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**BEEF FARM
BUSINESS SUMMARY**

**1990 Northeast Beef
Farm Business Summary**

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1990 NORTHEAST BEEF
FARM BUSINESS SUMMARY

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Introduction

The Beef Farm Business Summary is a compilation and analysis of business records from participating cow-calf farms. The primary objective of the summary is to provide producers with information about their beef farm business that can be used to identify "weak links" that limit profitability. To facilitate this evaluation, analysis is provided with six "critical success factor" categories; size of business, rates of production, cost control, capital efficiency, profitability and financial integrity. A summary of the data by these categories for high, average and low profitabilit groups provides benchworks for individuals to identify their "weak links". The farm summaries also provide the basis for continued extension education programs, data for applied research studies, and for use in the classroom. Regardless of the use of the data, confidentiality of individual farm data is maintained.

The Beef Farm Business Summary is an integral part of the New York State and national Integrated Resource Management (IRM) programs. IRM is a beef management concept in which performance indicators of an operation are used to maximize a beef producer's profitability through optimum utilization of all available resources.

The following farm business summary was compiled in 1991 by the Department of Animal Science in conjunction with the Department of Agricultural Economics, using data submitted by forty-five farmers. Working with cooperative extension agents and Cornell University personnel, participating farmers completed farm income, expense and production check-in forms. Forty-two of the farmers providing farm records were located in New York State. These farms were located in twenty-three different counties across the state. Three Vermont farmers participated. Summaries were collected from farms with a variety of resources and management objectives. Data was collected for the calendar year 1990. All of the producers have a cow-calf component in their operation. Some sell all calves at weaning, others feed out some or all of their calves to a finished weight.

These forty-five farms are not a scientific sample and are not necessarily representative of all Northeast beef farms. The averages published in this report are not intended to represent the average of all beef farms and should not be interpreted as such. The averages are calculated to provide the cooperators with a comparison when analyzing their own records. The purpose of the Beef Farm Business Summary is to present the cooperators and other beef producers with a format for summarizing and analyzing their business and to offer some data which may be useful to potential beef producers and Cooperative Extension agents.

The Beef Farm Business Summary was made possible by help from Cooperative Extension agents Michael Baker, Carl Crispell, Thomas Gallagher, Karen Hoffman, Lisa Kempisty, Lou Anne King, Joan Petzen, Ed Staehr and David Weaver. Special thanks to Dr. John Kunkel, University of Vermont and Dave and Linda Pellett from Saint Lawrence County who organized Business Summary workshops. Thank you also to the participating beef producers. Without their kind cooperation, the Beef Farm Business Summary would not be possible.

Accrual procedures have been used to provide the most accurate accounting of farm receipts and farm expenses for measuring farm profits. An explanation of these procedures is found on pages 16-18. Five measures of farm profits are calculated on pages 21-22. The balance sheet is on page 23 and the cash flow statement is featured on page 27. Throughout the document key phrases are underlined to help the reader locate specific information in the text.

Economic Factors Affecting Northeast Beef Producers

The beef industry is cyclic. The time between price high points has historically been 10-12 years. The primary reasons for the cattle cycle are lags inherent to individual decision making and the lag time between industry entry and production.

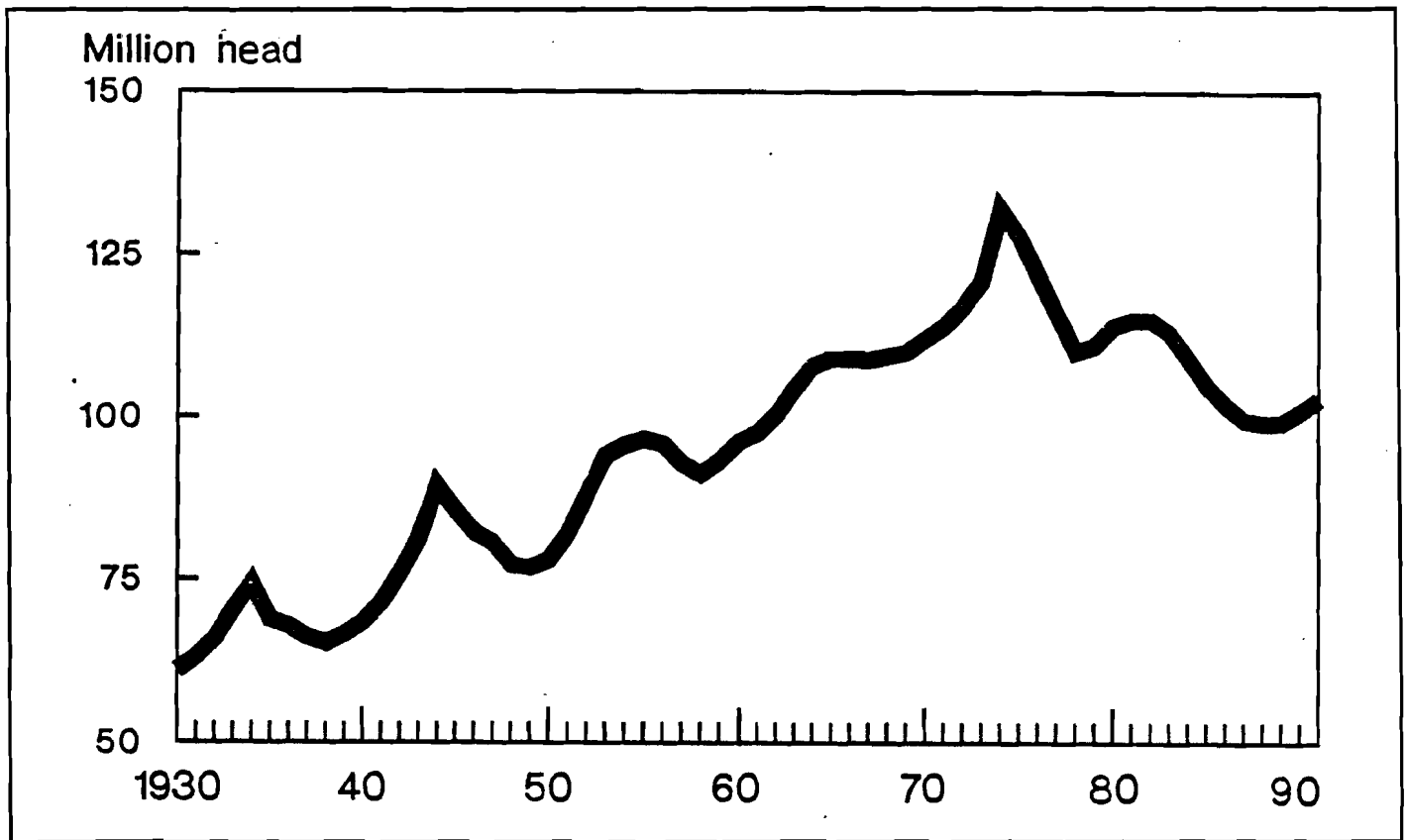
As prices start to climb from a price trough, producers are encouraged to expand production by using all available heifers for breeding stock. Holding back heifers and cull cattle reduces the number of animals available for slaughter. This decrease in beef production tends to push prices higher. As prices increase, herd building intensifies and beef production is constrained even more causing beef prices to climb still higher. Eventually, this process moves the cow herd and total cattle numbers to a point where the number of cattle produced for slaughter exceeds consumer demand. Beef prices begin to decline. As prices decline, herd building turns into herd liquidation. Heifers are no longer held and cows from the expanded herd are slaughtered. Beef prices and cow numbers both decline.

The cattle cycle is a result of the highly competitive structure of the beef industry. Many small producers acting independently create the cycle. The length of the cycle depends on both biologic and psychological factors. It takes at least two years from the time a heifer is first bred until her calf is ready to slaughter, creating a lag between when heifers are saved back until their calves reach slaughter.

During all the phases of the cattle cycle there is a lag in the producers response to changes in the market. At the bottom of the price cycle, the producers may be somewhat wary of the past low prices and are reluctant to increase their herd. Some time into the price recovery, the "in-and-out" individual may start into production. After the cycle has peaked and prices are decreasing, producers may continue to hold cow numbers up hoping for a price recovery, until the price drops sufficiently for panic to cause widespread selling. These response lags explain why the building phase of the cycle can last six to eight years and the liquidation phase can last three to four years. Figure 1 shows the peaks and troughs of the U.S. Cattle Inventory since 1930.

By watching the cattle cycle closely, a producer can benefit from an increasing market and cut losses in a declining market. While prices are high, the producer can cull from the herd any marginal cows and heifers. During the down phase, the producer can build cow numbers and have a efficient number of producing cows when the market turns up again.

Figure 1. U.S. Cattle Inventory, 1930 - 1990



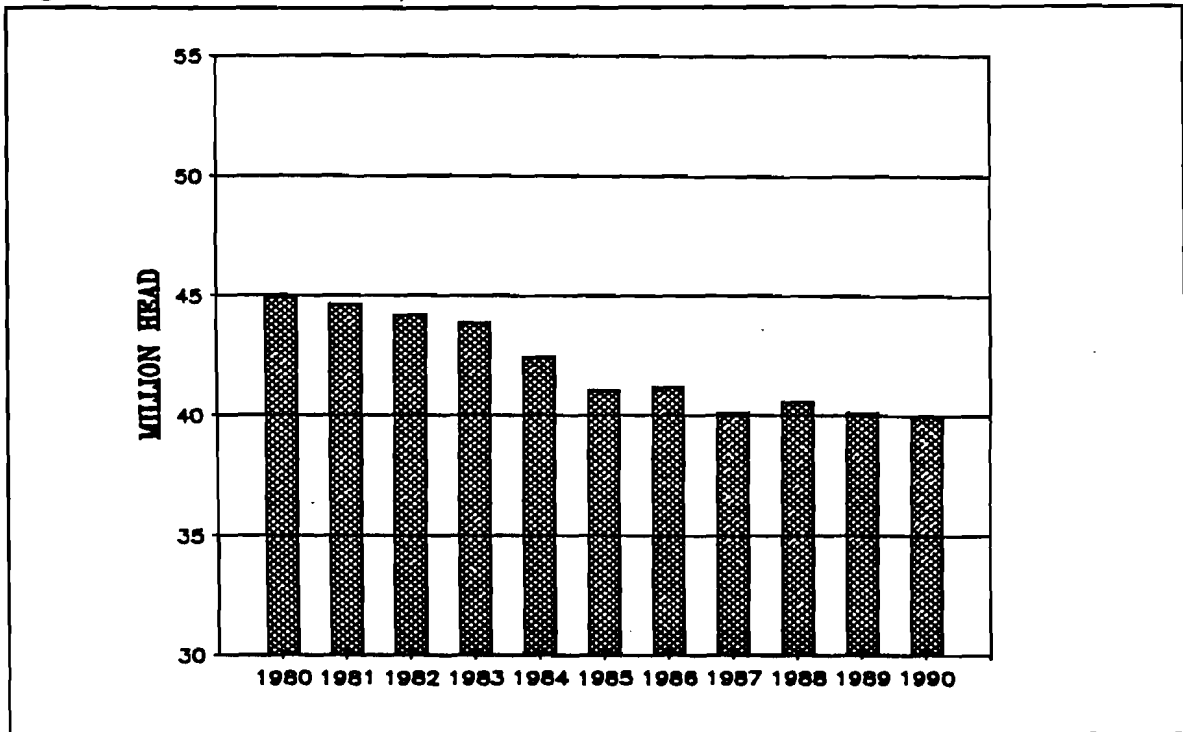
Source: USDA, ERS. February 1991. Outlook '91 Charts. 67th Annual Agricultural Outlook Conference.

The beef cycle reflects the relationship between prices, finished cattle supplies and the number of cows and heifers held for breeding. Other factors affecting the price of beef include cattle slaughter characteristics (size and mix), consumer demand, cost of production, farm to retail margins, world trade, market psychology and weather.

The current herd expansion phase of the cattle cycle, started in 1989, continued in 1990. Both farm level and retail beef prices reached record levels in 1990. The availability of feeder and finished cattle remained tight resulting in a 1.5 % decline in total beef production from 1989 to 1990. A decline in commercial cattle slaughter of 2 % was partially offset by higher slaughter weights.

Despite a slight herd expansion in 1989, the 1990 calf crop was the smallest since 1960 at 39.9 million head (figure 2). In the next few years the calf crop is expect to increase due to decreased cow slaughter and increased numbers of heifers entering the breeding herd. In 1990, cow slaughter decreased 7 % from 1989 levels and replacement heifer numbers were at the highest level since 1986, up more than one percent.

Figure 2. U.S. Calf Crop, 1980-1990

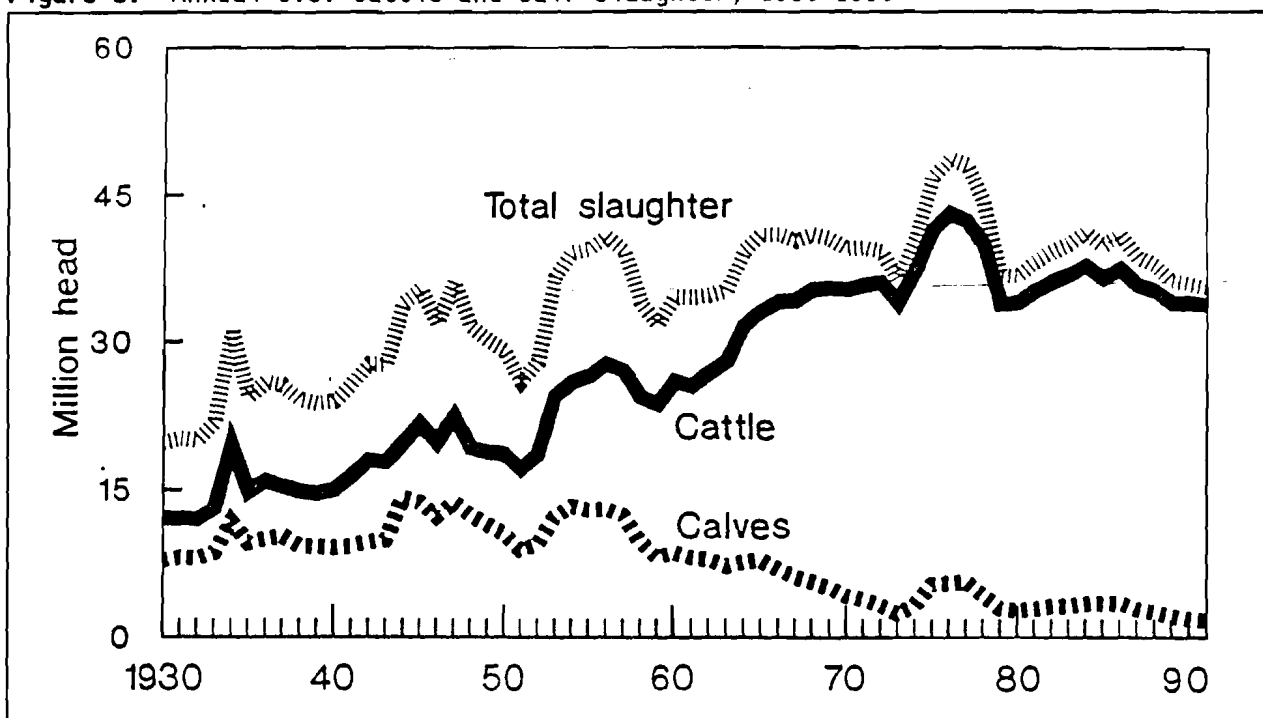


Source: USDA NASS. Cattle. July 27, 1990. LVGN(7-90).

The small calf crop did not stop a large number of feeder calves being put on feed in 1990 as feeder cattle imports increased and calf slaughter decreased (Figure 3). 1990 cattle on-feed inventories in 7 representative states were at the highest level since 1979. However, marketing of these animals was depressed in 1990, as feedlot operators tended to hold the animals to a heavier weight and a early 1991 market.

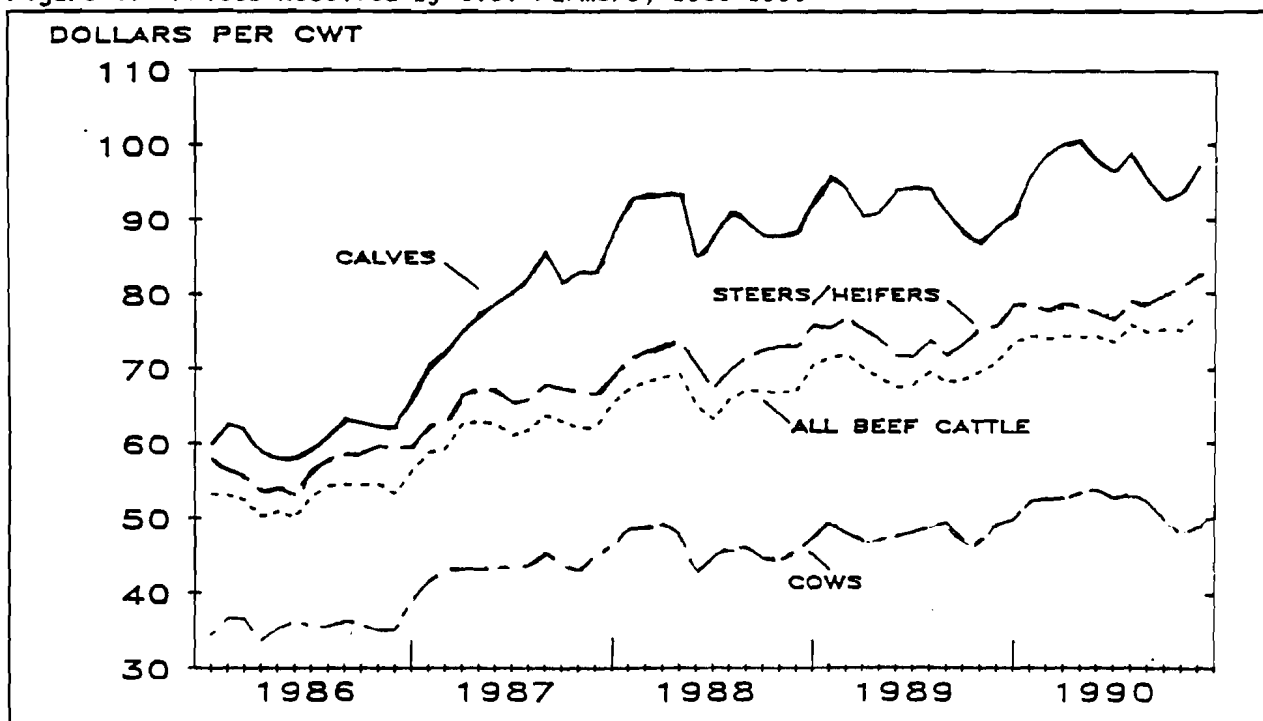
Throughout 1990 prices for both feeder and fed steers stayed at record levels. Figure 4 shows national average beef prices received for beef calves, steers and cows. Strong feeder prices and industry costs only slightly above last year resulted in calculated positive returns to cow-calf producers in 1990.

Figure 3. Annual U.S. Cattle and Calf Slaughter, 1930-1990



Source: USDA, ERS. February 1991. Outlook '91 Charts. 67th Annual Agricultural Outlook Conference.

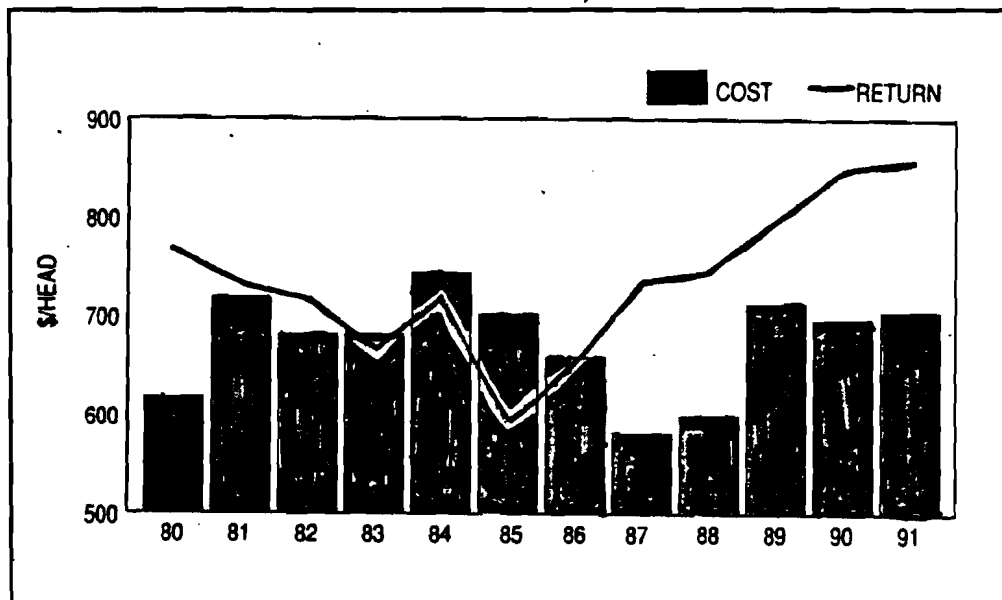
Figure 4. Prices Received by U.S. Farmers, 1986-1990



Source: USDA NASS, Agricultural Prices. Dec. 31, 1990. PR1(12-90).

Figure 5 shows the total industry costs to produce a fed steer have been less than the average price of a fed steer since 1987.

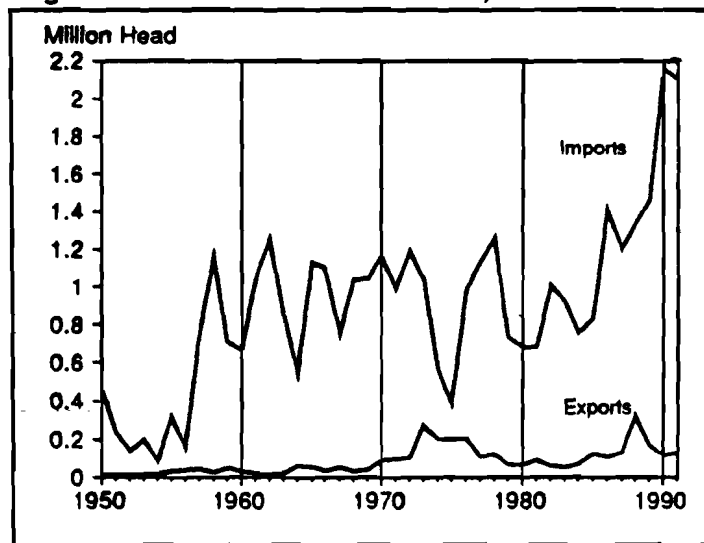
Figure 5. U.S. Cattle Industry Costs for and Returns to Produce A Fed Steer, 1980-1991



Source: National Cattlemen's Association. The Beef Brief. Sept. 1991. Vol 1. No. 3.

As a result of the smaller U.S. calf crop and high feeder and fed cattle prices, live cattle imports were at an all time high (figure 6). These were primarily from Canada and Mexico. Total beef and veal imports also increased in 1990. Based on carcass weight, this increase was about 8 percent over 1989 levels. Both live animal and beef exports declined in 1990 from 1989 levels. Beef carcass exports were down 1.6 percent and live animal exports were down 29 percent. Last year about 5 % of U.S. beef production was exported.

Figure 6. U.S. Cattle Trade, 1950-1990



Source: USDA ERS. Livestock and Poultry Situation and Outlook Report. Feb. 1991.

The beef cycle is also affected by changes in the demand for beef. The per capita consumption of beef increased 46 % from 1959 to 1976 and since then has decreased to a level close to 1959 consumption. The shift in consumer preference from beef to poultry is due to a variety of factors including diet and health concerns over fat and cholesterol and consumer demand for convenience foods. However the impact on beef demand from changing tastes and preferences is minor when compared to the response to price differences between beef and poultry. In 1950 poultry was selling for about 80 % the price of beef. Today, poultry is selling at about 30 % the price of beef. In order for beef to meet the challenge of poultry and other alternative foods, greater emphasis has to be placed on increased efficiency.

In response to the beef industry's need for greater efficiency, the National Cattlemen's Association has sponsored a committee of cattlemen, extension, agribusiness, and university professionals to initiate state and national integrated resource management (IRM) programs. IRM is a management concept in which the key performance indicators of an operation are analyzed, decisions made and action taken to provide maximum profitability by optimal utilization of all resources. IRM involves using a team approach to develop recommendations which will help producers maximize efficiency and thereby profitability.

Two Northeast states, New York and Vermont, are currently developing IRM programs. The New York Beef Cattlemen's Association (NYBCA) and Dr. Danny Fox, Cornell University are working together to implement an IRM program in New York State. A primary ingredient in the New York IRM program is the Northeast Beef Farm Business Summary. As described in this publication, the NBFBS objective is to help participating producers become more profitable by identifying farm strengths and weaknesses.

Summary of the Farm Business - Selected Factors

Selected farm business summary factors include the size of the farm business, rates of production, cost control, capital efficiency, profitability, return on equity and financial summary. The average and the range values for selected business factors are presented in Table 1. Average values for 1989 data and average and range values for 1990 data are shown. All of the thirty-two farms participating in the 1989 summary and the forty-five farms participating in the 1990 summary are included in the values in Table 1. This table gives a broad view of the business performance of all of the participating farms. Table 2, Selected Performance Factors, 1989 and 1990 for the Same Twenty-three Farms, demonstrates the changes from one year to the next in the annual performance of the twenty-three farms who participated in both years.

Definitions of Selected Business Factors

The average number of cows is the mean number of open and bred cows held during the year ($[\text{open and bred cows as of January 1} + \text{open and bred cows as of December 31}] / 2$). The average number of heifers and average number of bulls is computed in the same way. The % calves weaned is calculated by dividing the total number of calves weaned by the sum of the total number of calves born, plus calves purchased as a cow-calf pair less calves sold as a cow-calf pair. The % calves born is calculated by dividing the total number of calves born alive by the total of pregnant cows in the herd plus pregnant cows purchased less pregnant cows sold. The Calves weaned per cow wintered is the number of calves weaned divided by the total number of open and bred cows in inventory at the beginning of the year. This value is then put on a percentage basis by multiplying by 100. The average wean age is the average number of days between birth and weaning. Cost control, capital efficiency, and profitability measures given on a per cow basis use the average number of cows (as defined above) as the denominator.

Purchased feed/cow is the sum of beef grain purchased and beef roughage purchased, on an accrual basis, per cow. Hired labor and machinery cost per cow is calculated as the sum of accrued expenditures for hired labor, machinery repair, farm auto, machinery hire and lease, machinery depreciation and an interest charge of five percent on the average machinery investment. The interest charge represents the opportunity cost of the dollars invested in machinery. Hired labor, machinery and crop cost per cow is the sum of: hired labor and machinery cost per cow (as defined above), accrued fertilizer & lime and accrued seed, spray and other crop expenses.

All of the capital efficiency measures are averages of the beginning and end of the year. Assets are valued on a market value basis for calculation of capital efficiency measures. The profitability measures are shown in table 7. Details concerning profitability analysis are in the "Profitability Measures" text, pages 21-22. Farm net worth is the total market value of assets less liabilities as of December 31. The debt to asset ratio is the total number of dollars of debt per each dollar of assets. Farm debt per cow is the December 31 total liability value divided by the total number of open and bred cows as of December 31.

Table 1.

Selected Business Factors, 1989 and 1990, All Farms

Item	- 1989 -	1990	
	Average	Average	Range
Number of Farms	32	45	
Size of Business			
Average number of cows	38.7	40.5	7 - 110.5
Average number of heifers	9.5	8.3	0 - 40.5
Average number of bulls	3.7	3.3	0 - 36.5
Total lbs. weaned	16,823	17,594	1,400 - 60,600
Rates of Production			
% Calves weaned	96.5	93.3	67 - 109
% Calves born	94.4	96.0	75 - 111
Calves weaned per cow wintered (%)	77.5	85.9	40 - 111
Average weaning weight, lbs.	514	520	293 - 820
Average wean age, days	208	207	152 - 300
Cost Control			
Purchased feed cost/cow	\$ 99	\$ 115	\$ 0 - 447
Hired Labor & Mach. cost/cow	312	404	20 - 5,405
Hired Labor, mach. & crop cost/cow	361	469	20 - 6,240
Capital Efficiency (average for year)			
Mach. & equip. investment/cow	\$ 1,145	\$ 1,251	\$ 218 - 13,789
Real estate investment/cow	6,667	5,867	0 - 38,182
Total capital investment/cow	9,405	8,803	1,385 - 42,465
Profitability			
Net cash farm income	\$ (2,321)	\$ (2,861)	\$ (59,750) - 38,991
Net farm income w/o appr.	(541)	(5,492)	(78,655) - 72,104
Net farm income with appr.	7,037	1,553	(67,563) - 74,706
Financial Summary			
Farm Net Worth (12/31)	\$ 284,347	286,142	\$ 34,392 - 1,823,148
Debt to asset ratio	.08	.09	0 - .58
Farm debt per cow	\$ 750	\$ 912	\$ 0 - 9,430

Analysis of Selected Business Factors

The selected business factors shown in Table 1 are a one page synopsis of the farm business's size, productivity and profitability. Averages are shown for the 32 farms participating in the 1989 summary and averages and ranges shown for the 45 farms participating in the 1990 business summary. Twenty-three farms participated in both studies. Be careful when comparing changes in business factors in Table 1 from one year to the next. With the small number of farms involved, most large changes between 1989 and 1990 are due to the economic profiles of the individual farms involved and not changes in the beef industry. To compare specific year to year differences in the farms, see Table 2, Selected Performance Factors, 1989 and 1990 for the Same Twenty-three Farms.

In 1990, the average number of cows on the forty-five farms was 40.5 with a range of 7 to 110. The reproductive efficiency of the farms tended to be very good with Percent Calves weaned and Percent calves born averaging 93.3 % and 96 % respectively. Twenty-one farms weaned 100 % of their calves born and twenty-four farms had 100 % live calf births.

There was a large variation between the farms in the economic factors: cost control, capital efficiency and profitability. This variation was evident in the cost control measures where purchased feed per cow varied from \$ 0 to \$ 447 and hired labor and machinery cost varied from \$20 to \$5,405 per cow. Hired labor and machinery cost tended to be related to farm size with the smaller farms having the highest machinery and labor cost per cow. This reflects the fixed component of investment in machinery required for a farming operation.

Capital efficiency is an important factor in the operation of a beef cow calf enterprise. As cow calf businesses tend to be labor and capital extensive with a small profit margin, over capitalization can be devastating to the health of the business. The cow calf industry is, however, prone to this problem partially because many part time producers, under a time constraint, need reliable equipment. The machinery and equipment investment per cow ranged from \$218 to \$13,789. Of the average total capital investment per cow of \$8,803, 67 percent or \$5,867 was real estate investment. The real estate investment per cow varied from \$0 to \$38,182.

Net cash farm income, which is farm cash receipts less farm cash expenses and purchased breeding stock, is the money available to make principle payments, capital purchases and contribute toward family living and savings. Average net cash farm income for 1990 participating farms was negative \$2,861. Net farm income, calculated on an accrual basis, includes depreciation of buildings and machinery, changes in inventory and changes in accounts payable and receivable. Average net farm income for the forty-five farms was negative \$5,492. Net farm income with appreciation is the total farm accrual receipts less total farm accrual expenses plus livestock, machinery and real estate appreciation. Appreciation represents the change in farm inventory values caused by changes in prices during the year. Appreciation is included in Net Farm Income in order to reflect the entire change in farm net worth. The average Net Farm Income including appreciation was \$1,553.

Farm net worth is the market value of all farm assets less all farm debt. The average farm net worth for the forty-five beef farms was \$ 286,142. The debt to asset ratio indicates that on the average for every \$1.00 of farm assets there is \$.09 of farm debt. The average farm debt per cow on December 31, 1990 was \$912. The debt level of the beef farms participating in the beef farm business is relatively low for an agricultural business. The debt to asset ratio and debt per cow for the 1990 New York State Dairy Farm Business Summary was .34 and the average farm debt per cow was \$ 2,220¹.

¹ Smith, S.F., Knoblauch, W.A. and L.D. Putnam. 1990 New York State Dairy Farm Business Summary. A.E. Res 91-5. Dept. Ag. Economics, Cornell University.

Selected Performance Factors for the Same Twenty-three Farms

Definitions of Selected Performance Measures, Same Farms

The Selected Performance Measures shown in Table 2 are similar (and for some items the same) as the Business Measures listed in Table 1. The measures in Table 2 are selected to be used as a diagnostic tool to compare the performance of these farms from one year to the next. Where possible measures are in a "per unit" basis, ie. per cow and per acre. This allows comparison of different size farms. The right hand column is left blank for you to fill in your farm's values. Listed under the "Page" column in Table 2 is the page number of your Individual Farm Business Summary that the value listed under "Item" appears.

The values in table 2 are averages for the same twenty-three farms that participated in both the 1989 and 1990 Beef Farm Business Summary. Each of these measures is also included in other tables in this publication and described in greater detail in those areas.

The size of business and investment/cow measures are described above (Analysis of Selected Business Measures). Capital Turnover is the average farm assets divided by the annual farm accrual receipts. Capital Turnover shows the number of years of farm receipts required to equal or "turnover" the average capital investment.

Total Accrual Receipts/cow is the sum of cash farm receipts adjusted for changes in inventory and accounts payable divided by the sum of all open and bred cows. The other "per cow" values are calculated in the same way. Accrual Operating Expenses are all accrual farm business expenses except breeding stock purchases and depreciation. Breeding stock purchases, building and machinery depreciation are added together. The Net Farm Income is total accrual receipts less total accrual expenses (including breeding stock purchases and depreciation). This value does not include appreciation. See pages 16 - 18 for more detail about accrual receipts and expenses.

Debt Payment as a Percent of Total Cash Receipts is calculated: total debt payment (interest plus principal) paid during the year divided by the total cash receipts received for the year. Net Non-farm Contribution to Farm is the cash required by the farm from non-farm sources to meet farm cash requirements for operating expenses, debt payments, and capital purchases.

Marketing indicators include the average feeder calf price received and average finished cattle price received in dollars per hundredweight. Three crop production measures are included: Tons hay crop dry matter per acre; Direct crop expenses/crop acre; and Purchased feed/cow. Direct crop expenses included the accrual expenses for fertilizer, lime, seed, spray and other crop expenses divided by the total number of crop acres. The Purchased feed cost/cow is purchased beef grain and roughage per cow on an accrual basis. These three measures together indicate cropping system performance, costs and the alternative cost of purchased feed.

Table 2. Selected Performance Factors, 1989 and 1990
for the Same Twenty-three Farms

Item	Page ¹	1989 Average	1990 Average	Your 1990 Value
Size of Business				
Average Number of Cows	1	46.0	49.9	_____
Total lbs. Weaned	1	20,350	27,541	_____
Capital Efficiency				
Farm Capital Investment/cow	8	\$ 7,802	\$ 8,454	_____
Real Estate Investment/cow	8	\$ 5,193	\$ 5,892	_____
Machinery & Equip. Inv./cow	1	\$ 695	\$ 886	_____
Capital Turnover, years	8	11.3	14.1	_____
Profitability				
Total Accrual Receipts/cow	3	\$ 740	\$ 659	_____
Total Accrual Oper. Exp/cow	2	\$ 580	\$ 627	_____
Breeding Stock & Depreciation/cow	2	\$ 154	\$ 151	_____
Net Farm Income/cow ²		\$ 6	\$ (119)	_____
Debt Payment & Cashflow				
Total Debt Payment/cow	5	\$ 129	\$ 142	_____
Debt Payments as a Percent of Total Cash Receipts	5	19%	18%	_____
Net Nonfarm Contribution to Farm	6	\$ 4,561	\$ 4,208	_____
Marketing				
Average Feeder Price Received/cwt	7	\$ 75.58	\$ 85.23	_____
Average Finish Cattle Price/cwt	7	\$ 72.70	\$ 71.11	_____
Crop Production & Purchased Feed Costs				
Tons hay crop dry matter/acre	7	1.9	1.9	_____
Direct crop expenses/crop acre	7	\$ 20.54	\$ 21.68	_____
Purchased feed cost/cow	1	\$ 92.00	\$ 87.00	_____

¹ Page number of the Individual Beef Farm Business Summary where Performance Measure is located.

² Net Farm Income/cow = Total Accrual Receipts/cow (page 3) - Total Accrual Expenses/cow (page 2).

Analysis of Selected Performance Factors, Same Farms

The performance of these twenty-three farms has not changed dramatically from 1989 to 1990. The total quantity of weaned calves increased by 7,191 pounds. That is an increase in the total pounds weaned per cow from 442 to 552 pounds.

The average capital investment per cow increased slightly, \$ 652, or about 8 percent. However, the time required to payback capital purchases from operating receipts (capital turnover) was greater in 1990 than 1989. This is due to a decrease in receipts in 1990. For these twenty-three farms accrual receipts per cow decreased and accrual expenses per cow increased from 1989 to 1990. The net farm income per cow decreased \$125 from 1989 to 1990.

Debt payments per cow increased marginally in 1990 from \$ 129 to \$ 142. The average non-farm contribution to the farm's cashflow decreased in 1990 by \$ 353.

The average price received for feeder and finished cattle varied considerably from year to year. In 1989, the average feeder cattle price received was \$ 75.58 per hundred weight. In 1990, the average feeder price as \$ 85.23 per hundred weight. The price received for finished animals decreased slightly.

Business Characteristics and Resources Used

Some major business characteristics are shown in Table 3. Eighteen of the farms are full time businesses and twenty-seven are part time. The average farm tenure is over 16 years. Forty-one of the producers indicated beef was the primary farm enterprise. Most of the farm businesses use a manual account book for recordkeeping.

Table 3.

<u>Business Characteristics of Forty-five Northeast Beef Farms, 1990</u>			
<u>Item</u>	<u>Number of Farms</u>	<u>Item</u>	<u>Average Years</u>
Full Time Business	18	Farmer has operated farm	16.6
Part Time Business	27	Has owned beef herd	14.6
Beef Primary Enterprise	41		
Beef Non Primary Ent.	4		
Business Type			
Single Proprietor	38		
Partnership	5		
Corporation	2		
Record Keeping System			
Account Book	32		
Check-Write System	7		
On-farm Micro Computer	4		
Agrifax System	2		

Land, labor and animal resources used in the farm business are listed in Table 4. Labor is measured in months. In this analysis 200 hours is considered one month of labor. Land use and herd size averages include only those farms reporting a value for the item. The range includes all farms. The total worker equivalent of 13.9 is the months of labor per year required to operate the average beef enterprise in the 1990 study. This value is equivalent to one full time person working 200 hours each month of the year and a second person working 200 hours/month for almost 2 months.

Table 4.

Resources Used on Northeast Beef Farms, 1989 and 1990			
Item	Average 1989	Average 1990	Range 1990
Number of farms	32	45	
Land Used			
Total Acres			
Owned	219	216	0 - 1,166
Rented	124	97	0 - 560
Tillable Acres			
Owned	79	67	0 - 200
Rented	77	63	0 - 285
Total Tillable	156	129	0 - 400
Pasture Acres			
Owned	70	62	0 - 800
Rented	37	33	0 - 450
Total Pasture	107	95	0 - 800
Herd Size			
Average Number Cows	38.7	40.5	7 - 110.5
Average Number of Cows, Bulls & Heifers	51.9	52.1	10 - 188
Labor (months)			
Operator(s)	9.93	9.39	4 - 25.7
Hired Labor	2.04	1.91	0 - 27.3
Family Unpaid	2.75	2.37	0 - 34.0
Total Worker Equivalent	15.12	13.94	4 - 61.1

Farm Income

Cash receipts, change in inventory, changes in accounts receivable, accrual receipts and accrual receipts per cow are listed in Table 5. Cash receipts include the actual amount of cash received for farm products, services and government payments. Accrual Receipts represent the value of all farm production and services actually provided during the year. Increases in livestock inventory caused by herd growth are included as accrual receipts under the changes in inventory column. Decreases in inventory caused by herd reduction are deducted. The change in inventory column does not reflect changes in inventory due to price changes (appreciation). A positive change in crop inventory is shown if there is an increase in grown feeds in inventory from the beginning to the end of the year. The Farm Statement of Net Worth (page 23) and Value of Beef Inventory (page 33) present the details concerning changes in inventory.

Table 5.

Farm Income, Average of Forty-five Northeast Beef Farms, 1990

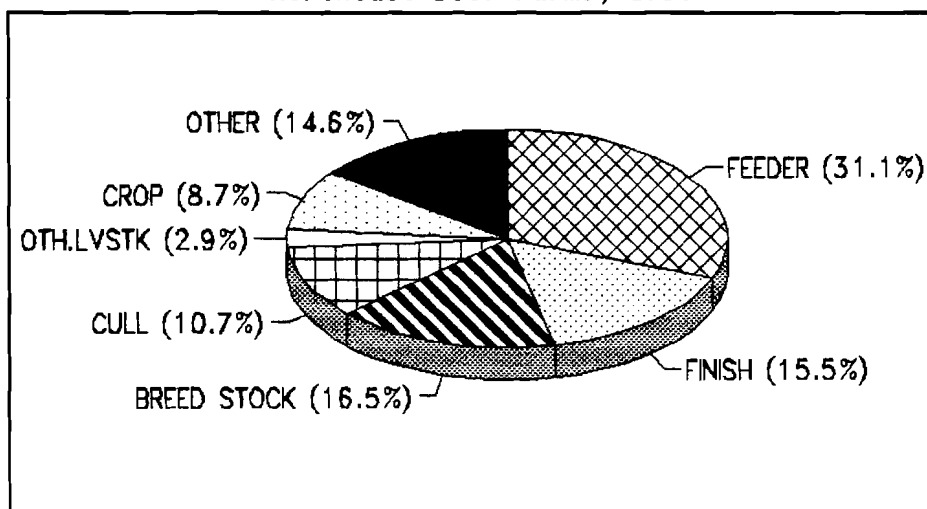
Item	Cash Receipts	Change in Inventory	Change in Acct's Rec'bl	Accrual Receipts	Accrual per cow ¹
Feeder calf sales	\$ 7,795	\$ 732	\$ 11	\$ 8,538	\$ 211
Finished cattle	4,817	(623)	96	4,290	106
Breeding stock	2,576	1,876	(42)	4,410	109
Cull cattle	2,914		0	2,914	72
Other livestock	662	212	0	874	22
Crop Sales	1,890	359	31	2,280	56
Custom work	490		0	490	12
Government payments	1,126		32	1,158	29
Misc. receipts	2,308		13	2,321	57
Total Cash Receipts	\$ 24,578				
TOTAL ACCRUAL RECEIPTS		\$ 2,556	\$ 141	\$ 27,275	\$ 674

¹ Sum of total Accrual Receipts / Sum open and bred cows on all farms.

The changes in accounts receivable column adjusts accrual income to exclude cash received in this year for goods which changed ownership in a previous year and include income from the current years sales that has not been received. An increase in accounts receivable will increase the accrual receipts accordingly. A decrease in accounts receivable will decrease accrued receipts. Accrual receipts per cow are calculated by dividing the sum of accrued receipts from all farms by the total number of cows on all farms.

Non-farm receipts such as off-farm income are excluded from the farm income statement. Gas leases and other payments attributed to the farm land base are included as miscellaneous receipts. Twelve farms sold only feeder calves, three farms sold only finish cattle, two farms sold only breeding cattle; eight farms sold breeding and feeder cattle; 11 farms sold feeder and finished cattle and seven farms sold feeder calves, finished and breeding cattle. Eleven of the farms had cash income from crop sales. The average cash crop income for these farms was \$ 7,733. Figure 7 shows the distribution of receipts on an accrual basis.

Figure 7. Distribution of 1990 Accrual Income on 45 Northeast Beef Farms, 1990



Farm Expenses

Cash Expenses are those farm expenses which were paid for in 1990. Accrual Expenses include the costs of inputs actually used in the year's production. The value of purchased feeds and supplies used out of the farm inventory are included as a cost. Charges for items purchased but not paid for in 1990, shown as an increase in accounts payable, are included in accrual expenses. Conversely, decreases in accounts payable, items purchased in previous years and paid for in 1990, decrease accrual expenses. Accrual expenses/cow are calculated by dividing the sum of accrued expenses from all farms by the total number of cows. Farm business expenditures are grouped into seven major categories.

Hired labor expenses include wages, social security paid on labor, worker's compensation insurance, unemployment insurance, and privileges purchased for hired labor.

Feed costs include beef grain and concentrate, beef roughage and other livestock feed. Beef grain and concentrate includes concentrates, minerals, protein, and grain purchased for the beef herd. Hay and silage purchased for the beef herd is entered as beef roughage purchased. All feed purchased for non-beef livestock is included in other livestock feed.

Machinery costs represent all the operating costs of using power machinery on the farm. Ownership costs such as depreciation and interest on investment are excluded here but are included in the machinery cost measures in Selected Factors (Table 1).

Livestock expenses include the cost of supplies and services directly associated with the care and maintenance of the beef herd. Breeding expenses include purchased semen, artificial breeding supplies, and pregnancy exams. Feeders and stockers purchased are the cost of cattle purchased that are purchased for resale not for breeding stock. Marketing, and other beef expenses include trucking, marketing fees, commissions, advertising, bull test fees, ID tags, grading, branding and stock supplies.

Crop expenses include the costs of fertilizer, lime, seeds, pesticides, and other crop supplies.

Real estate expenses are the direct costs associated with owning and maintaining farm land and buildings. Taxes include all town, county and school taxes paid on farm real estate. Corporate taxes are itemized under miscellaneous and sales taxes are capitalized with the cost of the improvement. Insurance includes all fire and farm liability insurance paid on farm property and excludes life insurance and personal and employee health insurance.

Other expenses include telephone, electricity, interest paid and other miscellaneous expenses. Electricity and telephone expenses include only the farm share. Interest is made up of all interest paid on farm liabilities including finance charges. Other operating expenses are all other farm operating expenses, not previously itemized, which are for a farm enterprise other than the beef enterprise.

Breeding stock purchased are only those animals purchased which are added to the breeding herd. This expense is normally a capital purchase and not included in the operating expenses for this reason.

Table 6.

Farm Expenses, Average of Forty-five Northeast Beef Farms, 1990

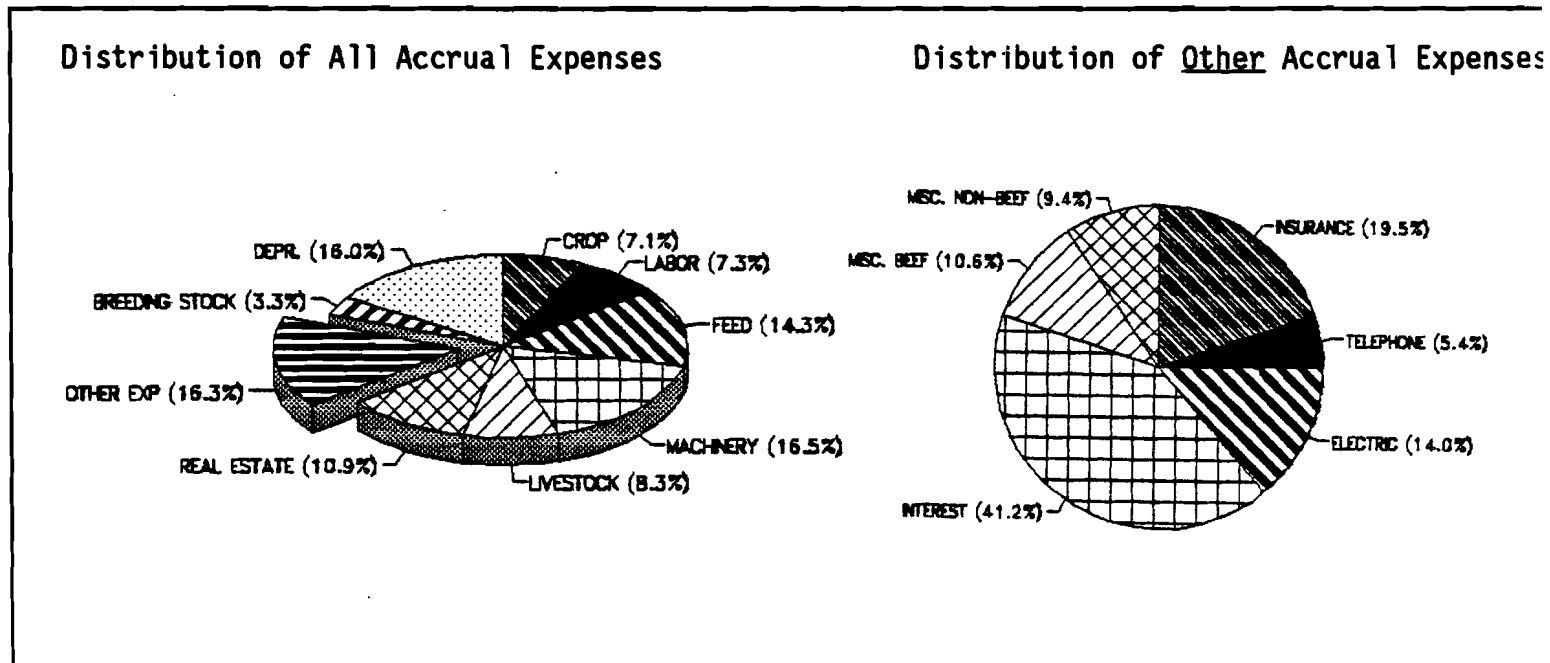
Item	Cash Expenses	Change in Inventory	Change in Acct's Pay'bl	Accrual Expenses	Accrual Exp./cow ¹
Hired labor	\$ 2,362	\$	\$	\$ 2,362	\$ 58
Feed					
Beef grain purchased	2,870	(83)	22	2,809	69
Beef roughage purchased	1,637	(30)		1,607	40
Other livestock feed	276	(5)		271	7
Machinery					
Gasoline & oil	1,730	70		1,800	44
Machinery repairs	2,815			2,815	70
Farm auto expense	333			333	8
Machinery hire & lease	458			458	11
Livestock					
Vet & medicine	910	(29)		881	22
Breeding expense	315	1		316	8
Feeders purchased	378			378	9
Stockers purchased	0			0	0
Mktg & other beef exp.	1,137	6		1,143	28
Crops					
Fertilizer & lime	1,576	96	(46)	1,626	40
Seed, spray, other crop	650	47		697	17
Real Estate					
Land, bld & fence rep.	1,040	(11)		1,029	25
Taxes (real estate)	1,949			1,949	48
Rent & lease	594	2		596	15
Other					
Insurance	1,045			1,045	26
Telephone	285			285	7
Electricity	749			749	19
Interest Paid	2,203			2,203	54
Misc. beef expenses	551	20		571	14
Other operating expenses	500	2		502	12
Total Operating Exp.	26,363	86	(24)	26,425	651
Breeding Stock Purch.	1,076		14	1,090	27
Machinery Depreciation				3,950	98
Building Depreciation				1,302	32
Total Cash Expenses	\$ 27,439				
Total Accrual Expenses		\$ 86	\$ (10)	\$ 32,767	\$ 808

¹ Sum of total Accrual Expenses / Sum open and bred cows on all farms.

Machinery and building depreciation charges are based on income tax figures. Depreciation is an estimate of the value of capital assets used up during the year's production. Depreciation is part of total accrual expenses but not part of total cash expenses.

The largest beef operating expense is machinery repairs, the next largest is beef grain, followed by hired labor and interest expense. Of all accrual expenses, the greatest was machinery depreciation. The total accrual income per cow was \$ 674. The accrual operating expense per cow was \$ 651 and total accrual farm expenses per cow were \$ 808 (operating expenses plus breeding expenses and depreciation). Figure 8 illustrates the distribution of accrual expenses into the major expense headings from Table 6. The distribution of the "other" category's components are shown on the right.

Figure 8. Distribution of 1990 Accrual Expenses on 45 Northeast Beef Farms



Farm Profitability Measures

Farm owners/operators contribute labor, management, and capital to their businesses. The best combination of these resources produces optimum profits. Farm profits can be measured as the return to all contributed resources or as the return to one or more individual resources such as labor and management. A series of farm profitability measures are summarized in Table 7.

Net cash farm income is total farm cash receipts less total farm cash expenses. Cash expenses include breeding stock purchased.

Net farm income without appreciation is total accrual receipts less total accrual expenses. Physical changes in inventories are included in this value. Appreciation of capital items (livestock, machinery and real estate) is excluded.

Net farm income including appreciation is total accrual income plus livestock, machinery and real estate appreciation, less total accrual expenses. Livestock, machinery and real estate appreciation from the beginning of the year to the end is estimated by each participating beef producer. The changes in inventory and appreciation are detailed in Table 10, Farm Inventory and Table 18, Value of Beef Inventory.

Table 7. Measures of Farm Profitability,
Average of Forty-five Northeast Beef Farms, 1990

<u>Item</u>	<u>----- Average -----</u>
Total Farm Cash Receipts	\$ 24,578
- Total Farm Cash Expenses	<u>27,439</u>
Net Cash Farm Income	(2,861)
Total Accrual Receipts	\$ 27,275
- Total Accrual Expenses	<u>32,767</u>
Net Farm Income w/o Appreciation	(5,492)
Total Accrual Receipts	\$ 27,275
+ Livestock Appreciation	+ 2,812
+ Machinery Appreciation	+ 1,935
+ Real Estate Appreciation	+ 2,298
- Accrual Expenses	<u>32,767</u>
Net Farm Income w/appreciation	1,553
Net Farm Income w/o Appreciation	\$(5,492)
- Family Labor Unpaid @ \$ 650 /month ¹	- 1,663
- Interest on \$ 95,320 average investment in Non-Real Estate equity capital @ 5%	<u>4,766</u>
Return to Labor, Management & Real Estate Ownership	(11,921)
- Interest on \$ 185,540 average investment in Real Estate equity capital @ 5%	<u>9,277</u>
Return to Operator Labor & Management	(21,198)

¹ Hours unpaid labor /200 hours worked per month) x \$ 650 wages per month.

Return to Labor, Management and Real Estate Ownership identifies the amount of net farm income contributed by the owner-operator's labor, management and real estate ownership. This measure is calculated as total accrual receipts less total accrual expenses less the value of unpaid family labor less the opportunity cost of using non-real estate equity. The interest charge is 5 percent. The interest charge reflects the long-term average rate of return that a farmer might expect to earn in a comparable risk investment. This interest rate is charged on average equity in all farm assets except real estate.

Return to Operator Labor and Management is the share of the net farm income without appreciation returned to the operator's labor and management. To calculate Return to Operator Labor and Management, deduct an interest charge of 5 percent on the average real estate equity from the Return to Labor, Management and Real Estate Ownership value.

The average net cash farm income of the forty-five summary farms is negative \$ 2,861. Net farm income without appreciation is negative \$ 5,492. Net farm income with appreciation is \$ 1,553. The difference between these two values, \$ 7,045, is the appreciation in the value of farm assets. These producers benefitted especially from increases in real estate values and increases in the value and quantity of livestock held. However, the opportunity costs of these investments contributed to low returns to Labor, Management and Real Estate Ownership and to Operator Labor and Management (negative \$ 11,921 and negative \$ 21,198 respectively).

Farm Statement of Net Worth

The first step in evaluating the financial status of the farm is to construct a Statement of Net Worth (balance sheet) which identifies all the assets and liabilities of the business. The second step is to evaluate the relationship between the assets, liabilities and net worth and changes that occurred during the year. Farm assets are valued at market value. The market value includes appreciation due to changes in price and changes in inventory quantities.

Liabilities include only farm liabilities and the farm portion of liabilities such as mortgages and auto loans. The farm net worth and equity position of the farms in the summary tended to be very strong with an average net worth at the end of the year of \$ 286,142. The average farm net worth increased from the beginning to the end of the year by \$ 10,549. Farm assets increased by \$ 13,995 and farm liabilities increased \$ 3,446.

Table 8.

Farm Statement of Net Worth,
Average of Forty-five Northeast Beef Farms, 1990

ASSETS	Jan 1, 1990	Dec. 31, 1990	Change
Current			
Farm cash, checking, savings	\$ 3,043	\$ 3,702	\$ 659
Accounts receivable	361	458	97
Stocks & certificates	501	507	6
Feed & Supplies	11,755	12,056	301
Intermediate			
Cows	\$ 31,142	\$ 34,438	\$ 3,296
Heifers	4,716	5,111	395
Bulls	3,126	3,561	435
Finish & Feeder Cattle	7,432	7,855	423
Other Livestock	436	648	212
Machinery & Equipment	34,663	37,207	2,544
FLB/PCA Stock	334	278	(56)
Long-term			
Land & buildings	\$ 199,552	\$ 205,235	\$ 5,683
Total Farm Assets	\$ 297,061	\$ 311,056	\$ 13,995
LIABILITIES & NET WORTH			
Current			
Accounts Payable	\$ 64	\$ 54	\$ (10)
Short term debt	430	480	50
Operating Debt	225	517	292
Advance Government Receipts	32	0	(32)
Intermediate debt	3,342	6,921	3,579
FLB/PCA stock	334	278	(56)
Long-term debt	17,041	16,664	(377)
Total Farm Liabilities	\$ 21,468	\$ 24,914	\$ 3,446
Farm Net Worth	\$ 275,593	\$ 286,142	\$ 10,549

Balance Sheet Analysis

The balance sheet analysis continues by examining financial and debt ratios and factors measuring levels of debt. Percent equity, calculated by dividing net worth by assets, is the percentage of all farm assets owned by the farmer at the end of the year. Equity increases as the value of assets increase more than liabilities. The debt to asset ratio is compiled by dividing liabilities by assets at the end of the year. Low debt to asset ratios reflect strength in solvency and the potential capacity to borrow. Debt levels per cow are the sum of the total farm debt divided by the sum of open and bred cows on all farms.

Net worth is the amount farm assets exceed liabilities. The change in net worth from the beginning to the end of the year is measured without and with appreciation. Change in net worth without appreciation measures how much more (or less) the farm is worth not including changes due to price moves. The average change in net worth for the forty-five participating farms was \$10,549 with appreciation and \$ 3,505 without appreciation. Purchased land and machinery was accounted for the largest increase in assets. Increasing value of livestock market values increased net worth on many of these farms. The majority of the debt on these farms is structured as long-term debt such as mortgages. Twenty-one of the forty-five farms reported no farm liabilities at the end of 1990.

Table 9.

Balance Sheet Analysis, Average of Forty-five Northeast Beef Farms, 1990	
Item	Average
<u>Financial Ratios.</u>	
Percent equity	91 %
Debt to asset ratio	0.09
<u>Change in Net Worth</u>	
Without appreciation	\$ 3,505
With appreciation	10,549
<u>Debt Analysis, Dec. 31, 1990</u>	
Accounts payable as % of total liabilities	0 %
Operating Debt as % of total liabilities	2 %
Current & intermediate liabilities as % of total liabilities	33 %
Long-term liabilities as a % of total liabilities	67 %
<u>Debt Levels Per Cow, Dec. 31, 1990</u>	
Total farm debt	\$ 912
Long-term debt	677
Current & intermediate debt	199
Operating debt & accounts payable	36

Farm Inventory

The farm inventory, table 10, details the changes in the value of major farm assets (real estate, machinery & equipment, beef & other livestock and feed & supplies) from the beginning to the end of the year. Beef inventory changes are detailed in Value of Beef Inventory, table 18.

Table 10.
Farm Inventory, Average of Forty-five Northeast Beef Farms, 1990

	Real Estate	Machinery & Equipment	Beef & Other Livestock	Feed & Supplies
Beginning of Year	\$ 199,552	34,663	46,852	11,755
+ Purchases	4,736	5,099		
+ Nonfarm Noncash Transfers	0	0		
- Lost Capital	48			
- Sales	0	540		
- Depreciation	<u>1,302</u>	<u>3,950</u>		
= Net Investment	202,938	35,272	48,801	
+ Appreciation	<u>2,298</u>	<u>1,935</u>	<u>2,812</u>	
= End of Year	205,236	37,207	51,613	12,056

Repayment Analysis

Repayment analysis, table 11, shows the amount of principal, interest and total payments made on debt of various terms. This table can be helpful when making decisions about acquiring and structuring new debt. Total debt payment per cow is the total interest and principal paid during the year divided by the average number of cows. The percentage of debt payment to cash receipts is an indication of the amount of cash required to make debt payments. The average debt payment made by participating beef producers in 1990 was \$ 238 per cow. On the average 28 percent of cash receipts is used to service debt. However, the range in debt as a percent of total receipts was 0 % to 970%. The average, 28 percent is unusually large considering that about nearly one-half of the participating farmers have no farm debt at all. The large average real estate investment and the relatively high real estate debt burden per cow indicate a land base that is greater than the economic needs of the beef herd is being charged against the beef enterprise.

Table 11.
Repayment Analysis, Average of Forty-five Northeast Beef Farms, 1990

Debt Payments	Principal	Interest	Total
Long term	\$ 993	\$ 1,542	\$ 2,535
Intermediate term	1,951	600	2,551
Short-term	877	42	919
Operating (net reduction)	88	27	115
Total	\$ 3,909	\$ 2,211	\$ 6,120
Total Debt Payment			
Per Cow	\$ 213		
Percent of total cash receipts	28 %		

Capital and Labor Efficiency Analysis

Capital efficiency factors, table 12, measure how intensively the capital is being used in the farm business. The labor analysis is a listing of the hours of work contributed to the farm as estimated by the business summary participant. The estimated hours are used to determine the full-time equivalent months of labor used by the farm.

The capital turnover is a measure of capital efficiency as it shows the number of years of farm receipts required to equal or "turnover" capital investment. It is computed by dividing the average farm assets by the year's total farm accrual receipts. The average capital turnover for the forty-five farms is 15.7 years. Capital turnover varied between 2.5 and 89.5 years.

The value of the operators labor to the beef farm is estimated at \$900 per month (one month of labor equals 200 hours). The value of the family unpaid labor is estimated at \$ 650 per month. The value of the unpaid family labor is the months of labor (hours of labor divided by 200) multiplied by \$650. The average value of operator, hired and family labor used per farm was \$ 13,412 or \$ 477 per cow.

Table 12.

Capital & Labor Efficiency Analysis, Average of Forty-five Northeast Beef Farms, 1990

<u>Capital Efficiency (Average for Year)</u>		
	<u>Per Cow</u>	
Farm capital	\$	8,803
Real estate		5,867
Machinery & equip.		1,251
Capital Turnover, years		15.7
 <u>Labor Force</u>		
	<u>Hours</u>	
Operator(s)		1,877
Family paid		53
Family unpaid		475
Hired		383
Total		2,789/200 = 13.94 Months Labor
 <u>Labor cost</u>		
	<u>Total</u>	<u>Per Cow</u>
Value of Operator(s)		
Labor (\$900/month)	\$ 9,388	\$ 321
Family unpaid (\$650/month)	1,663	70
Hired	2,362	85
Total Labor	\$ 13,412	\$ 477
 <u>Machinery Cost</u>		
Machinery Cost	\$ 9,352	\$ 319
Total Labor & Machinery Costs	\$ 22,764	\$ 796
Hired Labor & Machinery Costs	\$ 11,714	\$ 404

Annual Cash Flow Statement

Completing an annual cash flow summary and analysis is necessary to determine how well the cash generated by the business met the annual cash needs of the business. Understanding last year's cash flow is the first step toward planning and managing cash flow for current and future years. This cash flow statement includes only farm cash inflow and outflow.

The cash flow statement lists the farm cash inflows at the top of the page, cash outflows next, and the difference at the bottom of the page. Cash inflows include all cash farm receipts, receipts from the sale of farm assets, additional funds borrowed, as well as cash available in the beginning of the year. Cash outflows include all cash farm expenses, capital purchases, principal payments and decreases in operating debt.

For the forty-five Forty-five Northeast beef farms, the average cash inflow in 1990 is \$35,845 and the average cash outflow is \$ 41,226. The farm families contributed an average of \$ 5,381 of non-farm income or savings to the farm. Besides operating expenses, the major farm cash outflows were principal payments on loans and machinery purchases.

Table 13.

Annual Cash Flow Statement, Average of Forty-five Northeast Beef Farms, 1990

Cash Inflows

Beginning farm cash, checking & savings	\$ 3,043	
Cash farm receipts	24,577	
Sale of assets : Machinery	540	
Real estate	0	
Money borrowed (intermediate & long-term)	6,423	
Money borrowed (short-term)	928	
Increase in operating debt	334	
TOTAL		\$ 35,845

Cash Outflows

Cash farm operating expenses	\$ 26,362	
Capital purchases: Breeding livestock	1,100	
Machinery	5,099	
Real estate	4,736	
Principal payments (intermediate & long-term)	3,010	
Principal payments (short-term)	877	
Decrease in operating debt	42	
TOTAL		\$ 41,226
NET NONFARM CONTRIBUTION TO FARM		\$ 5,381

Beef Enterprise Analysis

The beef enterprise receipts and expenses, table 14, shows the average receipts and expenses attributed to just the beef enterprise. The purpose of the beef enterprise table is to calculate the profitability of the beef enterprise and to determine to what extent the beef enterprise contributes to the profitability of the entire farm. Non-beef income and expenses such as income from other livestock, other livestock feed and other operating expenses are excluded. Other income or expenses which may be wholly or partially attributed to the beef enterprise are allocated by the participating beef producer on a percentage basis. Because most of participating beef producers had only a beef enterprise, the beef enterprise analysis is very similar to the farm income and expenses, tables 5 and 6. The average beef enterprise net cash farm income is negative \$ 2,956 and the beef enterprise net farm income (accrual) is negative \$ 4,617. The accrual beef enterprise net farm income per cow is negative \$ 113.

Table 14.

Beef Enterprise Receipts and Expenses
Average of Forty-five Northeast Beef Farms, 1990

RECEIPTS	Cash Receipts	Change in Inv.	Change in Acct's Rec'bl	Accrual Receipts	Accrual Inc./cow ¹
Feeder calf sales	\$ 7,795	\$ 732	\$ 11	\$ 8,538	\$ 211
Finished cattle	4,817	(623)	96	4,289	106
Breeding stock	2,576	1,876	(42)	4,410	109
Cull cattle	2,914			2,914	72
Crop Sales	402	215		617	15
Custom work	57			57	1
Government payments	798	32		830	21
Misc. receipts	1,103	212		1,314	33
Total Cash Receipts	\$ 20,462				
TOTAL ACCRUAL RECEIPTS		\$ 2,444	\$ 65	\$ 22,971	\$ 568
EXPENSES	Cash Expenses	Change in Inventory	Change in Acct's Pay'bl	Accrual Expenses	Accrual Exp./cow ²
Hired labor	\$ 1,934	\$	\$	\$ 1,934	\$ 48
Feed					
Beef grain purchased	2,870	(83)	22	2,809	69
Beef roughage purchased	1,637	(30)		1,607	40
Machinery					
Gasoline & oil	1,342	5		1,347	33
Machinery repairs	2,404			2,404	59
Farm auto expense	315			315	8
Machinery hire & lease	318			318	8
Livestock					
Vet & medicine	904	(28)		876	22
Breeding expense	315	(1)		314	8
Feeders purchased	378			378	9
Stockers purchased	0			0	0
Mktg & other beef exp.	1,129	6		1,135	28
Crops					
Fertilizer & lime	1,378	83	(23)	1,438	36
Seed, spray & oth crop	539	18		557	14
Real Estate					
Land, bld & fence rep.	956	(26)		930	23
Taxes (real estate)	1,707			1,707	42
Rent & lease	574			574	14
Other					
Insurance	853			853	21
Telephone	247			247	6
Electricity	607			607	15
Interest Paid	1,384			1,384	34
Misc. beef expenses	551	18		569	14
Total Operating Exp.	22,342	(38)	(1)	22,303	551
Breeding Stock Purch.	1,076		14	1,090	27
Machinery Depreciation				3,210	79
Building Depreciation				985	24
Total Cash Expenses	\$ 23,418				
TOTAL ACCRUAL EXPENSES		\$ (37)	\$ 13	\$ 27,588	\$ 681
Beef Enterprise Income	\$ (2,956)			\$ (4,617)	\$ (113)

¹ Sum total accrual receipts/sum open and bred cows on all farms.

² Sum total accrual expenses/sum open and bred cows on all farms.

Herd and Crop Management

This section reports production information for the cropping program and the beef herd. Production efficiency is a key ingredient of a consistently profitable farm. Crop yields, calving percentages, weaning weights and other productivity measures must be high to be successful in the competitive beef industry.

1990 Crop Production

On many cow calf operations, decisions concerning the cropping program could make a big difference in profitability. A complete evaluation of available land resources, how they are being used, how well crops are producing and what it costs to produce them is required to evaluate alternative cropping and feed purchase choices.

In table 15, forage crop yields are reported as total tons dry matter produced and tons dry matter produced per acre. Corn silage production is shown on a wet and dry matter basis. Corn grain and oats are measured in dry bushels. The acreage devoted to pasture is also shown. Crop acres and yields compiled for the average represent only the number of farms reporting each crop. Forty-one of the forty-five farms produced dry hay or hay crop silage. Fourteen farms produced corn silage and eight produced corn grain. Twenty-eight of the farms had some rotated pasture, twenty-one of the farms had some non-rotated pasture. Of those farms that used rotated and non-rotated pasture, the average acreage was 75 and 118 acres, respectively.

Table 15.

1990 Crop Production, Average of 45 Northeast Beef Farms

Crop	Farms	Acres	Production	
			Total	Per Acre
Hay crop - Total	41	98	169	1.7 tn DM
Corn silage (wet)	14	30	354	11.8 tn AF
Corn silage (dry)			122	4.1 tn DM
Other forage	2	11	17	1.5 tn DM
Total forage	41	109	211	1.9 tn DM
Corn grain	8	15	783	63.8 bu.
Oats	3	11	447	40.2 dry bu
Rotated Pasture	28	75		
Non-rotated Pasture	21	118		
Crop residue pastured	6	69		

Herd and Crop Management Analysis

Table 16 contains summaries of productivity in various categories. The average herd and crop management measures include only those farms reporting a given measure. The range is the top and bottom value of all farms in the summary. The herd productivity on the forty-five farms tended to be very good. Average conception rate, percent born and percent weaned averages were all in the 90 percent range. The conception rate is the percentage of cows and heifers exposed to the bull who are confirmed pregnant. Calves born per cow wintered (91.3%) and Calves weaned per cow wintered (85.9%) are the number of calves born and weaned divided by the open and bred cows in the herd on Jan 1, 1990. Average weaning weight is indicative of genetic capability of the herd as well as pasture and feed management.

On the average farm, 20 calves were sold as feeders weighing 543 pounds at an average price of \$82.52 per hundredweight and 11 were sold as finished cattle weighing 1,026 pounds at an average price of \$75.05 per hundredweight. As discussed in Economic Factors Affecting Forty-five Northeast Beef Producers, page 4, the demand for feeder calves was strong in 1990. However, if cost of gain is competitive, retaining ownership to finished weights can be an effective way to increase profits and decrease risk by selling more product per breeding cow maintained and spreading price risk over two phases of beef production.

Forage production, both hay crop and corn silage, were below average New York State typical levels. Average hay crop yield of 1.9 tons per acre (as-fed) and corn silage yields of 11.8 ton per acre were below the annual state averages of 2.21 and 15 tons per acre¹. When the forage production is at the low end of the range, it is probably more cost efficient to buy forage than produce it. The direct crop expenses/crop acre also varied widely. Direct crop expenses include the accrual expenses for fertilizer, lime, seed, spray and other crop expenses divided by the total number of crop acres.

One of the key measures of efficiency is the number of days productive pasture is available. Every day on pasture saves an average of 50 cents to one dollar in feed costs². The average days on pasture was 184, which is typical of the Northeast. However, it is not known how productive the pasture was over the 185 days. A decline in pasture quality and quantity in late summer and fall can reduce calf gains by 1 to 2 lb/day³. The cost of increasing land productivity must be weighed against reductions in feed costs/cow and the increased number of cows that can be kept.

¹ New York Agricultural Statistics 1990-1991. New York Department of Agriculture and Markets. July 1991.

² Philip Teague, Soil Conservation Service Economist. Personal communication.

³ Dan G. Fox, Fact Sheet 1300B. Cornell Beef Production Manual. Cornell University 1986.

Table 16.

Herd and Crop Management Analysis,
Average and Range of Forty-five Northeast Beef Farms, 1990

Item	Average	Range
Conception Rate %	95.2	73.3 - 100.0
Calves born %	96.0	75.0 - 111.0
Calves born per cow wintered %	91.3	58.8 - 100.0
Calves weaned %	93.3	66.7 - 109.0
Calves weaned per cow wintered %	85.9	40.0 - 100.0
 Average weaning weight	 520	 293 - 820
Average calf weaning age, days	207	152 - 300
Average cow weight at weaning, lbs.	1,126	825 - 1,550
Number of bulls used	1.8	0.0 - 6.0
 Number of feeders sold	 20.5	 3 - 42
Average weight / feeder sold	543	293 - 830
Avg. feeder price received/cwt.	\$ 82.51	\$ 57.17 - 102.67
 Number of finished cattle sold	 11.5	 2 - 67
Average weight / finished cattle sold	1,026	610 - 1350
Ave. finished cattle price received/cwt.	\$ 75.05	\$ 53.83 - 94.53
 Tons hay crop dry matter per acre	 1.7	 .6 - 3.9
Tons forage dry matter per acre	1.9	.6 - 3.9
Tons forage dry matter harvested/cow	6.0	.4 - 22.7
Direct crop expenses /crop acre	\$ 26.69	\$ 0 - 120.00
 Tillable acres /cow	 4.1	 0 - 17.9
Pasture acres /cow	3.2	0 - 9.1
Days on pasture	184	90 - 250

Beef Herd AnalysisLivestock Market Values

The number of head, the average weight and prices assigned to the classes of beef livestock at the beginning and end of the year are shown in table 17. The price of pregnant cows and heifers is calculated on a per head basis. All other prices are in dollars per pound.

Table 17.

Livestock Market Values and Stock Numbers,
Average of Forty-five Northeast Beef Farms, 1990

Cattle Type	----- Jan. 1, 1990 -----			----- Dec. 31, 1990 -----		
	# Hd	Lbs/head	Price	# Hd	Lbs/head	Price
Bred cows & heifers	38	1,164	\$ 808/hd	31	1,093	\$ 729/hd
Open cows	2	1,066	0.56/lb	1	1,139	0.56/lb
Replacement heifer	8	692	0.85/lb	9	673	0.91/lb
Service bulls	2	1,676	0.70/lb	2	1,575	0.77/lb
Other bulls	2	820	0.70/lb	1	700	0.77/lb
Feeder cattle	13	540	0.79/lb	14	570	0.82/lb
Finish cattle	3	869	0.80/lb	2	947	0.77/lb

Value of Beef Inventory

The change in value of the beef inventory is shown on table 18. The first column indicates the value of animals held at the beginning of the year at beginning of the year prices. The second column, Change in inventory without appreciation is the change from the beginning to the end of the year in livestock numbers valued at the beginning of the year prices. The next column, appreciation, shows the increase (or decrease) in value due to price changes. The last column shows the end of the year market value of the livestock inventory.

The average farm showed a \$ 1,738 increase in the physical inventory of cattle and a \$ 2,812 increase in the value of the inventory held due to price changes. This table may vary from table 9, due to changes in the inventory of non-beef livestock.

Table 18.

Value of Beef Inventory (Jan. 1, 1990 and Dec. 31, 1990),
Average of Forty-five Northeast Beef Farms, 1990

	Beg. of year value	+ Change in inv. w/o appreciation	+ Appreciation	End of year value
Pregnant Cows & Heifers	\$ 30,028	\$ 2,279	\$ 1,174	\$ 33,481
Open Cows	1,114	(197)	41	958
Rep. Heifers	4,716	58	336	5,111
Service Bulls	2,190	(71)	573	2,693
Other Bulls	936	(194)	127	869
Feeder Cattle	5,263	732	292	6,286
Finish Cattle	2,169	(623)	22	1,569
TOTAL	\$ 46,416	\$ 1,738	\$ 2,812	\$ 50,965

Performance Measures:Farms in High 1/3, Middle 1/3 and Low 1/3 Profitability Groups

The forty-one farms whose primary farm enterprise was beef production were sorted by the profitability measure net farm income without appreciation. The average performance factors for the 13 farms with the highest net farm income are shown in the first column of numbers under the heading Higher 1/3. The performance factors for the 14 farms in the middle profitability group were averaged and appear in the middle column. The performance results of the 14 farms with the lowest net farm income appear in the next column.

Although it is a small sample set, table 19 shows some interesting trends. In these 41 farms, profitability is not strictly related to business size. The highest profit group had the largest average number of cows but the middle group had fewer cows than the lowest profit group. If a farm has higher costs than returns per unit (per cow), economies of size are not going to increase that farm's profitability. The more cows the farm has the larger its losses will be. The approximate range in net farm income without appreciation for each profit group was \$ 72,000 to \$ 1,400 (higher 1/3), \$1,400 to negative \$ 6,000 (middle 1/3) and negative \$6,000 to negative \$52,000 (lower 1/3).

Reproductive success didn't vary greatly between profit group. However, average weaning weight and hay yield were both higher in the top group.

Cost control was a strong indicator of profitability. Those farms with the lowest costs/cow tended to have the highest net farm income. Most cost control measures are lower for the farms in the highest 1/3 profit group than those in the middle group and lower for the middle group than farms in the lower profit group (figure 9). A key to profitability in beef production is the ability to keep operating and overhead costs at a minimum. Especially telling is Total Operating Expenses/cow. The producers in the lower 1/3 group must have receipts per cow greater than \$869 to cover operating expenses, including variable expenses such as feed and veterinary and overhead expenses such as taxes and interest. The producers in the lower 1/3 profit group must receive income/cow of over \$ 1,104 to cover operating expenses plus replacement of machinery, purchased breeding stock and other capital purchases.

Capital efficiency is also directly related to the profitability of these 41 farms. Total capital and real estate investment per cow were lower in the higher profit groups. Most dramatic is capital turnover. This is the average farm assets divided by the farm accrual receipts. It shows the number of years of income required for the farmer to "buy back" his or her asset base. The capital turnover interval in the middle group was twice as great as that of the high group and half that of the low group. In other words, the capital turnover increased exponentially from the higher to the lower profit groups.

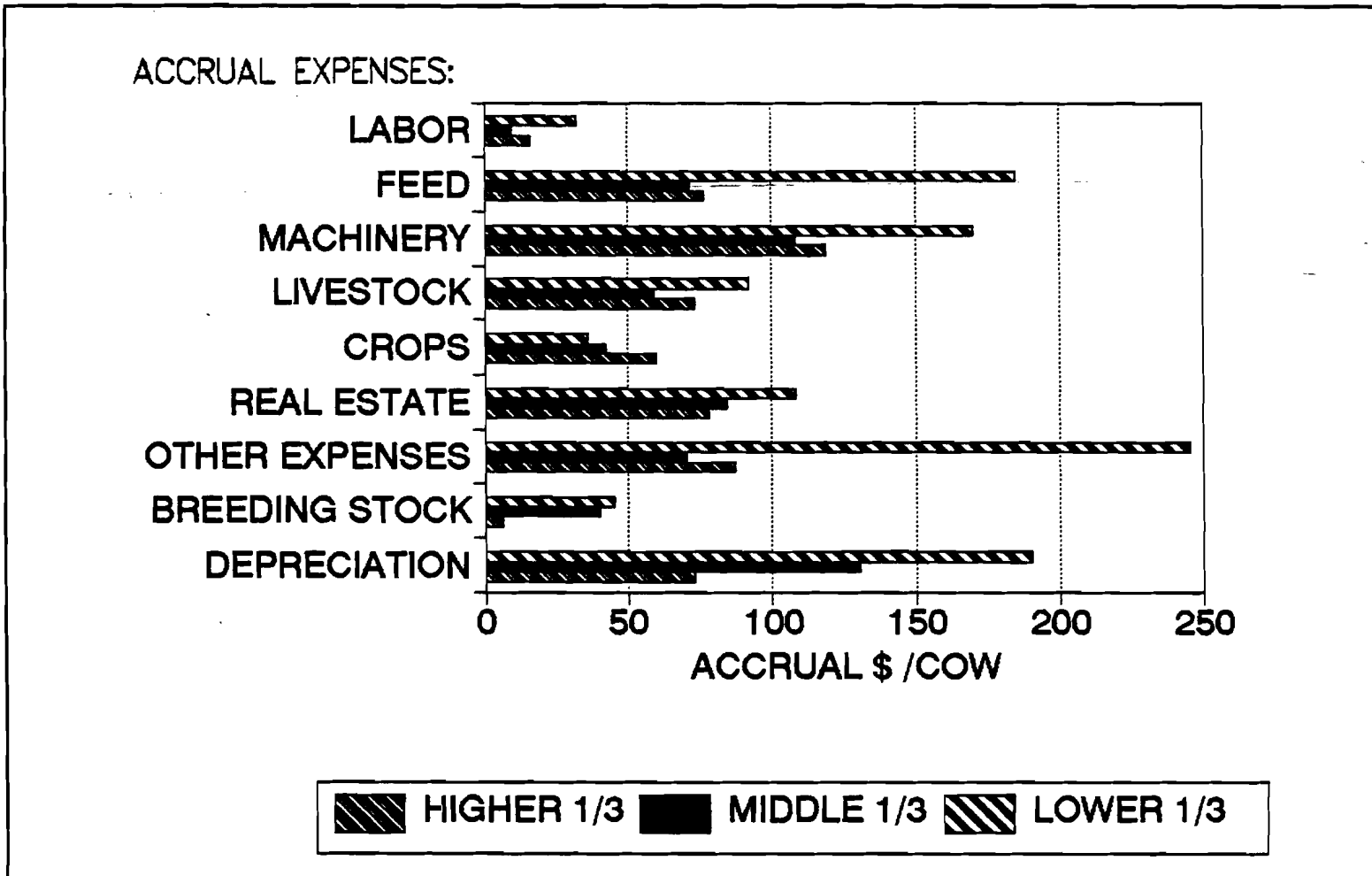
It is not surprising that the profit measures are linear from the higher to lower profit groups as the farms are sorted by net farm income without appreciation. Note that averages for the higher 1/3 profit group were positive for all of the profitability measures, including return to operator, labor and management. These operators were able to maintain a return that exceeded all accrual expenses, a draw for unpaid family labor and a charge on farm equity.

Table 19. Selected Performance Factors, 1990
Average of Farms¹ in Higher, Middle and Lower One Third Profit
Group When Sorted by Net Farm Income Without Appreciation

	High 1/3	Middle 1/3	Low 1/3
Number farms in Group	13	14	14
Size of Business			
Average Number of Cows	57	22	43
Total lbs. Weaned	26,960	8,937	17,012
Rates of Production			
Conception Rate % (pregnant/exposed)	95.2	97.2	92.9
% Calves born	97.1	97.3	94.5
Calves weaned as % cows wintered	88.8	87.8	80.4
Average weaning weight, lbs.	538	508	509
Tons hay crop dry matter/acre	2.0	1.6	1.6
Cost Control			
Purchased cash feed cost/cow	\$ 69	\$ 102	\$ 167
Direct crop expenses/crop acre	20	19	27
Hired Labor & Mach. cost/cow	177	286	372
Hired Labor, mach. & crop cost/cow	233	334	407
Total Depreciation Expenses/cow	73	130	190
Total Accrual Overhead Expenses/cow	233	290	541
Total Operating Expenses/cow	505	442	869
Total Accrual Expenses/cow	583	611	1,104
Capital Efficiency			
Farm Capital Investment/cow	\$ 5,466	\$ 8,596	\$ 9,618
Real Estate Investment/cow	3,138	5,954	6,897
Machinery & Equip. Inv./cow	753	1,057	1,020
Capital Turnover, years	6.5	12.9	27.7
Profitability			
Net cash farm income	\$ 9,291	\$ (1,449)	\$ (12,481)
Net farm income without appreciation	17,042	(2,045)	(21,487)
Net farm income with appreciation	21,524	1,958	(9,404)
Return to Oper. Labor, Management & Real Estate Ownership	9,499	(5,751)	(27,164)
Return to Oper. Labor & Management	2,759	(10,429)	(41,896)
Debt Payment & Cashflow			
Farm Debt Payment/cow	\$ 91	\$ 95	\$ 211
Net Farm Cashflow	6,473	(3,239)	(14,807)
Marketing			
Number of Feeder cattle sold	24	13	20
Average Feeder Price Received/cwt	\$ 80.61	\$ 85.18	\$ 82.05
Number of Finish cattle sold	16	6	12
Average Finish Cattle Price/cwt	\$ 77.82	\$ 64.60	\$ 84.28

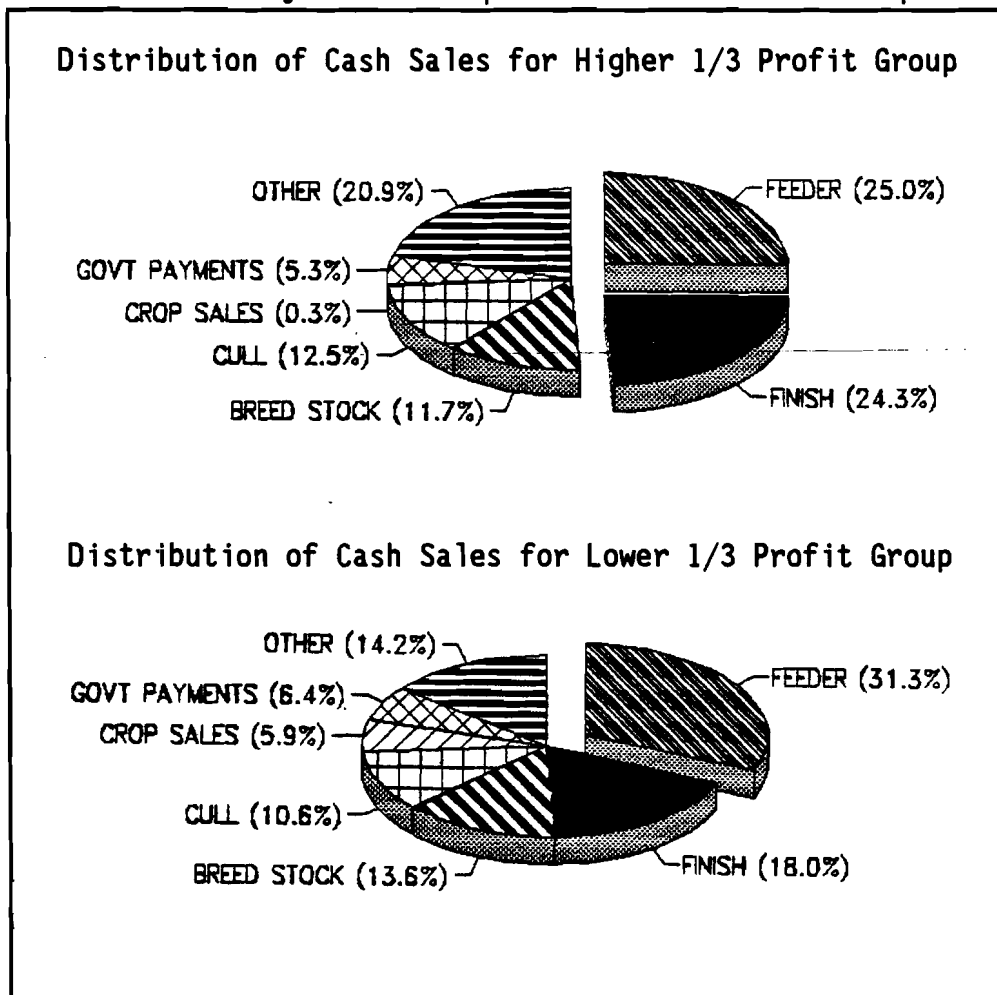
¹ Forty-one farms whose primary farm enterprise is beef production.

Figure 9. Average 1990 Accrual Expenses per Cow on 41 Farms with a Primary Beef Enterprise for Three Profit Groups



The higher profit groups did not receive more per pound for their beef sales but tended to sell more feeder and finish cattle than the other groups. The lower profit group received a greater proportion of their cash income from feeder cattle sales. The higher profit group has a greater proportion of farm receipts from finish cattle sales. See figure 10.

Figure 10. Distribution of Cash Sales on 41 Farms with a Primary Beef Enterprise for Two Profit Groups



Farm Business Chart

The Farm Business Chart, table 20, is a tool which can be used in analyzing the farm business. The figure at the top of each column is the average of the top 20 percent of the 41 farms whose primary enterprise is beef production. The second figure in the column is the average for the second 20 percent, the third for the third 20%, etc. The farms in the top 20 percent for one factor would not necessarily be the same farms which make up the top 20 percent for any other factor. Each factor is independent of all others.

The best position is generally near the top of the chart. However, the lowest costs and investment levels may not be the most profitable. In some cases the "best" management position may be somewhere in the middle of the chart. For instance a producer with a regular veterinary health program may have greater veterinary expenses than a producer who only treats animals on an emergency basis. However, the higher expense producer be ultimately more profitable due to less death loss, less herd turnover and higher weaning weights than the lower cost producer. A producer's whose values fall consistently at the the bottom of the chart for a given group a measures indicates a problem in that area.

Draw a line through each value which most closely reflects your farm's values for these measures. Where on the chart does your farm fall ?

Table 20. Farm Business Chart for Northeast Beef Producers¹, 1990

Size of Business		Rates of Production				
Aver. # Cows	Total lbs. weaned	Conception Rate	% Calves born	Weaned/cow wintered	Aver. wean weight (lbs)	Hay Crop dm/acre
89	39,110	100	101	100	643	2.34
51	22,310	100	100	96	569	1.90
33	15,743	98	99	88	506	1.74
20	7,719	94	96	81	469	1.43
11	3,858	85	86	65	424	.84

Cost Control							
Purchased feed cost/cow	Direct crop expense/crop acre	Hired lab&mach. cost/cow	Hired lab. mach&crop cost/cow	Depr. exp./cow	Over-head exp/cow	Total oper. exp/cow	Total accrual exp/cow
\$ 15	\$ 0	\$ 90	\$ 121	\$ 11	\$ 73	\$ 270	\$ 340
38	2	182	212	62	120	437	572
78	11	252	287	110	183	588	726
143	22	338	387	168	236	709	958
274	60	514	593	343	497	1,128	1,409

Capital Efficiency				Financial Analysis		
Capital inv./cow	Real Est. inv./cow	Mach inv./cow	Capital turnover	Farm Net Worth	Debt to Asset Ratio	Farm Debt /Cow
\$ 2,487	\$ 769	\$ 300	4.3	\$ 776,377	.00	\$ 0
4,342	1,934	608	7.3	258,979	.00	0
6,382	3,795	851	10.3	180,199	.00	128
8,258	5,538	1,061	13.7	114,360	.06	502
17,145	13,824	1,812	40.9	61,889	.28	2,126

Profitability Measures					
Net Cash Farm Income	-- Net Farm Income w/o apprec.	-- Net Farm Income w/apprec.	-- Return to Oper. Labor, Mang. & RE	-- Return to Oper. Labor & Management	
\$ 16,178	\$ 23,758	\$ 31,688	\$ 16,154	\$ 10,105	
2,108	4,445	8,528	(1,032)	(5,276)	
(1,167)	(1,987)	3,834	(6,361)	(10,064)	
(3,890)	(7,718)	(2,018)	(10,937)	(18,104)	
(20,008)	(28,431)	(17,856)	(35,547)	(56,662)	

Debt Payment & Cashflow		Marketing	
Total Debt Payment/cow	Net Farm Cashflow	Aver. Feeder Price/cwt.	Aver. Finish price/cwt.
\$ 0	\$ 16,208	\$ 93.70	\$ 92.63
0	1,227	86.50	90.50
35	(2,874)	83.36	79.91
122	(8,673)	80.82	65.54
336	(23,955)	71.83	56.15

¹ Forty-one farms whose primary farm enterprise is beef production.

Conclusion

The average farm in the 1990 Northeast Beef Farm Business Summary has a negative or just breakeven profit margin depending on the profitability measure used. This finding is consistent with the results of the last five Northeast Beef Farm Business Summaries. It may be true that in any industry as competitive as the beef industry, the average producer will not be profitable. In this highly competitive business only the above average producers are profitable.

In 1990 the participating farmers received net farm incomes (without appreciation) that varied between positive \$ 72,000 and negative \$ 78,000. Of the 45 farms participating in the summary, eighteen farms had positive net farm incomes. Table 19 gives some indication what these farms have in common. The most profitable farms in the summary had very good productivity, but not necessarily the best. They had low per cow costs but not always the lowest. They tended to have a large herd but not always the largest. They had low capital inputs per cow, but not necessarily the lowest. The good producers exploited their strengths and sought to minimize their weaknesses. They were able to do this because they monitor their business and evaluate their strengths and weaknesses on a regular basis.

The purpose of the Beef Farm Business Summary is to help the producer determine their individual farm's niches and weak-links. The next step of the integrated resource management program is to provide the producer with the help necessary to exploit the niches and limit the problem areas. This help may come in many forms; from land grant colleges, local cooperative extension, your veterinarian or from one of your fellow beef producers.

One of the participating producers in the beef farm summary with consistently excellent results shared some of his "secrets" with the authors. Paraphrased, these are:

- . Recognize that beef cattle are byproducts of excess land and land ownership.
- . Have an understanding spouse (who doesn't mind receiving a fence stretcher for her (or his) birthday.
- . During the New Year's bowl games, take inventory and build a budget.
- . Do not expect success by adding up the books at the end of the year. Monitor the cash flow on a monthly basis. Write it out and review it with the (understanding) spouse. The sooner you know about a problem or opportunity the sooner you may act upon it.
- . Timeliness in book work, field work and herd work contribute to profitability.
- . Do not overlook government programs including ASCS and SCS cost sharing programs.
- . Exploit niches.
- . Follow markets on at least a weekly basis.
- . There are certain economies of scale. Think in terms of shipping units, i.e. tractor trailer loads, for feed in and cattle out.
- . Look for opportunities to work with other landowners to mutual benefit.
- . Combine all of the above !

Participation in the Farm Business Summary is free. If you or a neighbor or friend would like to participate in the Beef Farm Business Summary contact: Caroline Rasmussen, Department of Animal Science, 130 Morrison Hall Ithaca NY 14853. (607) 255-5923.