AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

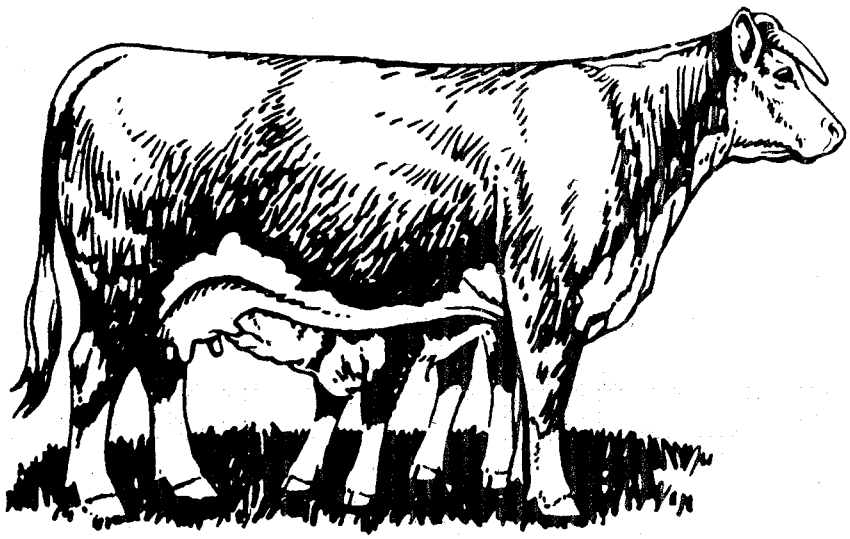
AgEcon Search
http://ageconsearch.umn.edu
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Agricultural Economics Report No. 240 October 1988

Single-Calf Heifer System Profitability Compared to Other North Dakota Beef Production Systems

Randall S. Sell
David L. Watt
Randall D. Little
Timothy A. Petry



SB
205
.S7
N64
no.
240

Department of Agricultural Economics • Agricultural Experiment Station
North Dakota State University • Fargo, ND 58105-5636

Preface

Research for this report was conducted under North Dakota Agricultural Experiment Station Research Project No. 1376. This report, which contains an intensive look at the profitability of retained ownership, is an updated version of "Retained Ownership-Production and Marketing Alternatives for Cow-Calf Producers," Agricultural Economics Report No. 213. This report contains two new enterprises and some corrections. The reader is also referred to "Comparing the Profitability of Beef Production Enterprises in North Dakota," Agricultural Economics Report 210.

The authors would like to thank Vern Anderson, Steve Boyles, Roger Johnson, Russell Danielson, Harlan Hughes, and LaDon Johnson of North Dakota State University, and Olin Cox of Juhl's Nutrition and Management Services for helpful suggestions, ideas, and comments throughout the development and review of this study. The authors would also like to thank the following for their cooperation and the information they provided:

Brookover Cattle Company, Inc.
Hendrickson Land and Cattle Company
Hertz-de Baca Cattle Management Company
Juhl's Nutrition and Management Services, Inc.
Onida Feeders, Inc.

Special mention is due John R. Brethour, whose applied research work and reports which motivated the addition of the two new enterprise possibilities to this report. Special thanks are due to Cindy Schuler for her diligence in typing the manuscript and to Carol VavRosky for the quality figures she provided.

Table of Contents

	Page
List of Tables	ii
List of Figures	ii
Highlights	iii
Description of the Situation	2
Risk	3
Costs of Production	4
The Cow-Calf Operation	4
Backgrounding and Wintering	6
Wintering and Pasturing	6
Surplus and Single-Calf Heifers	6
Custom Feeding	8
Livestock Prices	8
Methodology	10
The Decision to Custom Feed	17
Selecting a Custom Feedlot	17
Systems of Payment	21
The Contract Arrangement	22
Summary and Conclusions	24
Appendix A	25
Appendix B	39
Appendix C	45
Appendix D	49
Appendix E	57
References	61

List of Tables

Table		Page
1	TOTAL ESTIMATED ADJUSTED PRODUCTION COSTS PER COW OF THE COW-CALF OPERATION AND COW-CALF OPERATION WITH THE RETAINED OWNERSHIP ALTERNATIVES IN NORTH DAKOTA, BY CALF CROP, 1958-1983	12
2	ESTIMATED PROFIT PER COW OF THE COW-CALF OPERATION AND COW-CALF OPERATION WITH THE RETAINED OWNERSHIP ALTERNATIVES IN NORTH DAKOTA, BY CALF CROP, 1958-1983	14
3	SUMMARY OF RESULTS FOR THE COW-CALF AND COW-CALF WITH THE RETAINED OWNERSHIP ALTERNATIVES	16

List of Figures

Figure		Page
1	Seasonal Herd Inventories for a Traditional Cow-Calf Production System in North Dakota	5
2	Seasonal Herd Inventories for a Surplus Heifer System in North Dakota	7
3	Seasonal Herd Inventories for a Single-Calf Heifer System in North Dakota	9
4	Estimated Profitability Per Cow on the Cow-Calf and the Single-Calf Heifer System Operations in North Dakota, 1958-1986	18
5	Estimated Profitability Per Cow on the Cow-Calf and the Cow-Calf and Backgrounding Operations in North Dakota, 1958-1986	18
6	Estimated Profitability Per Cow on the Cow-Calf and the Cow-Calf, Wintering and Pasturing Operations in North Dakota, 1958-1986	19
7	Estimated Profitability Per Cow on the Cow-Calf and the Cow-Calf and Custom Feeding Weaned Calves Operations in North Dakota, 1958-1986	19
8	Estimated Profitability Per Cow on the Cow-Calf and the Cow-Calf, Backgrounding, and Custom Feeding Operations in North Dakota, 1958-1986	20
9	Estimated Profitability Per Cow on the Cow-Calf and the Cow-Calf, Wintering, Pasturing, and Custom Feeding Operations in North Dakota, 1958-1986	20

Highlights

Cow-calf producers, because of their position in the beef production process, are especially vulnerable to the price extremes that characterize the cattle cycle. In light of this, cow-calf producers need to evaluate marketing alternatives to the most popular one of selling weaned calves.

The objective of this study is to estimate the profitability of several options of retained ownership, including custom feeding and two alternatives of the single-calf heifer system. Cost of production budgets were constructed at 1984 prices for a cow-calf operation in North Dakota, for the retained ownership alternatives and for the single-calf heifer systems. The cost components of these budgets were adjusted back to 1958 and ahead to 1986 using indices of prices paid by farmers. Estimated profitability was calculated by subtracting total cost from total revenue.

The single-calf heifer system is calculated to be much more profitable than any others. Because of the novelty of this enterprise, many of the budgeted values and performance indicators are not well tested. Producers are cautioned to be certain that the performance level is realistic for their operation before adopting a single-calf heifer system. Compared to traditional cow-calf practices, producers can usually increase profit per cow by retaining ownership of calves. There were several years, however, when selling weaned calves was the most profitable alternative. While retaining ownership reduced price risk relative to the cow-calf operation, the alternatives considered were still exposed to significant price risk. Availability of sufficient additional capital and the different managerial requirements are important factors to consider when deciding to custom feed.

SINGLE-CALF HEIFER SYSTEM PROFITABILITY COMPARED TO OTHER NORTH DAKOTA BEEF PRODUCTION SYSTEMS

Randall S. Sell, David L. Watt, Randall D. Little, and Timothy A. Petry*

The cattle cycle, with its fluctuations in inventory and prices, imposes a unique set of risks on beef production. Cow-calf producers, because of their position in the beef production process, are especially vulnerable to the price extremes that characterize the cattle cycle. Slaughter plant and feedlot operations are capable, to some extent, of passing some of their losses along in the system. Their decisions to buy and at what price are based on anticipated market conditions at the expected time of sale. For example, if a feedlot operator expects a difficult period in the future, his bid price for feeder cattle will be adjusted accordingly. He also has the option to operate at less than full capacity or to discontinue feeding. The cumulative effect of feedlot managers' decisions heavily influences demand for weaned calves. Cow-calf operators often have little choice but to accept lower prices. Thus, cow-calf operators receive a culmination of losses that occur as lower slaughter cattle prices and feeding losses are passed through the system (Hasbargen et al. 1983).

Cow-calf operators need to evaluate marketing alternatives to selling weaned calves. The objective of this study is to estimate the potential benefits of vertical integration by cow-calf producers. A historical approach is used involving annual calf crops from 1958 to 1985. Vertical integration, defined as the combination and coordination of successive production and/or marketing stages within one firm (Cramer and Jenson 1985), provides alternatives to the traditional marketing plan of selling weaned calves in the fall. The vertical integration alternatives examined in this study involve retaining ownership of calves beyond weaning for sale as light or heavy yearlings or slaughter cattle. Retaining ownership enables producers to delay marketing during periods of depressed feeder cattle prices. Tax implications of retaining ownership are not considered in this study.

Two surplus heifer systems are included. One, denoted the surplus heifer system, retains all heifer calves as replacement animals through first calving, then at 76 days postpartum the final selection of replacement animals is made. The heifers to be culled have their calves weaned early, are put on a finishing ration and are marketed on a grade and yield basis as 1100 lb. slaughter heifers. The second system, called the single-calf heifer system, keeps no brood cows. All calves are weaned at 76 days postpartum. Then all heifers are put on a finishing ration for 60 days and marketed grade and yield. In the fall all steer calves are sold, all heifer calves are retained, and additional heifer calves are purchased in order to remain at a stable herd

---

*Sell is graduate research assistant, Watt is associate professor, Department of Agricultural Economics, North Dakota State University, Fargo; Little is Ph.D. candidate, Oklahoma State University; and Petry is associate professor, Department of Agricultural Economics, North Dakota State University, Fargo.

size. The surplus heifer system was first developed and researched by John R. Brethour, Kansas State Experiment Station, Fort Hayes, Kansas.

Retaining ownership should reduce the total cost of gain for the cow-calf producer. Studies have shown that cow-calf operations selling weaned calves are less profitable than operations that retain ownership (Ford et al. 1985; Lambert and Sands 1984; and Whitley and O'Connor 1981). Lambert and Sands (1984) concluded that retained ownership through slaughter was profitable in six of the nine years studied, while selling the same calves at weaning would have been profitable in only three years. They also concluded that because seasonal price tendencies for calves and fed cattle generally favor retained ownership, the cattle feeder can improve his odds of both avoiding seasonally low calf prices and achieving seasonally high fed cattle prices by retaining ownership. Ford et al. (1985) concluded that live weight marketed and profitability were increased when ownership of the animal was maintained and that retained ownership through the feedlot finishing phase produced the highest profitability of the strategies studied.

Custom feeding is defined in this study as maintaining ownership of cattle and the right to major management decisions concerning those cattle which have been physically relocated to another's lot for growing and/or finishing where daily supervision is the responsibility of a second party. Producers who custom feed are paying for the feeding services and expertise of the feedlot operator.

The profitability of the following production alternatives will be estimated and evaluated:

1. Cow-calf;
2. Surplus heifer system
3. Single-calf heifer system
4. Cow-calf and backgrounding;
5. Cow-calf and wintering;
6. Cow-calf, wintering, and pasturing;
7. Cow-calf and custom backgrounding;
8. Cow-calf and custom feeding a weaned calf;
9. Cow-calf, backgrounding, and custom feeding;
10. Cow-calf, wintering, and custom feeding; and
11. Cow-calf, wintering, pasturing, and custom feeding.

Description of the Situation

Beef production is a vital part of the agricultural industry in North Dakota. The sale of cattle and calves is a major source of cash farm receipts, ranking second to wheat in 1986. Receipts for the sale of cattle and calves accounted for 16 percent of total cash receipts for all crop and livestock products and 69 percent of total cash receipts for all livestock products in 1986 (North Dakota Agricultural Statistics 1988).

The cow-calf enterprise is the major beef enterprise in North Dakota. Beef cows constituted about 90 percent of the total cow herd in North Dakota at the beginning of 1988 (North Dakota Agricultural Statistics 1988).

According to the Census of Agriculture, the average-sized beef cow herd in North Dakota had 77 cows. About 44 percent of the farms and ranches with beef cows had between 50 and 200 head.

Virtually all calves produced in the state are either sold at weaning, backgrounded and sold in the spring, or wintered, pastured, and sold the next fall. The number of calves sold at weaning or held for further feeding is contingent primarily upon feed availability. A greater proportion of the calf crop is fed beyond weaning in years of ample moisture when feed supplies are adequate. But in years when feed is inadequate, more calves are sold in the fall at weaning. Feeder calves sold in North Dakota are generally shipped out of state for finishing. Less than 10 percent of the calves are fed to slaughter weight in North Dakota.

Risk

Risk and uncertainty are interchangeable terms used to describe an action selected by a decisionmaker that has alternative outcomes (Boehlje and Eidman 1984). The risks farmers face can be divided into two broad types, business and financial.

Business risk is defined as the inherent uncertainty in the firm independent of the way it is financed. The major sources of business risk are price and production risk.

Price or market risk, which is the source of risk considered in this study, is the result of factors that lead to unpredictable shifts in supply and demand of inputs and products. Seasonal, cyclical, and trend natures of prices are predictable to some extent, but the inability to accurately predict prices and price movements is the source of price uncertainty. Many government actions concerning trade agreements, embargoes, and fiscal and monetary policy contribute to price variation.

Production risk, the second source of business risk, is the result of factors affecting the production level that are beyond the manager's control, such as weather, disease, insect damage, and changes in governmental regulations. Production is reflected in variability in yields per acre, weaning weights, rate of gain, and other variables used to measure the amount of physical production (Boehlje and Eidman 1984).

Financial risk is defined as the added variability of net returns to owner's equity that results from the financial obligation associated with debt financing (Boehlje and Eidman 1984). Financial risk also includes uncertain loan availability and fluctuating interest rates, which reflect the price of debt capital. It deals primarily with the firm's ability to meet long-run claims and increases as leverage increases (Barry, Hopkins, and Baker 1979). Leverage, which is measured by the ratio of debt to equity, multiplies the potential financial return or loss that will be generated with different production and price levels.

Costs of Production

Budgets reflecting the costs of production of several beef cattle enterprises typical to North Dakota and the custom feeding options were constructed at 1984 price levels (Appendix A). The budgets included a cow-calf operation; surplus heifer system; single-calf heifer system; backgrounding, wintering, and pasturing steers and heifers; custom backgrounding steers and heifers; and custom feeding weaned, backgrounded, wintered, and wintered and pastured steers and heifers.

The approach used to construct these budgets is based on the "opportunity cost" (returns foregone in the best alternative use) of resources employed. When using the opportunity cost method, inputs are valued using current market prices, rather than what may have actually been paid for the inputs. Examples of resources that are valued differently using the opportunity cost method include feed, which may be cheaper when produced on the farm than if purchased; operator and family labor, which generally remains unpaid; pasture rent, which is unpaid for owned land; and interest expenses, which would not be paid when inputs were paid for at the time of purchase (Johnson et al. 1986).

There is much variation in production costs among producers. Differences occur due to production practices, managerial ability, and size and type of machinery employed. This variability means that the costs individual producers incur (and consequently their profitability) may vary considerably from the estimate of average costs presented. Conclusions reached, therefore, do not apply to producers with costs significantly different from the average. However, the trends indicated should provide a general idea of the profitability of the cattle enterprises considered over time.

The Cow-Calf Operation

The cow-calf production costs were based on an average-sized spring calving operation.[1] The operation weaned calves from 90 percent of the cows and heifers assumed bred. It was assumed that cow-calf operators replaced 16 percent of brood cows annually. To allow for this they retained 18 percent of their calves, all heifers, from which replacements were chosen. Cull cows and cull replacement heifers weighed 1,000 and 750 lbs., respectively. Weaned steers and heifers weighed 425 and 400 lbs., respectively. There were 45 percent of a steer (half of the 90 percent calf crop) and 27 percent of a heifer (half of the 90 percent calf crop minus the 18 percent retention rate) sold per cow each year (Figure 1).

---

[1]The methodology used in this report to estimate production costs per cow is basically the same as that used in earlier reports, Comparing Profitability of Beef Production Enterprises in North Dakota, AER 210 and Retained Ownership -Production and Marketing Alternatives for Cow-Calf Producers, AER 213. The change in the value of the cow, which was included in AER 210 has been dropped from the budgets in subsequent publications.

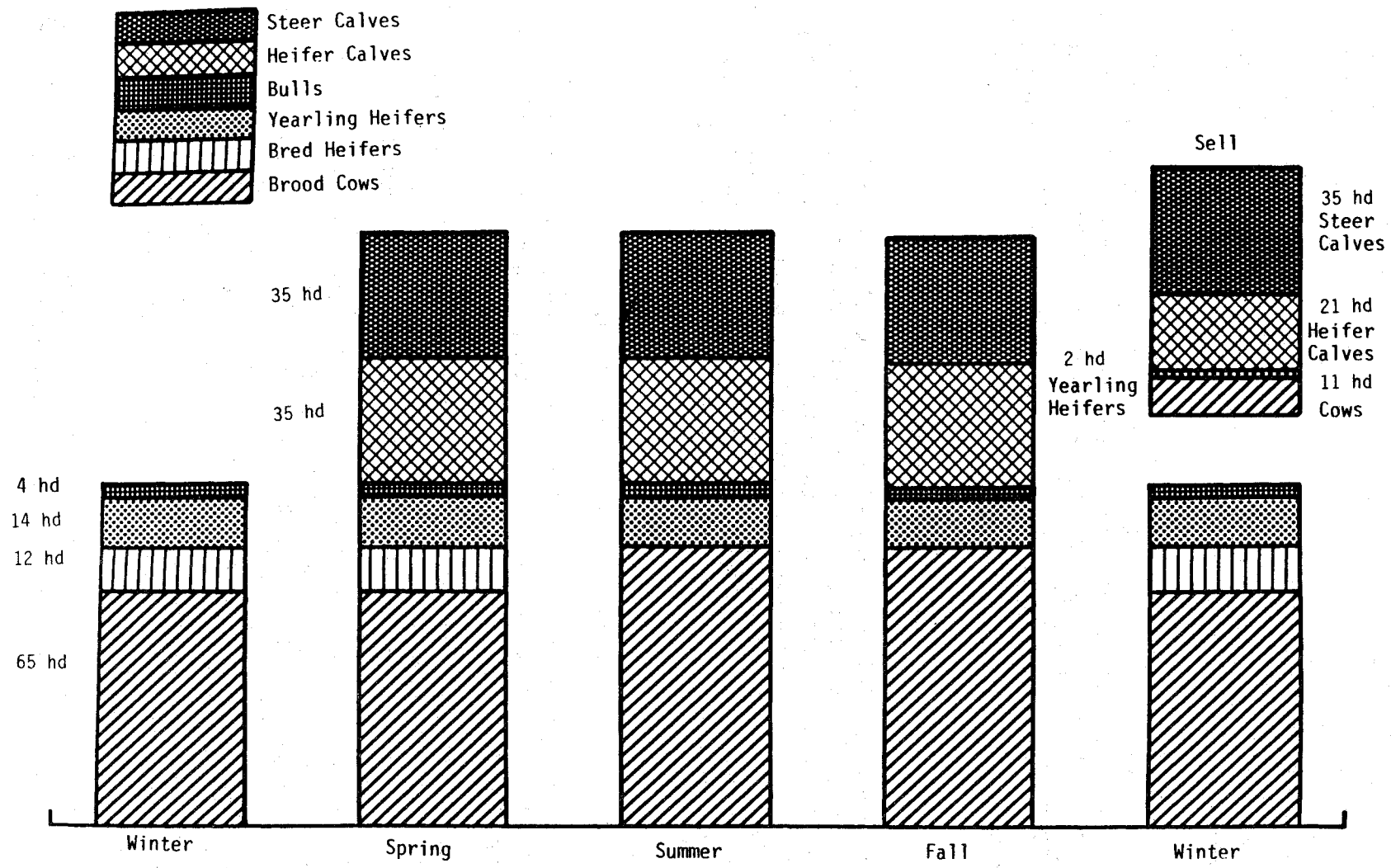


Figure 1. Seasonal Herd Inventories for a Traditional Cow-Calf Production System in North Dakota.

*Cows 90 percent calves born live, 16 percent replacement, 1 percent death loss.
Heifers 90 percent calves born live, 18 percent heifer retainment.

Backgrounding and Wintering

Backgrounding and wintering are winter feeding programs common in North Dakota. Backgrounding emphasizes a higher rate of gain that requires feeding a high protein and energy ration. Calves enter the backgrounding program after weaning in the fall and are sold or custom fed in the spring. Program length was assumed to be 150 days. Steers entered the backgrounding program at 425 lbs. and were fed to a market weight of 675 lbs. Heifers entered the program at 400 lbs. and were marketed at 625 lbs. The average daily gains for steers and heifers were 1.7 and 1.5 lbs., respectively.

The wintering program involves low weight gains and an inexpensive, high roughage diet. Calves enter the wintering program in the fall and are typically either sold or pastured in the spring. Program length was assumed to be 150 days. Steers weighed 425 lbs. and heifers weighed 400 lbs. when entering the program and 575 lbs. and 535 lbs., respectively, at the end. Average daily gains for wintered steers and heifers were 1.0 and 0.9 lbs., respectively.

Wintering and Pasturing

Many producers follow a wintering program with a pasturing program when sufficient forage is available. Compensatory gain is higher for wintered calves than for backgrounded calves, so their capacity for growth on pasture is greater. The pasturing program was assumed to be 120 days. Steers and heifers entered the pasturing program weighing 575 and 535 lbs., respectively. Steers weighed 800 lbs. and heifers 740 lbs. at the end of the program. Average daily gains for pastured steers and heifers were 1.9 and 1.7 lbs., respectively.

Surplus and Single-Calf Heifers

The surplus and single-calf heifer systems are comparable to the traditional cow-calf system in that all three systems have the same summer pasture requirements.

Since no research has yet been conducted, certain costs and production coefficients are not known with certainty. For the surplus heifer system it was assumed that 16 percent of the brood cows are replaced annually. All heifer calves are kept through first calving. It was estimated that 88 percent of these animals will be pregnant the following fall and that 83 percent will give birth to live calves. The brood cows give birth to 92 percent live calves. Selection for the herd replacements was done at 76 days postpartum at which time those heifers not chosen as herd replacements would have their calves weaned and go onto a finishing ration to be marketed approximately 60 days later at 1100 lbs. It is critical that the heifers are finished as quickly as possible so that they will grade choice instead of grading as heiferettes. A seasonal herd inventory for the surplus heifer system is shown in Figure 2.

Another management system analyzed in this study is the single-calf heifer system. This system differs from the previous in that no brood cows

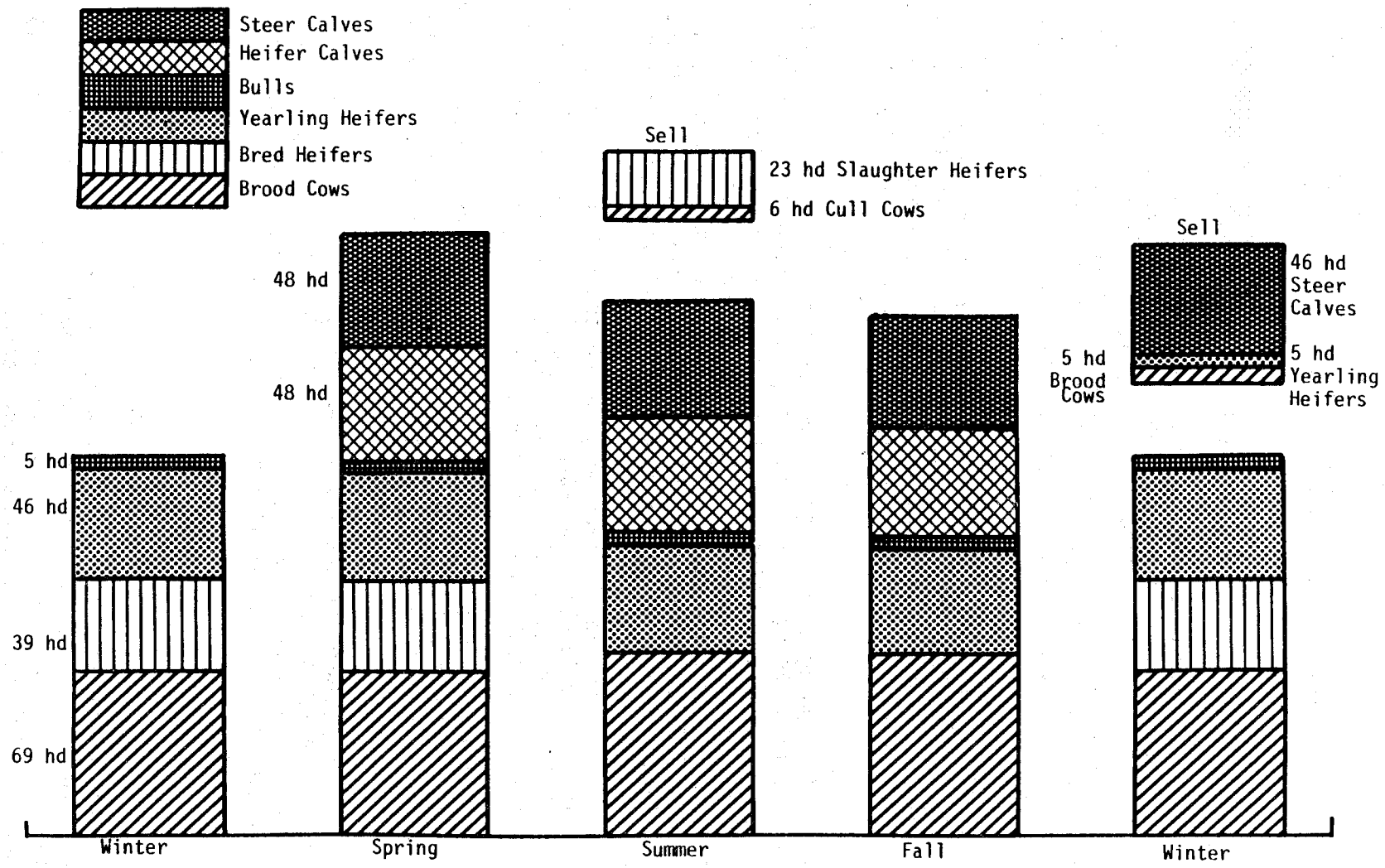


Figure 2. Seasonal Herd Inventories for a Surplus Heifer System in North Dakota.

*Cows 92 percent calves born live, 16 percent replacement, 1 percent death loss.
Heifers 83 percent calves born live, 88 percent heifers bred, 3.5 percent death loss.
Early weaned calves 4 percent death loss.
Slaughter heifers 85 percent grade choice.

are maintained in the herd. Instead, all calves are weaned at 76 days and all heifers are marketed on a grade and yield basis at approximately 1100 lbs., 137 days postpartum. It is assumed that 88 percent of the yearling heifers breed and of these 83 percent have live calves. All steer calves are marketed at 425 lbs. at about 210 days. In order to have a dynamically stable herd, 92 heifer calves are purchased as 400 lb. weanling calves (Figure 3).

Custom Feeding

Several custom feeding options were considered in this paper. The following basic assumptions apply to each alternative. Truckloads of animals weighing 50,000 lbs. each were shipped 450 miles to a feedlot. A one-way transportation charge of $1.81 per mile was used. A 4 percent transit shrink was assumed for all animals shipped to the feedlot. All animals were sold at the feedlot with a 3 percent pencil shrinkage subtracted in lieu of additional marketing charges.

Steers and heifers in the custom backgrounding program weighed 408 and 384 lbs., respectively, upon arrival at the feedlot and 700 and 650 lbs. at the time of sale. Average daily gains were 1.85 lbs. for steers and 1.67 lbs. for heifers. The feeding period was 158 days for steers and 150 days for heifers.

Weaned calves going directly to custom feedlots in the fall weighed the same as those entering the custom backgrounding lots. However, these calves were fed to slaughter weight. Steers weighed 1,100 lbs. and heifers 970 lbs. when sold. Steers were fed to gain 2.0 lbs. per day up to 700 lbs. and 3.0 lbs. per day from 700 to 1,100 lbs. Heifers were fed to gain 1.8 lbs. per day to 650 lbs. and 2.7 lbs. per day from 650 to 970 lbs. Custom feeding weaned steers and heifers to slaughter weight took 280 and 267 days, respectively.

Backgrounded steers and heifers weighed 648 and 600 lbs., respectively, when entering the custom feedlot. Average daily gains for steers and heifers were 3.0 and 2.7 lbs. It was assumed to take 151 days for a backgrounded steer and 138 days for a backgrounded heifer to reach slaughter weight.

Wintered steers and heifers weigh 552 lbs. and 514 lbs., respectively, when entering the custom feedlot. Average daily gains were 3.0 and 2.7 lbs. It took 183 days for a wintered steer and 170 days for a wintered heifer to reach slaughter weight.

Wintered and pastured steers and heifers weighed 768 and 710 lbs., respectively, when entering the feedlot for custom feeding. Average daily gains for steers and heifers was 3.0 and 2.7 lbs. It took 111 days to feed a wintered and pastured steer and 97 days to feed a wintered and pastured heifer to slaughter weight.

Livestock Prices

The market prices used in this study were compiled from 1958 to 1986 (Appendix B). The prices from 1963 to 1986 for steers and heifers marketed in North Dakota were based on USDA Market News Service prices received at West Fargo for No. 1 muscle thickness, medium-frame feeder cattle. USDA prices

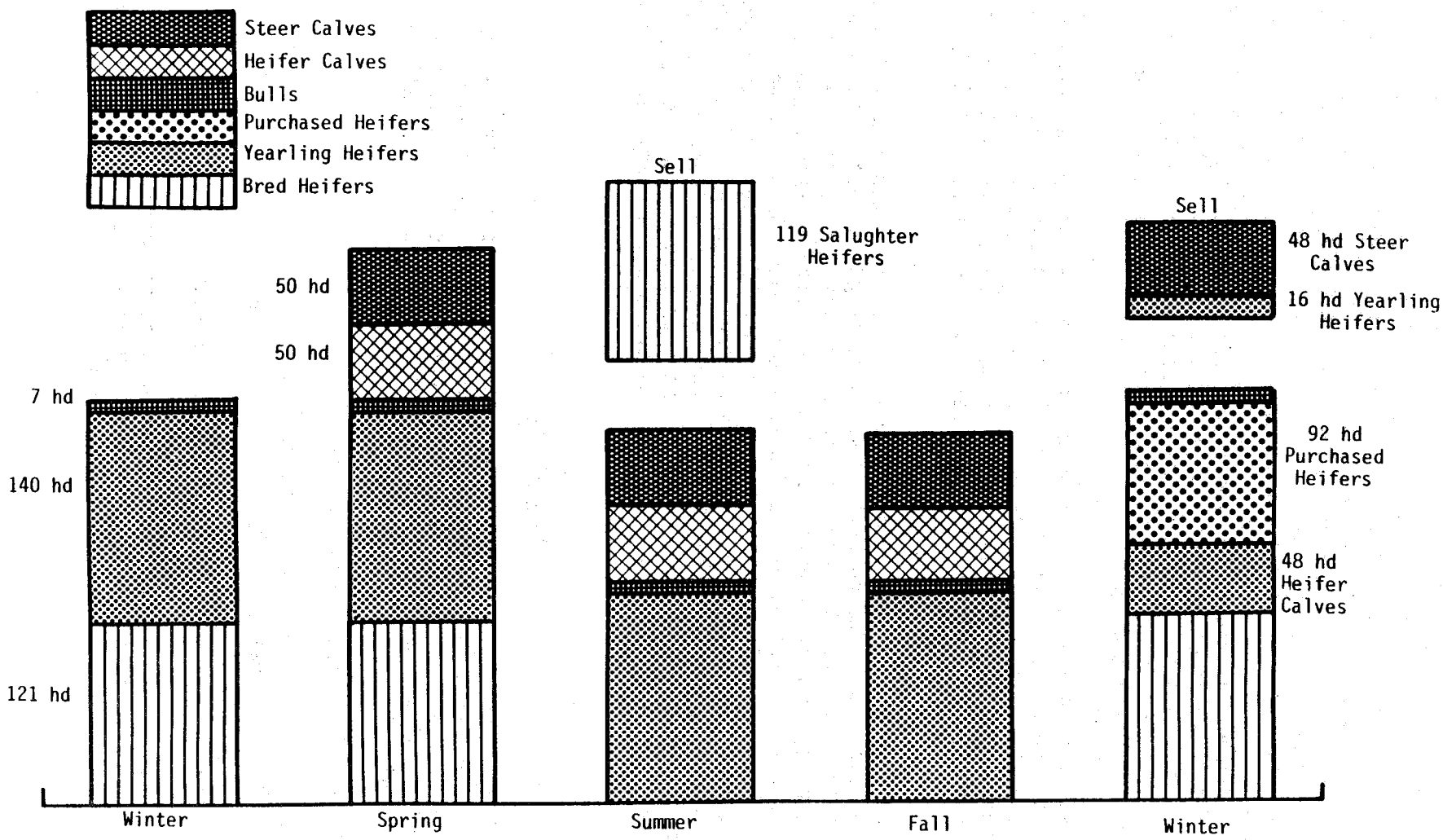


Figure 3. Seasonal Herd Inventories for a Single-Calf Heifer System in North Dakota.

*Heifers 83 percent calves born live, 88 percent bred, 3.5 percent death loss.
Early weaned calves, 4 percent death loss.
Slaughter heifers, 85 percent grade choice.

were unavailable prior to 1963, so prices received at Kansas City were adjusted using simple linear regression and used as proxies from 1958 to 1962. Regressions were computed between 10 years of prices from the two sources, with West Fargo prices as the dependent variable and Kansas City prices as the independent variable. The regressions examined the relationship between the prices at the two locations for 400-500 lb. steers and heifers, 500-600 lb. steers and heifers, 600-700 lb. steers and heifers, and 700-800 lb. steers and heifers. The equations generated in the regressions as well as the coefficients of determination (R^2) values and T-values are included in Appendix B. It should be noted that the regression results yielded fairly high R^2 and T-values, which demonstrate a strong relationship between the cattle prices from the two sources.

Prices used in the custom backgrounding and feeding options were based on 600-700 lb. choice steer and heifer yearlings at Kansas City and 900-1,100 lb. choice slaughter steers and heifers at Omaha. Cull cow prices were based on West Fargo 1000-1100 pound utility cow prices. Prices from 1958 to 1962 were calculated by regressing prices from West Fargo on Omaha utility cow prices.

Market prices used were three-month averages of prices received around the expected sale date. Weaned calf prices were based on September, October, and November prices. The slaughter heifer prices for the surplus heifer systems were based on July, August, and September prices. Backgrounded, wintered, and custom backgrounded calf prices were based on March, April, and May prices. Pastured calf and custom-fed, weaned calf prices were averages of August, September, and October prices. Prices for custom-fed, backgrounded calves were averages of September, October, and November prices; custom-fed, wintered calves, October, November, and December prices; and custom-fed, wintered, and pastured calves, the averages of December, January, and February prices.

Methodology

The production cost components were adjusted for price changes over time back to 1958 using indices of prices paid by farmers (Appendix C). Per cow production costs are divided by the hundredweights (cwt) of expected output to derive an estimate of a breakeven price that would cover all costs using this equation:

$$BE = (CC_t + WP_t + PP_{t+1} + CF_{t+1})/EO$$

where

BE = Breakeven price per cwt produce

CC_t = Cow-Calf production costs in year t

WP_t = Winter feeding program production costs in year t
WP_t = (.45 X steer winter program costs + .27 X heifer winter program costs)

PP_{t+1} = Pasturing program production costs in year t+1
PP_{t+1} = (.45 X steer pasturing costs + .27 X heifer pasturing costs)

CF_{t+1} = Custom feeding program production costs in year t+1,
CF_{t+1} = (.45 X steer custom feeding costs + .27 X heifer custom feeding costs)

EO = Expected output per cow
EO = (.45 X expected steer selling weight + .27 X expected heifer selling weight + revenue from cull cows and heifers)

The percentages used to adjust the steer and heifer production costs and expected selling weights reflect the percentage of steers and heifers sold per cow in the herd. It was assumed that 45 percent of a steer (half of the 90 percent calf crop) and 27 percent of a heifer (half of the 90 percent calf crop minus the 18 percent retention rate) were sold per cow. Production costs of feeding programs were included only when applicable, otherwise they equal zero in the equation. For example, if a calf was sold at weaning, then all production cost terms would equal zero except the cow-calf production costs, while if the calf was wintered, pastured, custom fed, and then sold, each production cost term would be included to reflect the costs of each production segment.

The break-even price was subtracted from an adjusted market price to derive an estimate of profit per cwt. The adjusted market price was equal to 63 percent (.45/(.45 + .27)) of the steer price plus 37 percent (.27/(.45 + .27)) of the heifer price, which reflects the combination of steers and heifers that are sold per cow. Profit per cwt was multiplied by the cwt of expected output per cow to yield an estimate of the profit per cow.

Perhaps the best method of evaluating retained ownership is comparing production costs and profitability involved with calves from a given calf crop. The increased capital requirements for the surplus heifer and the single-calf heifer system are evident (Table 1). For example, in 1984 it cost $305.72 per cow per year with the traditional cow-calf system versus $759.77 for the single-calf heifer system. The availability of funds to finance the single-calf heifer system should be a primary concern before trying to adapt the system. Also, added feed costs represent the majority of the cost increase with the single-calf heifer system, and management would need to carefully consider that aspect. Another concern for management with both the surplus heifer systems is the percentage of heifers that are marketed as choice versus marketed as heiferettes. For the purposes of this study it is assumed 85 perccent of the heifers were marketed as choice.

The profitability in terms of dollars per cow of the various systems is presented in Table 2. The cow-calf operation was profitable in 18 of the 29 years evaluated. Returns averaged $.78 per cow over the study period (Table 3). The most profitable system was the single-calf heifer system which was profitable 26 years and had an average return of $54.53 per cow. Factors contributing to the profitability of this system include: (1) taking advantage of the reproductive and growth ability of the young beef animal, (2) there are no brood cows overwintered with this system, and (3) sale of slaughter heifers before the seasonally low fall prices.

TABLE 1. TOTAL ESTIMATED ADJUSTED PRODUCTION COSTS PER COW OF THE COW-CALF OPERATION AND COW-CALF OPERATION WITH THE RETAINED OWNERSHIP ALTERNATIVES IN NORTH DAKOTA, BY CALF CROP, 1958-1983

Year	Cow-Calf	Single-Calf Heifer System	Cow-Calf Backgrounding	Cow-Calf Wintering	Cow-Calf, Wintering and Pasturing	Cow-Calf Custom Backgrounding
1958	90.52	279.00	91.22	81.75	103.76	94.49
1959	92.59	274.43	95.41	85.88	107.41	98.59
1960	89.99	255.56	95.65	86.36	107.72	98.52
1961	91.15	264.16	96.05	86.66	108.16	98.95
1962	92.31	270.75	97.11	87.63	109.21	100.03
1963	94.56	272.82	101.05	91.13	112.27	104.25
1964	93.33	254.52	102.61	92.79	114.43	105.67
1965	96.73	259.78	104.54	94.61	117.78	107.52
1966	104.29	291.04	107.51	97.14	120.47	110.56
1967	103.73	288.79	108.11	97.88	122.26	110.72
1968	102.98	281.65	108.01	98.39	124.89	109.64
1969	111.29	305.03	114.69	104.85	132.29	115.95
1970	115.94	323.01	118.86	108.45	136.41	120.31
1971	115.48	338.96	120.90	110.15	140.36	122.19
1972	119.10	364.52	122.21	111.37	150.32	122.96
1973	177.03	513.51	173.32	156.81	201.52	177.97
1974	200.62	487.03	219.86	199.81	244.62	225.74
1975	195.27	482.65	225.36	206.10	253.74	229.32
1976	196.55	495.77	226.52	206.88	256.35	229.91
1977	199.01	516.35	232.36	213.19	270.16	234.44
1978	226.47	624.73	246.30	227.42	300.33	247.09
1979	280.07	762.79	296.81	275.53	352.17	298.37
1980	316.40	792.15	340.49	316.42	397.25	343.22
1981	340.01	798.82	377.95	351.74	429.32	381.31
1982	311.60	745.40	351.12	327.39	402.30	351.47
1983	296.08	727.71	340.69	314.88	390.63	342.19
1984	305.71	759.76	351.69	325.12	397.14	353.18
1985	267.35	670.88	301.37	279.05	348.12	299.55
1986	251.22	654.65				

TABLE 1. TOTAL ESTIMATED ADJUSTED PRODUCTION COSTS PER COW OF THE COW-CALF OPERATION AND COW-CALF OPERATION WITH THE RETAINED OWNERSHIP ALTERNATIVES IN NORTH DAKOTA, BY CALF CROP, 1958-1983 (CONTINUED)

Year	Cow-Calf	Surplus Heifer System	Cow-Calf Custom Feeding	Cow-Calf, Backgrounding, & Custom Feeding	Cow-Calf, Wintering, & Custom Feeding	Cow-Calf, Wintering, Pasturing, & Custom Feeding
1958	90.52	109.86	141.52	147.81	149.04	146.39
1959	92.59	112.11	142.69	150.17	151.05	148.46
1960	89.99	109.00	144.76	150.64	151.87	149.17
1961	91.15	110.36	145.85	151.62	152.86	150.25
1962	92.31	111.71	149.31	154.67	156.33	152.58
1963	94.56	114.85	150.97	157.60	158.73	154.68
1964	93.33	113.42	154.85	160.05	161.42	157.98
1965	96.73	117.06	160.76	165.55	167.33	163.60
1966	104.29	125.58	160.58	167.65	168.84	165.80
1967	103.73	124.72	157.05	165.78	166.45	165.74
1968	102.98	122.76	161.31	168.24	169.84	170.64
1969	111.29	131.59	170.68	178.48	180.49	180.12
1970	115.94	137.40	175.05	183.50	185.24	185.49
1971	115.48	137.56	178.01	186.82	188.66	190.63
1972	119.10	141.33	228.23	222.40	231.02	226.15
1973	177.03	211.16	285.17	291.48	298.79	287.51
1974	200.62	242.28	319.29	330.96	332.97	328.33
1975	195.27	235.09	327.39	339.90	343.31	338.65
1976	196.55	236.98	325.18	338.88	341.46	340.80
1977	199.01	238.51	339.11	349.95	353.34	360.56
1978	226.47	265.68	381.73	391.56	399.38	409.41
1979	280.07	324.73	440.13	455.92	464.90	473.69
1980	316.40	367.21	492.05	512.89	521.36	527.51
1981	340.01	395.71	500.78	534.15	536.68	548.89
1982	311.60	361.72	485.57	511.65	518.51	522.16
1983	296.08	349.83	481.79	504.38	509.78	514.89
1984	305.71	360.48	454.78	492.73	492.94	503.78
1985	267.35	313.72	400.77	430.58	433.11	447.84
1986	251.22	294.15				

TABLE 2. ESTIMATED PROFIT PER COW OF THE COW-CALF OPERATION AND COW-CALF OPERATION WITH THE RETAINED OWNERSHIP ALTERNATIVES IN NORTH DAKOTA, BY CALF CROP, 1958-1983

Year	Cow-Calf	Surplus Heifer System	Cow-Calf Backgrounding	Cow-Calf Wintering	Cow-Calf, Wintering and Pasturing	Cow-Calf Custom Backgrounding
1958	36.87	39.00	54.29	42.10	54.32	51.45
1959	19.12	31.87	34.88	24.46	26.86	33.68
1960	13.59	18.24	25.93	16.35	30.19	21.58
1961	18.10	18.01	26.09	16.57	40.68	23.83
1962	21.06	28.17	18.67	11.17	26.55	20.94
1963	3.05	11.70	-2.24	-6.82	-2.49	-0.53
1964	- 8.91	-1.76	-3.75	-8.43	15.54	3.27
1965	5.92	9.14	19.40	10.65	21.38	24.80
1966	9.59	13.45	12.30	5.10	18.17	11.14
1967	10.39	14.62	17.08	8.95	18.18	19.63
1968	16.26	18.93	30.09	19.45	38.94	40.06
1969	21.67	26.15	41.60	29.01	30.89	45.49
1970	29.51	29.20	33.92	21.92	48.52	38.28
1971	48.54	43.19	56.37	50.56	76.59	57.51
1972	79.91	68.89	116.72	104.07	134.89	118.36
1973	27.63	62.03	19.55	20.23	-35.14	18.31
1974	-76.46	-56.29	-80.70	-82.06	-48.49	-81.50
1975	-53.57	-29.99	-35.99	-38.98	-61.60	-36.23
1976	-38.23	-45.03	-48.98	-49.23	-41.72	-45.23
1977	6.19	-25.28	20.31	13.14	66.20	20.72
1978	78.31	48.26	147.96	128.16	122.61	154.16
1979	68.18	77.07	28.02	20.09	36.33	30.43
1980	-10.41	13.53	-39.91	-48.52	-55.33	-31.99
1981	-76.69	-62.50	-85.94	-97.19	-80.29	-78.03
1982	-55.95	-33.41	-50.39	-61.58	-94.47	-37.57
1983	-48.04	-38.89	-52.89	-61.70	-51.03	-38.12
1984	-52.33	-32.40	-57.15	-65.74	-85.23	-43.13
1985	-17.24	-21.49	-40.59	-39.63	- 9.34	-22.00
1986	-53.57	20.41				

TABLE 2. ESTIMATED PROFIT PER COW OF THE COW-CALF OPERATION AND COW-CALF OPERATION WITH THE RETAINED OWNERSHIP ALTERNATIVES IN NORTH DAKOTA, BY CALF CROP, 1958-1983 (CONTINUED)

Year	Cow-Calf	Single Calf Heifer System	Cow-Calf Custom Feeding	Cow-Calf, Backgrounding, & Custom Feeding	Cow-Calf, Wintering, & Custom Feeding	Cow-Calf, Wintering, Pasturing, & Custom Feeding
1958	36.87	62.07	53.64	42.69	36.95	43.03
1959	19.12	73.19	32.45	26.99	31.06	42.32
1960	13.59	55.06	28.22	24.15	27.10	37.94
1961	18.10	39.51	57.22	55.59	53.52	41.69
1962	21.06	68.59	25.05	15.94	8.71	5.68
1963	3.05	36.50	24.52	16.01	10.74	11.18
1964	- 8.91	33.65	31.47	23.38	20.73	31.74
1965	5.92	59.34	22.63	13.70	8.17	13.57
1966	9.59	41.00	31.16	21.02	16.86	21.78
1967	10.39	45.36	40.26	31.12	32.49	35.78
1968	16.26	59.97	46.84	33.65	30.37	36.71
1969	21.67	74.79	42.01	27.10	19.31	33.14
1970	29.51	62.16	61.94	54.50	57.23	72.30
1971	48.54	79.82	76.54	62.90	66.35	98.06
1972	79.91	110.26	111.58	86.13	36.55	96.41
1973	27.63	118.92	24.46	-3.59	-20.82	-25.15
1974	-76.46	13.63	28.25	13.09	1.94	-25.62
1975	-53.57	-40.26	-58.71	-65.35	-60.89	-57.70
1976	-38.23	-15.02	-29.86	-38.70	-33.93	-22.04
1977	6.19	72.41	50.43	43.39	44.01	77.46
1978	78.31	110.24	93.77	94.20	88.28	78.47
1979	68.18	102.04	64.34	32.20	10.50	-16.11
1980	-10.41	20.86	-26.89	-62.70	-89.06	-82.46
1981	-76.69	59.20	-52.22	-100.36	-108.41	-112.57
1982	-55.95	29.23	-47.93	-78.03	-75.39	-41.62
1983	-48.04	50.31	-23.80	-45.79	-43.83	-44.60
1984	-52.33	7.29	-59.76	-69.50	-41.49	-66.55
1985	-17.24	97.17	32.50	11.64	9.41	-9.08
1986	-53.57					

TABLE 3. SUMMARY OF RESULTS FOR THE COW-CALF AND COW-CALF WITH THE RETAINED OWNERSHIP ALTERNATIVES

	Cow-Calf	Surplus Heifer System	Cow-Calf Backgrounding	Single-Calf Heifer System	Cow-Calf Wintering	Cow-Calf, Wintering, Pasturing	Cow-Calf Custom Backgrounding	Cow-Calf Custom Feeding	Cow-Calf, Backgrounding, & Custom Feeding	Cow-Calf, Wintering, & Custom Feeding	Cow-Calf, Wintering, Pasturing, & Custom Feeding
	$/cow										
Average	.78	12.75	7.31	54.53	-0.64	8.63	11.40	24.29	9.48	5.02	9.78
Maximum	79.91	77.07	147.96	118.92	128.16	134.89	154.16	111.58	94.20	88.28	98.06
Minimum	-76.69	-62.50	-85.94	40.26	-97.19	-94.47	-81.50	-59.76	-100.36	-100.41	-112.57
Standard Deviation	42.52	38.50	53.02	37.16	50.65	57.74	51.05	44.34	49.09	46.71	53.14
Coefficient Of Variation	54.75	2.81	7.25	.68	-79.16	6.69	4.48	1.83	5.18	9.31	5.43

The cow-calf, custom feeding alternative was the next most profitable production alternative. It was profitable 27 of out 28 years with returns averaging $24.29 per cow. The surplus heifer system alternative had an average return of $12.75 per cow. Next profitable on a per cow basis was the cow-calf, custom backgrounding which was profitable 18 years and had an average return of $11.40. Since pasture capacity permits a larger number of cows, the single-calf heifer systems were much more profitable from a total revenue perspective. The least profitable of all the enterprises was the cow-calf, wintering alternative.

The coefficient of variation (CV), which is the standard deviation divided by the mean, provides a measure of variation relative to earnings. The CV provides a means of comparing the riskiness and, in this case, price risk of production alternatives. The large CV of the traditional cow-calf operation is the result of its relatively small profit and high variability. The surplus heifer systems reduced price risk primarily due to the larger profit margin while the retained ownership alternatives reduced price risk because of reduced variability in profits. The cow-calf, wintering, custom feeding; the cow-calf, custom feeding and the single-calf heifer system had the lowest CV values, indicating they had the lowest associated price risk of the options considered. The CV values for the remaining retained ownership alternatives, with the exception of the cow-calf, wintering alternative, had similar values.

The potential benefits of retained ownership are illustrated in Figures 4 through 9. Profit per cow in the traditional cow-calf operation in one year should be compared with profit per cow in the cow-calf and retained ownership alternative in the following year to determine any impact on the profitability of retaining ownership of a given calf crop. Cow-calf producers could have improved profitability per cow by retaining ownership rather than selling at weaning in most of the years studied. The single-calf heifer system generally was more profitable than any other system for all years studied while the surplus heifer system was comparable to the retained ownership alternatives.

The Decision to Custom Feed

Custom feeding enables cow-calf producers with sound, progressive breeding programs to capitalize on more breeding improvements than just increased weaning weights. It also provides a way in which producers can capture any profits backgrounders and cattle feeders would have realized. However, feeding to slaughter weight will delay earnings four to ten months. Capital requirements will increase substantially because of the longer period of ownership. A producer that custom feeds is bound by contract with the feedlot, establishing a security interest in the cattle until all charges have been paid.

Selecting a Custom Feedlot

Custom feedlots sell feeding management and expertise, which is the basis upon which they compete. Producers should investigate carefully before selecting a feedlot because of the variety of services offered and methods of handling financial details (Doane's Agricultural Report 1982).

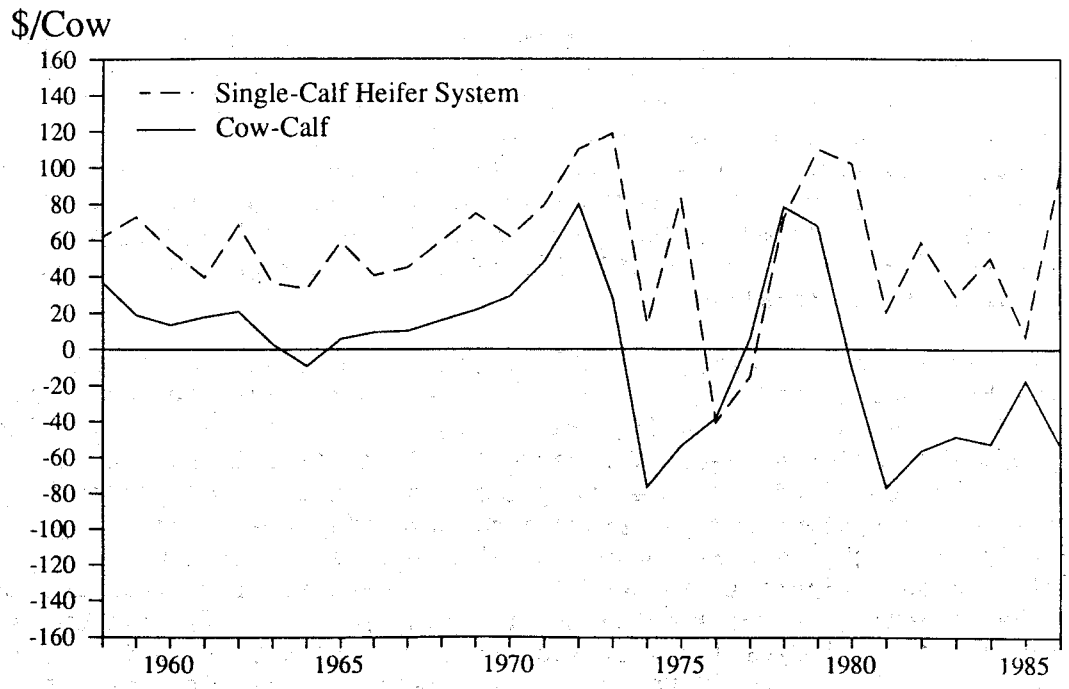


Figure 4. Estimated Profitability Per Cow on the Cow-Calf and the Single-Calf Heifer System Operations in North Dakota, 1958-1986.

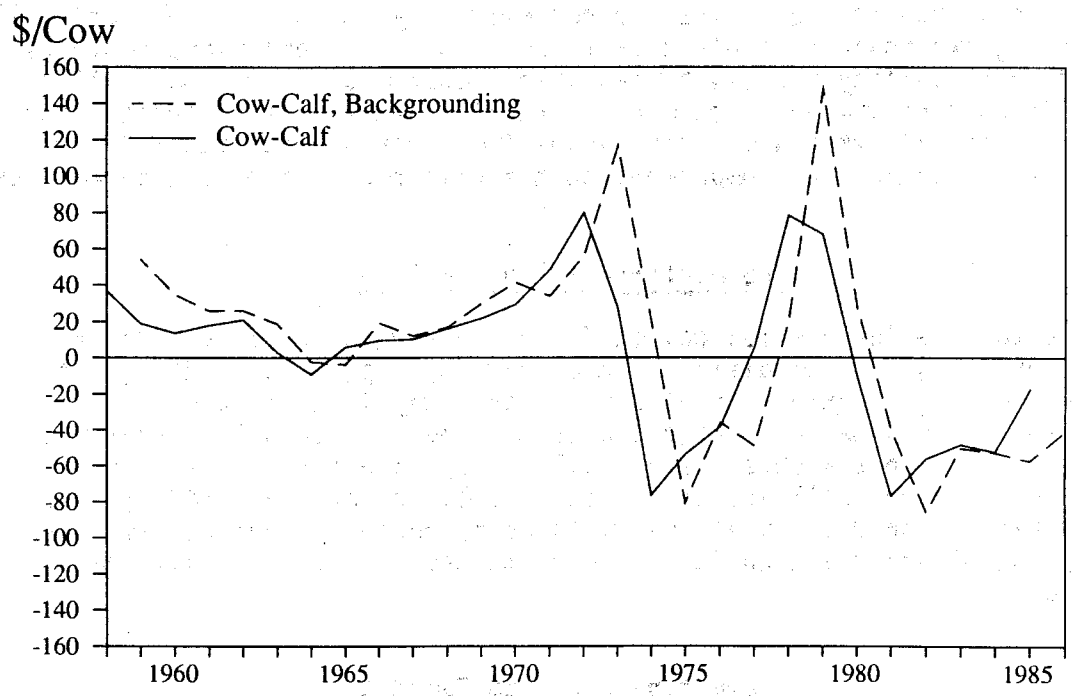


Figure 5. Estimated Profitability Per Cow on the Cow-Calf and the Cow-Calf and Backgrounding Operations in North Dakota, 1958-1986.

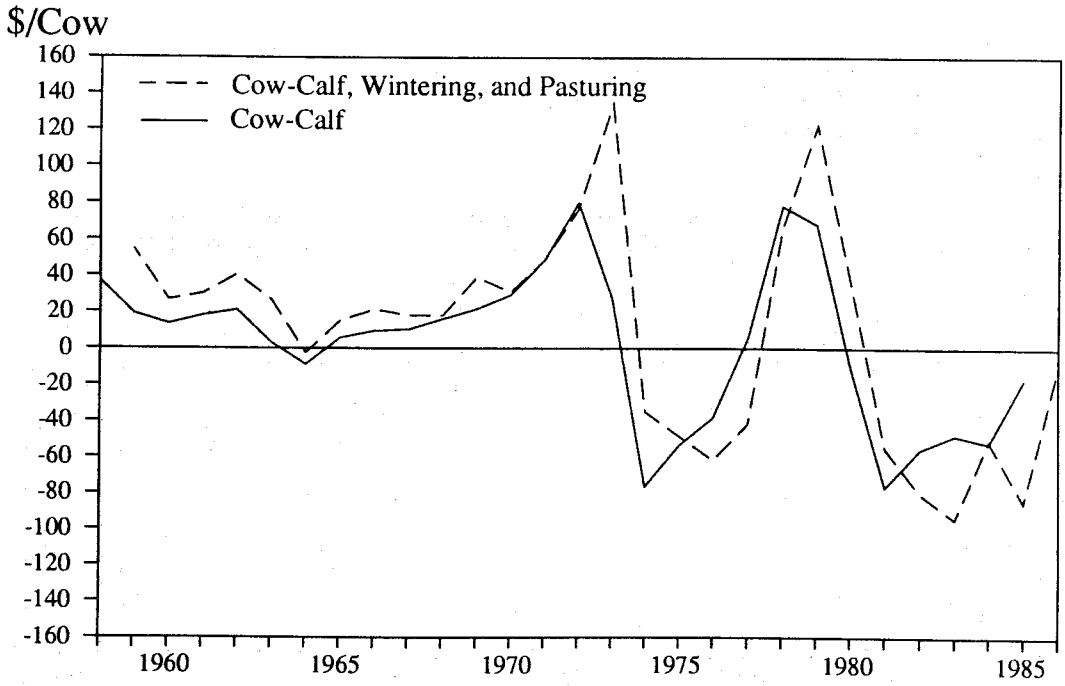


Figure 6. Estimated Profiability Per Cow on the Cow-Calf and the Cow-Calf, Wintering and Pasturing Operations in North Dakota, 1958-1986.

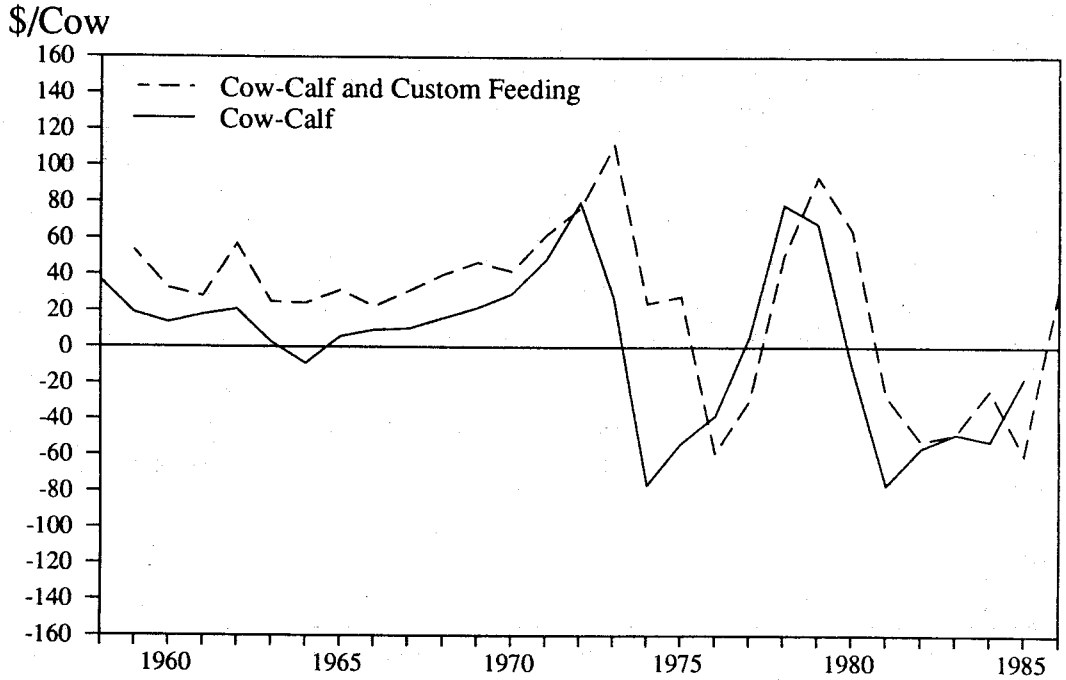


Figure 7. Estimated Profitability Per Cow on the Cow-Calf and the Cow-Calf and Custom Feeding Weaned Calves Operations in North Dakota, 1958-1986.

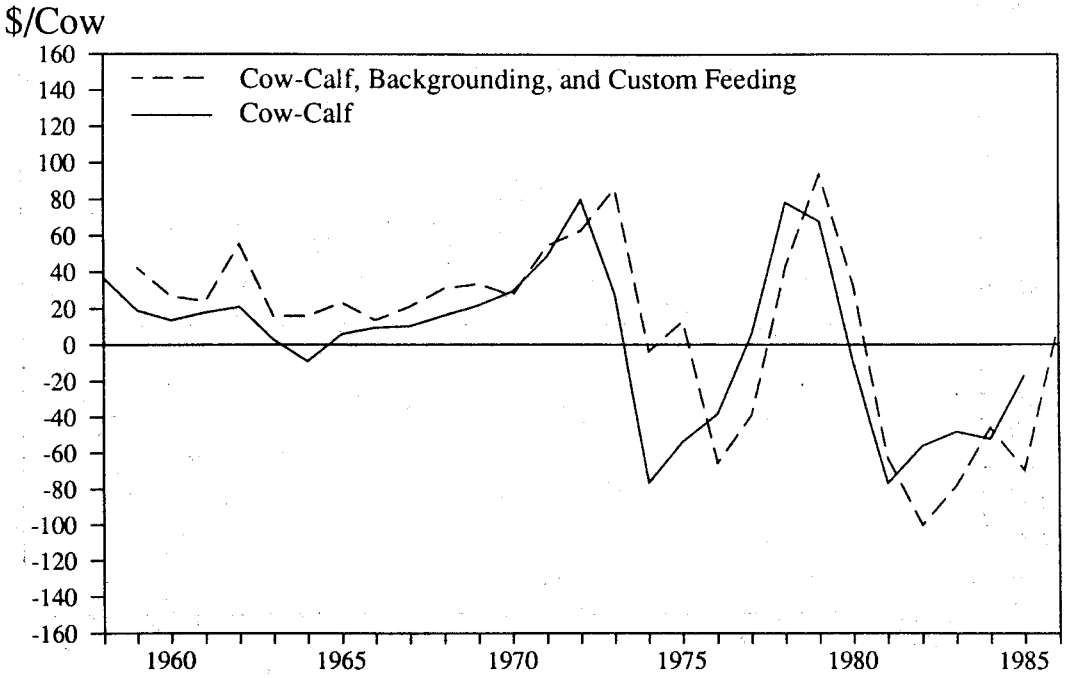


Figure 8. Estimated Profitability Per Cow on the Cow-Calf and the Cow-Calf, Backgrounding, and Custom Feeding Operations in North Dakota, 1958-1986.

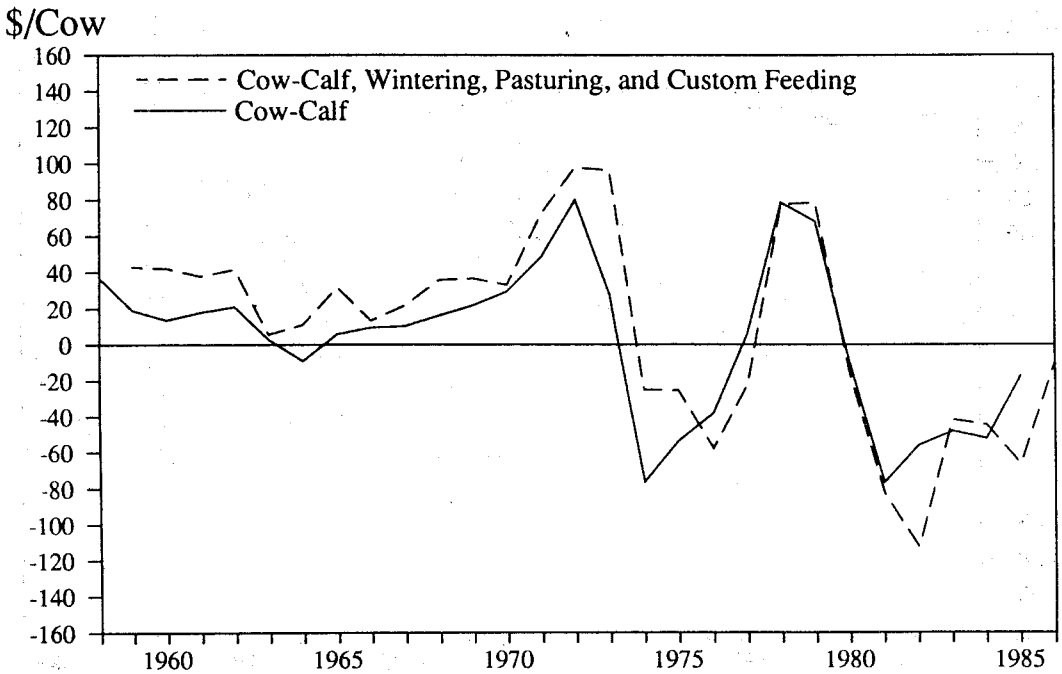


Figure 9. Estimated Profitability Per Cow on the Cow-Calf and the Cow-Calf, Wintering, Pasturing, and Custom Feeding Operations in North Dakota, 1958-1986.

Location of the feedlot with respect to weather, shipping distance and transportation costs, and proximity to feed supplies and packing houses is important. Low-humidity climates are preferred because performance typically drops when humidity is high. When low-cost, locally grown feed is available, it can provide a feedlot with an attractive competitive edge. The proximity of several packing plants is important because this increases the potential number of competitive price bids for finished cattle.

A good place to start in the search for a custom feedlot is talking with other producers who have custom fed cattle. They can provide important information about feedlots with whom they have dealt or recommendations of others to try. Extension specialists in the area where the cattle are to be fed are another good source of information.

After selecting several feedlots for further consideration, it is important for the producer to take the time to visit each. It is during these visits that he will meet the people he will be dealing with. During these visits the producer should learn as much as possible about the feedlot's operation and management. He should evaluate the general appearance of the feedlot; a clean, well-maintained operation should be a reflection of its management. Other items to note include availability of clean water in properly located water tanks, adequate shelter, usable handling and loading facilities, location of the mounds, width of the concrete apron along feed bunks, and the space per head in the lot and at the feed bunk. Mounds should be 6 to 8 feet high and 6 feet wide at the top (Minish and Fox 1982) and should be built near the concrete feeder apron to keep the cattle nearer the feed bunk. Cattle require 150 square feet per head in the lot and 25 square feet per head on the mound in a sloping well-drained dirt lot with mounds, and 400 square feet per head in the lot and 25 square feet per head on the mound in a nearly level dirt lot with mounds. Feeder cattle over 600 lbs. require about 22 to 26 inches of feeder per head (Minish and Fox 1982).

Rather than contracting directly with a custom feeder, a cow-calf producer may consider contracting with a livestock management company. Livestock management companies serve as agents managing cattle for owners who want their cattle custom fed. They take care of the details involved with custom feeding that a cow-calf producer with little experience in custom feeding may miss. They evaluate and select the feedlots and typically have someone who visits the feedlots periodically, preferably unscheduled, to check progress and performance. This is an important service to an owner living far from the feedlot.

Livestock management companies also help develop marketing plans that meet the owner's goals. Because this often involves hedging, the cattle management company should be equipped and prepared to provide that service. Many are also capable of providing financing to qualified cattle owners who want to custom feed but choose not to finance with local financial agencies.

Systems of Payment

Two types of costs, direct feedlot service charges and ownership costs, are incurred when custom feeding. The direct feedlot charges include feed costs; yardage charges which feedlots use to cover operating and fixed costs; veterinary treatment charges to cover a routine vaccination, dipping, and a

worming program for incoming cattle; and hazard insurance to cover losses from windstorms, lightning, etc. and death loss over 10 percent. The ownership costs include interest on the cattle investment, interest on feedlot charges, and transportation expenses.

Guyer (1975) lists the following methods of calculating payment from owner to feeder currently being used:

1. Feed costs plus yardage
2. Feed mark-up (to cover yardage)
3. Price per pound of gain
4. Price per head per day

Feed cost plus yardage is the approach used most often when feeders have the capability to weigh feed. When using this type of contract, the cattle owner should be concerned about record accuracy, the quality of health management, competitive feed prices, lot design and management, and specified goals the cattle are fed to meet.

The feed mark-up method is used by some feedlots to cover milling costs and yardage charges. A dry matter or 90 percent dry matter basis is preferred for the mark-up in order to compare yardage costs more accurately. The same concerns to the cattle owner apply to the feed mark-up method as the feed cost plus yardage.

The price per pound of gain method is typically used by feedlots that do not have facilities available to weigh feed. This type of arrangement provides motivation for the feeder to use the best management practices to obtain high rates of gain at least cost, which, in turn, should be advantageous to the owner because health problems and death loss may be minimized.

Contracts based on a flat price per head may be best when the owner is willing to accept rather low rates of gain. This type of contract is useful when calves utilize unharvested crop residues, winter range, or other feeds when daily feed intake and cost of gain are difficult to measure. However, certain stipulations should be added to the contract, such as bonuses for a low death loss or for meeting a minimum average daily gain and to provide incentives for the feeder to provide good management.

The Contract Arrangement

Satisfied parties to a contract arrangement can exist only if both parties are fully informed and all important points are covered by the contract. Guyer (1975) lists the following factors that should be included in detail in custom feeding contracts.

Weighing conditions, including fill procedures to be used prior to weighing, when and where calves are to be weighed, and allowable pencil shrink should be agreed upon when the contract price is set. Care should be taken so feeders will not be penalized when cattle enter the feedlot with too much fill nor should the owner pay for excessive fill at the time of sale.

Assigning responsibility for death loss is very important. Excessive death loss as a result of poor cattle health should not be charged to the feeder. Neither should the owner be expected to absorb excessive death loss resulting from negligent health management practices by the feeder. Many contracts specify that the owner stand all death losses for a specified period of time after arrival at the feedlot, typically one month. After that the feeder and owner may share the death loss.

Veterinary, medicine, and immunization costs should be paid by the owner. Feeders should insist that vaccinations, dehorning, castration, etc. be done prior to arrival at the feedlot. If the feeder must perform these operations after arrival, cost of gain should be adjusted to give the feeder adequate compensation for the lost gain due to the stress of treatment and other costs involved.

A minimum and maximum length of the feeding period should be specified. Cost of gain is usually high for short growing periods because time is needed for adjustment and recovery from shipment. Cost of gain is also higher in long growing periods as cattle reach heavier weights. Weight of cattle should also be specified because lightweight cattle gain at less cost than heavier feeders.

Both owners and feeders may benefit from including guidelines regarding rate of gain in the agreement. Faster rates of gain are usually lower cost gains when a given final weight is the terminal point in the feeding program. However, faster gaining cattle that are fed for a given period of time finish at a heavier average weight. Fast gains during the growing phase are offset to some extent by the slower and more expensive rate of gain in the finishing phase.

The method and timing of payments or financing arrangements are very important. Partial payments made during the feeding period, usually at bi-weekly or monthly intervals, reduce the interest payments for feed and yardage charges the owner would have to pay. If financed, cash outlay during the feeding period is usually not required.

The terms of the contract should give the feeder a security interest in the cattle until all charges have been paid. Feeders should familiarize themselves with laws governing liens and mortgages to ensure payment for feed and services rendered. Owners should also be aware of their rights if they are mortgaging their cattle. The feeder must notify the holder of the mortgage of his intent to assert his lien for feeds and services within 10 days of receipt of the cattle if he wants his lien to be considered first.

An example of a contract arrangement between a custom feeder and a cattle owner is presented in Appendix D. This sample contract simply provides an outline to follow. It should not be used until appropriate ammendments tailoring it to individual situations are added and it has been checked for compliance with the laws of the appropriate state.

Summary and Conclusions

The objective of this study was to discuss the potential benefits of retaining ownership in cow-calf operations. Eleven alternative management schemes were examined: (1) traditional cow-calf; (2) surplus heifer system; (3) single-calf heifer system; (4) cow-calf and backgrounding; (5) cow-calf and wintering; (6) cow-calf, wintering, and pasturing; (7) cow-calf and custom backgrounding; (8) cow-calf and custom feeding a weaned calf; (9) cow-calf, backgrounding, and custom feeding; (10) cow-calf, wintering, and custom feeding; (11) cow-calf, wintering, pasturing, and custom feeding. Profitability per cow and average return on production cost were estimated from 1958 to 1986. The budgets used to estimate costs of production were based on the opportunity cost of the resources used.

Results indicated that beef production, especially the cow-calf operation, is exposed to significant price risk. The use of three-month average market prices to calculate profitability probably reduced the price risk that individual producers actually face when selling cattle on one particular day. This riskiness reflects the need for informed managerial involvement in production and marketing decisions. As the risks in beef production increase, the level of management should increase as well, especially with respect to financing. Exposure to financial risk should be minimized.

Both surplus heifer systems were estimated to be a viable production alternative for North Dakota producers. They demonstrated less price risk than either the traditional cow-calf or retained ownership alternatives. However, more management is needed for calving and breeding the greater the percentage of heifers in the herd. Surplus heifer systems have greater capital requirements than the retained ownership alternatives. Although no farm records are available for this system, 85 percent of the slaughter heifers were assumed to be grade choice. A lower percentage grading choice would adversely affect the profitability of this alternative.

Producers must consider the additional production risk of custom feeding because the animals are outside their personal management control. According to the results of the study, cow-calf producers could improve profit considerably by retaining ownership. There were several years, however, when selling calves at weaning was the most profitable.

It should be noted that the estimates of profitability discussed in this study are returns to management. Because retaining ownership and the surplus heifer systems requires a higher level of management, the increased returns may not offset the costs inherent to additional management.

Retained ownership was shown to be a viable production and marketing alternative that can reduce the price risk inherent to the cow-calf operation that markets weaned calves. However, all production alternatives considered in this paper were exposed to considerable price risk. Retaining ownership increases the cost of ownership in terms of the additional operating capital required. An operation's cash flow must be carefully analyzed prior to considering retaining ownership due to the increased operating expense burden, especially in the first year.

Appendix A

SURPLUS HEIFER SYSTEM (1984)

	(Per Cow)
Feed Expense	$214.32
Labor Expense[1]	35.28
Market Expense	15.00
Operating Expense	29.50
Operating Interest[2]	14.68
Livestock Interest[3]	44.36
Ownership Costs[4]	9.03
Total Expense	362.17

[1]Labor expense = (1.05% x traditional cow-calf labor)

[2]Operating interest = (Feed expense + operating expense) X interest rate X .5

[3]Livestock interest = (Cow value X interest rate) where cow value = (10 cwts. X price)

[4]Ownership costs = ($75 X interest rate)

SINGLE-CALF HEIFER SYSTEM BUDGET (1984)

	(Per Cow)
Feed Expense	$420.26
Labor Expense[1]	36.96
Marketing Expense	15.00
Operating Expense	29.50
Purchased Heifer Calves[2]	173.60
Operating Interest[3]	27.08
Livestock Interest[4]	51.70
Ownership Costs[5]	9.03
	763.13

[1]Labor expense = (1.10% X traditional cow-calf labor)

[2]Purchased heifer calves = (92 hd X 4 cwts./hd X price/cwt) ÷ 121 hd

[3]Operating interest = (feed expense + operating expense) X .5 X interest rate

[4]Livestock interest = (cow value X interest rate)

[5]Ownership costs = ($75 X interest rate)

COW-CALF BUDGET (1984)

	(Per Cow)
Feed Expense	$162.66
Labor 8 hrs @ $4.20/hr	33.60
Other Operating Expenses	29.50
Marketing Expenses	15.00
Interest on Operating Expenses[1]	11.57
Livestock Interest[2]	44.36
Ownership Costs[3]	9.03
Total Production Costs	$305.72

Break-Even Price: 4.25 cwt x .45 = 1.9125
4.00 cwt x .27 = 1.0800
2.9925

$$\frac{\$305.72}{2.9925 \text{ cwt}} = \$102.16/\text{cwt}$$

---

[1] Interest on operating expenses = (feed expense + pasture rent + other operating expenses) x interest rate x .5

[2] (Fall cow price X 10 cwt. X interest rate)

[3] $75 X interest rate

COW-CALF AND SURPLUS HEIFER PRODUCTION COEFFICIENTS

a. Weaned steers weigh 425 lbs*

Weaned heifers weigh 400 lbs*

Cull heifers weigh 750 lbs

Cull cows weigh 1,000 lbs

Slaughter heifers 1,100 lbs

b. 16% cow replacement rate

1% cow death loss

18% heifer retention rate

c. 90% calf crop (45% steers + 45% heifers)

d. 63% calves sold steers (45 steers/72 hd sold)

37% calves sold heifers (27 heifers/72 hd sold)

85% heifers grade choice

15% marketed as heiferettes

e. 299.25 lbs calf wt sold per cow per year

425 lbs steer x .45	=	191.25
400 lbs heifer x .27	=	108.00
		299.25

*Even though the surplus heifer systems have a larger percentage of heifers included in the herd, their calves are weaned early and for this reason the weaning weights are not changed.

BACKGROUNDING (1984)

	Steers (Per Head)	Heifers (Per Head)
Feeder Cost	$280.63	$228.32
Feed Expense	76.94	72.64
Other Operating Expenses	20.72	20.72
Labor	16.80	16.80
Marketing Expenses	10.00	10.00
Interest on Operating Expenses[1]	2.83	2.73
Interest on Calves[2]	13.89	11.30
Death Loss[3]	2.81	2.28
Overhead	10.00	10.00
Total Production Costs	$434.62	$374.79

Breakeven Price: Steers $\frac{\$434.62}{6.75 \text{ cwt}}$ = $64.39/cwt Heifers $\frac{\$374.79}{6.25 \text{ cwt}}$ = $59.97/cwt

---

[1](Feed expense + operating expense + labor) x (interest rate x .5) x percent of year on feed.

[2]Feeder cost x interest rate x percent of year on feed.

[3]Feeder cost x .01.

Production Coefficients

	Steers	Heifers
a. Purchase weight in lbs	425	400
Selling weight in lbs	675	625
b. Average daily gain in lbs	1.7	1.5
c. Feeding period in days	150	150
d. Death loss in percent	1	1

WINTERING (1984)

	Steers (Per Head)	Heifers (Per Head)
Feeder Cost	$280.63	$228.32
Feed Expense	40.65	38.38
Other Operating Expenses	20.72	20.72
Labor	16.80	16.80
Marketing Expenses	10.00	10.00
Interest on Operating Expenses[1]	1.93	1.88
Interest on Calves[1]	13.89	11.30
Death Loss[1]	2.81	2.28
Overhead	10.00	10.00
Total Production Costs	$397.43	$339.68

Breakeven Price: Steers $\frac{\$397.43}{5.75 \text{ cwt}}$ = $69.12/cwt Heifers $\frac{\$339.68}{5.35 \text{ cwt}}$ = $63.49/cwt

[1]Refer to backgrounding budget.

Production Coefficients

	Steers	Heifers
a. Purchase weight in lbs	425	400
Selling weight in lbs	575	535
b. Average daily gain in lbs	1.0	.9
c. Feeding period in days	150	150
d. Death loss in percent	1	1

PASTURING (1984)

	Steers (Per Head)	Heifers (Per Head)
Feeder Cost	$380.48	$305.16
Pasture Rent	40.00	40.00
Feed Expense	10.89	10.43
Other Operating Expenses	19.68	19.68
Labor	10.50	10.50
Marketing Expenses	10.00	10.00
Interest on Operating Expenses[1]	1.60	1.60
Interest on Calves[2]	15.06	12.08
Death Loss[2]	3.80	3.05
Overhead	5.00	5.00
Total Production Costs	$497.01	$417.50

Breakeven Price: Steers $\frac{\$497.01}{8.0 \text{ cwt}}$ = $62.13/cwt Heifers $\frac{\$417.50}{7.40 \text{ cwt}}$ = $56.42/cwt

[1](Pasture rent + feeder expense + other operating expenses + labor) x .5 x interest rate x percent of year on feed.

[2]Refer to backgrounding budget.

Production Coefficients

	Steers	Heifers
a. Purchase weight in lbs	575	535
Selling weight in lbs	800	740
b. Average daily gain in lbs	1.9	1.7
c. Feeding period in days	120	120
d. Death loss in percent	1	1

CUSTOM BACKGROUNDING (1984)

	Steers (Per Head)	Heifers (Per Head)
Feeder Cost	$280.63	$228.32
Feed Expense	112.42	96.44
Transportation Expense	6.92	6.52
Veterinary & Medical Expenses	7.00	7.00
Yardage Charge	14.21	13.50
Interest on Operating Expenses[1]	3.84	3.22
Interest on Calves[2]	14.63	11.30
Death Loss[2]	2.81	2.28
Total Production Costs	$442.46	$368.58

Breakeven Price: Steers $\frac{\$442.46}{(7.00 \times .97)}$ = $65.16/cwt

Heifers $\frac{\$368.58}{(6.50 \times .97)}$ = $58.46/cwt

[1][Transportation expenses + (feed expense + veterinary and medical expense + yardage charge) X .5] x interest rate x percent of year on feed.
[2]Refer to backgrounding budget.

Production Coefficients	Steers	Heifers
a. Purchase weight in lbs	425	400
Selling weight in lbs	700	650
b. Average daily gain in lbs	1.85	1.67
c. Feeding period in days	158	150
d. Shrinkage in percent		
In transit	4	4
At marketing	3	3
e. Death loss in percent	1	1

CUSTOM FEEDING WEANED CALVES (1984)

	Steers (Per Head)	Heifers (Per Head)
Feeder Cost	$280.63	$228.32
Feed Expense	280.42	236.81
Transportation Expense	6.92	6.52
Veterinary & Medical Expenses	7.00	7.00
Yardage Charge	25.20	24.03
Interest on Operating Expenses[1]	15.08	12.37
Interest on Calves[2]	25.92	20.11
Death Loss[2]	2.81	2.28
Total Production Costs	$643.98	$537.44

Breakeven Price: Steers $\frac{\$643.98}{(11.00 \times .97)} = \$60.35/cwt$

Heifers $\frac{\$537.44}{(9.70 \times .97)} = \$57.12/cwt$

[1]Refer to custom backgrounding budget.
[2]Refer to backgrounding budget.

Production Coefficients	Steers	Heifers
a. Purchase weight in lbs	425	400
Selling weight in lbs	1,100	970
b. Average daily gain in lbs	2.0 (to 700 lbs)	1.8 (to 650 lbs)
	3.0 (700 to 1,100 lbs)	2.7 (650 to 970 lbs)
c. Feeding period in days	280	267
d. Shrinkage in percent		
In transit	4	4
At marketing	3	3
e. Death loss in percent	1	1

CUSTOM FEEDING BACKGROUNDED CALVES (1984)

	Steers (Per Head)	Heifers (Per Head)
Feeder Cost	$431.84	$341.81
Feed Expense	189.84	155.40
Transportation Expense	11.13	10.18
Veterinary & Medical Expenses	7.00	7.00
Yardage Charge	13.59	12.42
Interest on Operating Expenses[1]	5.80	4.86
Interest on Calves[2]	21.51	17.03
Death Loss[2]	4.32	3.42
Total Production Costs	$685.03	$552.12

Breakeven Price: Steers $\frac{\$658.03}{(11.00 \times .97)}$ = $64.20/cwt

Heifers $\frac{\$552.12}{(9.70 \times .97)}$ = $58.68/cwt

[1]Refer to custom backgrounding budget.
[2]Refer to backgrounding budget.

Production Coefficients	Steers	Heifers
a. Purchase weight in lbs	675	625
Selling weight in lbs	1,100	970
b. Average daily gain in lbs	3.0	2.7
c. Feeding period in days	151	138
d. Shrinkage in percent		
In transit	4	4
At marketing	3	3
e. Death loss in percent	1	1

CUSTOM FEEDING WINTERED CALVES (1984)

	Steers (Per Head)	Heifers (Per Head)
Feeder Cost	$380.50	$305.15
Feed Expense	230.16	191.52
Transportation Expense	9.47	8.76
Veterinary & Medical Expenses	7.00	7.00
Yardage Charge	16.47	15.30
Interest on Operating Expenses[1]	8.23	6.98
Interest on Calves[2]	22.97	18.42
Death Loss[2]	3.80	3.05
Total Production Costs	$678.60	$556.18

Breakeven Price: Steers $\frac{\$678.60}{(11.00 \times .97)} = \$63.60/\text{cwt}$

Heifers $\frac{\$556.18}{(9.70 \times .97)} = \$59.11/\text{cwt}$

[1]Refer to custom backgrounding budget.
[2]Refer to backgrounding budget.

Production Coefficients	Steers	Heifers
a. Purchase weight in lbs	575	535
Selling weight in lbs	1,100	970
b. Average daily gain in lbs	3.0	2.7
c. Feeding period in days	183	170
d. Shrinkage in percent		
In transit	4	4
At marketing	3	3
e. Death loss in percent	1	1

CUSTOM FEEDING WINTERED AND PASTURED CALVES (1984)

	Steers (Per Head)	Heifers (Per Head)
Feeder Cost	$501.39	$422.74
Feed Expense	139.44	109.20
Transportation Expense	13.28	12.16
Veterinary & Medical Expenses	7.00	7.00
Yardage Charge	9.99	8.73
Interest on Operating Expenses[1]	3.35	2.73
Interest on Calves[2]	18.36	15.48
Death Loss[2]	5.01	4.23
Total Production Costs	$697.82	$528.27

Breakeven Price: Steers $\frac{\$697.82}{(11.00 \times .97)} = \$65.40/\text{cwt}$

Heifers $\frac{\$528.27}{(9.70 \times .97)} = \$56.15/\text{cwt}$

[1]Refer to custom backgrounding budget.
[2]Refer to backgrounding budget.

Production Coefficients	Steers	Heifers
a. Purchase weight in lbs	800	740
Selling weight in lbs	1,100	970
b. Average daily gain in lbs	3.0	2.7
c. Feeding period in days	111	97
d. Shrinkage in percent		
In transit	4	4
At marketing	3	3
e. Death loss in percent	1	1

Appendix B

APPENDIX TABLE B1. CATTLE PRICES

Year	West Fargo							
	Heifers	Steers	Heifers	Steers	Heifers	Steers	Heifers	Steers
	400-500#		500-600#		600-700#		700-800#	
	Sept., Oct., Nov.		- - - - - March, April, May - - - -				Sept., Oct., Nov.	
1958	30.13	33.73	26.96	29.75	27.36	29.75	26.18	29.58
1959	27.07	30.38	29.04	31.70	29.26	31.70	26.84	29.06
1960	22.77	26.37	25.23	28.62	25.80	28.62	23.50	24.27
1961	25.01	27.86	23.68	26.52	24.38	26.52	23.37	25.38
1962	26.43	30.49	24.03	26.53	24.70	26.53	24.32	27.92
1963	24.89	26.93	23.03	25.37	23.03	25.37	22.02	25.56
1964	19.80	21.65	20.09	21.39	20.09	21.39	18.01	20.55
1965	19.93	25.84	19.10	22.00	19.10	22.00	20.93	24.56
1966	26.20	29.13	24.18	27.24	24.52	27.24	24.09	25.31
1967	26.02	29.86	23.87	26.23	23.87	26.23	24.01	25.21
1968	25.96	29.59	24.79	27.50	24.79	27.50	24.52	25.42
1969	29.90	33.12	27.30	30.36	27.30	30.36	28.05	29.98
1970	32.44	36.54	31.41	34.25	31.07	34.25	29.03	29.22
1971	36.56	40.69	30.59	33.36	30.59	33.36	33.21	32.93
1972	44.04	49.46	37.41	41.30	34.64	39.21	35.24	40.82
1973	54.32	61.32	50.23	55.31	47.64	52.29	45.43	54.19
1974	26.10	29.66	40.79	45.74	38.64	42.10	26.13	31.83
1975	28.74	34.84	25.64	31.29	26.51	31.18	31.88	36.39
1976	32.16	38.96	37.06	44.03	36.38	42.25	30.24	36.72
1977	39.34	45.89	35.18	41.40	34.26	39.52	35.12	40.23
1978	66.32	73.10	52.55	58.24	50.65	55.13	56.23	62.35
1979	84.06	95.41	83.61	90.88	78.91	86.10	68.42	79.74
1980	72.63	82.38	67.60	76.68	63.47	71.84	64.34	72.37
1981	58.43	65.85	62.03	69.04	60.16	65.64	56.94	63.51
1982	58.70	65.92	57.45	66.47	57.33	64.43	57.27	65.33
1983	53.33	62.22	61.31	68.64	59.84	65.88	51.48	57.05
1984	57.08	66.03	57.04	66.17	54.69	63.98	57.25	62.67
1985	55.16	63.34	59.77	67.01	58.36	64.55	52.51	57.60
1986	60.51	67.75	53.79	62.66	50.51	57.94	58.01	61.99

- CONTINUED -

APPENDIX TABLE B1. CATTLE PRICES (CONTINUED)

Year	Slaughter Heifers Choice Heifers 1000-1100#		Cull Cows 1000#		Kansas City Heifers 600-700#	Kansas City Steers 600-700#	Omaha Heifers 900-1100#	Omaha Steers 900-1100#
	July, Aug., Sept		Spring	Fall	March, April, May		Aug., Sept., Nov.	
1958	24.59	20.21	17.53	18.57	26.00	29.75	25.17	25.93
1959	25.69	21.11	18.57	15.62	28.90	31.70	25.86	27.00
1960	23.15	19.03	16.12	14.25	26.39	28.62	23.19	24.24
1961	22.25	18.29	15.86	14.95	23.04	26.52	23.06	23.85
1962	25.13	20.65	15.12	15.33	24.67	26.46	26.68	28.23
1963	23.07	18.96	15.14	13.39	24.00	26.25	23.25	24.04
1964	22.28	18.31	13.39	11.74	20.53	22.53	23.37	24.21
1965	24.28	19.96	13.53	13.62	21.26	23.85	24.43	25.93
1966	24.69	20.29	18.57	16.53	26.12	28.79	24.37	25.33
1967	24.79	20.37	17.33	15.86	23.78	26.62	25.64	26.39
1968	25.50	20.96	18.22	16.68	25.70	28.38	26.17	27.29
1969	28.24	23.21	19.29	18.98	29.30	32.72	27.64	28.77
1970	28.12	23.11	22.98	19.83	31.60	35.29	28.48	29.26
1971	30.26	24.87	22.04	21.04	31.47	34.41	31.67	32.63
1972	33.99	27.93	24.54	25.29	35.30	39.20	33.93	35.10
1973	46.11	37.90	33.66	32.74	46.02	53.46	45.64	46.66
1974	40.51	33.29	31.10	20.30	38.19	43.03	41.53	42.55
1975	45.33	37.25	22.91	22.22	27.46	31.98	46.42	47.87
1976	34.37	28.25	30.98	22.99	36.71	42.84	35.41	37.29
1977	37.17	30.55	29.30	25.34	35.43	40.79	39.04	40.92
1978	49.44	40.63	38.29	41.10	49.87	55.81	51.68	53.86
1979	61.44	50.50	57.98	48.17	77.15	88.52	63.57	65.46
1980	65.94	54.20	47.91	47.30	63.75	72.22	66.98	69.72
1981	62.23	51.15	44.50	40.90	61.23	67.84	61.58	64.40
1982	60.77	49.95	43.02	39.62	58.92	66.55	60.02	61.72
1983	57.39	47.17	44.36	37.30	61.80	68.40	58.91	60.01
1984	61.29	50.37	43.83	36.84	58.81	66.88	61.95	62.63
1985	49.65	40.80	41.44	34.84	60.84	67.68	53.89	53.75
1986	55.43	45.56	37.30	37.11	53.23	61.31	58.35	59.40

- CONTINUED -

APPENDIX TABLE B1. CATTLE PRICES (CONTINUED)

	Omaha					
	Heifers	Steers	Heifers	Steers	Heifers	Steers
Year	900-1100#		900-1100#		900-1100#	
	Sept., Oct., Nov.		Oct. Nov., Dec.		Dec., Jan., Feb.	
1958	25.62	26.11	26.12	26.26	27.03	27.61
1959	25.16	26.41	24.53	25.80	25.30	26.09
1960	23.37	24.57	24.02	25.26	25.38	26.34
1961	23.18	24.17	23.71	24.77	25.05	25.74
1962	27.23	28.80	27.33	28.57	25.77	26.36
1963	22.71	23.55	21.99	22.77	21.25	21.73
1964	23.12	23.95	22.71	23.30	22.29	22.77
1965	24.13	25.48	24.12	25.21	25.31	26.15
1966	23.89	24.72	23.43	24.18	23.68	24.39
1967	25.21	25.98	24.77	25.60	25.04	25.85
1968	26.11	27.23	26.48	27.46	26.97	27.73
1969	26.81	27.90	26.72	27.59	27.85	28.47
1970	27.49	28.30	26.72	27.50	28.50	29.37
1971	31.93	32.70	32.61	33.27	34.60	35.41
1972	33.35	34.40	34.07	35.12	37.57	40.35
1973	41.39	42.39	39.58	40.47	43.32	44.29
1974	38.58	39.58	37.30	38.19	35.12	36.09
1975	46.03	47.35	44.88	46.05	40.49	41.66
1976	36.36	38.00	37.56	39.00	37.40	38.77
1977	39.85	41.49	40.98	42.42	42.55	43.92
1978	52.27	54.34	53.02	54.76	58.64	60.26
1979	64.93	66.88	65.13	67.18	64.67	67.49
1980	65.08	67.30	63.46	65.51	61.24	62.96
1981	59.79	62.21	58.16	60.17	59.66	61.18
1982	58.12	59.65	57.41	58.87	58.76	59.82
1983	58.49	59.39	59.91	60.61	65.08	65.67
1984	62.21	62.61	63.42	63.49	63.88	64.16
1985	57.82	57.54	61.60	61.42	59.33	59.68
1986	60.23	60.23	60.34	60.23	59.55	59.88

APPENDIX TABLE B2. EQUATIONS USED TO ADJUST KANSAS CITY AND OMAHA PRICES TO WEST FARGO PRICES

Regression Equations
400-500# Steers West Fargo Price = -1.8201946 + (1.0343523 x Kansas City Price) R^2 = .978 T-Value = 35.155
400-500# Heifers West Fargo Price = -3.2100313 + (1.1254112 x Kansas City Price) R^2 = .972 T-Value = 31.107
500-600# Steers West Fargo Price = -1.7479408 + (1.0194804 x Kansas City Price) R^2 = .988 T-Value = 48.229
500-600# Heifers West Fargo Price = -1.0131856 + (1.03754 x Kansas City Price) R^2 = .990 T-Value = 61.98
600-700# Steers West Fargo Price = -2.1280667 + (1.0340014 x Kansas City Price) R^2 = .984 T-Value = 41.624
600-700# Hiefers West Fargo Price = 1.9244081 + (.9436183 x Kansas City Price) R^2 = .773 T-Value = 11.68
700-800# Steers West Fargo Price = -.5434368 + (.9881594 x Kansas City Price) R^2 = .987 T-Value = 45.332
700-800# Heifers West Fargo Price = 4.1015440 + (.8410749 x Kansas City Price) R^2 = .766 T-Value = 11.31
1000-1100# Spring Utility Cows West Fargo = -.7293112 + (1.0931868 x Omaha Price) R^2 = .9844 T-value = 22.44
1000-1100# Fall Utility Cows West Fargo Price = -3.4451497 + (1.337059 x Omaha Price) R^2 = .9885 T-value = 26.25

Appendix C

APPENDIX TABLE C1. INDEX OF PRICES PAID BY FARMERS (1984 = 100)

Year	Feed Index	Labor Index	Production Item Index	Land Index	Transportation Index	Marketing Index	Interest Rate
1958	36.73	20.10	29.87	30.20	27.59	26.02	3.82
1959	36.92	21.28	29.85	30.82	28.75	26.37	4.75
1960	35.99	21.87	29.87	30.82	28.75	26.55	4.50
1961	36.36	22.46	29.85	30.67	29.07	26.73	4.50
1962	36.73	23.05	30.21	30.59	29.68	27.17	4.50
1963	38.40	23.64	30.53	30.51	29.84	27.61	4.50
1964	38.03	24.23	30.21	30.43	30.25	27.70	4.50
1965	38.40	25.38	30.92	30.67	30.77	28.41	5.00
1966	40.07	27.37	32.25	31.25	31.18	29.56	5.75
1967	39.52	29.53	32.37	31.76	32.08	30.27	5.71
1968	37.11	32.04	32.37	33.73	33.11	31.09	6.38
1969	37.85	35.25	33.71	35.84	34.39	32.60	7.67
1970	40.07	37.76	34.93	35.92	36.16	33.81	7.30
1971	41.56	39.71	36.61	38.51	38.05	35.62	5.67
1972	41.93	42.02	39.17	41.57	38.47	37.73	5.32
1973	63.45	45.82	47.32	46.59	39.72	43.47	8.23
1974	76.81	52.51	53.68	57.49	44.18	49.39	9.99
1975	74.03	56.73	58.93	65.49	48.32	54.27	8.27
1976	75.70	62.10	62.39	68.31	53.10	57.93	6.81
1977	73.84	66.77	64.62	72.78	56.85	60.98	7.13
1978	72.36	71.58	70.09	78.51	59.51	65.85	9.78
1979	80.89	78.17	80.36	86.20	68.01	75.00	13.78
1980	91.09	84.41	89.06	92.94	80.11	84.15	15.92
1981	98.70	91.60	95.42	97.33	89.83	91.46	18.50
1982	89.80	96.23	96.54	98.35	93.52	95.73	16.08
1983	98.70	98.88	98.55	100.47	95.73	97.56	10.83
1984	100.00	100.00	100.00	100.00	100.00	100.00	12.04
1985	85.53	102.19	97.11	98.75	98.82	99.12	9.93
1986	79.78	106.16	93.22	99.06	94.67	97.08	8.33

SOURCES: Agricultural Prices, Encyclopedia of Banking and Finance, and Federal Reserve Bulletin, 1985.

Appendix D

FEEDING CONTRACT[1]

This agreement, made and entered into as of this _____ day of _____, 19____, by and between _____ of _____, hereinafter called the "Grower," and _____ of _____, hereinafter called the "Feeder."

Witnesseth

Whereas, the Grower has about _____ head of _____, herein referred to as "stock," which he desired fed and finished for market; and

Whereas, the Feeder having ample resources to do so, desires to feed and finish said stock for market so that he may share in the sales proceeds thereof; and

Whereas, in order to provide for the proper care, feeding, and marketing of the stock, the Grower and the Feeder desire to appoint a supervising agent and to authorize him to supervise such care, feeding, and marketing, and to perform other related duties, all in accordance with the terms and conditions hereinafter set forth;

Now, therefore, in consideration of the premises and the mutual promises herein contained, to be kept and performed by the respective parties hereto, it is agreed by said parties as follows:

A. The Grower agrees:

1. If the stock covered hereby are mortgaged, to obtain the written consent of the mortgagee or mortgagees (which includes any assignee of any such mortgage) to this contract before the same shall become effective.

2. After giving _____ days' advance notice to the supervising agent and the Feeder, to ship to the Feeder about _____ head of feeder stock, between the _____ day of _____ 19____, and the _____ day of _____ 19____, the exact date of shipment to be at the Grower's option but within the above-described limits and to bill stock to market with stop-over enroute at _____ transit feeding yards.

3. That upon the arrival of said stock at the transit feeding yards, the supervising agent is hereby authorized and directed:

(a) To advise the Feeder when the stock will be delivered to him so that he can be prepared to receive said stock promptly.

---

[1]This contract form is presented solely as a suggested basic outline. It should no be used as a legal instrument until it has been checked for compliance with the laws of the appropriate state. Amendments should be considered to fit individual situations.

(b) To take charge of said stock at transit feeding yards and feed, water, and rest the same for forty-eight (48) hours prior to weighing.

(c) To sort off all the stock deemed undesirable by him for feeding purposes, and dispose of such off sorts according to written instructions which may be given by the Grower.

(d) To grade the animals deemed by him to be satisfactory for feeding purposes into reasonably uniform lots of similar type, size, quality, and weight according to written specifications given by the Feeder, with the minimum weight of each animal not less than _____ pounds and the maximum weight of each animal not more than _____ pounds, and the average weight of the stock not to exceed _____ pounds, and to weigh the stock, in case of lambs, with fleeces dry, which weigh less _____ percent, shall be and is hereinafter referred to as the "contract weight."

(e) To count the stock when he makes delivery thereof to the Feeder at the _____ transit feeding yards and obtain the Feeder's acknowledgement of receiving stock on the form attached to this contract.

(f) To inspect said stock carefully from time to time, to make certain that the stock while in the Feeder's possession are at all times properly fed, watered, sheltered, and cared for in an efficient manner, and to make written reports promptly of each such inspection to the Grower, sending one copy to the Feeder, and retaining a copy in his files for inspection by either party hereto.

(g) To "cut-out" or "mark-out" stock that are deemed by him to be finished for market, direct the marketing of same, and to distribute the net proceeds arising from the sale of the stock in accordance with the terms of this contract, particularly subsection 9 of section C hereof.

B. The Feeder agrees:

1. If the feed or pasture is mortgaged, to obtain the written consent of the mortgagee or mortgagees (which includes any assignee of any such mortgage) to this contract before the same shall become effective.

2. To promptly accept delivery of the stock from the supervising agent at the _____ transit feeding yards.

3. To set aside sufficient feed to finish the stock for market and to pasture, feed, water, shelter, and care for said stock in a proper manner at his farm located _____; all in accordance with the provisions of this agreement.

4. To pay all expenses for feed, water, shelter, veterinary service, and any necessary expenses from the time of delivery of the stock for feeding until they are reloaded for shipment to market or sold locally, and in the event of his failure to pay the same, the supervising agent is hereby authorized and directed to advance such amounts and to deduct the same with interest at the rate of _____ percent per annum, from any amounts due Feeder hereunder.

5. To permit inspection by the supervising agent and the Grower at any and all times and to follow strictly all reasonable instructions of the supervising agent with respect to the feeding, care, handling, and marketing of the stock.

C. The Grower and Feeder agree:

1. The supervising agent is hereby appointed the agent and attorney-in-fact of the Grower and the Feeder for the purpose of receiving, handling, supervising the care and feeding of, and selling the stock, and receiving and distributing the proceeds, as specified in this contract, provided, however, that the foregoing appointment and authorization, and all other undertakings and agreements in this contract contained relative to the supervising agent, shall not become effective until a supervising agent satisfactory to both Grower and Feeder has agreed in writing to act in said capacity in accordance with the terms and conditions herein set forth.

2. The title to all of said stock shall at all times during the term of this contract be and remain in the Grower free and clear of any claims, charges, costs, or expenses of the Feeder, other than as provided herein, and with no right in the Feeder to encumber or sell the stock. The Feeder shall not remove the animals from the farm or ranch without the consent of the supervising agent or the Grower.

3. Freight charges and feed expense from Grower's loading point to the feed-in-transit yards at which Feeder accepts delivery shall be advanced by the supervising agent, and the amounts so advanced, with interest at the rate of _____ percent per annum, may be deducted by the supervising agent from the proceeds of sale of the stock. Freight and feed expense so advanced shall be and remain a first lien and charge upon said stock and the proceeds of sale thereof.

4. Stock shall be fed _____ for grain feed and
(list grains)
_____ for roughage and _____ for
(list roughage) (list supplemental feeds)
supplemental feeds, in such rations as shall be prescribed by the supervising agent.

5. Any loss of stock or any damage from the crippling of stock due to the carelessness or negligence of the Feeder shall be borne by the Feeder. The amount of pounds involved in any such loss shall be computed by multiplying the average contract weight of the stock by number of stock lost, and the sum of this poundage shall be subtracted from the total number of pounds of gain obtained by the Feeder. Any loss of or damage to stock not due to the carelessness or negligence of the Feeder shall be shared--the Grower losing the average per head contract weight and the Feeder losing the feed and labor represented by his gain. The Feeder shall remove the pelts or hides showing brands, if any, of animals that have died and the same shall become the property of the Grower. Responsibility for losses and the amount thereof shall be determined in the first instance by the supervising agent provided that if either the grower or the Feeder refuses to accept such determination, the matter shall be settled by arbitration as provided in paragraph C-11 hereof.

6. The supervising agent is hereby fully authorized and empowered by the Grower and the Feeder to designate the time or times of marketing, the marketing place or places, the price or prices at which said stock shall be sold, and to sell and market said stock in his name through a bonded sales agency or to a financially responsible packing company, and to receive the sales proceeds of said stock in trust to be distributed to said parties as their interests may appear under this contract.

7. If, at any time, in the opinion of the supervising agent or the Grower, the stock is not properly cared for, either of them may serve notice on the Feeder to surrender said stock to the supervising agent or Grower; upon service of such notice, the Feeder hereby agrees to deliver said stock, in the manner provided in said notice. In any such case, either the supervising agent or the Grower is authorized:

(a) To market said stock and make settlement for same as provided in this agreement, or

(b) To select another party to finish the stock, in which event said stock shall be weighed on nearest scale and after deducting four percent (4%) shrink from the resulting weight, the Feeder shall be compensated for gain in weight at the rate of _____ cents per pound.

8. On any partial shipment of stock to market, the supervising agent shall withhold twenty-five percent (25%) of the net sales proceeds so as to protect all parties in the fulfillment of this contract distributing the remainder in accordance with the terms of paragraph C-9 hereof.

9. After payment of freight, marketing expenses, and supervising compensation amounting to _____ cents per head of all animals delivered to Feeder under this contract, _____ percent of the remaining proceeds shall be paid the supervising agent as full compensation for his services hereunder. The remainder of the proceeds from the sale of the stock shall be apportioned between the Grower and the Feeder on the following basis:

(a) The Feeder shall receive the market price for the gain in weight of the stock, which weight shall be the difference between the contract and the market weight on the sale of the stock.

(b) The Grower shall receive for the contract weight _____ cents per pound, which shall be considered to be the going market price of the feeder stock at the time this contract is executed.

(c) Any money remaining over and above the deductions for (a) and (b) shall be divided between the Grower and Feeder on the following basis:

Seventy percent (70%) to the Grower and thirty percent (30%) to the Feeder, providing eighty-five percent (85%) or more of the stock sell at the "shipper or packer top" classification. In case the percent of stock in the "shipper or packer top" grades falls between seventy-five percent (75%) and eighty-five percent (85%), the division of the remaining proceeds shall be eighty percent (80%) to the Grower and twenty percent (20%) to the Feeder. In case less than seventy-five percent (75%) of the stock sell at the "shipper or packer top" classification, all of the remaining proceeds shall go to the Grower.

(d) If sales proceeds are insufficient to permit a full settlement under items (a) and (b), then the difference between the amount available for distribution and the amount that would be required for making a distribution as provided in items (a) and (b) shall be considered a deficit which shall be borne by the parties on the following basis:

All of the deficit shall be borne by Grower if ninety percent (90%) of the stock sell at the "shipper or packer top" classification. If less than ninety percent (90%) of the stock and more than seventy-five percent (75%) sell at the "shipper or packer top" classification, the Grower shall stand seventy percent (70%) of the deficit and the Feeder thirty percent (30%). If less than seventy-five percent (75%) of the stock sell at the "shipper or packer top" classification, then the deficit shall be divided equally between the Grower and Feeder.

10. The terms of this contract shall be binding upon the heirs, executors, or administrators of both Grower and Feeder in like manner as upon the original parties.

11. Any disagreement arising under this contract, which the supervising agent is unable to settle in a manner acceptable to both the Grower and the Feeder shall be arbitrated by a committee of three, one member to be selected by the Grower, one by the Feeder, and the third member by the two representatives selected. The decision of any two of the arbiters shall be final and binding on all parties hereto. This shall include the naming of a new supervisor if necessary.

In witness whereof, the parties hereto have hereunto affixed their signatures the day and year first above written.

_____(SEAL)
(Grower)

Witnesses (for Grower):

_____

_____

_____(SEAL)
(Feeder)

Witnesses (for Feeder):

_____

_____

SOURCE: Federal Extension Service, USDA.

Appendix E

APPENDIX TABLE E1. FEED REQUIREMENTS FOR SURPLUS HEIFER SYSTEM

	Corn Silage	Alfalfa	Straw	Corn	Barley	Soybean Meal
	pounds					
46 hd. Heifer calves 211 days	106,766	106,766	19,412			
Bulls 3 hd. young	8,145	10,860				
Bulls 2 hd. mature		10,860				
Bred heifers mid gest. 61 days	61,854	19,032	11,895			
Bred heifers late gest. 69 hd. 90 days	105,300	35,100	10,530			
Mature cows mid gest. 69 hd. 61 days	50,508	29,463	42,090			
Mature cows late gest. 69 hd. 90 days	86,940	55,890	49,680			
Mature cows lactation 62 hd. 30 days	87,420	18,600				
Bred heifers lactation 38 hd. 30 days	109,900			9,891		3,297
Slaughter heifers 23 hd. 61 days	21,747			13,329	25,254	
Early weaned calves hd. 134 days		6,834		6,834	6,834	2,278
Total	638,580	293,405	133,607	30,054	32,088	5,575

APPENDIX TABLE E2. FEED REQUIREMENTS FOR SINGLE-CALF HEIFER SYSTEM

	Corn Silage	Alfalfa	Straw	Corn	Barley	Soybean Meal
140 hd. heifer calves 211 days	324,900	324,900	59,080			
Bulls 4 hd. young	10,860	14,480				
Bulls 3 hd. mature		16,290				
Bred heifers 121 hd. midgest. 61 days	191,906	59,048	36,905			
Bred heifers late gest. 121 hd. 90 days	326,700	108,900	32,670			
Lactating heifers 119 hd. 76 days	452,200			40,698		13,566
Finishing ration 119 hd. x 61 days	130,662			68,961	112,515	
Early weaned calves 134 days 100 hd.		40,200		40,200	40,200	13,400
Total	1,437,228	563,818	128,665	149,859	152,715	26,966

References

Board of Governors of the Federal Reserve System. 1985. Federal Reserve Bulletin. Vol. 71, No. 5. Washington, D.C.

Brethour, John. A Single-Calf Heifer System. A monograph. August 1986.

Bureau of the Census. 1982 Census of Agriculture - North Dakota. Washington, D.C.: U.S. Department of Commerce, March 1984.

Cramer, Gail L. and Clarence W. Jenson. Agricultural Economics and Agribusiness. Second Edition. New York: John Wiley and Sons, Inc., 1982.

Doane's Agricultural Report. "Feeding Cattle in Commercial Feedlots." Vol. 45, No. 37-6. St. Louis: Doane-Western, Inc., 1982.

Ford, M.J., D.C. Clanton, and M.E. England. "Computer Simulation-Retained Ownership Profitable." 1986 Beef Cattle Report. Agr. Exp. Sta., University of Nebraska, Lincoln, 1985.

Guyer, Paul Q. "Contract Feeding of Growing Calves." Great Plains Beef Cattle Handbook. GPE 4004. Cooperative Ext. Service, Great Plains States, 1975.

Hasbargen, Paul R., Tommy Beale, John E. Ikerd, Douglas E. Murfield, and David C. Petritz. Cattle Cycles: How to Profit from Them. Misc. Publication No. 1430. Washington, D.C.: Extension Service, USDA, 1983.

Johnson, Roger G., Mir B. Ali, David M. Saxowsky, and Randall D. Little. Cost of Producing Farm Commodities in North Dakota. Agr. Econ. Misc. Rpt. No. 90, Dept. of Agr. Econ., North Dakota State Univ., Fargo, January 1986.

Lambert, Chuck and Micheal B. Sands. Kansas Steer Futurities-Summary of Nine Years of Retained Ownership. Bulletin MF-712. Cooperative Ext. Service, Kansas State University, Manhattan, 1984.

Little, Randall D. and David L. Watt. Comparing the Profitability of Beef Production Enterprises in North Dakota. Agr. Econ. Rpt. No. 210, Dept. of Agr. Econ., North Dakota State Univ., Fargo, April 1986.

Little, Randall D., David L. Watt, and Timothy A. Petry. Retained Ownership-Production and Marketing Alternatives for Cow-Calf Producers. Agr. Econ. Rpt. 213, Dept. of Agr. Econ., North Dakota State University, Fargo, August 1986.

Mann, Glenn G. (Editor). 1983. Encyclopedia of Banking and Finance. 8th ed. Bankers Publishing Co. Boston.

Minish, Gary L. and Danny G. Fox. Beef Production and Management. Second Edition. Reston, Virginia: Reston Publishing Co., 1982.

Toman, Norman and Wallace Eide. 1983. "Break-Even Prices for Backgrounding Calves." Bulletin EC-783, Cooperative Extension Service, NDSU, Fargo.

Toman, Norm, Tim Petry, and Billy Rice. 1985. Enterprise Analysis: The Cow Herd. Bulletin EC-872. Cooperative Extension Service, NDSU, Fargo.

U.S. Department of Agriculture, Agricultural Marketing Service, Livestock Division, Market News Service. West Fargo.

U.S. Department of Agriculture, Crop Reporting Board. Agricultural Prices. Selected issues, Washington, D.C.

U.S. Department of Agriculture, Economic Research Service. Livestock and Meat Statistics. Selected bulletins, Washington, D.C.

U.S. Department of Agriculture, Statistical Reporting Service. North Dakota Agricultural Statistics. Selected issues, Fargo.

Whitley, Carol and Carl O'Connor. Production and Marketing Strategies for Oregon High Desert Rangeland Cattle Producers, 1968-1978. Circular of Information 688. Agr. Exp. Sta. Oregon State University, Corvallis, 1981.