

AGRIBUSINESS MANAGEMENT CONTEST

2006 Career Development Events in Agriculture
Kansas State University, Manhattan, Kansas

PROBLEMS SECTION - KEY

For the following problems, place your answer for each question in the corresponding numbered space on the answer card. Computations may be done in the margins or on the back of this paper, but not on the card. Each question is worth five (5) points. There is only one correct answer for each question.

Problem I - BALANCE SHEET AND ANALYSIS

Use the following beginning and ending Balance Sheet for Mrs. Nettie Worth when answering questions 1 through 12.

Balance Sheet for Mrs. Nettie Worth, Rodeo Ranch, Wildparty, Kansas.

	12/31/01	12/31/02
<u>Assets</u>		
Current Assets		
Cash/Checking	\$ 5,001	\$ 6,624
Inventories		
Crops and Feed	\$ 12,325	\$ 9,951
Market Livestock	\$ 31,702	\$ 39,000
Supplies	\$ 4,156	\$ 5,006
Prepaid Expenses	<u>\$ 342</u>	<u>\$ 2,346</u>
Total Current Assets	\$ 53,526	\$ 62,927
Non-Current Assets		
Breeding Livestock	\$ 59,720	\$ 70,748
Machinery and Equipment	\$ 56,192	\$ 53,992
Buildings and Improvements	\$ 49,700	\$ 50,950
Land	<u>\$269,000</u>	<u>\$273,000</u>
Total Non-Current Assets	\$434,612	\$448,690
Total Farm Assets	\$488,138	\$511,617
<u>Liabilities</u>		
Current Liabilities		
Current Portion of Term Debt	\$ 19,841	\$ 18,839
Accounts Payable	\$ 2,046	\$ 2,119
Accrued Interest	\$ 2,311	\$ 3,196
Operating Loans Payable	\$ 3,896	\$ 4,264
Current Portion - Deferred Taxes	<u>\$ 13,763</u>	<u>\$ 15,418</u>
Total Current Liabilities	\$ 41,857	\$ 43,836
Non-Current Liabilities		
Breeding Livestock	\$ 9,725	\$ 9,424
Machinery	\$ 25,857	\$ 22,087
Farm Mortgage	\$ 89,521	\$ 87,642
Non-Current Portion-Deferred Taxes	<u>\$ 33,220</u>	<u>\$ 37,116</u>
Total Non-Current Liabilities	\$158,323	\$156,269
Total Farm Liabilities	\$200,180	\$200,105
Net Worth or Equity	\$287,958	\$311,512
Total Liabilities and Net Worth	\$488,138	\$511,617

Questions 1 through 12 refer to Mrs. Worth's Balance Sheet shown on the previous page. Round ratios to two decimals.

1. What was Mrs. Worth's Current Ratio on December 31, 2002?

- A. 1.04:1 $\frac{CA}{CL} = \frac{62,927}{43,836} = 1.4355$
- B. 1.06:1 $\frac{CA}{CL} = \frac{62,927}{43,836} = 1.4355$
- C. 1.12:1 $\frac{CA}{CL} = \frac{62,927}{43,836} = 1.4355$
- D. 1.28:1 $\frac{CA}{CL} = \frac{62,927}{43,836} = 1.4355$
- E.** 1.44:1 $\frac{CA}{CL} = \frac{62,927}{43,836} = 1.4355$

2. What was Mrs. Worth's Current Ratio on December 31, 2001?

- A. 1.04:1 $\frac{CA}{CL} = \frac{53,526}{41,857} = 1.278$
- B. 1.06:1 $\frac{CA}{CL} = \frac{53,526}{41,857} = 1.278$
- C. 1.12:1 $\frac{CA}{CL} = \frac{53,526}{41,857} = 1.278$
- D.** 1.28:1 $\frac{CA}{CL} = \frac{53,526}{41,857} = 1.278$
- E. 1.44:1 $\frac{CA}{CL} = \frac{53,526}{41,857} = 1.278$

3. How much working capital did Mrs. Worth have on December 31, 2001?

- A. \$ 3,898
- B.** \$ 11,669

CA	53,526
-CL	-41,857
WC	11,669
- C. \$ 19,091
- D. \$ 62,927
- E. None of the above

4. Which measure shows the size or magnitude of the amount of profitability?

- A. Equity-to-asset ratio
- B. Net worth
- C. Debt-to-asset ratio
- D. All of the above
- E.** None of the above

5. Consider the change in liquidity on Mrs. Worth's ranch between December 31, 2001 and December 31, 2002. Based on her balance sheet information, was her farm business:

- A.** More liquid on December 31, 2002

$\frac{2001}{2002}$	CR	1.28	1.44
	WC	11,669	19,091
- B. More liquid on December 31, 2001
- C. Less liquid on December 31, 2002
- D. Both B and C
- E. None of the above

6. What was Mrs. Worth's Debt-to-Asset Ratio on December 31, 2002?
- A.** 39.11% $\frac{TL}{TA} = \frac{200,105}{511,617} \times 100 = 39.112\%$
 B. 57.00%
 C. 59.18%
 D. 66.76%
 E. 81.04%
7. Based on the December 31, 2002 balance sheet for Mrs. Worth, what percent of all debts (liabilities) as of 12/31/02 were scheduled to be paid during the year 2003?
- A. 18.47% $\frac{TCL}{TL} = \frac{43,836}{200,105} \times 100 = 21.906\%$
B. 21.91%
 C. 59.18%
 D. 66.76%
 E. 81.04%
8. What percent of Mrs. Worth's assets were financed by debt on December 31, 2002?
- A. 21.91%
B. 39.11%
 C. 59.18%
 D. 66.76%
 E. 81.04%
9. Consider the change in solvency on Mrs. Worth's ranch between December 31, 2001 and December 31, 2002. Based on her balance sheet information, was her farm business:
- | | | | |
|--------------------------------------|----|----------------------------------|-------------|
| A. More solvent on December 31, 2002 | | <u>2001</u> | <u>2002</u> |
| B. More solvent on December 31, 2001 | DA | 41.01% | 39.11% |
| C. Less solvent on December 31, 2001 | NW | 287,958 | 311,512 |
| D. Both A and C | | | |
| E. None of the above | | Smaller DA and larger NW in 2002 | |
10. What was Mrs. Worth's Equity-to-Asset Ratio on December 31, 2002?
- A. 31.50% $\frac{NW}{TA} = \frac{311,512}{511,617} \times 100 = 60.888\%$
 B. 40.82%
 C. 59.17%
D. 60.89%
 E. 75.04%

11. What percent of Mrs. Worth's assets were financed by equity on December 31, 2001?
- A. 31.50% $\frac{287,958}{488,138} \times 100 = 58.991$
 - B. 40.82% 488,138
 - C.** 58.99%
 - D. 66.35%
 - E. 75.50%
12. Assume the liability values are accurate and the asset values shown on the balance sheet accurately represent the values of the assets if the assets had been sold on the dates specified. If on December 31, 2002, Mrs. Worth had sold all of her assets and paid off all of her debts, how much money would she have had left?
- A. \$416,338
 - B.** \$311,512
 - C. \$265,043
 - D. \$ 68,258
 - E. None of the above

Problem II - INCOME STATEMENT AND ANALYSIS

Mrs. Worth withdrew \$32,000 last year for family living expenses. Use this \$32,000 as the value of Mrs. Worth's unpaid family and operator labor and management. Mrs. Worth feels that she could earn a 7 percent return on her money in off-farm investments. Use this figure in calculating the opportunity cost of Mrs. Worth's assets or equity. Use this information, the balance sheet on page 2, and the following Income Statement for Mrs. Worth to answer questions 13 through 19.

2002 Income Statement for Mrs. Nettie Worth, Rodeo Ranch, Wildparty, Kansas

<u>Revenues</u>		<u>Expenses</u>	
Crops	\$ 57,354	Purchased Feed	\$ 3,683
Calves	\$ 39,002	Seed	\$ 5,000
Hay	\$ 15,246	Fertilizer	\$ 5,310
Inventory Changes		Livestock Expenses	\$ 4,145
Crops	\$ 701	Gasoline, Fuel, and Oil	\$ 7,118
Livestock	\$ 2,301	Hired Labor	\$ 6,052
Accounts Receivable	\$ (-510)	Repairs	\$ 5,287
Cull Cows	\$ 2,645	Inventory Adjustments	
Other	<u>\$ 438</u>	Prepaid Expenses	\$ 275
Total Gross Revenues	\$117,177	Account Payable	\$ 725
		Depreciation	\$ 5,980
		Interest	\$ 7,831
		Other	<u>\$ 536</u>
		Total Expenses	\$51,942
		Net Farm Income from Operations	\$65,235
		Gain/Loss on Sale of Capital Assets	<u>\$ 3,200</u>
		Net Farm Income	\$68,435

13. What is Mrs. Worth's 2002 net farm income (return to unpaid family and operator labor, equity capital, and management)?
- A. \$50,925
 B. \$56,124
 C. \$60,604
D. \$68,435
 E. None of the above
14. What is Mrs. Worth's 2002 adjusted net farm income (return to unpaid family and operator labor, total capital, and management)?
- | | | | |
|-----------|-------------------|------------|--------|
| A. | \$62,036 | NFI | 68,435 |
| B. | \$56,124 | + Interest | +7,831 |
| C. | \$60,604 | Adj NFI | 76,266 |
| <u>D.</u> | \$76,266 | | |
| E. | None of the above | | |

Two measures of profitability are the rate of return on assets (ROA) and the rate of return on equity (ROE). Definitions for ROA and ROE are:

ROA = (Net farm income from operations plus farm interest expense minus the value of unpaid family and operator labor and management) divided by average total farm assets. Multiply by 100 to express as a percentage.

ROE = (Net farm income from operations minus value of unpaid family and operator labor and management) divided by average farm equity. Multiple by 100 to express as a percentage.

15. If the value of Mrs. Worth's unpaid family and operator labor and management is \$32,000, what is Mrs. Worth's ROA? ROUND PERCENTAGE TO TWO DECIMALS.
- | | | |
|-----------|-------|--|
| A. | 1.75% | ROA = NFI from Ops. + Interest |
| B. | 2.20% | <u>- unpaid Family & Op. Labor</u> x 100 |
| C. | 3.96% | Ave TA |
| D. | 4.01% | |
| <u>E.</u> | 8.22% | $\frac{65,235 + 7,831 - 32,000}{(488,138 + 511,617)/2} \times 100 = 8.215\%$ |

16. If the value of Mrs. Worth's unpaid family and operator labor and management is \$32,000, what is Mrs. Worth's ROE? ROUND PERCENTAGE TO TWO DECIMALS.
- A. 1.75% ROE = $\frac{\text{NFI from Ops.}}{\text{Ave NW}} \times 100$
B. 2.20% - unpaid Family & Op. Labor
C. 3.96%
D. 4.01%
E. 11.09% $\frac{65,235 - 32,000}{(287,958 + 311,512)/2} \times 100 = 11.088$
17. The two balance sheets on page 2 of this exam are market value balance sheets. This means that Mrs. Worth's assets are valued at current market value. Suppose that in 2003 the market value of Mrs. Worth's land increases by 10 percent. The December 31, 2003 market value of all assets except land is the same as the December 31, 2002 value. However, as an unusual coincidence, her net farm income from operations in 2003 is identical to her net farm income from operations in 2002. How will the 10 percent increase in land value affect Mrs. Worth's rate of return on assets (ROA)?
- A. ROA will be smaller on December 31, 2003 than it was on December 31, 2002
B. ROA will be the same on December 31, 2003 and on December 31, 2002
C. ROA will be larger on December 31, 2003 than it was on December 31, 2002
D. More information is needed to determine the direction of change in ROA
E. None of the above

Mrs. Worth is concerned about her operating profit margin. The Operating Profit and Operating Profit Margin Ratio are defined as:

Operating Profit = Net farm income from operations, plus interest expense, minus the opportunity cost of unpaid family and operator labor and management.

Operating Profit Margin Ratio = Operating Profit divided by total gross revenues. (Multiply by 100 to express as a percentage.)

18. If the value of Mrs. Worth's unpaid family and operator labor and management is \$32,000, what is the Operating Profit for Mrs. Worth's ranch?
- A. \$ 9,472 65,235
B. \$10,943 +7,831
C. \$26,726 -32,000
D. \$41,066 41,066
E. None of the above

19. What is the Operating Profit Margin Ratio for Mrs. Worth's ranch? ROUND PERCENTAGE TO TWO DECIMALS.

- A. 13.82% $\frac{41,066}{117,177} \times 100 = 35.046\%$
- B. 26.47%
- C. 25.97%
- D.** 35.05%
- E. 45.83%

Problem III – INVESTMENT ANALYSIS

Use the following information to answer Questions 20 through 22.

Suppose you are considering two alternative investments that each have an initial investment cost of \$8,000. Annual net cash flows received at the end of each year for 3 years are as follows: The discount rate is 10%. Salvage value is zero.

<u>Year</u>	Net Cash Flow (Dollars)	
	Investment A	Investment B
1	2,000	6,000
2	4,000	4,000
3	6,000	2,000

You also have the following information about the present value of \$1.00 with 10% interest compounded annually using the formula, $Pv = 1/(1+r)^N$.

<u>Year</u>	<u>10%</u>
1	0.9091
2	0.8264
3	0.7513
4	0.6830
5	0.6209

20. What is the net present value of Investment A?

- A. \$4,260
- B. \$2,263 \$2,000 X 0.9091 = \$1,818.20
- C. \$1,984 \$4,000 X 0.8264 = \$3,305.60
- D.** \$1,632 \$6,000 X 0.7513 = \$4,507.80
- E. \$ 998 NPV_A = \$1,631.60

24. What is the corn basis on April 30 at the ethanol plant?
- A. - \$0.09
 - B. \$0.09
 - C. \$2.31
 - D. \$2.25
 - E. None of the above
25. By June 16 when the hedge was offset, what happened to the corn basis at the ethanol plant?
- A. No change
 - B. Changed to -\$0.06/bu
 - C. Weakened
 - D. Strengthened
 - E. None of the above.
26. What is the net result of the hedge?
- A. Break-even
 - B. \$0.12/bu loss
 - C. \$0.06/bu loss
 - D. \$0.06/bu gain
 - E. \$0.18/bu loss
27. What is the net price the ethanol producer paid for the corn on June 16?
- A. \$2.25/bu
 - B. \$2.31/bu
 - C. \$2.37/bu
 - D. \$2.40/bu
 - E. \$2.46/bu

Problem V - LIVESTOCK MARKETING

For questions 28 through 33, refer to the following information. In March, a Kansas cattle producer buys a June CME Live Cattle Put Option with a \$72.00/cwt strike price for a \$1.65/cwt premium. Assume the producer's local basis when the cattle are sold is -\$1.25/cwt. Assume no commissions and zero interest cost on margins and premiums.

28. What is the producer's expected minimum price he will receive for the cattle?
- A. \$72.00
 - B. \$70.35
 - C.** \$69.10
 - D. \$73.65
 - E. None of the above
29. Assume the June Live Cattle Contract was trading at \$73.75 when the cattle were sold. What is the net price received for the cattle?
- A. \$70.75
 - B.** \$70.85
 - C. \$72.00
 - D. \$72.50
 - E. \$73.75
30. Assume the June Live Cattle Contract was trading at \$71.70/cwt when the Put Option was purchased. The Put Option is best described as
- A. At-the-money
 - B.** In-the-money
 - C. Out-of-the-money
 - D. Worthless
 - E. None of the above
31. At expiration, any remaining value of the Put Option is known as
- A. Time value
 - B. Residual value
 - C. Maturity value
 - D.** Intrinsic value
 - E. None of the above

32. Assume the June Live Cattle Futures Contract is at \$70.00/cwt when the producer's option expires. What would the Put Option be worth, assuming no time value?
- A. \$ 0.00/cwt
 - B. \$ 0.65/cwt
 - C.** \$ 2.00/cwt
 - D. \$68.75/cwt
 - E. \$70.00/cwt
33. Assume the June Live Cattle Futures Contract is at \$76.60/cwt when the producer's option expires. What is the producer's cost of hedging his cattle?
- A.** \$1.65/cwt
 - B. \$4.60/cwt
 - C. \$6.25/cwt
 - D. \$7.50/cwt
 - E. Nothing, the option is worthless

Problem VI – BEEF COW-CALF ENTERPRISE BUDGET

Attached at the end of the exam is a four-page Farm Management Guide entitled, "Beef Cow-Calf Enterprise," that was prepared by Sarah L. Fogleman and Rodney Jones, Kansas State University, October 2003. As stated on page 1, "This budget uses projected 2004 input and output prices for illustrative purposes." The budget was prepared Fall 2003. Budgets for three different weaning percentages are shown on page 18. Page 17 has line by line explanations of how various budget entries were calculated. Page 19 has additional information about the cow-calf enterprise; some of this information was used to calculate budget entries. Use the information in the guide as necessary to answer questions 34 through 40. Some of the questions can be answered without the guide.

34. Use TC as an abbreviation for Total Costs Per Cow. Based on the example budget on page 18, how does weaning percentage affect Total Costs Per Cow (TC)?
- A. TC are largest when weaning percentage is 82%
 - B. TC are largest when weaning percentage is 88%
 - C. TC are largest when weaning percentage is 94%
 - D.** TC are not affected by weaning percentage
 - E. All of the above

35. Use ROTC as an abbreviation for Return Over Total Costs. Based on the example budget on page 18, how does weaning percentage affect Return Over Total Costs (ROTC)?
- A. ROTC are largest when weaning percentage is 82%
 - B. ROTC are largest when weaning percentage is 88%
 - C.** ROTC are largest when weaning percentage is 94%
 - D. ROTC are not affected by weaning percentage
 - E. All of the above
36. Which of the following could be non-cash expenses for a cow-calf enterprise?
- A. Depreciation on facilities and equipment
 - B. Labor expense
 - C. Crop residue grazing expense
 - D.** All of the above
 - E. None of the above
37. When projecting the economic profit potential of the cow-calf enterprise, you should include interest costs
- A. Based only on facilities and equipment investment
 - B. Based only on the breeding stock value
 - C.** As an opportunity cost regardless of whether the capital is borrowed or not
 - D. Only on the amount of money borrowed
 - E. None of the above.
38. If weaning percentage increases with no change in costs, break even price will
- A. Remain constant
 - B. Increase
 - C.** Decrease
 - D. Increase the first year, then decrease
 - E. All of the above

39. If you assume you are going to raise and develop your own replacement females on the farm, when calculating cow-calf enterprise budget projections you should
- A. Include an annual depreciation expense for raised heifers as a cost in the enterprise budget
 - B.** Reduce the number of female calves sold to reflect the number of heifers retained
 - C. Include an “opportunity” cost of purchased replacements, as well as the costs associated with developing the home raised females
 - D. Exclude cull cow sales from the income section of the budget projection
 - E. None of the above
40. Table 5 on page 19 shows the expected percentage of steers and heifers per cow and the steer and heifer expected price. Line 3 on page 18 shows the expected weight of the cull cows and the culling percentage. The expected price used for cull cows was \$49.89/cwt. Suppose in December 2003 mad cow disease is confirmed in the Western United States resulting in decreases in expected prices to \$80.00/cwt. for steers, \$76.00/cwt. for heifers, and \$36.00/cwt. for cull cows. Using these new prices and the weights, culling rate, and percentage of steers and heifers per cow with a 94% weaning percentage, what is the expected Gross Returns Per Cow?
- A. \$352.17
 - B. \$395.27
 - C.** \$463.93
 - D. \$553.40
 - E. \$600.20

560	X	0.47	X	\$0.80	=	\$210.56
540	X	0.47	X	\$0.76	=	\$192.89
1050	X	0.16	X	\$0.36	=	<u>\$ 60.48</u>
						\$463.93

Beef Cow-Calf Enterprise

Department of Agricultural Economics



Kansas State University Agricultural Experiment Station and Cooperative Extension Service

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Livestock Production

The beef cow-calf enterprise plays an important role in the livestock economy of the state. Cows perform well on poor quality forages, such as corn or sorghum stalks and other crop residues, when properly supplemented after calving. Commercial cows are especially adapted to areas where there is an abundance of native grass, along with crop residues and winter forages.

This budget uses projected 2004 input and output prices for illustrative purposes. The budget is based on a typical spring calving cow herd. Individual producers should use their own prices, and adjust production factors to match their individual situation. For example, a typical fall calving herd would be expected to have higher feed costs, but also a higher gross return than that depicted in this example.

Feed

A beef cow-calf enterprise requires about 5 tons of forage on a dry matter basis or 5.7 tons of hay equivalent per cow per year. This feed level includes feed for the cows, bulls, replacement stock, and calves to weaning (Table 1). Crop residue and winter wheat can be used in the fall to provide part of the feed requirements.

In southern Kansas, year-round native pasture can be used with some supplemental protein or alfalfa hay in the winter. In eastern Kansas, brome and fescue can be used for extended grazing. However, good management dictates that 1 to 1½ tons of harvested forage be available during the winter months.

Labor

Labor requirements for a beef cow-calf enterprise vary considerably depending upon the size of the herd and how they are handled (Table 2). Labor required to produce feed or pasture for the livestock is not included in the annual labor requirement to manage the cow-calf enterprise.

Capital

Land required to produce a year-round feed supply varies from 3 to 5 acres in eastern Kansas, between 7 and 10 acres in the Flint Hills, and 10 to 15 acres in western Kansas. Land costs are accounted for by the price of feed charged to the livestock.

Capital requirements for livestock equipment and facilities can vary greatly. The budget assumes hay is used for winter feed. The required facilities include livestock buildings, feed storage, corrals, and working facilities. Required equipment includes feed handling and feeding equipment, watering equipment, manure handling equipment, and transportation equipment. The estimated new capital investments for a 200-cow enterprise are shown in Table 3.

Production Levels and Costs

Costs per unit and net returns in livestock production are highly dependent on production levels. The following estimated budget includes three production levels. Production levels vary for a number of reasons including livestock quality or genetics, weather, input levels, and management. The three production levels included in this estimated budget reflect production variability due to weather and management as opposed to the quality of the livestock, since livestock values are held constant. Budgeting at multiple production levels can help producers examine the financial risk that is directly related to production risk of a livestock enterprise. The production levels in the cow-calf budget are assumed to vary due to differences in weaned calf percentages. Varying the weaned calf percentage affects the number of calves available for sale (Table 5).

The budget for each production level includes a charge or opportunity cost for all resources used by the beef cow enterprise. Interest on buildings and equipment is assumed on one-half of the original cost. This budget assumes steer calves are sold at 560 pounds and heifer calves at 540 pounds.

Information Included in Budget

1. **Steer sales:** see Table 5.
2. **Heifer sales:** see Table 5.
3. **Cull cow sales:** based on 16 percent culling rate (Cull cow sales plus insurance payments).
4. **Other:** includes any additional revenue associated with the cow-calf enterprise (government disaster payments, for example).
5. **Pasture:** charged at average rental rates per AUM for cows and calves, bulls, and replacement heifers (Table 1). Rental rates are a proxy for the total production cost of pasture including a land charge (see Table 1).
6. **Crop residue:** see Table 1.
7. **Hay-forage:** see Table 1.
8. **Grain:** no grain fed.
9. **Protein-minerals:** see Table 1.
10. **Labor:** estimated to be 5 hours per cow (see Table 2).
11. **Veterinary, drugs, supplies:** costs for treatment and disease prevention.
12. **Marketing costs:** include only if these costs have not been deducted from line D.
13. **Utilities, fuel, and oil:** gasoline, diesel, and oil used when observing cattle, hauling feed, scraping and hauling manure, and hauling livestock. Utilities are the beef cow enterprise's share of the farm telephone, electricity, gas, and water expenses.
14. **Facilities and equipment repairs:** share of expenses for repairs on livestock machinery and equipment, fences, corrals, and feed bunks.
15. **Breeding charge:** includes the sale value of 16 percent of the calf crop (heifers), annual bull cost (depreciation, lease, or artificial insemination charges), interest on breeding stock, and insurance on breeding stock.
16. **Professional Fees:** includes legal fees, accounting and farm management fees, consultant fees, etc.
17. **Miscellaneous:** includes small tools, ear tags, etc., plus livestock's share of farm organization fees, magazines, and office supplies.
18. **Depreciation on facilities and equipment:** based on original investment per cow of \$135 in facilities and feed storage with a life of 20 years; and equipment investment of \$123 per cow with a life of 10 years. All facilities and equipment are assumed to have a 35 percent salvage value at the end of the useful life.
19. **Interest on facilities and equipment:** interest is calculated based on the following formula $[(\text{Total investment per cow} + \text{salvage value (35\% of investment value)} + 2) \times 7\% \text{ interest rate.}]$
20. **Insurance and taxes on facilities and equipment:** averages approximately 0.25 percent and 1.5 percent of original investment, respectively.
21. **Interest on operating costs:** calculated on one-half of variable costs at the current interest rate of 7 percent.
22. **Hundredweight weaned:** $\{[(\text{weaning percentage} + 2) \times \text{steer weight}] + [(\text{weaning percentage} + 2) \times \text{heifer weight}]\} + 100.$

COST-RETURN PROJECTION—BEEF COW-CALF ENTERPRISE (PER COW)

	Weaning Percentage			Your Farm
	82%	88%	94%	
RETURNS PER COW:				
1. Steers: 560 lbs (see Table 5.)	\$ 215.20	\$ 230.95	\$ 246.70	
2. Heifers: 540 lbs (see Table 5.)	194.43	208.66	222.89	
3. Cull Cows: 1,050 lbs × 16%	83.82	83.82	83.82	
4. Other				
A. GROSS RETURNS PER COW	\$ 493.45	\$ 523.43	\$ 553.40	
COSTS PER COW:				
5. Summer Pasture (6 months)	\$ 120.19	\$ 120.19	\$ 120.19	
6. Crop Residue	7.50	7.50	7.50	
7. Hay — Forage	91.58	91.58	91.58	
8. Grain				
9. Protein and Mineral	27.14	27.14	27.14	
10. Labor	50.00	50.00	50.00	
11. Veterinary, Drugs, and Supplies	14.50	14.50	14.50	
12. Marketing Costs	13.00	13.00	13.00	
13. Utilities, Fuel, and Oil	20.60	20.60	20.60	
14. Facilities and Equipment Repairs	26.50	26.50	26.50	
15. Breeding Charge				
a. Capital Replacement (16% of Heifer Calves)	75.88	75.88	75.88	
b. Annual Bull Cost or A.I. Charge	12.00	12.00	12.00	
c. Interest on Breeding Stock	53.48	53.48	53.48	
d. Insurance on Breeding Stock	7.64	7.64	7.64	
16. Professional Fees (legal, accounting, etc.)	1.50	1.50	1.50	
17. Miscellaneous	7.25	7.25	7.25	
18. Depreciation on Facilities and Equipment	\$ 12.39	\$ 12.39	\$ 12.39	
19. Interest on Facilities and Equipment ¹	12.21	12.21	12.21	
20. Insurance and Taxes on Facilities and Equipment	4.52	4.52	4.52	
B. SUBTOTAL	\$ 557.89	\$ 557.89	\$ 557.89	
21. Interest on 1/2 Operating Costs @ 7%	13.29	13.29	13.29	
C. TOTAL COSTS PER COW	\$ 571.18	\$ 571.18	\$ 571.18	
D. RETURN OVER TOTAL COSTS (A - C)	\$ -77.73	\$ -47.75	\$ -17.78	
22. Cwt. Weaned	4.51	4.84	5.17	
E. AVERAGE GROSS RETURN NEEDED/CWT.				
23. To Cover Total Costs	\$ 108.06	\$ 100.69	\$ 94.27	
24. To Cover Feed Costs	\$ 54.64	\$ 50.91	\$ 47.66	
F. ASSET TURNOVER (D + INVESTMENT)²	48.27%	51.20%	54.13%	
G. NET RETURN ON INVESTMENT				
((D + 15c + 19 + 21) ÷ INVESTMENT) ²	0.12%	3.05%	5.99%	

¹Original cost of facilities and equipment plus salvage value divided by 2, times at an interest rate of 7 percent.

²Investment equals total value of breeding stock and facilities-equipment.

Table 1. Feed Requirements Per Cow Unit

Pasture		
Cow and Calf	\$17.46 / AUM × 6.0 AUM	\$103.92
Replacement	\$17.46 / AUM × 4.0 AUM X 16%	11.08
Bull Share	\$17.46 / AUM × 6.1 AUM X 4%	4.23
	Pasture Per Cow Unit	\$120.19
Harvested Forage		
Cow (Dry)	18 lbs. Hay/day × 60 days	1,080 lbs
Cow (Lact.)	34 lbs. Hay/day × 60 days	2,040 lbs
Heifer	19 lbs. Hay/day × 120 days × 16%	364.8 lbs
Bull	30 lbs. Hay/day × 120 days × 4%	144 lbs
	Hay Equivalent per Cow Unit	3,628.8 lbs
	@ \$50.48/ton	\$91.58
Crop Residue		
Per Cow Unit	60 days = 1,500 lbs. \$0.005	7.5
Protein Supplement		
Cow	90 days × 1 lb	90
Heifer	180 days × 1 lb. X 16%	28.8
	Per Cow Unit	118.8
	@ 208.41/ton	\$12.38
Salt and Mineral Mix		
	60 lbs @ 24.60/cwt.	\$14.76

Table 2. Annual Labor Requirements

Cow Numbers	Hours Per Cow
Under 40	14
40 - 80	11
80 - 120	8
Over 120	5

Table 3. Capital Investment (Except Land) per Cow Unit — 200 Cows

Facilities and Improvements	\$27,075
Cowherd Share of Equipment	\$24,600
Total Investment	\$51,675
Investment Per Cow	\$258.38

Table 4. 2002 Total Costs Per Beef Cow (Sell Calves < 625 lbs) —Average 109 Farms, Kansas Farm Management Association¹

Item	Per Cow
Feed	\$284.87
Hired Labor	\$13.19
Veterinarian and Drugs	\$14.54
Fuel, Oil	\$11.96
Utilities	\$8.74
Marketing and Breeding	\$13.66
Repairs, Auto and Truck Expense	\$26.54
Machine Hire	\$2.23
Miscellaneous	\$5.04
Interest Paid	\$22.63
Personal Property Tax	\$1.69
General Farm Insurance	\$6.33
Real Estate Tax	\$5.30
Depreciation	\$22.35
Operator's Capital	\$69.24
Operator's Labor	\$66.23
TOTAL	\$574.44

¹Average number of cows was 117, with an average weight of calves sold of 592 pounds.

Table 5. Calf Sales Per Beef Cow

Weaning Percentage	82	88	94	Price/cwt
Steer (560 lbs)	0.41	0.44	0.47	\$93.73
Heifer (540 lbs)	0.41	0.44	0.47	\$87.82

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