1963	132	6.0
Kansas	1955-57	101	9.6
Indiana	1956-59	44	7.1

*Includes all labor in caring for the cow and her share of replacement such as: feeding, observing, handling, treating, repairs to fences and buildings used by the herd.

APPENDIX TABLE IV
DIFFERENCES IN RETURNS PER COW WITH CHANGES
IN WEANING WEIGHTS AND PERCENT CALF CROP

Percent Calf Crop	Returns from 450# calf *			Returns from 500# calf			Returns from 550# calf *		
	Gross	Above Variable Cost**	Above All Costs ⁺	Gross	Above Variable Cost**	Above All Costs ⁺	Gross	Above Variable Cost**	Above All Costs ⁺
100	105.56	28.07	12.57	114.80	37.31	21.81	124.04	46.55	31.05
95	101.40	23.91	8.41	110.28	32.79	17.29	118.96	41.47	25.97
90	97.24	19.75	4.25	105.56	28.07	12.57	113.88	36.39	20.89
85	93.09	15.60	.10	100.94	23.45	7.95	108.79	31.30	15.80
80	88.93	11.44	-4.06	96.32	18.83	3.34	103.71	26.22	10.72

*Returns from all sources, based on information used in determining income over costs on page 38; calves at \$22, 16% cow replacement and selling 1000 pound cows at \$14 per hundredweight.

**It is assumed rate of herd replacement would stay the same, and cows would receive the same amount of pasture and roughage regardless of calving rate.

⁺This is a return to management. All costs have been paid including interest on capital at 5% and labor paid at the rate of \$1.00 per hour.

FORM A. DETERMINING GOALS, NEEDS, AND RESOURCES

I. GOALS OF OUR FAMILY: _____

II. INCOME NEEDS OF OUR FAMILY:

A. Total Income Needs Per Year for:

- 1. Family living \$ _____
- 2. Principal payments on debts \$ _____
- 3. Other fixed obligations \$ _____
- Total Present Yearly Income Needs \$ _____

B. Expected Future Income Needs \$ _____

C. Non-farm Sources of Income Available Each Year

Source	Annual Income
1. _____	\$ _____
2. _____	\$ _____
3. _____	\$ _____
Total Non-farm Income	\$ _____

D. Farm and Family Earnings Needed from Farm (A less C) \$ _____

III. INVENTORY OF AVAILABLE RESOURCES:

A. Land Resources

- 1. Total number of acres _____
- 2. Acres suitable for intensive land use with proper soil treatment and mechanical controls _____
- 3. Acres suitable only for perm. pasture and forage _____
- 4. Acres suitable only for timber _____
- 5. Acres in farmstead, roads, etc. _____
- 6. Total value of land \$ _____
- 7. Value of land per acre \$ _____

B. Buildings and Improvements*

Major Buildings	Present Value
1. _____	\$ _____
2. _____	\$ _____
3. _____	\$ _____
4. _____	\$ _____
Total Investment in all Buildings and Improvements	\$ _____

C. Livestock on Hand*

	Kind	Number	Present Value
1.	Beef Breeding Herd	_____	\$ _____
2.	Other Cattle	_____	\$ _____
3.	Dairy Cattle	_____	\$ _____
4.	Swine Breeding Herd	_____	\$ _____
5.	Other Hogs	_____	\$ _____
6.	Sheep	_____	\$ _____
7.	Poultry	_____	\$ _____
	Total Investment in Livestock		\$ _____

D. Machinery and Equipment*

	Type	Remaining Value
1.	Crop Machinery	\$ _____
2.	Power and Hauling Machinery	\$ _____
3.	Livestock Equipment	\$ _____
4.	Other	\$ _____
	Total Machinery and Equipment Investment	\$ _____

*This information should include all investments and can be obtained from detailed farm inventory records, or depreciation schedules from income tax returns.

IV. FINANCIAL POSITION, DATE _____

A. Assets (What We Own)

1.	Farm Land	\$ _____
2.	Buildings and improvements	\$ _____
3.	Livestock	\$ _____
4.	Machinery & equipment	\$ _____
5.	Feed, seed & supplies	\$ _____
6.	Cash on hand	\$ _____
7.	Non-farm assets (Household & personal, life insurance, govt. bonds, etc.)	\$ _____
	Total Assets	\$ _____

B. Liabilities (What We Owe)

1.	Real estate mortgages	\$ _____
2.	Chattel mortgages and notes	\$ _____
3.	Accounts payable	\$ _____
4.	Installment payment balance	\$ _____
5.	Other obligations: _____	\$ _____
	Total Liabilities	\$ _____

C. Net Worth (Total Assets Minus Total Liabilities) \$ _____

D. Previous Net Worth \$ _____

FORM B. DETERMINING TOTAL CAPITAL REQUIREMENTS PER BEEF COW UNIT

Example Farm

REQUIREMENTS	INVESTMENT
A. CATTLE	
1. Total Number in the Herd	<u>26</u>
<u>21</u> cows x <u>\$175</u> value per head	<u>\$ 3675.00</u>
<u>4</u> replacements x <u>\$90</u> value per head	<u>\$ 360.00</u>
<u>1</u> bulls x <u>\$400</u> value per head	<u>\$ 400.00</u>
2. Total Investment in Herd.	<u>\$ 4435.00</u>
B. BUILDINGS AND EQUIPMENT (Used by the Cow Herd)	
1. Value of Sheds, Silos, Etc.	<u>\$ 1050.00</u>
2. Value of Equipment, Bunks, Scales, Etc.	<u>\$ 250.00</u>
3. Total Value of Buildings and Equipment	<u>\$ 1300.00</u>
C. LAND VALUE (Acres Used by the Cow Herd)	
1. As Pasture	
Permanent pasture: <u>78</u> acres x <u>\$100</u> value	<u>\$ 7800.00</u>
Rotation pasture: <u>—</u> acres x <u>—</u> value.	<u>\$ —</u>
Wooded pasture: <u>—</u> acres x <u>—</u> value	<u>\$ —</u>
Total acres used for pasture	<u>78</u>
Total value of land used for pasture	<u>\$ 7800.00</u>
2. For Hay and Other Roughage	
Hay: <u>26</u> acres x <u>\$150</u> value of land	<u>\$ 3900.00</u>
Silage: <u>—</u> acres x <u>—</u> value of land	<u>—</u>
Total acres used for roughage	<u>\$ 26</u>
Total value of land used for roughage	<u>\$ 3900.00</u>
3. Total Investment in Land (for both pasture and hay)	<u>\$11,700.00</u>
D. TOTAL INVESTMENT IN CATTLE, BUILDINGS, EQUIPMENT, LAND FOR PASTURE AND ROUGHAGE (A2 + B3 + C3)	<u>\$17,435.00</u>
E. AVERAGE INVESTMENT PER COW UNIT (D ÷ A1)	<u>\$ 670.57</u>

FORM B. DETERMINING TOTAL CAPITAL REQUIREMENTS PER BEEF COW UNIT

Our Farm

REQUIREMENTS	INVESTMENT
A. CATTLE	
1. Total Number in the Herd	_____
_____ cows x _____ value per head	\$ _____
_____ replacements x _____ value per head	\$ _____
_____ bulls x _____ value per head	\$ _____
2. Total Investment in Herd	\$ _____
B. BUILDINGS AND EQUIPMENT (Used by the Cow Herd)	
1. Value of Sheds, Silos, Etc.	\$ _____
2. Value of Equipment, Bunks, Scales, Etc.	\$ _____
3. Total Value of Buildings and Equipment	\$ _____
C. LAND VALUE (Acres Used by the Cow Herd)	
1. As Pasture	
Permanent Pasture: _____ acres x _____ value.	\$ _____
Rotation pasture: _____ acres x _____ value	\$ _____
Wooded pasture: _____ acres x _____ value.	\$ _____
Total acres used for pasture	_____
Total value of land used for pasture	\$ _____
2. For Hay and Other Roughage	
Hay: _____ acres x _____ value of land	\$ _____
Silage: _____ acres x _____ value of land	\$ _____
Total acres used for roughage	_____
Total value of land used for roughage	_____
3. Total Investment in Land (for both Pasture and Hay)	\$ _____
D. TOTAL INVESTMENT IN CATTLE, BUILDINGS, EQUIPMENT, LAND FOR PASTURE AND ROUGHAGE (A2 + B3 + C3)	
	\$ _____
E. AVERAGE INVESTMENT PER COW UNIT (D ÷ A1)	
	\$ _____

FORM C. ESTIMATING INCOME ABOVE COSTS PER BEEF COW UNIT

Example Farm

RETURNS AND COSTS

A. ANNUAL RETURNS PER COW UNIT

1. Percent Calf Crop Expected.	<u>90</u> %
2. Estimated Weight at Weaning Time.	<u>450</u> lbs.
3. Expected Price at Weaning	\$ <u>22.</u>
4. Percent Cow Replacement.	<u>16</u> %
5. Weight and Price of Cows Sold (<u>1000</u> lbs. x \$ <u>14</u>)	
6. Returns from Calf Sales (<u>450</u> lbs. x \$ <u>22</u> x <u>90</u> % x <u>84</u> % sold)	\$ <u>74.84</u>
7. Returns from Cow Sales (<u>1000</u> lbs. x \$ <u>14</u> x <u>16</u> % sold).	\$ <u>22.40</u>
8. Total Returns Per Cow Unit (Line 6 + Line 7)	\$ <u>97.24</u>

B. ANNUAL COSTS PER COW UNIT

Variable Costs (Cost of each item ÷ _____ cows in herd)

1. Grain: <u>2</u> Bushels x \$ <u>1</u>	\$ <u>2.00</u>
2. Roughage as Hay Equivalent: <u>1.5</u> Tons x \$ <u>16</u>	\$ <u>24.00</u>
*3. Pasture as Hay Equivalent: <u>3.5</u> Tons x \$ <u>7</u>	\$ <u>24.50</u>
4. Protein, Salt and Mineral	\$ <u>5.00</u>
5. Breeding Charge, Bull Cost	\$ <u>5.00</u>
6. Veterinary and Drugs	\$ <u>3.00</u>
7. Marketing: 3% of Total Returns (Line A-8 above)	\$ <u>2.92</u>
**8. Interest on Investment Per Cow Unit (5% Form D, Line A-3)	\$ <u>8.52</u>
**9. Taxes & Insurance Per Cow Unit (1.5% of Form D, Line A-3)	\$ <u>2.55</u>
10. Total Variable Costs Per Cow Unit (Add Lines 1 through 9)	\$ <u>77.49</u>

Fixed Costs (Cost of each item ÷ _____ cows in herd)

11. Buildings & Equipment: Insurance, Depr., Repairs, Taxes. <u>10</u> % of Investment \$ <u>50</u> (Form D, Line B-2)	\$ <u>5.00</u>
12. Interest on Investment in Buildings and Equipment <u>5</u> % of Investment \$ <u>50</u>	\$ <u>2.50</u>
13. Labor: <u>8</u> Hours x \$ <u>1.00</u>	\$ <u>8.00</u>
14. Total Fixed Cost Per Cow Unit (Add Lines 11, 12, and 13)	\$ <u>15.50</u>

C. TOTAL COST PER COW UNIT (B-10 plus B-14) \$ 92.99

D. NET RETURN ABOVE VARIABLE COST PER COW UNIT (A-8 minus B-10) \$ 19.75

***E. NET RETURN ABOVE ALL COST PER COW UNIT (A-8 minus C): This is a return to management \$ 4.25

*If some of the pasture has zero opportunity cost, the total pasture charge should be reduced accordingly.

**These are variable costs when considering the enterprise. However, once the cows are on the farm, these costs become fixed regardless of production.

***In this example, labor has been paid \$1 per hour and interest on investment at 5%.

FORM C. ESTIMATING INCOME ABOVE COSTS PER BEEF COW UNIT

Our Farm

RETURNS AND COSTS

A. ANNUAL RETURNS PER COW UNIT

1. Percent Calf Crop Expected. _____%
2. Estimated Weight at Weaning Time. _____lbs.
3. Expected Price at Weaning \$ _____
4. Percent Cow Replacement _____%
5. Weight and Price of Cows Sold (_____ lbs. x \$ _____) \$ _____
6. Returns from Calf Sales
(_____ lbs. x \$ _____ x _____ % x _____ % sold) \$ _____
7. Returns from Cow Sales (_____ lbs. x \$ _____ x _____ % sold) . . . \$ _____
8. Total Returns Per Cow Unit (Line 6 + Line 7) \$ _____

B. ANNUAL COSTS PER COW UNIT

Variable Costs (Cost of each item ÷ _____ cows in herd)

1. Grain: _____ Bushels x \$ _____ \$ _____
2. Roughage as Hay Equivalent: _____ Tons x \$ _____ \$ _____
- *3. Pasture as Hay Equivalent: _____ Tons x \$ _____ \$ _____
4. Protein, Salt and Mineral \$ _____
5. Breeding Charge, Bull Cost \$ _____
6. Veterinary and Drugs \$ _____
7. Marketing: 3% of Total Returns (Line A-8 above) \$ _____
- **8. Interest on Investment Per Cow Unit (5% Form D, Line A-3) \$ _____
- **9. Taxes & Insurance Per Cow Unit (1.5% of Form D, Line A-3) \$ _____
10. Total Variable Costs Per Cow Unit (Add Lines 1 through 9) \$ _____

Fixed Costs (Cost of each item ÷ _____ cows in herd)

11. Buildings & Equipment: Insurance, Depr., Repairs, Taxes.
_____ % of Investment \$ _____ (Form D, Line B-2) \$ _____
12. Interest on Investment in Buildings and Equipment
_____ % of Investment \$ _____ \$ _____
13. Labor: _____ Hours x \$ _____ \$ _____
14. Total Fixed Cost Per Cow Unit (Add Lines 11, 12, and 13) \$ _____

C. TOTAL COST PER COW UNIT (B-10 plus B-14) \$ _____

D. NET RETURN ABOVE VARIABLE COST PER COW UNIT (A-8 minus B-10) \$ _____

***E. NET RETURN ABOVE ALL COST PER COW UNIT (A-8 minus C): This
is a return to management \$ _____

*If some of the pasture has zero opportunity cost, the total pasture charge should be reduced accordingly.

**These are variable costs when considering the enterprise. However, once the cows are on the farm, these costs become fixed regardless of production.

***In this example, labor has been paid \$1 per hour and interest on investment at 5%.

FORM D. DETERMINING PERCENT RETURN ON INVESTMENT PER BEEF COW UNIT

Our Farm

REQUIREMENTS	INVESTMENT
A. CATTLE	
1. Total Number in the Herd (See Form B, Line A-1)	_____
2. Total Investment in Herd (See Form B, Line A-2)	\$ _____
3. Average Investment Per Head ($2 \div 1$)	\$ _____
B. BUILDINGS AND EQUIPMENT (Used by the Herd)	
1. Total Value of Buildings and Equipment (See Form B, Line B-3) . .	\$ _____
2. Average Investment Per Head ($B-1 \div A-1$)	\$ _____
C. VALUE OF FEED NEEDED PER COW (Whether purchased or produced, priced at market value.)	
1. Roughage as Hay Equivalent: _____ Tons x \$ _____	\$ _____
*2. Pasture as Hay Equivalent: _____ Tons x \$ _____	\$ _____
3. Protein, Salt, Minerals	\$ _____
4. Grain	\$ _____
5. Total Value Feed Needed Per Cow (Add Lines 1 through 4)	\$ _____
D. TOTAL AVERAGE INVESTMENT PER COW UNIT IN CATTLE, BUILDINGS, EQUIPMENT, AND FEED NEEDED ($A-3 + B-2 + C-5$)	
E. EXPECTED NET RETURN ON THIS INVESTMENT	
1. Total Annual Returns Per Cow Unit (Form C, Line A-8)	\$ _____
2. Total Costs Per Cow Unit Excluding Interest on Investment	
Variable cost per cow unit \$ _____ (Form C, Line B-10) Minus	
interest on cow investment \$ _____ (Form C, Line B-8) equals	
\$ _____ Plus labor (Form C, Line B-13) \$ _____ equals	
3. Expected Net Return on Investment (Line 1 minus Line 2).	\$ _____
F. PERCENT RETURN ON CAPITAL (Line E-3 \div Line D x 100).	
	_____ %

*If some of the pasture is from crop residues, use the opportunity cost of the residues to determine value.

How Does This Rate of Return on Capital Compare with Other Alternative Uses for This Same Money in the Farm Business; with Investment Opportunities Outside the Farm Business?

FORM D. DETERMINING PERCENT RETURN ON INVESTMENT PER BEEF COW UNIT

Example Farm

REQUIREMENTS	INVESTMENT
A. CATTLE	
1. Total Number in the Herd (See Form B, Line A-1)	<u>26</u>
2. Total Investment in Herd (See Form B, Line A-2)	<u>\$4,435.00</u>
3. Average Investment Per Head ($2 \div 1$)	<u>\$ 170.57</u>
B. BUILDINGS AND EQUIPMENT (Used by the Herd)	
1. Total Value of Buildings and Equipment (See Form B, Line B-3) . .	<u>\$1300.00</u>
2. Average Investment Per Head ($B-1 \div A-1$)	<u>\$ 50.00</u>
C. VALUE OF FEED NEEDED PER COW (Whether purchased or produced, priced at market value.)	
1. Roughage as Hay Equivalent: <u>1.5</u> Tons x \$ <u>16</u>	<u>\$ 24.00</u>
*2. Pasture as Hay Equivalent: <u>.35</u> Tons x \$ <u>7</u>	<u>\$ 24.50</u>
3. Protein, Salt, Minerals	<u>\$ 5.00</u>
4. Grain	<u>\$ 2.00</u>
5. Total Value Feed Needed Per Cow (Add Lines 1 through 4)	<u>\$ 55.50</u>
D. TOTAL AVERAGE INVESTMENT PER COW UNIT IN CATTLE, BUILDINGS, EQUIPMENT, AND FEED NEEDED ($A-3 + B-2 + C-5$)	
	<u>\$276.07</u>
E. EXPECTED NET RETURN ON THIS INVESTMENT	
1. Total Annual Returns Per Cow Unit (Form C, Line A-8)	<u>\$ 97.24</u>
2. Total Costs Per Cow Unit Excluding Interest on Investment	
Variable cost per cow unit \$ <u>77.49</u> (Form C, Line B-10) Minus	
interest on cow investment \$ <u>8.52</u> (Form C, Line B-8) equals	
\$ <u>68.97</u> Plus labor (Form C, Line B-13) \$ <u>8.00</u> equals	<u>\$ 76.97</u>
3. Expected Net Return on Investment (Line 1 minus Line 2)	<u>\$ 20.27</u>
F. PERCENT RETURN ON CAPITAL (Line E-3 \div Line D \times 100)	
	<u>7.3%</u>

*If some of the pasture is from crop residues, use the opportunity cost of the residues to determine value.

How Does This Rate of Return on Capital Compare with Other Alternative Uses for This Same Money in the Farm Business; with Investment Opportunities Outside the Farm Business?