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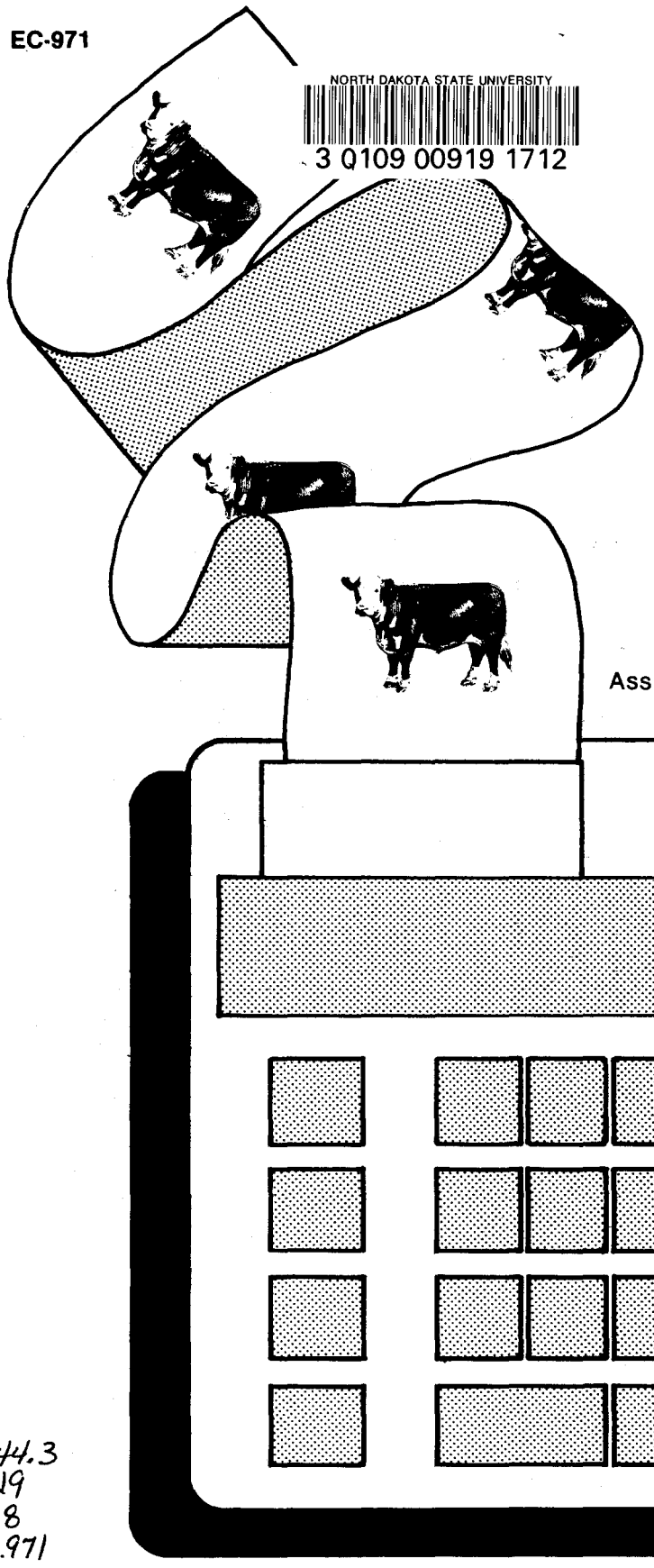

Preparing and Understanding A Beef Cow-Calf Enterprise Budget

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As the beef industry goes from the liquidation phase of the current cattle cycle into the expansion phase of the next cattle cycle, profitable production systems will change. Astute cattlemen will "push the pencil" looking for production and marketing alternatives that will make the most profit.

A very useful pencil pushing tool is an **enterprise budget.** An enterprise budget provides managers with a management worksheet that integrates the physical production and aspects details of a given enterprise. Beef-cow producers needs to have a working knowledge of a beef-cow enterprise budget and need to know how to use an enterprise budget as an essential money, management, and marketing tool.

Purpose

The purpose of this publication is to present a long-run enterprise budget for a herd of large-framed beef cows weaning 550-pound steer calves. A long-run planning period covering years 1988-1991 will be assumed. This budget will illustrate how production and economic concepts can be integrated into a single management guide. Emphasis throughout this publication will be on: (1) the integration of production and economic information into a management worksheet and (2) the recommended procedures for calculating opportunity costs and cash flow costs of production associated with a beef-cow herd.

A computerized spreadsheet template designed for county agents' microcomputers and/or producers' on-farm IBM compatable microcomputers accompanies this publication. A manual worksheet is provided in Appendix B for those cow-calf producers who do not have access to a microcomputer.

Budgets for Cash Flow Verses Opportunity Cost

This publication will illustrate two kinds of enterprise budgets that cow-calf producers should utilize. First, an "economic budget" based on opportunity costs will be presented. Second a "cash flow budget" based on out-of-pocket costs will be presented. It is essential to understand the distinction between opportunity costs and cash flow costs.

The economic budget is based on the assumption that the cow herd has to pay the "opportunity cost" of the resources used. That is, if the local elevator will pay $1.90 for oats, then the cow herd should be charged the $1.90 opportunity cost of the oats fed to the cow herd. This opportunity cost concept should be utilized for all resources depleted by the cow herd.

The "cash flow budget" calculates only the out-of-pocket costs that a beef cow producer incurs. For example, if the beef cow producer raises the oats fed to the cow herd, only the out-of-pocket production costs are charge to cash flow costs in the cow herd.

If the cow herd is being operated with equity capital, cash costs will generally be less than opportunity costs. If the cow herd is being operated with borrowed capital, cash costs will include both interest and principal payments and will generally be more than opportunity costs. Since each operation's equity position is different, each producer needs to tailor the beef-cow enterprise budget to his unique equity situation.

An Example Beef Cow-Calf Enterprise Budget

A beef cow enterprise budget is a management worksheet composed of production and marketing coefficients representing a specific level of production technology. Opportunity costs are assigned to the resources used and market prices are assigned to the products produced. The set of production coefficients and an associated set of economic prices make up an **enterprise budget.** Alternative production technologies can be evaluated by inserting different sets of production coefficients.

A beef cow enterprise budget should contain six sections. The six sections are: (1) description of the production technology and management ability assumed; (2) the products produced, the market prices assumed, and the projected revenue to the enterprise; (3) projected feed quantities digested plus quantity wasted and their economic cost; (4) projected livestock expenses; (5) projected fixed costs; and (6) a summary of the economic cost/returns and cash flow projection for the enterprise. Let's look in detail at each of the six recommended sections on a beef-cow enterprise budget.

1. Description

The description section should describe the production system and technology level being represented. An overall description of the production levels assumed should be included as an indicator of the management level being delineated.

Table 1 presents an example enterprise budget description for a large-framed beef cow-calf enterprise selling 550-pound weaned steer calves in the fall. Heifers were assumed to weigh 30 pounds less than steers at weaning time. As you can see, the size of the herd assumed and the associated production levels are expressed to establish the management level assumed in the enterprise budget.

Table 1. Beef Cow Herd Selling Weaned Calves in the Fall

Description
A spring calving 100-cow herd weaning 90 percent calf crop. Heifer calves weight 520 pounds and steer calves weight 550 pounds. Cow death loss of 1 percent and 15 percent cow culling rate. Heifer retention rate projected at 85 percent. Feed requirements include 100 cows and 19 replacement heifers. Assumed to have three bulls. Calves sold in the fall at 5-8 months old with 4 percent transit shrink. Cows on pasture 180 days with 30 days on the aftermath. Replacement heifers are assumed raised.

2. Receipts

This section should plainly express the products produced and the products sold. Each product is valued at the forecasted market price. The set of production coefficients presented in Table 2 are suggested by NDSU Extension Service animal science specialists as typical for North Dakota cattlemen producing 550-pound weaned steers. The planning prices for the 1988-1991 planning period are suggested by NDSU agricultural outlook economists.__1/

The planning prices are significantly higher than for the first seven years in the 80's. Current indications are that we are entering into a new price cycle that is projected to start another cattle cycle. Typically, gross returns are substantially higher for cow-calf producers in the early expansion phase of the cattle cycle. Projections are that this will again hold true for the rest of this decade.

Table 2 presents the specific production coefficients and planning prices assumed in this publication.

Table 2. Projected Annual Long-run Receipts - 100 Cow Herd

Steers	45 head	528 pounds	$.80 /lb =	$19,008
Heifers	26 head	499 pounds	$.75 /lb =	$ 9,800
Cull cows	14 head	900 pounds	$.45 /lb =	$ 5,670
Cull heifers	4 head	875 pounds	$.65 /lb =	$ 2,175
Cull bull	1 head	1700 pounds	$.50 /lb =	$ 850
		Total Income Per Herd		$37,503
		Total Income Per Cow		$ 375

__1/ Harlan Hughes, "Long-Range Planning Prices 1987-1991." NDSU Extension Service Publications, Fall 1987.

A beef cow herd has the capacity of generating income from the sale of five different potential products. These potential products are: (1) steer calves, (2) heifer calves, (3) cull cows, (4) cull replacement heifers, and (5) cull bulls. The projected average revenue for large framed cows over the 1987-1991 planning period is $375 per cow (see Table 2). This is significantly higher than what cattlemen have experienced in the first half of the 80s.

While Table 2 looks to be reasonably simple, it typically takes considerable time to assemble: (1) the production coefficients that best represent an individual herd and (2) the economic planning prices that best fit price expectations. While NDSU Extension Service has suggested values for both the production coefficients and planning prices, the ultimate coefficients and prices for your enterprise budget is up to you.

3. Feed Expenses

NDSU Extension Service has feed consumption data available for alternative feeding programs and has access to microcomputer software designed to help beef cow producers tailor a feeding program to their available feed supplies. Beef cow producers can access this feed planning assistance by contacting their local county agent.

The beef cow herd's feeding program should be divided into a summer grazing program and a winter feeding program. Table 3 illustrates a typical feeding program for a beef cow-calf herd denoting a summer and a winter feeding program. If fall and spring feeding programs are different, then these could also be expressed as discrete feeding programs.

Tables 3 through 11 present the opportunity costs on the right-hand side and cash flow costs on the left-hand side.

The beef cow producer who produces and harvests his own feed for the cow herd may well have cash feed costs significantly lower than the opportunity costs of feeds. Cash flow feed costs are projected to be $55 per cow while opportunity costs of feeds are projected to be $190 per cow. The $0.75 per bushel cash cost of producing oats and the $15 cash production cost per ton of producing hay are signficantly different than the opportunity costs assigned of $1.90 for oats and $45 for hay. As seen in Table 3, the opportunity cost of debt-free cattleman raising home-grown feeds can be approximately four times the cash flow costs for this same feed.

Table 3. Feed Expense

Cash Flow						Opportunity Cost
		180 Summer Pasture Program				
$ 372	$ .50	Pasture	743	AUMs	$ 7.00/AUM =	$ 5,204
$ 8	$ .50	Rpl. Hfrs.	.9	AUM/HD	$ 7.00/AUM =	$ 712
$ 395	$400.00	Min & Salt	.99	ton	$400.00/ton =	$ 395
		155 Day Winter Feeding Program				
$ 164	$ .75	Oats	218.0	bushels	$ 1.90/bu =	$ 414
$ 350	$140.00	Protein	2.5	ton	$140.00/ton =	$ 350
$3,750	$ 15.00	Hay	250.0	ton	$ 45.00/ton =	$11,250
$ 0	$ 10.00	Corn Sil	.0	ton	$ 13.00/ton =	$ 0
$ 0	$ 5.00	Oat Straw	.0	ton	$ 20.00/ton =	$ 0
$ 406	400	Min & salt	1.01	ton	$400.00/ton =	$ 406
$ 30	$ .01	Aftermath	30	days	$ .10/day =	$ 300
Heifer	Feed	included	14.39	Lbs DMI	$ 1.74/Cwt dry	N/A
		(BEEF GROWER DATA)				
$5,474		Total Feed Cost Per Herd				$19,030
$ 55		Feed Cost Per Cow				$ 190

4. Livestock Expenses

Forecasted livestock expenses vary with the number of cows in the herd and with the management and production levels assumed. The top section of Table 4 lists the suggested livestock expenses for a large-framed beef cow herd weaning 550-pound steer calves. Since all of these resources are purchased, the cash flow costs and opportunity costs are equal.

Breeding costs can be handled several different ways. One common way is to enter the cost of the bull as a flat breeding fee per cow. For example, one example budget showed a $10 breeding fee per cow.

An alternative for handling breeding costs was selected and is presented in the middle section of Table 4.

Breeding costs are calculated with the following factors:

1. Depreciation = (Purchase Price + salvage price)/Years of use
2. Interest = Going interest rate x original purchase cost__2/
3. Taxes = 0%
4. Insurance = 1% of purchase price annually

The opportunity cost of breeding is projected at $953 per 100 cows or $9.53 per cow.

Table 4. Livestock Expenses

Cash Flow				Opportunity Cost
$ 808		Vet and Medicine	$ 8.08/cow	$ 808
$ 350		Fly Tags	$ 3.50/cow	$ 350
$ 60		Bull Semen Check	$20.00/bull	$ 60
$ 238		Worm Cows & Heifers	$ 2.00/head	$ 238
$ 868		Utilities & Gen Farm	$ 8.68/cow	$ 868
$ 906		Power and Fuel	$ 9.06/cow	$ 906
$ 701		Miscellaneous	$ 7.01/cow	$ 701
$ 800		Marketing	$ 8.00/cow	$ 800
$4,731				$4,731
		Bull Depreciation		
	Loan			
	$0 total	a: purchase price	$1,750/bull	
Loan Pmt	12% APR	b: salvage value	$ 850	
$ 0	1 yr	c: years of use	3.00	$900
$ 53		d: insurance	1%	$ 53
$1,750	xxxx xxxxxx	e: cash pmt for new bulls		xxxxx
$ 0	$.00	Bedding	$2.00/cow	$200
$ 0	0%	Interest Feed & Lvsk	.00% @ 6 Mo	$ 0
$6,533		Total Livestock Costs		$5,883
$ 65		Livestock Costs Per Cow		$ 59

__2/ The bottom line of the suggested enterprise budget is the returns to labor, management, and equity capital. Therefore, no interest is charged for the bull investment capital.

Cash cost of breeding includes the property taxes (which are assumed to be zero in North Dakota) and a 1% charge for insurance. In addition, the cash cost of breeding includes the financial ownership of the bull. If the bull purchase is financed with borrowed capital, the loan repayments (both principal and interest) are considered cash costs; however, principal and interest costs are not considered opportunity costs. In this case, one bull, costing $1,750, is purchased for cash each year.

Since this example enterprise budget is for a debt-free herd, the purchase price of the one bull purchased annually comes out of equity capital. The purchase price ($1,750) and the insurance ($53) make up the projected $1,803 cash costs of breeding. The cash flow cost of breeding per cow is projected at $18.03 per cow.__3/

5. Fixed Expenses

Fixed expenses are the most difficult for most beef cow producers to specify and will vary the most from producer to producer. As an aid, fixed expense categories can be remembered by using the DIRTI formula. DIRTI stands for depreciation, interest, repairs, taxes, and insurance. Let's first look at a set of suggested fixed expenses to see what should be included.

The figures in Table 5 were used to enumerate the fixed opportunity costs associated with the buildings, equipment, and cows. Fixed expenses in Table 6 are divided into two primary categories. First, depreciation, repairs, taxes and insurance are included in one category, and interest on investment is segregated out into a second category. Since return to equity capital is considered in the bottom line of this budget, no interest charges are considered in the opportunity costs section of Table 6.

Table 5. DIRTI Factors for Fixed Costs

	Buildings	Equipment	Cows
Depreciation	5%	10%	——
Interest	6%(1/2)	6%(1/2)	12%
Repairs	1%	2%	——
Taxes__1/	0%	0%	0%
Insurance	1%	1%	1%
Sub-Total	13%	19%	12%
Total (excluding interest)	7%	13%	1%

__1/ Land taxes are charged to the crop/pasture enterprise and not to the cow herd.

Cash fixed costs associated with the buildings, equipment, and cows are different than fixed opportunity costs. First of all, depreciation is not a cash cost while all the other items in the DIRTI formula are cash costs. The left hand side of Table 6 presents the fixed cash costs assumed in this enterprise budget under the assumption that all the equipment, buildings, and cows are debt free. Financing charges (both principal and interest) are cash costs. A debt-free herd will have considerably lower cash fixed costs as compared to a highly leveraged herd.

Table 6. Fixed Expenses

Cash Flow	Depreciation, Repairs, Taxes & Insurance			Opportunity Cost
$100	2% Total Bldg. Invest.	$5,000	7%	$350
$300	3% Total Eqpt. Invest	$10,000	13%	$1,300
$700	1% Investment /cow	$700	1%	$700
$83	1% Heifer Investment	$550	1%	$104
$53	1% Bull Investment	$5,251	1%	$53
xxxxx	Total Inv/Cow	$1,006	xxxx	xxxxx

Loan Pmt.	Interest on Investment Capital At		Int. Rate	Years	Dollars
$0	$0 Total Bldg. Invest.	$5,000	12%	15	xxxx
$0	$0 Total Eqpt. Invest	$10,000	12%	10	xxxx
$0	$0 Investment/Cow $	$700	12%	7	xxxx
$0	$0 Investment/Heifer	$550	12%	1	xxxx
xxxxx	xxxx Average Bull Value	$1,300	12%	xxxx	xxxx
$1,235	Total Fixed Cost Per Herd				$2,506
$12	Total Fixed Costs Per Cow				$25

__3/ Please note that the cash income from the sale of cull bulls is included in the receipts section. If cash costs of breeding are adjusted for the projected $850 cull bull income, the cash costs of breeding is reduced to $9.53 per cow.

Fixed expenses vary considerably from producer to producer. Astute managers will be aware of the great variation in fixed costs from cow herd to cow herd and they will want to estimate their own unique fixed costs.

7. Economic Summary

This section summarizes all of the economic information presented in the previous sections into a cost/returns summary for the enterprise. The total receipts, opportunity costs, and cash flow costs are brought forward and summarized.

It is important to note that no charges have been entered for labor, management and equity capital; therefore, the bottom line in this enterprise budget for opportunity costs is the projected returns to labor, management, and capital. While this is a somewhat different approach from what economists customarily recommend, this approach may correspond more closely to how cattlemen think. Cattlemen do not typically pay themselves for labor, management, or equity capital, so projected returns to labor, management, and equity capital should be the bottom line of beef-cow enterprise budgets.

Table 7 indicates that a large-framed beef cow herd selling 550-pound weaned steer calves is projected to cover its opportunity costs of production and provide a returns to labor, management, and equity capital of $101 per cow (see Table 7). If all resources are paid their opportunity costs, then this enterprise is projected to return $101 per cow.

Positive returns to labor, management, and equity capital indicate that an existing large-framed cow herd weaning 550-pound steer calves is projected to be profitable over the next two to four years. It even suggests that it might even be profitable to expand the beef cow herd — at least with equity capital. Expansion with borrowed capital, however, needs to be more fully evaluated.

Adjustments for Multiple Products

The last section on this enterprise budget is designed to help livestock producers project: (1) their costs of production and (2) the overall debt repayment ability of their cow herd. Generally, we want to calculate the costs of production in terms of the primary units of product that are sold — in this case cwts of steer calves sold. The complication is that we are selling five different products — steer calves, heifer calves, cull cows, cull replacement heifers, and cull bulls. Cost allocation to specific products becomes very difficult in a beef-cow enterprise that produces up to five joint products.

Researchers have devised a procedure to help livestock producers alleviate this joint products problem 4/. They devised a method to calculate the "cwts of steer equivalents" produced and then all costs of production can be allocated to these steer equivalents. Let's apply the steer calf equivalents concept to this beef-cow enterprise.

Table 2 indicates that this enterprise is projected to bring in a total of $37,503 from the five joint products produced. Taking this total income and dividing it by the price of the primary product, in this case steer calves, gives the "cwt's of steer equivalents" produced in this enterprise. In this case:

Cwt Steer Equivalents = $37,503 divided by $80.00 /cwt
= $468.79

Table 7. Cost/Return Summary

Cash Flow		Opportunity Cost
$37,503	Receipts	$37,503
$12,007	Less Feed and Livestock Expenses	$24,913
$25,496	Returns Above Variable Costs	$12,590
$1,235	Less Fixed Expenses	$2,506
$24,261	Returns to Labor & Mgt. & Equity Capital Per Herd	$10,084
xxxxxx	Total Receipts Per Cow	$375.03
xxxxxx	Total Expenses Per Cow	$274.19
xxxxxx	Returns to Labor & Mgt. & Equity Capital Per Cow	$100.84

4/ Harlan Hughes, Arlin Brannstrom, and Robert Luening, "Costs of Producing Milk On Wisconsin's Electronic Farm Record (EFR) Dairy Research Farm in 1974", Ag Economics Staff Paper No. 100, Department of Agricultural Economics, University of Wisconsin, June 1975.

This is interpreted to mean that this beef cow herd is projected to produce an income equal to the sale of 469 cwt of steer calf equivalents. All production costs can be attributed to this 469 cwts of production and a cost per cwt can be calculated. In this case the projected opportunity cost of production is the sum of feed costs, livestock costs and the fixed costs; therefore,

Total Costs of Production (excluding labor, management, and equity capital) = $19,030 + $5,883 + $2,506
= $27,419

Cost of producing a cwt of steer equivalent (excluding labor, management, and equity capital) can then be calculated as:

Cost per Cwt Produced = $27,419 divided by 468.79
= $58.49 per Cwt Steer Equivalent

With the assumed $80 planning price for the next four-year planning period, this budget projects a returns to labor, management, and equity capital of $21.51 per steer equivalent. This kind of projected return almost guarantees that many cattlemen will expand their herds. This is one more indicator that the liquidation phase of the nation's beef cow herd for the current cattle cycle will end and that another cattle cycle will begin in 1988.

For certain types of management questions it is desirable to calculate only the variable cost associated with production. Variable costs are those costs that are directly related to the production level of the enterprise. If production is halted, then these costs would be reduced to zero. In this case:

Variable Costs = Feed Costs + Livestock Costs
= $19,030 + $5,883
= $24,913

Variable costs of production per cwt of steer calf equivalent can easily be calculated by:

Variable Costs Of Production = $24,913 divided by 468.79
= $53.14

This means that if resources were paid their opportunity costs, this livestock producer would need to receive $53.14 per cwt for this steer calves to cover variable costs of production. While this figure may seem low by historic standards, its low value is due to: (1) above average weaning weights and (2) relatively low forage costs.

The cash costs of production can also be summarized using cwt of steer equivalents. In this case, the costs used are the cash variable and cash total costs. Cash costs of production are projected at $25.61 for feed and livestock costs and $28.25 for total costs (excluding labor, management, and equity capital). These results are presented on the left hand side of Table 8. After deducting $10,000 for family living draw, $14,261 is projected to be left over to pay additional debt per cow. This comes to $142 per cow available for additional debt repayment.

Budget For Weaning 450-Pound Steer Calves With Medium-Framed Cows

Medium-framed beef cows typically produce 425 to 475-pound weaned steer calves. An enterprise budget for a typical medium beef cow herd producing 450-pound steer calves is presented in Appendix C. Readers interested in a budget for medium-framed cows are encouraged to consult the budget in Appendix C.

Summary

Economic costs will vary from producer to producer but can be predicted, to some degree, for a region or state. Cash costs, on the other hand, are highly influenced by the financial strategies of the individual producer and are impossible to predict.

The complete enterprise budget developed in this publication for large-framed cows is presented in Table 9. Rather than utilizing the numbers in this publication beef cow producers should generate their own enterprise budgets. Creating your own beef-cow enterprise budget will prove to be considerably more useful than using the one provided in this publication.

Table 8. Adjustments For Multiple Products

Cash Flow		Opportunity Cost
$468.79	Cwts of steer equivalents sold	$468.79
$80.00	Receipts Per Steer Equivalent	$80.00
$25.61	Cost Per Hundred Weight Steer Eq. Sold (Variable)	$53.14
$28.25	Cost Per Hundred Weight Steer Eq. Sold (All Costs)	$58.49
xxxxx	Returns To Labor, Mgt., & Eq. Cap/Steer Eq.	$21.51
$10,000	Family Living To Be Supported From Cow Herd	xxxxx
$14,261	Cash Available To Pay Debt From Herd	xxxxx
$142.61	Cash Available To Pay Debt Per Cow	xxxxx

Source: **Cow-Calf. Cal on Disk #24.**

A worksheet for utilizing your on-farm microcomputer or your local county extension agent's microcomputer to generate beef cow budgets is presented in Appendix A. Worksheets for manually generating the budget are presented in Appendix B. Hopefully, this publication and its associated SuperCalc 3 and /or Lotus 1-2-3 spreadsheet templates will make it easier for North Dakota beef cow producers to generate their own beef cow enterprise budgets. The person that generates the budget gains the most useful management assistance; therefore, we recommend that you, the manager, do the budgeting and do not delegate it to another person.

Table 9. Beef Cow Herd Selling Calves In Fall 1988-91 Long Run Date: 12/18/87

Description

A spring calving 100-cow herd weaning 90% calf crop. Heifer calves weigh 520 lbs. & steer calves weigh 550 lbs. Cow death loss of 1% rate and 15% cow culling rate. Heifer retention 90%. Actual retention rate is 85%. Feed requirements include 100 cows and 19 replacement heifers. Assumed to have 3 bulls. Calves sold in the fall at 5-8 months old with 4% transit shrink. Cows on pasture 180 days with 30 days on aftermath. Replacement heifers are assumed raised.

Receipts

Steers	45 head	528 pounds	$.80 /lb. =	$19,008
Heifers	26 head	499 pounds	$.75 lb. =	$9,800
Cull Cows	14 head	900 pounds	$.45 lb. =	$5,670
Cull Hfrs.	4 head	875 pounds	$.65 /lb. =	$2,175
Cull Bull	1 head	1700 pounds	$.50 /lb. =	$850
		Total Income Per Herd		$37,503
		Total Income Per Cow		$375

Feed Expense

Cash Flow					Opportunity Cost
		180 Summer Pasture Program			
$372	$.50	Pasture	743 AUMs	$7.00/AUM =	$5,204
$8	$.50	Rpl. Hfrs.	.9 AUM/HD	$7.00/AUM =	$712
$395	$400.00	Min&salt	.99 ton	$400.00/ton =	$395
		155 Day Winter Feeding Program			
$164	$.75	Oats	218.0 bushels	$1.90/bu. =	$414
$350	$140.00	Protein	2.5 ton	$140.00/ton =	$350
3,750	$15.00	Hay	250.0 ton	$45.00/ton =	$11,250
$0	$10.00	Corn Sil	.0 ton	$13.00/ton =	$0
$0	$5.00	at Straw	.0 ton	$20.00/ton =	$0
$406	400	Min&salt	1.01 ton	$400.00/ton =	$406
$30	$.01	Aftermath	30 days	$.10/day =	$300
Heifer	Feed	Included	14.39 Lbs. DMI	1.74/Cwt Dry	N/A
		(BEEF GROWER DATA)			
$5,474		Total Feed Cost Per Herd			$19,030
$55		Feed Cost Per Cow			$190

Livestock Expenses

Cash Flow			Opportunity Cost
$808	Vet and Medicine	$8.08 / cow	$808
$350	Fly Tags	$3.50 / cow	$350
$60	Bull Semen Check	$20.00 / bull	$60
$238	Worm Cows & Heifers	$2.00 / head	$238
$868	Utilities & Gen Farm	$8.68 / cow	$868
$906	Power and Fuel	$9.06 / cow	$906
$701	Miscellaneous	$7.01 / cow	$701
$800	Marketing	$8.00 / cow	$800
$4,731			$4,731

Bull Depreciation

Loan Pmt.	Loan $0 total 12% APR 1 yrs.			
$0		a: purchase price	$1,750 / bull	
$53		b: salvage value	$850	
$1,750	xxxx xxxxx	c: years of use	$3.00	$900
		d: insurance	1%	$53
		e: cash pmt. for new bulls		xxxxx
$0	$.00	Bedding	$2.00 / cow	$200
$0	0%	Interest Feed & Lvsk.	.00% @ 6 Mo.	$0
$6,533		Total Livestock Costs		$5,883
$65		Livestock Costs Per Cow		$59

Fixed Expenses

Cash Flow					Opportunity Cost
	Depreciation, Repairs, Taxes & Insurance				
$100	2% Total Bldg. Invest.	$5,000	7%		$350
$300	3% Total Eqpt. Invest.	$10,000	13%		$1,300
$700	1% Investment /cow	$700	1%		$700
$83	1% Heifer Investment	$550	1%		$104
$53	1% Bull Investment	$5,251	1%		$53
xxxxx	Total Inv/Cow	$1,006	xxxx		xxxxx
Loan Pmt.	**Interest on Investment**	**Capital At**	**Int. Rate**	**Years**	**Dollars**
$0	$0 Total Bldg. Invest.	$5,000	12%	15	xxxx
$0	$0 Total Eqpt. Invest.	$10,000	12%	10	xxxx
$0	$0 Investment/Cow $	$700	12%	7	xxxx
$0	$0 Investment/Heifer	$550	12%	1	xxxx
xxxxx	xxxx Average Bull Value	$1,300	12%	xxxx	xxxx
$1,235	Total Fixed Cost Per Head				$2,506
$12	Total Fixed Costs Per Cow				$25

Cost/Return Summary

Cash Flow		Opportunity Cost
$37,503	Receipts	$37,503
$12,007	Less Feed and Livestock Expenses	$24,913
$25,496	Returns Above Variable Costs	$12,590
$1,235	Less Fixed Expenses	$2,506
$24,261	Returns to Labor & Mgt. & Equity Capital Per Herd	$10,084
$375.03	Total Receipts Per Cow	$375.03
$132.42	Total Expenses Per Cow	$274.19
$242.61	Returns to Labor & Mgt. & Equity Capital Per Cow	$100.84

Adjustments For Multiple Products

Cash Flow		Opportunity Cost
468.79	Cwts of steer equivalents sold	468.79
$80.00	Receipts Per Steer Equivalent	$80.00
28.25	Cost Per Hundred Weight Sold (All Costs)	$58.49
xxxxx	Returns To Labor, Mgt. & Eq. Cap/Steer Eq.	$21.51
$10,000	Family Living To Be Supported From Cow Herd	xxxxxx
$14,261	Cash Available To Pay Debt From Herd	xxxxxx
$142.61	Cash Available To Pay Debt Per Cow	xxxxxx

Source: **Cow-Calf Cal on Disk #24.**

Analyzing The Debt Carrying Capacity Of The Herd

Let's assume that the same cow herd presented in Part II of this publication has been financed with borrowed capital and that the cow herd has $700 debt per cow. Let's further assume that this debt is financed for 7 years at 12% interest and that $10,000 is to be withdrawn for family living.

If the debt described above is assumed to be an amortized loan over the seven year period, the annual payment (principal and interest) per cow will be $153.38 per year. This gives a total debt payment for the herd (principal and interest) of $15,380 per year. Since debt payment is a cash cost, cash costs of the herd would increase $15,380 over the cash cost of the debt free herd presented in Part II. Economic costs would not change. Table 10 presents the affected cash flow sections.

As reflected in Table 10, this additional debt does affect the net cash available — the bottom line — of the enterprise budget. The projected cash available after deducting $10,000 family living draw and servicing a $700 debt per cow is a minus $1,077 for the 100 cow herd. This averages out to minus $10.77 per cow. This means that either $1077 dollars will need to be obtained from another enterprise or family living draw will need to be reduced $1077.

Table 10. Cash Flow Impact Of $700 Debt Per Cow

Cash Flow					Opportunity Cost
	Depreciation, Repairs, Taxes & Insurance				
$100	2% Total Bldg. Invest.	$5,000	7%		$350
$300	3% Total Eqpt. Invest.	$10,000	13%		$1,300
$700	1% Investment/cow	$700	1%		$700
$83	1% Heifer Investment	$550	1%		$104
$53	1% Bull Investment	$5,251	1%		$53
xxxxx	Total Inv/Cow	$1,006	xxxx		xxxxx
Loan Pmt.	**Interest on Investment**	**Capital At**	**Int. Rate**	**Years**	**Dollars**
$0	$0 Total Bldg Invest.	$5,000	12%	15	xxxx
$0	$0 Total Eqpt. Invest.	$10,000	12%	10	xxxx
$15,338	$700 Investment/Cow $	$700	12%	7	xxxx
$0	$0 Investment/Heifer	$550	12%	1	xxxx
xxxxx	xxxx Average Bull Value	$1,300	12%	xxxx	xxxx
$16,573	Total Fixed Cost Per Herd				$2,506
$166	Total Fixed Costs Per Cow				$25

Cost/Return Summary

Cash Flow		Opportunity Cost
$37,503	Receipts	$37,503
$12,007	Less Feed and Livestock Expenses	$24,913
$25,496	Returns Above Variable Costs	$12,590
$16,573	Less Fixed Expenses	$2,506
$8,923	Returns to Labor & Mgt. & Equity Capital Per Herd	$10,084
$375.03	Total Receipts Per Cow	$375.03
285.80	Total Expenses Per Cow	$274.19
$89.23	Returns to Labor & Mgt. & Equity Capital Per Cow	$100.84

Adjustments For Multiple Products

Cash Flow		Opportunity Cost
468.79	Cwts of steer equivalents sold	468.79
$80.00	Receipts Per Steer Equivalent	$80.00
$60.97	Cost Per Hundred Weight Sold (All Costs)	$58.49
xxxxx	Returns To Labor, Mgt. & Eq. Cap/Steer Eq.	$21.51
$10,000	Family Living To Be Supported From Cow Herd	xxxxxx
$-1,077	Cash Available To Pay Debt From Herd	xxxxxx
$-10.77	Cash Available To Pay Debt Per Cow	xxxxxx

Source: **Cow-Calf. Cal on Disk #24.**

Computerization Of This Beef Cow-Calf Enterprise Budget

One of the desirable features of having an enterprise budget is being able to change the production coefficients and/or economic planning prices to study their projected impact on the enterprise's bottom line. The arithmetic of doing these "what if's" can get very long and tedious; therefore, it seems logical to put this enterprise budget onto a microcomputer.

This beef-cow enterprise budget has been set up as a SuperCalc template as well as a Lotus 1-2-3 template so that cattlemen with MS-DOS microcomputers equipped with commercial SuperCalc or Lotus 1-2-3 software can load and use the template. A user with a microcomputer can load the completed budget, make changes in the budget, and print out a new budget. The SuperCalc 3 and Lotus templates are available from Extension Computer Services, NDSU Extension Service and can be ordered through your local county agent.

A producer equipped with an on-farm MS-DOS microcomputer and this template can easily experiment with "what if's" to evaluate differ production and marketing strategies with the microcomputer. We refer to these experiments on paper as "what if" questions. For example, "what if" I change my feeding program to another set of feeds, what will be the projected bottom line for my enterprise? The appropriate feed coefficients are changed and the new enterprise budget is immediately calculated.

Typically, beef cow managers will ask several "what if" questions in any given computer session. While the computer does not do anything that the beef-cow producer could not do by hand, the microcomputer speeds up the arithmetic allowing the producer to concentrate on obtaining the input numbers used and interpreting of the output numbers.

APPENDIX A

COMPUTER WORKSHEET FOR COW-CALF SPREADSHEET

_____FRAMED BUDGET

BEEF COW HERD SELLING WEANED CALVES IN FALL _____ _____-RUN
DATE: _____

Description

A _____ cow herd weaning _____% calf crop. Heifer calves weighing _____ lbs. and steer calves weighing _____ lbs. Cow death loss of _____% rate and _____% cow culled each year. Heifer retention _____%. Feed requirements include _____ cows and _____ replacement heifers and _____ bulls. Calves sold in the fall at _____ months old and with a _____% transit shrink. Cows on pasture _____ days with _____ days addition on aftermath. Replacement heifers assumed raised.

Receipts

Steers	xxxxx head	xxxxx pounds	$.____/lb. =	xxxxx
Heifers	xxxxx head	xxxxx pounds	$.____/lb. =	xxxxx
Cull Cows	xxxxx head	_____ pounds	$.____/lb. =	xxxxx
Cull Hfrs.	xxxxx head	_____ pounds	$.____/lb. =	xxxxx
Cull Bull	xxxxx head	_____ pounds	$.____/lb. =	xxxxx
		Total Income Per Herd		xxxxx
		Total Income Per Cow		xxxxx

Feed Expense

Cash Flow				Opportunity Cost
		180 Summer Pasture Program		
xxxxx	$_____Pasture	xxxxx AUMs	$_____/AUM =	xxxxx
xxxxx	$_____Rpl. Hfrs.	xxxxx AUM/HD	$_____/AUM =	xxxxx
$395	$_____Min & Salt	_____ton	$_____/ton =	xxxxx
		_____Day Winter Feeding Program		
xxxxx	$_____Oats	_____bushels	$_____/bu =	xxxxx
xxxxx	$_____Protein	_____ton	xxxxx/ton =	xxxxx
xxxxx	$_____Hay	_____ton	$_____/ton =	xxxxx
xxxxx	$_____Corn Sil	_____ton	$_____/ton =	xxxxx
xxxxx	$_____Oat Straw	_____ton	$_____/ton =	xxxxx
xxxxx	$_____Min & Salt	_____ton	$_____/ton =	xxxxx
xxxxx	$_____Aftermath	_____days	$_____/day =	xxxxx
Heifer	Feed Included	_____Lbs. DMI	$_____/Cwt Dry	xxxxx
		(BEEF GROWER DATA)		
xxxxx		Total Feed Cost Per Herd		xxxxx
xxxxx		Feed Cost Per Cow		xxxxx

Livestock Expenses

Cash Flow				Opportunity Cost
xxxxx		Vet and Medicine	$_____/cow	xxxxx
xxxxx		Fly Tags	$_____/cow	xxxxx
xxxxx		Bull Semen Check	$_____/bull	xxxxx
xxxxx		Worm Cows & Heifers	$_____/head	xxxxx
xxxxx		Utilities & Gen. Farm	$_____/cow	xxxxx
xxxxx		Power and Fuel	$_____/cow	xxxxx
xxxxx		Miscellaneous	$_____/cow	xxxxx
xxxxx		Marketing	$_____/cow	xxxxx
xxxxx				xxxxx

Bull Depreciation

	Loan			
	$_____total	a: purchase price	$_____/bull	
Loan Pmt.	____% APR	b: salvage value	$_____	
xxxxx	_____yrs.	c: years of use	_____	xxxxx
xxxxx		d: insurance	_____%	xxxxx
xxxxx	xxxx xxxxxx	e: cash pmt. for new bulls		xxxxx
xxxxx	$_____	Bedding	$_____/cow	xxxxx
xxxxx	_____%	Interest Feed & Lvsk.	_____% @ 6 Mo.	xxxxx
xxxxx		Total Livestock Costs		xxxxx
xxxxx		Livestock Costs Per Cow		xxxxx

Fixed Expenses

Cash Flow					Opportunity Cost
	Depreciation, Repairs, Taxes & Insurance				
xxxxx	2% Total Bldg. Invest.	$_____	7%		xxxxx
xxxxx	3% Total Eqpt. Invest.	$_____	13%		xxxxx
xxxxx	1% Investment/Cow	$_____	1%		xxxxx
xxxxx	1% Heifer Investment	$_____	1%		xxxxx
xxxxx	1% Bull Investment	$_____	1%		xxxxx
xxxxx	Total Inv/Cow	$_____	xxxx		xxxxx
Loan Pmt.	Interest on Investment	Capital At	Int. Rate	Years	Dollars
xxxxx	$_____Total Bldg. Invest.	$_____	12%	_____	xxxx
xxxxx	$_____Total Eqpt. Invest.	$_____	12%	_____	xxxx
xxxxx	$_____Investment/Cow	$_____	12%	_____	xxxx
xxxxx	$_____Investment/Heifer	$_____	12%	_____	xxxx
xxxxx	$_____Average Bull Value	$_____	12%	xxxx	xxxx
xxxxx		Total Fixed Cost Per Herd			xxxxx
xxxxx		Total Fixed Costs Per Cow			xxxxx

Cost/Return Summary

Cash Flow		Opportunity Cost
xxxxx	Receipts	xxxxx
xxxxx	Less Feed and Livestock Expenses	xxxxx
xxxxx	Returns Above Variable Costs	xxxxx
xxxxx	Less Fixed Expenses	xxxxx
xxxxx	Returns to Labor & Mgt., & Equity Capital Per Herd	xxxxx
xxxxx	Total Receipts Per Cow	xxxxx
xxxxx	Total Expenses Per Cow	xxxxx
xxxxx	Returns to Labor & Mgt., & Equity Capital Per Cow	xxxxx

Adjustments For Multiple Products

Cash Flow		Opportunity Cost
xxxxx	Cwts. of steer equivalents sold	xxxxx
xxxxx	Receipts Per Steer Equivalent	xxxxx
xxxxx	Cost Per Hundred Weight Sold (All Costs)	xxxxx
xxxxx	Returns To Labor, Mgt., & Eq. Cap/Steer Eqp.	xxxxx
$_____	Family Living To Be Supported From Cow Herd	xxxxxx
xxxxx	Cash Available To Pay Debt From Herd	xxxxxx
xxxxx	Cash Available To Pay Debt Per Cow	xxxxxx

Source: **Cow-Calf. Cal on Disk #24.**

APPENDIX B

MANUAL BEEF-COW HERD BUDGET WORKSHEET

_____FRAMED BUDGET

BEEF COW HERD SELLING WEANED CALVES IN FALL _____ _____-RUN
DATE: _____

Description

A _____ cow herd weaning _____% calf crop. Heifer calves weighing _____ lbs. and steer calves weighing _____ lbs. Cow death loss of _____% rate and _____% cow culled each year. Heifer retention _____%. Feed requirements include _____ cows and _____ replacement heifers and _____ bulls. Calves sold in the fall at _____ months old and with a _____% transit shrink. Cows on pasture _____ days with _____ days addition on aftermath. Replacement heifers assumed raised.

Receipts

Steers	_____ head	_____ pounds	$____/lb. =	$_____
Heifers	_____ head	_____ pounds	$____/lb. =	_____
Cull Cows	_____ head	_____ pounds	$____/lb. =	_____
Cull Hfrs.	_____ head	_____ pounds	$____/lb. =	_____
Cull Bull	_____ head	_____ pounds	$____/lb. =	_____
		Total Income Per Herd		$_____
		Total Income Per Cow		_____

Feed Expense

Cash Flow				Opportunity Cost
		180 Summer Pasture Program		
$_____	$_____Pasture	_____ AUMs	$_____/AUM =	$_____
$_____	$_____Rpl. Hfrs.	_____ AUM/HD	$_____/AUM =	_____
$_____	$_____Min & Salt	_____ ton	$_____/TON =	_____
		_____Day Winter Feeding Program		
$_____	$_____Oats	_____bushels	$_____/bu =	$_____
$_____	$_____Protein	_____ton	$_____/ton =	$_____
$_____	$_____Hay	_____ton	$_____/ton =	$_____
$_____	$_____Corn Sil	_____ton	$_____/ton =	$_____
$_____	$_____Oat Straw	_____ton	$_____/ton =	$_____
$_____	$_____Min & Salt	_____ton	$_____/ton =	$_____
$_____	$_____Aftermath	_____days	$_____/day =	$_____
Heifer	Feed Included	_____Lbs. DMI	$_____/Cwt Dry	N/A
		(BEEF GROWER DATA)		
$_____		Total Feed Cost Per Herd		$_____
$_____		Feed Cost Per Cow		$_____

Livestock Expenses

Cash Flow				Opportunity Cost
$_____		Vet and Medicine	$_____/cow	$_____
$_____		Fly Tags	$_____/cow	$_____
$_____		Bull Semen Check	$_____/bull	$_____
$_____		Worm Cows & Heifers	$_____/head	$_____
$_____		Utilities & Gen. Farm	$_____/cow	$_____
$_____		Power and Fuel	$_____/cow	$_____
$_____		Miscellaneous	$_____/cow	$_____
$_____		Marketing	$_____/cow	$_____
$_____				$_____
_____				_____
$4,493				$4,493

Bull Depreciation

	Loan			
	$_____total	a: purchase price	$_____/bull	
Loan Pmt.	_____% APR	b: salvage value	$_____	
$_____	_____yrs.	c: years of use	_____	$_____
$_____		d: insurance	_____%	$_____
$_____	xxxx xxxxxx	e: cash pmt. for new bulls		xxxxx
$_____	$_____	Bedding	$_____/cow	$_____
$_____	_____%	Interest Feed & Lvsk.	_____% @ 6 Mo.	$_____
$_____		Total Livestock Costs		$_____
$_____		Livestock Costs Per Cow		$_____

Fixed Expenses

Cash Flow					Opportunity Cost
	Depreciation, Repairs, Taxes & Insurance				
$_____	2% Total Bldg. Invest.	$_____	7%		$_____
$_____	3% Total Eqpt. Invest	$_____	13%		$_____
$_____	1% Investment/Cow	$_____	1%		$_____
$_____	1% Heifer Investment	$_____	1%		$_____
$_____	1% Bull Investment	$_____	1%		$_____
xxxxx	Total Inv/Cow	$_____	xxxx		xxxxx
Loan Pmt.	Interest on Investment	Capital At	Int. Rate	Years	Dollars
$_____	$_____Total Bldg. Invest.	$_____	12%	15	xxxx
$_____	$_____Total Eqpt. Invest.	$_____	12%	10	xxxx
$_____	$_____Investment/Cow	$_____	12%	7	xxxx
$_____	$_____Investment/Heifer	$_____	12%	1	xxxx
xxxxx	xxxx Average Bull Value	$_____	12%	xxxx	xxxx
$_____		Total Fixed Cost Per Herd			$_____
$_____		Total Fixed Costs Per Cow			$_____

Cost/Return Summary

Cash Flow		Opportunity Cost
$_____	Receipts	$_____
$_____	Less Feed and Livestock Expenses	$_____
$20,768	Returns Above Variable Costs	$_____
$1,178	Less Fixed Expenses	$_____
$_____	Returns to Labor & Mgt., & Equity Capital Per Herd	$_____
$_____	Total Receipts Per Cow	$_____
$_____	Total Expenses Per Cow	$_____
$_____	Returns to Labor & Mgt., & Equity Capital Per Cow	$_____

Adjustments For Multiple Products

Cash Flow		Opportunity Cost
$_____	Cwts. of steer equivalents sold	$_____
$_____	Receipts Per Steer Equivalent	$_____
$_____	Cost Per Hundred Weight Sold (All Costs)	$_____
xxxxxx	Returns To Labor, Mgt., & Eq. Cap/Steer Eqp.	xxxxxx
$_____	Family Living To Be Supported From Cow Herd	xxxxxx
$_____	Cash Available To Pay Debt From Herd	xxxxxx
$_____	Cash Available To Pay Debt Per Cow	xxxxxx

Source: **Cow-Calf. Cal on Disk #24.**

APPENDIX C

MEDIUM-FRAMED BEEF COW BUDGET
WEANING 450-POUND STEER CALVES

BEEF COW HERD SELLING WEANED CALVES IN FALL 1987-91 LONG-RUN
DATE: 5/14/88

Description

A spring calving 100-cow herd weaning 90% calf crop. Heifer calves weigh 420 lbs. and steer calves weigh 450 lbs. Cow death loss of 1% rate and 15% cow culling rate. Suggested conception 85% Feed requirements include 100 cows and 19 replacement hfrs. 3 bulls. Calves sold in the fall at 5-8 months old with a 4% transit shrink. Cows on pasture 180 days with 30 days addition on aftermath. Assumed that replacement heifers are raised.

Receipts

Steers	45 head	432 pounds	$.80/lb. =	$15,552
Heifers	26 head	403 pounds	$.75/lb. =	$7,916
Cull Cows	14 head	900 pounds	$.45/lb. =	$5,670
Cull Hfrs.	4 head	875 pounds	$.65/lb. =	$2,175
Cull Bull	1 head	1700 pounds	$.50/lb. =	$850
		Total Income Per Herd		$32,162
		Total Income Per Cow		$322

Feed Expense

Cash Flow					Opportunity Cost
		180 Summer Pasture Program			
$372	$.50	Pasture	743 AUMs	$7.00/AUM =	$5,204
$8	$.50	Rpl. Hfrs.	.9 AUM/HD	$7.00/AUM =	$712
$395	$400.00	Min&salt	.99 ton	$400.00/ton =	$395
		155 Day Winter Feeding Program			
$164	$.75	Oats	218.0 bushels	$1.90/bu =	$414
$350	$140.00	Protein	2.5 ton	$140.00/ton =	$350
$3,375	$15.00	Hay	225.0 ton	$45.00/ton =	$10,125
$0	$10.00	Corn Sil	.0 ton	$13.00/ton =	$0
$0	$5.00	Oat Straw	.0 ton	$20.00/ton =	$0
$406	$400.00	Min & Salt	1.01 ton	$400.00/ton =	$406
$30	$.01	Aftermath	30 days	$.10/day =	$300
Heifer	Feed Included		14.25 Lbs. DMI	$2.56 $/cwt dry	xxxx
		(BEEF GROWER DATA)			
$5,099			Total Feed Cost Per Head		$17,905
$51			Feed Cost Per Cow		$179

Livestock Expenses

Cash Flow				Opportunity Cost
$808		Vet and Medicine	$8.08/cow	$808
$350		Fly Tags	$3.50/cow	$350
$60		Bull Semen Check	$20.00/bull	$60
$0		Worm Cows & Heifers	$.00/head	$0
$868		Utilities & Gen. Farm	$8.68/cow	$868
$906		Power and Fuel	$9.06/cow	$906
$701		Miscellaneous	$7.01/cow	$701
$800		Marketing	$8.00/cow	$800
$4,493				$4,493
		Bull Depreciation		
	Loan			
	$0 total	a: purchase price	$1,750/bull	
Loan Pmt.	12% APR	b: salvage value	$850	
$0	1 year	c: years of use	3.00	$900
$53		d: insurance	1%	$53
$1,750	xxxx xxxxxx	e: cash pmt. for new bulls		xxxxx
$0	$.00	Bedding	$2.00/cow	$200
$0	0%	Interest Feed & Lvsk.	.00% @ 6 Mo.	$0
$6,296			Total Livestock Costs	$5,646
$63			Livestock Costs Per Cow	$56

Fixed Expenses

Cash Flow					Opportunity Cost
	Depreciation, Repairs, Taxes & Insurance				
$100	2% Total Bldg. Invest.	$5,000	7%		$350
$300	3% Total Eqpt. Invest.	$10,000	13%		$1,300
$650	1% Investment/Cow	$650	1%		$650
$105	1% Heifer Investment	$700	1%		$132
$53	1% Bull Investment	$5,251	1%		$53
xxxxx	Total Inv/Cow	$984	xxxx		xxxxx
Loan Pmt.	Interest on Investment	Capital At	Int. Rate	Years	Dollars
$0	$0 Total Bldg. Invest.	$5,000	12%	15	xxxx
$0	$0 Total Eqpt. Invest.	$10,000	12%	10	xxxx
$0	$0 Investment/Cow	$650	12%	7	xxxx
$0	$0 Investment/Heifer	$700	12%	1	xxxx
xxxx	xxxx Average Bull Value	$1,300	12%	xxxx	xxxx
$1,208		Total Fixed Cost Per Herd			$2,484
$12		Total Fixed Costs Per Cow			$25

Cost/Return Summary

Cash Flow		Opportunity Cost
$32,162	Receipts	$32,162
$11,394	Less Feed and Livestock Expenses	$23,550
$20,768	Returns Above Variable Costs	$8,612
$1,208	Less Fixed Expenses	$2,484
$19,560	Returns to Labor & Mgt., & Equity Capital Per Herd	$6,128
$321.62	Total Receipts Per Cow	$321.62
$126.02	Total Expenses Per Cow	$260.34
$195.60	Returns to Labor & Mgt., & Equity Capital Per Cow	$61.28

Adjustments For Multiple Products

Cash Flow		Opportunity Cost
$402.03	Hundredweights Of Steer Equivalents Sold	$402.03
$80.00	Receipts Per Steer Equivalent	$80.00
$31.35	Cost Per Hundredweight Sold (All Costs)	$64.76
xxxxx	Returns To Labor, Mgt., & Eq. Cap/Steer Eqp.	$15.24
$10,000	Family Living To Be Supported From Cow Herd	xxxxxx
$9,560	Cash Available To Pay Debt From Herd	xxxxxx
$95.60	Cash Available To Pay Debt Per Cow	xxxxxx

Source: **Cow-Calf. Cal on Disk #24.**

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