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BEEF FARM BUSINESS SUMMARY

1991 Northeast Beef Farm Business Summary

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1991 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. 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 following farm business summary was compiled in 1992 by the Department of Animal Science in conjunction with the Department of Agricultural Economics, using data submitted by twenty-four farmers. Working with cooperative extension agents and Cornell University personnel, participating farmers completed farm income, expense and production check-in forms. Twenty-three of the farmers providing farm records were located in New York State. These farms were located in thirteen different counties across the state. One Vermont farmer participated. Summaries were collected from farms with a variety of resources and management objectives. Data was collected for the calendar year 1991. 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 twenty-four 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 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 Beef Farm Business Summary was made possible by help from Cooperative Extension agents Michael Baker, Thomas Gallagher, Karen Hoffman, Lisa Kempisty, Lou Anne King, Joan Petzen, Michael Stratton, and David Weaver. 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 page 10. 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. One of the most difficult aspects of financial management of the cow-calf business is to maintain a stable net cash flow during the various stages of the cattle cycle. Lack of understanding on how to work with the cattle cycle can lead to financial disaster for cow calf producers.

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

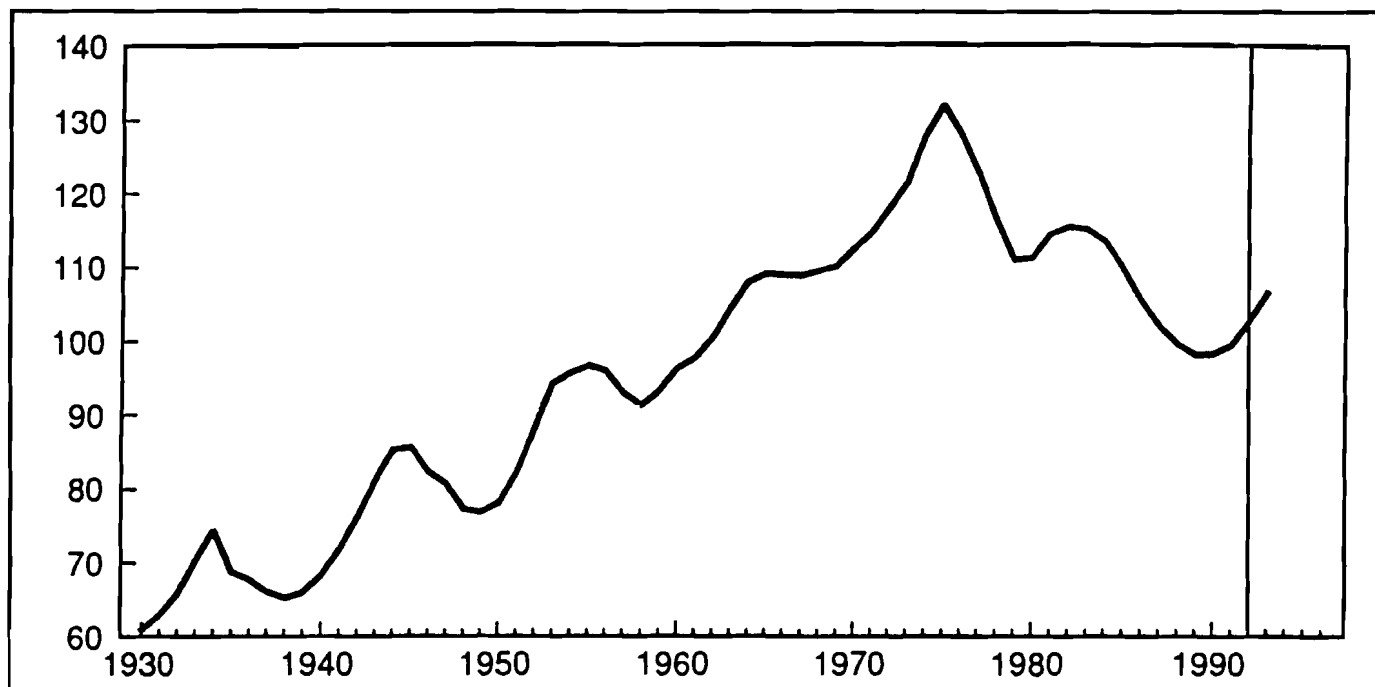
As prices start to climb (expansion phase) producers are encouraged to expand production by using all available heifers for breeding stock. Holding back heifers and cull cattle reduces the number of animals available for slaughter. This decrease in beef production tends to push prices higher. As prices 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.

Prices reflect the amount consumers are willing to pay for the supplies available. As supplies decline, packers bid more to get cattle to meet their slaughter needs. The price of the product increases until consumer resistance is reflected in the bid price by meat department managers. As beef inventories begin to back up, prices are dropped to move the product, and packers drop their bid price for the cattle. 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.

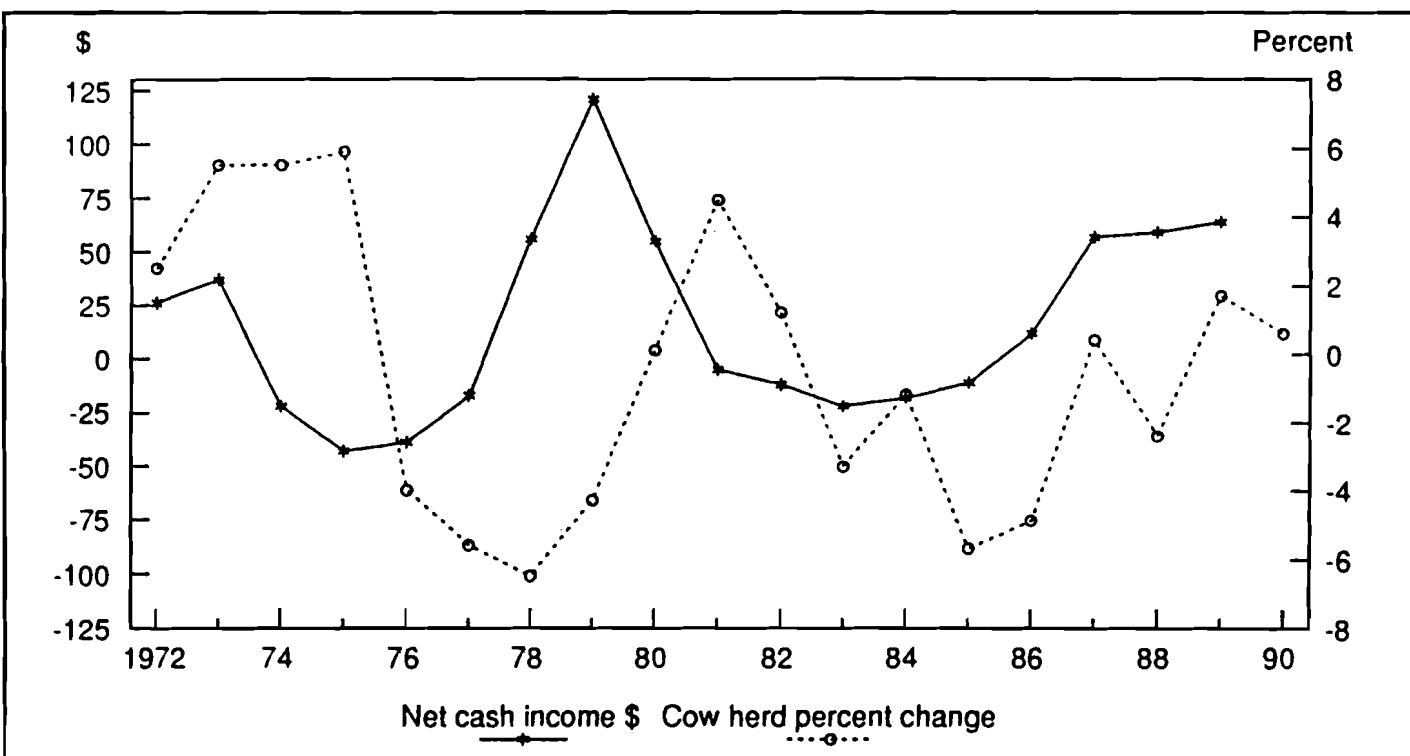
During all the phases of the cattle cycle there is a lag in the producers response to changes in the market. At the bottom of the price cycle, the producers may be somewhat wary of the past low prices and are reluctant to increase their herd. Some time into the price recovery, the "in-and-out" individual 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. Figure 2 demonstrates the relationship between the net cash income of cow calf producers and the size of the U.S. beef cow herd.

Figure 1 U.S. Cattle Inventory, 1930-1991 (million head)



Source: USDA, ERS. February 1992. Outlook '92 Charts. 68th Annual Agricultural Outlook Conference Washington DC. December 3-5 1991.

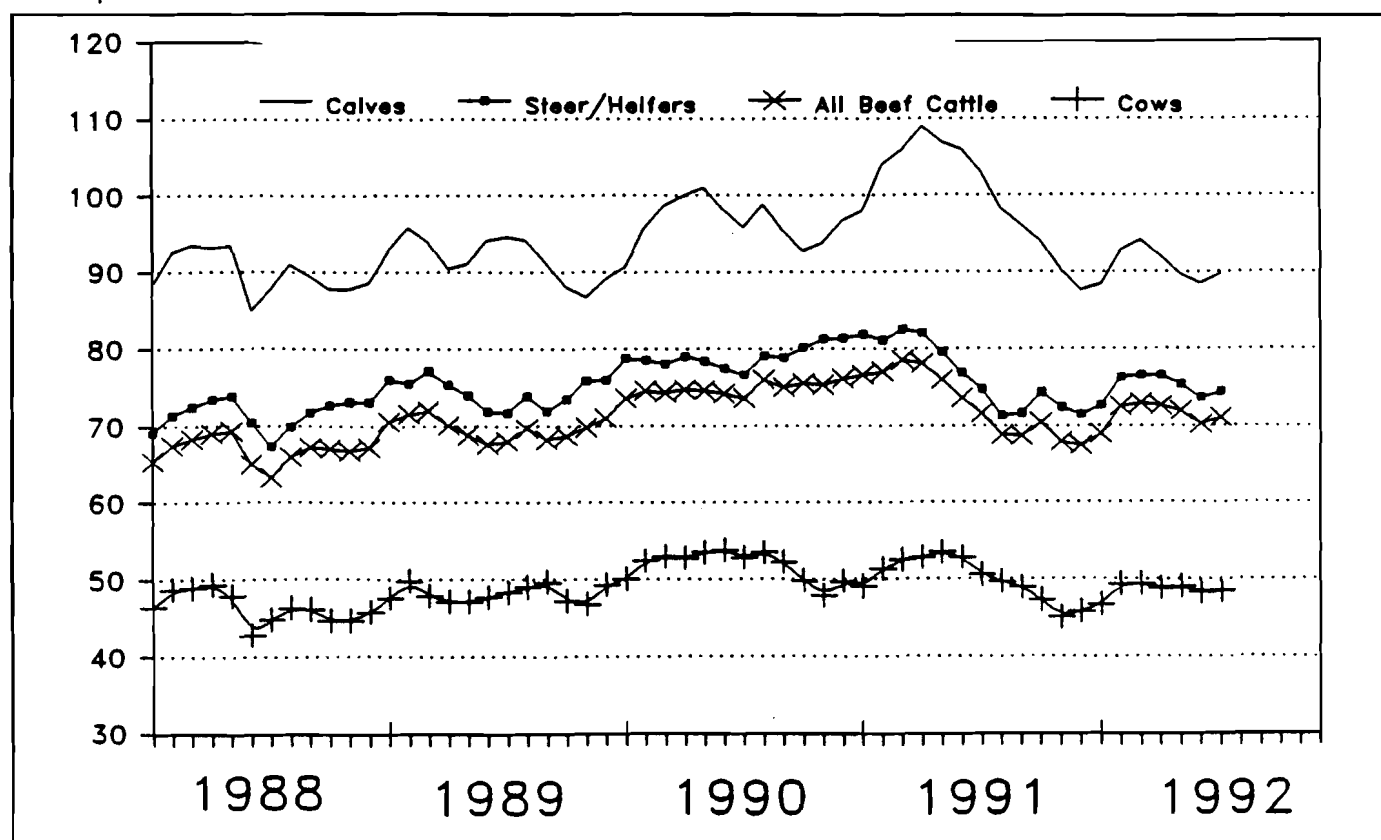
Figure 2. U.S. Beef Cow-calf Net Cash Income and Percentage Change in the Size of the U.S. Beef Cow Herd, 1972-90



Source: USDA, ERS. June 1992. The Beef Cow-calf Industry, 1964-87: Location and Size. Agricultural Economic Report No. 659. Kenneth R. Krause. Page 23.

The greatest profits for the cattle feeder occur when finished prices are rising relative to the price they paid for feeders. Losses are highest after prices have peaked and their feeder inventory was purchased when competition for feeders was high when prices were rising. They then must replace that inventory with lower purchase cost cattle. The greatest profits for cow herds is when competition for feeder cattle is high as prices are rising and are lowest as liquidation accelerates. Figure 3 shows the prices received by farms for cattle in the U.S. from 1988-1992. As this figure shows, the prices peaked for the current cattle cycle in early 1991. Even though the national cow herd has not expanded as much as expected given the positive cow-calf returns (figure 4), the prices for all cattle dropped in the beginning of 1991 due to a slight increase in the supply of feeder cattle, heavier slaughter weights and an expanding supply of competing meats.

Figure 3. Prices Received by Farmers, Cattle, U.S., 1988-1992 (Dollars per Cwt)



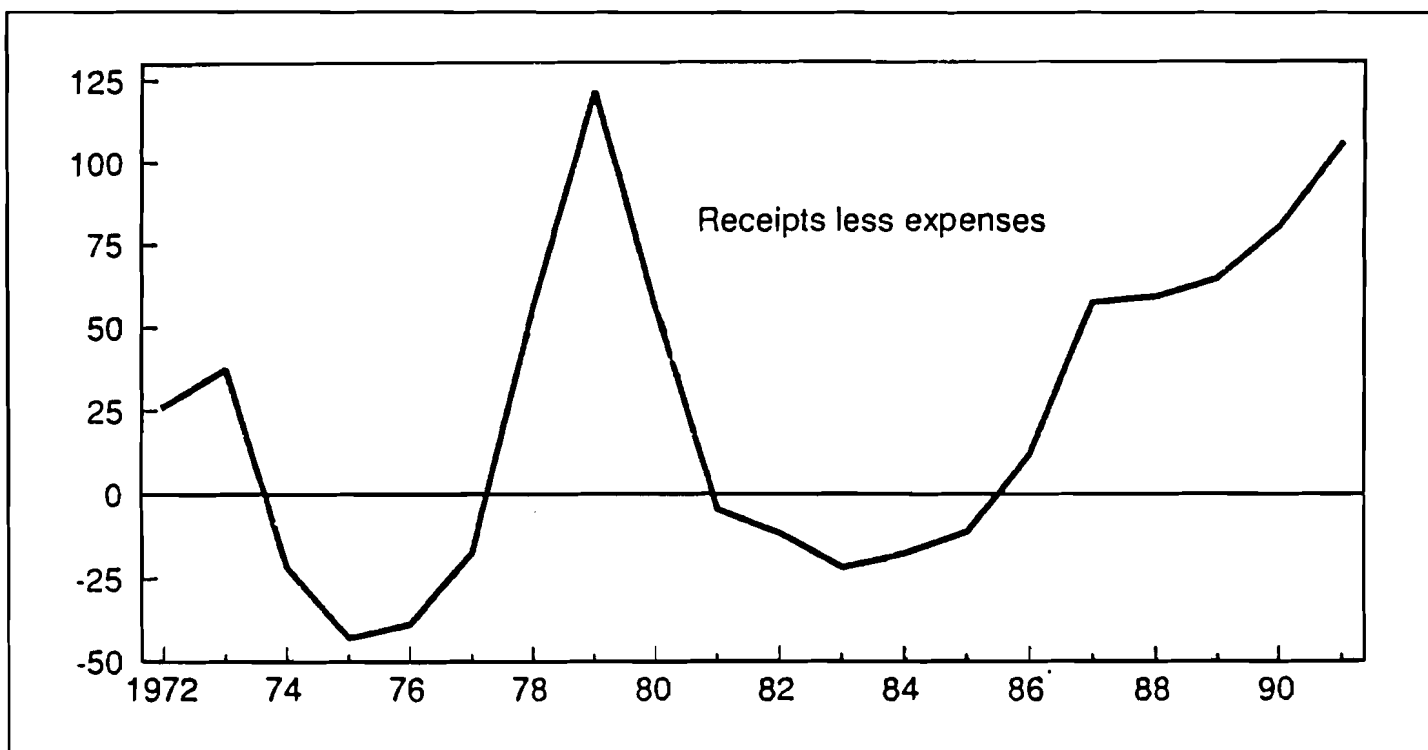
Source: USDA, NASS. July 1992. Agricultural Prices. PR 1(7-92) Page A-3.

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 continues at a lethargic rate. The beef cow inventory in the middle of 1992 was only slightly above 1991 levels and up only 2% from 1990. The 1992 calf crop is estimated at 39.5 million. This number is up less than 1 % from 1990 and 1991 calf crops. This calf crop was the fourth year of slow expansion but still the largest cattle inventory since 1987. The continuation of this slow expansion seems likely. This pace suggests favorable returns for cow-calf producers through the next couple of years. Figure 5 shows the almost level feeder cattle inventory over the past two years.

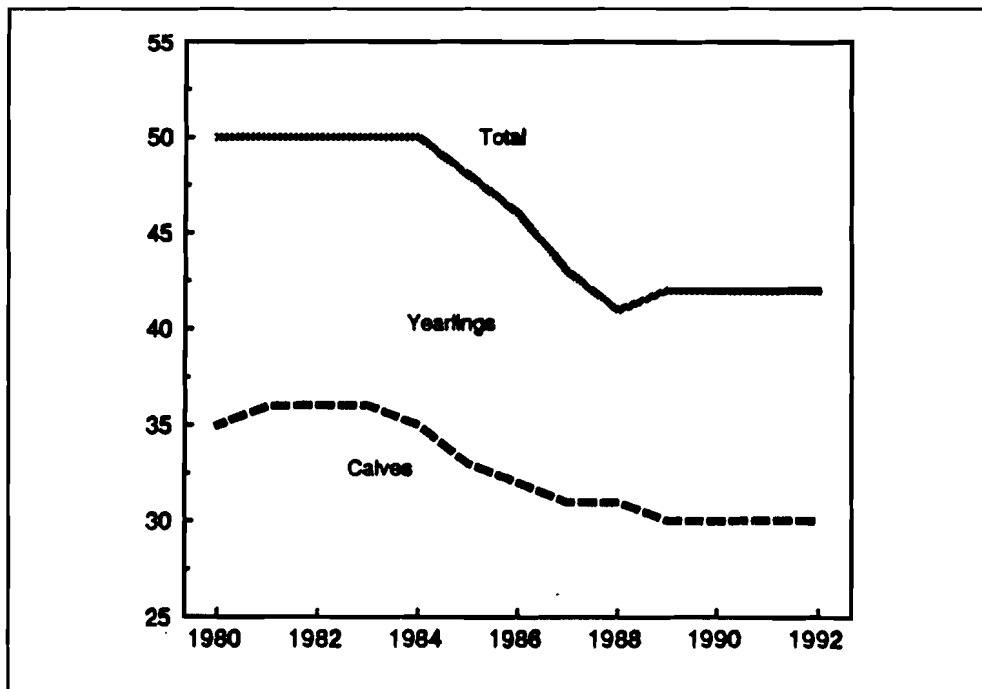
By watching the cattle cycle closely, a producer can benefit from an increasing market and cut losses in a declining market. While prices are high, the producer can cull from the herd any marginal cows and heifers. During the down phase, the producer can build cow numbers and have a efficient number of producing cows when the market turns up again. Figure 4 shows the cash returns to cow-calf producers from 1972-1991.

Figure 4 U.S. Cow-calf Cash Returns, 1972-1991



Source: USDA, ERS. February 1992. Outlook '92 Charts. 68th Annual Agricultural Outlook Conference Washington DC. December 3-5 1991.

Figure 5 July 1 Feeder Cattle Supply
(million head), 1980-1992



Source: USDA, ERS. August 1992. Livestock and Poultry Situation and Outlook Report. LPS-55.

Future successes are built on lessons of the past. Because of the nature of the cattle business, there will continue to be cattle cycles. However, the following are generally true of cow-calf operations that have remained profitable over a long period of time:

1. Those with the lowest production costs and debt will likely at least cover production costs during the liquidation phase.
2. Those in a low cost and strong financial position can expand when prices are low. This keeps their inventory cost down and positions them to have the highest number to sell when prices are rising.

Business Characteristics and Resources Used

Some major business characteristics of the 24 farms in the business summary are shown in Table 1. Eleven of the businesses are full time and thirteen are part time. The average farm tenure is over 16 years. Full time producers had been in the beef business longer on average than part time producers. The average tenure for the 11 full time businesses was over twenty years. The average number of years in the beef business for the 13 part-time producers was 12 years. All of the producers indicated beef was the primary farm enterprise.

Table 1.

| <u>Business Characteristics of Twenty-four Northeast Beef Farms, 1991</u> | | | |
|---|----------------------------|--------------------------|--------------------------|
| <u>Item</u> | <u>Number of Farms</u> | <u>Item</u> | <u>Average Years</u> |
| Full Time Business | 11 | Farmer has operated farm | 16.7 |
| Part Time Business | 13 | Has owned beef herd | 16.3 |
| Business Type | | | |
| Single Proprietor | 21 | | |
| Partnership | 1 | | |
| Corporation | 1 | | |
| Other | 1 | | |

Land, labor and animal resources used in the farm business are listed in Table 2. 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 11.3 is the months of labor per year required to operate the average beef enterprise in the 1991 study. This value is equivalent to one full time person working 200 hours for slightly more than eleven months of the year.

Table 2.

Resources Used on Northeast Beef Farms, 1990 and 1991

| <u>Item</u> | <u>Average 1990</u> | <u>Average 1991</u> | <u>Range 1991</u> |
|--|---------------------|---------------------|-------------------|
| Number of farms | 45 | 24 | |
| Land Used | | | |
| Total Acres | | | |
| Owned | 216 | 170 | 0 - 612 |
| Rented | 97 | 113 | 0 - 560 |
| Tillable Acres | | | |
| Owned | 67 | 85 | 0 - 300 |
| Rented | 63 | 69 | 0 - 255 |
| Total Tillable | 129 | 154 | 16 - 325 |
| Pasture Acres | | | |
| Owned | 62 | 31 | 0 - 112 |
| Rented | 33 | 43 | 0 - 450 |
| Total Pasture | 95 | 73 | 0 - 450 |
| Herd Size | | | |
| Average Number Cows | 40.5 | 44.0 | 8.5 - 126 |
| Average Number of Cows, Bulls & Heifers | 52.1 | 58.0 | 12.5 - 194.5 |
| Labor (months) | | | |
| Operator(s) | 9.4 | 8.8 | 1.8 - 26.5 |
| Hired Labor | 1.9 | 0.1 | 0 - 1.2 |
| Family Paid | 0 | 1.2 | 0 - 7.3 |
| Family Unpaid | 2.4 | 1.3 | 0 - 12.5 |
| Total Worker Equivalent | 15.1 | 11.3 | 2.1 - 29.5 |

Accounting Procedures

Accrual accounting is used for measuring farm profitability. Accrual procedures determine the value of production and cost of production for the year, regardless of whether cash was received or expended. This method is more accurate than cash accounting when examining the profitability of business over a given time period. Accrual accounting considers changes in accounts payable and receivable, prepaid expenses, and changes in inventory. By adjusting cash receipts and purchases by changes in open accounts and inventory, a more accurate measure of the value and cost of production for the year is obtained.

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 3. Average values for 1990 data and average and range values for 1991 data are shown. All of the forty-five farms participating in the 1990 summary and the twenty-four farms participating in the 1991 summary are included in the values in Table 3.

Table 3. Selected Business Factors, 1990 and 1991

| Item | - 1990 - Average | ----- 1991 ----- Average | ----- Range |
|---------------------------------------|---------------------|-----------------------------|----------------------|
| Number of Farms | 45 | 24 | |
| Size of Business | | | |
| Average number of cows | 40.5 | 44.0 | 8.5 - 126 |
| Average number of heifers | 8.3 | 10.3 | 0 - 47.5 |
| Average number of bulls | 3.3 | 3.8 | 0 - 31 |
| Total lbs. weaned | 17,594 | 19,906 | 2,675 - 99,450 |
| Rates of Production | | | |
| % Calves weaned | 93 | 95 | 82 - 100 |
| % Calves born | 96 | 100 | 74 - 125 |
| Calves weaned per cow wintered (%) | 86 | 88 | 71 - 110 |
| Average weaning weight, lbs. | 520 | 524 | 396 - 850 |
| Average wean age, days | 207 | 206 | 135 - 270 |
| Cost Control | | | |
| Purchased feed cost/cow | \$ 115 | \$ 81 | \$ 0 - 278 |
| Hired Labor & Mach. cost/cow | 404 | 217 | 14 - 527 |
| Hired Labor, mach. & crop cost/cow | 469 | 262 | 14 - 631 |
| Capital Efficiency (average for year) | | | |
| Mach. & equip. investment/cow | \$ 1,251 | \$ 853 | \$ 31 - 2,834 |
| Real estate investment/cow | 5,867 | 4,954 | 0 - 38,182 |
| Total capital investment/cow | 8,803 | 7,342 | 1,099 - 42,612 |
| Profitability | | | |
| Net cash farm income | \$ (2,861) | \$ (2,036) | \$ (78,020) - 46,732 |
| Net farm income w/o appr. | (5,492) | (3,032) | (65,487) - 20,229 |
| Net farm income with appr. | 1,553 | (1,713) | (65,487) - 31,054 |
| Financial Summary | | | |
| Farm Net Worth (12/31) | \$ 286,142 | \$ 212,119 | \$ 32,337 - 647,037 |
| Debt to asset ratio | .09 | .05 | 0 - .54 |
| Farm debt per cow | \$ 912 | \$ 571 | \$ 0 - 8,958 |

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 that were held by the producer over the winter. 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 accrual cow herd grain and cow herd roughage purchased per cow. This value excludes grain and roughage purchased to feed feeder, stocker and finish cattle. 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 6. Details concerning profitability analysis are in the "Profitability Measures" text, pages 19-20. 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.

Analysis of Selected Business Factors

The selected business factors shown in Table 3 are a one page synopsis of the farm business's size, productivity and profitability. Averages are shown for the 45 farms participating in the 1990 summary and averages and ranges shown for the 24 farms participating in the 1991 business summary. Be careful when comparing changes in business factors in Table 3 from one year to the next. With the small number of farms involved, most large changes between 1990 and 1991 are due to the economic profiles of the individual farms involved and not changes in the beef industry.

In 1991, the average number of cows on the twenty-four farms was 44.0 with a range of 8.5 to 126. The reproductive efficiency of the farms tended to be very good with Percent Calves weaned and Percent calves born averaging 95 % and 100 % respectively.

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 \$ 278 and hired labor and machinery cost varied from \$14 to \$527 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 \$31 to \$2,834. Of the average total capital investment per cow of \$7,342, 67 percent or \$4,954 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 1991 participating farms was negative \$2,036. 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 twenty-four farms was negative \$3,032. 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 negative \$1,713.

Farm net worth is the market value of all farm assets less all farm debt. The average farm net worth for the twenty-four beef farms was \$212,119. The debt to asset ratio indicates that on the average for every \$1.00 of farm assets there is \$.05 of farm debt. The average farm debt per cow on December 31, 1991 was \$571. 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 1991 New York State Dairy Farm Business Summary was .36 and the average farm debt per cow was \$ 2,327¹.

¹ Smith, S.F., Knoblauch, W.A. and L.D. Putnam. 1991 New York State Dairy Farm Business Summary. A.E. Res 92-6. Dept. Ag. Economics, Cornell University. August 1992.

Farm Income

Cash receipts, change in inventory, changes in accounts receivable, accrual receipts and accrual receipts per cow are listed in Table 4. 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). The negative change in crop inventory is shown because there is a decrease in grown feeds in inventory from the beginning to the end of the year. The Farm Statement of Net Worth (table 7, page 21) and Value of Beef Inventory (table 18, page 32) show details concerning changes in inventory.

Table 4.

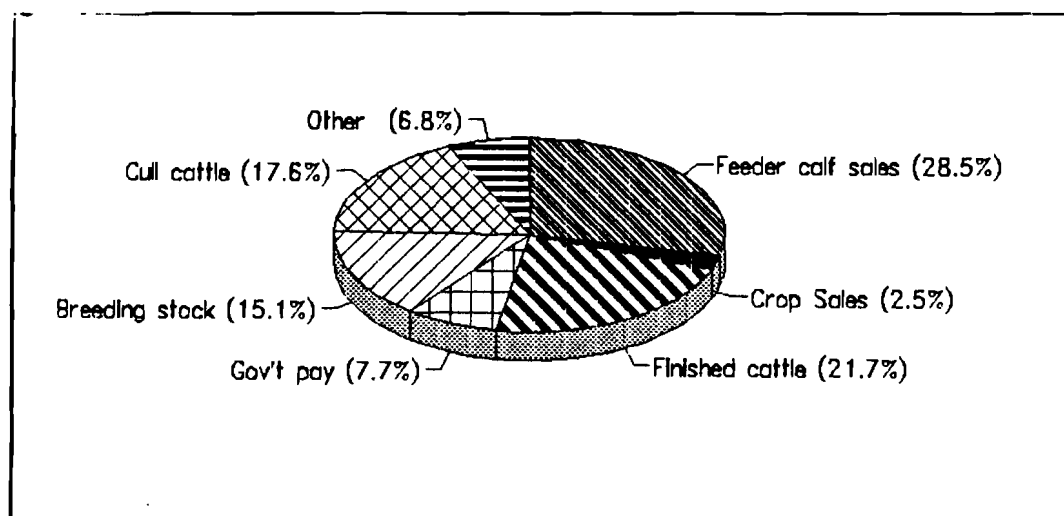
| Farm Income, Average of Twenty-four Northeast Beef Farms, 1991 | | | | | |
|--|---------------|---------------------|-------------------------|------------------|------------------------------|
| Item | Cash Receipts | Change in Inventory | Change in Acct's Rec'bl | Accrual Receipts | Accrual per cow ¹ |
| Feeder calf sales | \$ 7,501 | \$ (213) | \$ 0 | \$ 7,288 | \$ 166 |
| Finished cattle | 5,443 | 116 | 0 | 5,559 | 126 |
| Breeding stock | 4,434 | (471) | (92) | 3,871 | 88 |
| Cull cattle | 4,491 | | 0 | 4,491 | 102 |
| Other livestock | 24 | 92 | 0 | 116 | 3 |
| Crop Sales | 958 | (329) | 21 | 650 | 15 |
| Custom work | 490 | | 0 | 490 | 11 |
| Government payments | 1,960 | | 0 | 1,960 | 45 |
| Misc. receipts | <u>1,138</u> | <u> </u> | <u>0</u> | <u>1,138</u> | <u>26</u> |
| Total Cash Receipts | \$ 26,439 | | | | |
| TOTAL ACCRUAL RECEIPTS | | \$ (805) | \$ (71) | \$ 25,563 | \$ 582 |

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. Nine farms sold only feeder calves, two farms sold only finish cattle, one farm sold only breeding cattle; five farms sold breeding and feeder cattle; four farms sold feeder and finished cattle and three farms sold feeder calves, finished and breeding cattle. Seven of the farms had cash income from crop sales. The average cash crop income for these farms was \$3,285. Figure 6 shows the average distribution of receipts on an accrual basis.

Figure 6. Distribution of 1991 Accrual Income on 24 Northeast Beef Farms



Farm Expenses

Cash Expenses, table 5, are those farm expenses which were paid for in 1991. 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 1991, 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 1991, 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 cow herd grain and concentrate, cow herd roughage, feeder/finish ration feed and other livestock feed. Cow herd grain and concentrate includes concentrates, minerals, protein, and grain purchased for the beef breeding herd including cows, replacement heifers, breeding and replacement bulls. Hay and silage purchased for the breeding herd is included as cow herd roughage purchased. Feed purchased to feed heifers, bulls and steers being fed for the feeder, stocker or finish cattle market is shown as Feeder/finish ration. This includes all forages, concentrates and minerals purchased for feedlot animals. All feed purchased for non-beef livestock is included as 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 3).

Table 5.

Farm Expenses, Average of Twenty-four Northeast Beef Farms, 1991

| Item | Cash Expenses | Change in Inventory | Change in Acct's Pay'bl | Accrual Expenses | Accrual Exp./cow ¹ |
|--------------------------|---------------|---------------------|-------------------------|------------------|-------------------------------|
| Hired labor | \$ 2,433 | \$ | \$ | \$ 2,443 | \$ 55 |
| Feed | | | | | |
| Cow Herd Grain Purch. | 2,066 | 12 | | 2,078 | 47 |
| Cow Herd Roughage | 1,691 | 90 | | 1,781 | 40 |
| Feeder/finish Ration | 773 | (13) | (1) | 759 | 17 |
| Other livestock feed | 44 | (32) | | 12 | 0 |
| Machinery | | | | | |
| Gasoline & oil | 1,347 | 32 | | 1,379 | 31 |
| Machinery repairs | 1,828 | | | 1,828 | 42 |
| Farm auto expense | 330 | | | 330 | 8 |
| Machinery hire & lease | 405 | | | 405 | 9 |
| Livestock | | | | | |
| Vet & medicine | 1,043 | (54) | | 989 | 22 |
| Breeding expense | 274 | 1 | | 275 | 6 |
| Feeders/Stockers Purch. | 131 | | | 131 | 3 |
| Beef Marketing Expense | 295 | | | 295 | 7 |
| Supplies & Oth. beef | 587 | (9) | | 578 | 13 |
| Crops | | | | | |
| Fertilizer & lime | 1,516 | (13) | | 1,503 | 34 |
| Seed, spray, other crop | 685 | 65 | | 750 | 17 |
| Real Estate | | | | | |
| Land, bld & fence rep. | 1,192 | (5) | | 1,187 | 27 |
| Taxes (real estate) | 2,032 | | | 2,032 | 46 |
| Rent & lease | 819 | | | 819 | 19 |
| Other | | | | | |
| Insurance | 772 | | | 772 | 18 |
| Telephone | 227 | | | 227 | 5 |
| Electricity | 648 | | | 648 | 15 |
| Interest Paid | 777 | | | 777 | 18 |
| Misc. beef expenses | 660 | (10) | | 650 | 15 |
| Other operating expenses | 74 | | | 74 | 2 |
| Total Operating Exp. | 22,649 | 64 | (1) | 22,712 | 516 |
| Breeding Stock Purch. | 1,755 | | | 1,755 | 40 |
| Machinery Depreciation | | | | 2,776 | 63 |
| Building Depreciation | | | | 1,352 | 31 |
| Total Cash Expenses | \$ 24,404 | | | | |
| Total Accrual Expenses | | \$ 64 | \$ (1) | \$ 28,595 | \$ 650 |

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

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. Beef marketing expenses include trucking, marketing fees, commissions, advertising, bull test fees, and grading. Supplies and other beef expenses include identification tags, branding and other miscellaneous 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.

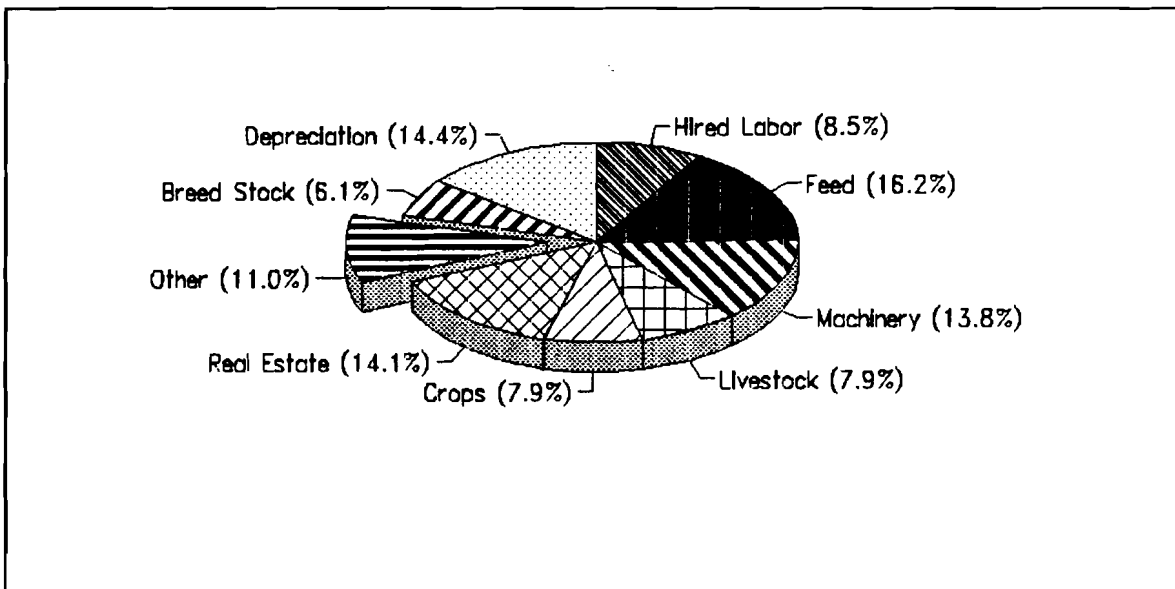
Other expenses include telephone, electricity, interest paid and other miscellaneous expenses. Electricity and telephone expenses include only the farm share. Interest is made up of all interest paid on farm liabilities including finance charges. Other operating expenses are all other farm operating 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.

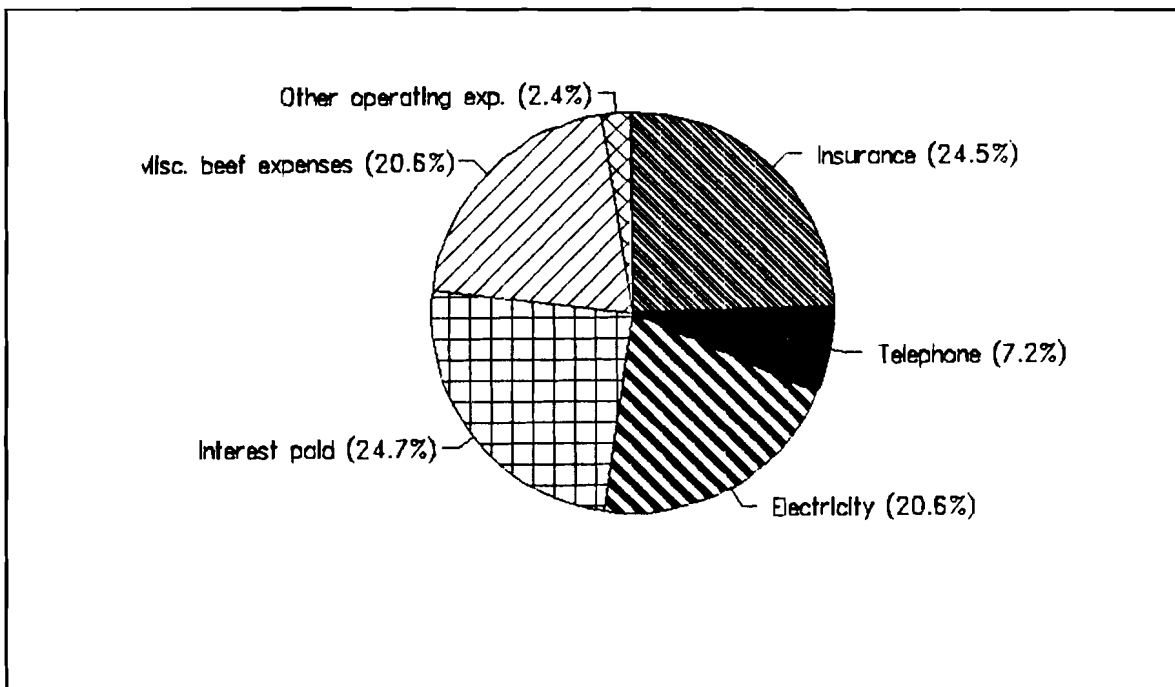
Machinery and building depreciation charges are based on income tax figures. Depreciation is an estimate of the value of capital assets used up during the year's production. Depreciation is part of total accrual expenses but not part of total cash expenses.

The largest beef operating expense is labor followed by cow herd grain and taxes. Of all accrual expenses, the greatest was machinery depreciation. The total accrual income per cow was \$ 582. The accrual operating expense per cow was \$ 516 and total accrual farm expenses per cow were \$ 650 (operating expenses plus breeding cattle purchased and depreciation). Figure 7 illustrates the distribution of accrual expenses into the major expense headings from Table 6. The distribution of the "other" category's components are shown in Figure 8.

**Figure 7. Distribution of 1991 Accrual Expenses on
24 Northeast Beef Farms**



**Figure 8. Distribution of 1991 "Other" Expenses as
% of All Accrual Expenses**



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 6.

Net cash farm income is total farm cash receipts less total farm cash expenses. Cash expenses include breeding stock purchased. Net cash farm income is an indication of the amount of cash the business has generated and expended during the year. Net cash farm income is an indicator of cash flow in the business. Cash flow is considered in greater detail in Table 11. However, net cash farm income should not be used as the major indicator of profitability as it does not include accrual adjustments for changes in inventory, accounts payable and receivable.

Net farm income is the return to the farm operator(s) and other unpaid family members for their labor, management and equity capital. It is the annual return from working, managing, financing and owning the farm business. Net farm income is computed with and without appreciation. Appreciation represents the change in farm inventory values caused by changes in prices during the year. Appreciation is a major factor contributing to changes in farm net worth and must be included in the profitability analysis.

Table 6. Farm Profitability, Average of Twenty-four Northeast Beef Farms, 1991

| <u>Item</u> | <u>----</u> | <u>Average</u> | <u>----</u> |
|---|-------------|----------------|---------------|
| Total Farm Cash Receipts | | \$ | 26,439 |
| - Total Farm Cash Expenses | - | | <u>24,404</u> |
| Net Cash Farm Income | | | 2,035 |
| Total Accrual Receipts | | \$ | 25,563 |
| - Total Accrual Expenses | - | | <u>28,595</u> |
| Net Farm Income w/o Appreciation | | | (3,032) |
| Total Accrual Receipts | | \$ | 25,563 |
| + Livestock Appreciation | + | | 437 |
| + Machinery Appreciation | + | | 83 |
| + Real Estate Appreciation | + | | 799 |
| - Accrual Expenses | - | | <u>28,595</u> |
| Net Farm Income w/appreciation | | | (1,713) |
| Net Farm Income w/o Appreciation | | \$ | (3,032) |
| - Family Labor Unpaid @ \$ 6.50/hour ¹ | - | | 1,662 |
| - Interest on \$ 91,820 average investment in Non-Real Estate equity capital @ 5% | - | | <u>4,591</u> |
| Return to Labor, Management & Real Estate Ownership | | | (9,285) |
| - Interest on \$ 117,720 average investment in Real Estate equity capital @ 5% | - | | <u>5,886</u> |
| Return to Operator Labor & Management | | | (15,171) |

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.

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 twenty-four summary farms is \$2,035. Net farm income without appreciation is negative \$ 3,032. Net farm income with appreciation is negative \$ 1,713. The difference between these two values, \$ 1,319, 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 \$ 9,285 and negative \$ 15,171 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 \$ 212,118, table 7. The average farm net worth increased from the beginning to the end of the year by \$ 5,164. The average farm assets increased by \$ 4,454 and farm liabilities decreased \$ 710.

Table 7.

| Farm Statement of Net Worth, Average of Twenty-four Northeast Beef Farms, 1991 | | | |
|---|-------------|---------------|----------|
| ASSETS | Jan 1, 1991 | Dec. 31, 1991 | Change |
| Current | | | |
| Farm cash, checking, savings | \$ 3,084 | \$ 3,247 | \$ 163 |
| Accounts receivable | 196 | 125 | (71) |
| Stocks & certificates | 797 | 797 | 0 |
| Feed & Supplies | 9,803 | 9,422 | (381) |
| Intermediate | | | |
| Cows | \$ 37,164 | \$ 36,599 | \$ (565) |
| Heifers | 5,383 | 6,561 | 1,178 |
| Bulls | 3,414 | 2,891 | (523) |
| Finish & Feeder Cattle | 7,089 | 6,868 | (221) |
| Other Livestock | 275 | 367 | 92 |
| Machinery & Equipment | 26,851 | 27,756 | 905 |
| FLB/PCA Stock | 95 | 91 | (4) |
| Long-term | | | |
| Land & buildings | \$ 123,744 | \$ 127,625 | \$ 3,881 |
| Total Farm Assets | \$ 217,895 | \$ 222,349 | \$ 4,454 |
| LIABILITIES & NET WORTH | | | |
| Current | | | |
| Accounts Payable | \$ 0 | \$ 0 | \$ 0 |
| Short term debt | 0 | 0 | 0 |
| Operating Debt | 10 | 0 | (10) |
| Advance Government Receipts | 0 | 0 | 0 |
| Intermediate debt | 2,762 | 2,273 | (489) |
| FLB/PCA stock | 95 | 91 | (4) |
| Long-term debt | 8,074 | 7,867 | |
| Total Farm Liabilities | \$ 10,941 | \$ 10,231 | \$ (710) |
| Farm Net Worth | \$ 206,954 | \$ 212,118 | \$ 5,164 |

Balance Sheet Analysis

The balance sheet analysis includes examination of 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 twenty-four participating farms was \$5,165 with appreciation and \$ 3,846 without appreciation. Purchased land and machinery accounted for the largest increase in assets. Increasing value of real estate 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. Fifteen of the twenty-four farms reported no farm liabilities at the end of 1991.

Table 8.

| Balance Sheet Analysis, Average of Twenty-four Northeast Beef Farms, 1991 | |
|--|----------|
| Item | Average |
| <u>Financial Ratios.</u> | |
| Percent equity | 95 % |
| Debt to asset ratio | 0.05 |
| <u>Change in Net Worth</u> | |
| Without appreciation | \$ 3,846 |
| With appreciation | 5,165 |
| <u>Debt Analysis, Dec. 31, 1991</u> | |
| Current & intermediate liabilities as % of total liabilities | 23 % |
| Long-term liabilities as a % of total liabilities | 77 % |
| <u>Debt Levels Per Cow, Dec. 31, 1991</u> | |
| Total farm debt | \$ 571 |
| Long-term debt | 526 |
| Current & intermediate debt | 45 |

Repayment Analysis

Repayment analysis, table 9, 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 producers in 1991 was \$ 72 per cow. On the average, nine percent of cash receipts is used to service debt.

Table 9.
Repayment Analysis, Average of Twenty-four Northeast Beef Farms, 1991

| Debt Payments | Principal | Interest | Total |
|--------------------------------|-----------|----------|----------|
| Long term | \$ 188 | \$ 517 | \$ 705 |
| Intermediate term | 360 | 135 | 495 |
| Short-term | 0 | 0 | 0 |
| Operating (net reduction) | 10 | | 10 |
| Total | \$ 558 | \$ 652 | \$ 1,210 |
| Total Debt Payment | | | |
| Per Cow | \$ 72 | | |
| Percent of total cash receipts | 9 % | | |

Capital and Labor Efficiency Analysis

Capital efficiency factors, table 10, 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 twenty-four farms is 8.7 years. Capital turnover varied between 2 and 28 years.

The rate of return on farm assets can also be called return on farm investment. This percentage gives an indication of how productively the farm assets are being utilized. A low return on assets indicates inefficiencies in the use of assets, low net income or a combination of both. This value is calculated with or without asset appreciation. This value is calculated: [Net farm income (with or without appreciation) + interest paid - the value of operator(s) labor] divided by the average value of all farm assets for the year) x 100. The average rate of return on farm assets for the 24 producers in the 1991 summary was negative 6.1 and negative 7.4 percent for returns with and without appreciation. The primary reason for the negative return on assets was a negative net farm income.

The rate of return on equity measures the rate of return on equity capital employed in the farm business. The higher the value, the more profitable the business. This value is also calculated with and without appreciation: [net farm income (with or without appreciation) less the value of operator(s) labor] divided by the annual average farm net worth. This number is then converted to a percentage by multiplying by 100.

The value of the operators and unpaid family labor to the beef farm is estimated at \$1300 per month. One month of labor equals 200 hours. The average value of operator, hired and family labor used per farm was \$ 13,412 or \$ 477 per cow.

Table 10.

Capital & Labor Efficiency Analysis,
Average of Twenty-four Northeast Beef Farms, 1991

Capital Efficiency (Average for Year)

| | |
|--|----------|
| Farm capital (per cow) | \$ 7,342 |
| Real estate (per cow) | 4,954 |
| Machinery & equip. (per cow) | 853 |
| Capital Turnover, years | 8.7 |
| Rate of Return on Farm Assets without appreciation | (7.4) % |
| Rate of Return on Farm Assets with appreciation | (6.1) % |
| Rate of Return on Farm Equity without appreciation | (9.3) % |
| Rate of Return on Farm Equity with appreciation | (7.7) % |

| | |
|--------------------|--------------------------------|
| <u>Labor Force</u> | <u>Hours</u> |
| Operator(s) | 1,756 |
| Family paid | 241 |
| Family unpaid | 252 |
| Hired | 14 |
| Total | 2,263 /200 = 11.3 Months Labor |

| | | |
|-------------------------------|--------------|----------------|
| <u>Labor cost</u> | <u>Total</u> | <u>Per Cow</u> |
| Value of Operator(s) | | |
| Labor (\$1300/month) | \$ 10,736 | \$ 360 |
| Family unpaid (\$1300/month) | 1,662 | 58 |
| Hired | 2,433 | 32 |
| Total Labor | \$ 14,831 | \$ 450 |
| Machinery Cost | \$ 6,704 | \$ 186 |
| Total Labor & Machinery Costs | \$ 21,535 | \$ 636 |
| Hired Labor & Machinery Costs | \$ 9,137 | \$ 218 |

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 these twenty-four farms the average cash inflow in 1991 is \$29,953 and the average cash outflow is \$ 33,185. The farm families contributed an average of \$ 3,232 of non-farm income or savings to the farm. Besides operating expenses, the major farm cash outflows were capital purchases of machinery and real estate.

Table 11.

Annual Cash Flow Statement,
Average of Twenty-four Northeast Beef Farms, 1991

Cash Inflows

| | | |
|---|----------|---------------|
| Beginning farm cash, checking & savings | \$ 3,084 | |
| Cash farm receipts | 26,440 | |
| Sale of assets : Machinery | 21 | |
| Real estate | 0 | |
| Money borrowed (intermediate & long-term) | 408 | |
| Money borrowed (short-term) | 0 | |
| Increase in operating debt | 0 | |
| TOTAL | | \$ 29,953 |

Cash Outflows

| | | |
|---|-----------|---------------|
| Cash farm operating expenses | \$ 22,649 | |
| Capital purchases: Breeding livestock | 1,755 | |
| Machinery | 3,618 | |
| Real estate | 4,605 | |
| Principal payments (intermediate & long-term) | 548 | |
| Principal payments (short-term) | 0 | |
| Decrease in operating debt | 10 | |
| TOTAL | | \$ 33,185 |
| NET NONFARM CONTRIBUTION TO FARM | | \$ 3,232 |

Beef Enterprise Analysis

The beef enterprise receipts and expenses, table 12, 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 producer on a percentage basis. Because most of participants had only a beef enterprise, the beef enterprise analysis is very similar to the farm income and expenses, tables 4 and 5. The average beef enterprise net cash farm income was \$ 2,251. Beef enterprise accrual net farm income was negative \$ 624 or negative \$ 13/cow.

Table 12.

Beef Enterprise Receipts and Expenses
Average of Twenty-four Northeast Beef Farms, 1991

| RECEIPTS | Cash Receipts | Change in Inv. | Change in Acct's Rec'b'l | Accrual Receipts | Accrual Inc./cow ¹ |
|------------------------|---------------|----------------|--------------------------|------------------|-------------------------------|
| Feeder calf sales | \$ 7,501 | \$ (213) | \$ | \$ 7,288 | \$ 166 |
| Finished cattle | 5,443 | 116 | | 5,559 | 126 |
| Breeding stock | 4,434 | (471) | (92) | 3,871 | 88 |
| Cull cattle | 4,491 | | | 4,491 | 102 |
| Crop Sales | 110 | (227) | | (117) | (3) |
| Custom work | 67 | | | 67 | 2 |
| Government payments | 657 | | | 657 | 15 |
| Misc. receipts | 420 | | | 420 | 10 |
| Total Cash Receipts | \$ 23,123 | | | | |
| TOTAL ACCRUAL RECEIPTS | | \$ (795) | \$ (92) | \$ 22,236 | \$ 506 |

| EXPENSES | Cash Expenses | Change in Inventory | Change in Acct's Pay'b'l | Accrual Expenses | Accrual Exp./cow ² |
|------------------------|---------------|---------------------|--------------------------|------------------|-------------------------------|
| Hired labor | \$ 2,239 | \$ | \$ | \$ 2,239 | \$ 51 |
| Feed | | | | | |
| Cow herd grain & conc. | 2,041 | 12 | | 2,053 | 47 |
| Cow herd roughage | 1,539 | 121 | | 1,660 | 38 |
| Feeder/finish ration | 353 | | (1) | 352 | 8 |
| Machinery | | | | | |
| Gasoline & oil | 1,077 | 36 | | 1,113 | 25 |
| Machinery repairs | 1,418 | | | 1,418 | 32 |
| Farm auto expense | 330 | | | 330 | 8 |
| Machinery hire & lease | 367 | | | 367 | 8 |
| Livestock | | | | | |
| Vet & medicine | 913 | (52) | | 861 | 20 |
| Breeding expense | 250 | 1 | | 251 | 6 |
| Feeders & stockers | 131 | | | 131 | 3 |
| Marketing | 295 | | | 295 | 7 |
| Stock suppl & oth beef | 482 | (9) | | 473 | 11 |
| Crops | | | | | |
| Fertilizer & lime | 1,212 | (12) | | 1,200 | 27 |
| Seed, spray & oth crop | 612 | 23 | | 589 | 14 |
| Real Estate | | | | | |
| Land, bld & fence rep. | 1,082 | (7) | | 1,075 | 24 |
| Taxes (real estate) | 1,639 | | | 1,639 | 37 |
| Rent & lease | 455 | | | 455 | 10 |
| Other | | | | | |
| Insurance | 639 | | | 639 | 15 |
| Telephone | 194 | | | 194 | 4 |
| Electricity | 552 | | | 552 | 13 |
| Interest Paid | 637 | | | 637 | 14 |
| Misc. beef expenses | 660 | (10) | | 650 | 15 |
| Total Operating Exp. | 19,117 | 103 | (1) | | 440 |
| Breeding Stock Purch. | 1,755 | | | 1,755 | 40 |
| Machinery Depreciation | | | | 1,558 | 35 |
| Building Depreciation | | | | 328 | 7 |
| Total Cash Expenses | \$ 20,872 | | | | |
| TOTAL ACCRUAL EXPENSES | | \$ 103 | \$ (1) | \$ 22,814 | \$ 523 |
| Beef Enterprise Income | \$ 2,251 | | | \$ (624) | \$ (13) |

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.

Crop Management

This section reports average crop production information. On many cow calf farms, 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 13, 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. Twenty-one of the twenty-four farms produced dry hay or hay crop silage. Eight farms produced corn silage and five produced corn grain. Fourteen of the farms had some rotated pasture, nine of the farms had some non-rotated pasture. Of those farms that used rotated and non-rotated pasture, the average acreage was 73 and 107 acres, respectively.

Table 13.

1991 Crop Production, Average of 24 Northeast Beef Farms

| Crop | Farms | Acres | ----- Production ----- | |
|-----------------------|-------|-------|------------------------|-------------|
| | | | Total | Per Acre |
| Hay crop - Total | 21 | 102 | 170 | 1.7 tn DM |
| Corn silage (wet) | 8 | 33 | 371 | 11.2 tn AF |
| Corn silage (dry) | | | 125 | 3.8 tn DM |
| Other forage | 1 | 13 | 46 | 1.4 tn DM |
| Total forage | 21 | 115 | 359 | 3.1 tn DM |
| Corn grain | 4 | 14 | 995 | 71.1 bu. |
| Oats | 2 | 9 | 362 | 40.2 dry bu |
| Rotated Pasture | 14 | 73 | | |
| Non-rotated Pasture | 9 | 107 | | |
| Crop residue pastured | 3 | 51 | | |

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 11.2 ton per acre were below the annual state averages of 2.5 and 14.0 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. However, in many cases, the hay production values reported by the BFBS participants includes only one cutting of hay. Many cow calf producers graze the hay field after a single cutting is harvested. The direct crop expenses/crop acre varied widely from zero to \$ 49 per acre. Direct crop expenses include the accrual expenses for fertilizer, lime, seed, spray and other crop expenses divided by the total number of crop acres.

¹ New York Agricultural Statistics 1991-1992. New York Department of Agriculture and Markets. July 1992.

Table 14.

Crop Management Analysis, Average and Range
of Twenty-four Northeast Beef Farms, 1991

| Item | Average | | Range |
|--------------------------------------|----------|------|---------|
| Tons hay crop dry matter per acre | 1.9 | .6 | - 5.2 |
| Tons forage dry matter per acre | 2.1 | .6 | - 5.2 |
| Tons forage dry matter harvested/cow | 5.9 | 1.6 | - 17.2 |
| Direct crop expenses /crop acre | \$ 18.30 | \$ 0 | - 49.40 |
| Tillable acres /cow | 4.8 | .7 | - 18.9 |
| Pasture acres /cow | 2.6 | .7 | - 5.9 |
| Days on pasture | 174 | 30 | - 280 |

Beef Herd Management Analysis

Table 15 shows the average and range of several herd productivity measures. Pregnancy, calving and weaning percentages are computed as a percent of all cows exposed to the bull (or AI) and all cows held through the winter. Considering herd productivity on the basis of the number of breeding animals held through the winter is important because maintaining cows through this period is a major expense for Northeast cow calf producers. Productivity measures such as pregnancy, calving and weaning percentage should only be compared between herds with similar calving seasons, management systems and land resources.

Pregnancy percentage is the number of females confirmed pregnant divided by the appropriate denominator - the number of females exposed to the bull/A.I. or the number of cows exposed and held through the winter. This value is then multiplied by 100 to create a percentage. This measure is an indicator of breeding performance. Possible reasons for a low value are inadequate nutrition, inadequate bull power or fertility, or presence of diseases causing early embryonic death.

Calving percentage is the number of calves born as a percentage of cows exposed to the bull and A.I. or as a percentage of the number of exposed animals held through the winter. The number of pregnant cows and heifers sold is subtracted from and the number of pregnant cows and heifers purchased is added to the denominator (cows exposed or cows held through the winter). This adjustment is made so that the sale or purchase of pregnant animals does not bias the calving percentage result. This measure is an indicator of breeding performance and gestational management in the herd. Like pregnancy percentage, this measure can highlight poor nutrition, fertility or presence of disease.

Table 15.

Herd Management Analysis,
Average and Range of Twenty-four Northeast Beef Farms, 1991

| Item | Average | Range |
|---|----------|----------------|
| PERCENT OF COWS EXPOSED TO BULL: | | |
| Pregnancy percentage | 90.9 | 62 - 100 |
| Calving percentage | 89.2 | 56 - 115 |
| Weaning percentage | 84.1 | 56 - 110 |
| PERCENT OF COWS HELD THROUGH WINTER: | | |
| Pregnancy percentage | 94.0 | 72 - 105 |
| Calving percentage | 93.4 | 72 - 115 |
| Weaning percentage | 88.2 | 71 - 110 |
| | | |
| Calves born as % cows confirmed pregnant | 99.7 | 74 - 125 |
| Calves weaned as % calves born | 94.6 | 82 - 100 |
| Pregnancy loss percentage | 3.7 | 0 - 26 |
| | | |
| Average weaning weight | 524 | 396 - 850 |
| Average calf weaning age, days | 207 | 135 - 270 |
| Total pounds calf weaned/farm | 19,906 | 2,675 - 99,450 |
| | | |
| Average cow weight at weaning, lbs | 1,157 | 850 - 1,550 |
| Calf wean weight as % cow weight | 45.4 | 33 - 71 |
| Total lbs. calf weaned as % total lbs. cows wintered | 37.5 | 23 - 68 |
| Pounds weaned per exposed female | 440 | 295 - 777 |
| | | |
| Number of bulls used | 1.8 | 0 - 5 |
| | | |
| Number of feeders sold | 22 | 1 - 48 |
| Average weight / feeder sold | 528 | 392 - 706 |
| Avg. feeder price received/cwt. | \$ 86.12 | \$ 59 - 151 |
| | | |
| Number of finished cattle sold | 17 | 1 - 55 |
| Average weight / finished cattle sold | 1,080 | 950 - 1250 |
| Ave. finished cattle price received/cwt. | \$ 78.80 | \$ 58 - 91 |

Weaning percentage (as percent of cows exposed) is the number of calves weaned as a percentage of the cows exposed to the bull or AI. Weaning percentage (as percent of cows wintered) is the number of calves weaned as a percentage of exposed cows held through the winter. The number of pregnant cows and cow-calf pairs sold are subtracted from and the number of pregnant cows and cow-calf pairs purchased are added to the denominator (cows exposed or cows wintered). This percentage measures the reproductive rate of the herd. Since reproductive rate has been shown to be a major factor in profitability, it is probably the most important single measure of production performance. Since reproduction is largely a function of nutrition, it is an excellent indicator of the adequacy of the nutrition program. Additionally, it is an excellent indicator of how well the cows are matched to the farms resources. The adequacy of the herd health program and any disease problems can be, in part, evaluated by this measure.

Pregnancy loss percentage is the percentage of cows confirmed pregnant that abort or give birth to a dead calf. Average weaning weight is indicative of genetic capability of the herd as well as pasture and feed management. Calf wean weight as % cow weight is the average calf wean weight divided by the average cow's weight at weaning multiplied by 100. This measure allows comparisons between beef herds with different size cows. Total lbs. calf weaned as % total lbs. cows wintered is calculated: (total pounds of calves weaned / (number of cows wintered * average cow weight at weaning)). This allows efficiency comparisons across herds of different size animals and herd sizes. Pounds weaned per exposed female is the sum total pounds of calves weaned divided by the number of cows and heifers exposed to the bull or A.I.

The herd productivity on the twenty-four farms tended to be very good. Average pregnancy and calving percentages were above 90 %. Six farms had greater than 100 % calving and three farms had greater than 100 % weaning percentages due to twinning. Five herds had 100 % calving and three herds had weaned 100 % calf crop from cows exposed. The average producer had only 3.7 % of his or her bred cows abort or die before calving. Thirteen of the farms used artificial insemination for part or all of their breeding program.

On the average farm, 22 calves were sold as feeders weighing 528 pounds at an average price of \$86.12 per hundredweight and 17 were sold as finished cattle weighing 1,080 pounds at an average price of \$78.80 per hundredweight. As discussed in Economic Factors Affecting Twenty-four Northeast Beef Producers, page 4, the demand for feeder calves was strong in 1991. 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.

Summary participants were asked to identify their primary marketing method, table 16. The majority of producers selling feeder cattle sold their cattle directly to feedlots or through a graded sale. However, the two producers in the summary who used a teleauction received a slightly better price per hundred weight than those selling direct or to a graded sale even though they were heavier. The heavier weight sold is the best measure of the increased return with the telemarketing program. The relative quality of the calves marketed is unknown. Of the nine producers selling finished beef, 5 sold freezer beef directly to consumers.

Table 16. Major Marketing Methods of Twenty-four Northeast Beef Farms, 1991

| Market | Number farms | Average Number Calves Sold | Average Weight | Average \$/cwt |
|----------------------|--------------|----------------------------|----------------|----------------|
| FEEDERS: Graded Sale | 6 | 9 | 485 | \$ 75.90 |
| Direct | 7 | 30 | 558 | 81.46 |
| Teleauction | 2 | 27 | 627 | 81.67 |
| FINISH: Carcass | 2 | 31 | 1,146 | \$ 77.03 |
| Freezer | 5 | 18 | 1,066 | 75.06 |
| Live | 2 | 2 | 1,050 | 89.90 |

Livestock 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 Twenty-four Northeast Beef Farms, 1991

| Cattle Type | ----- Jan. 1, 1991 ----- | | | ----- Dec. 31, 1991 ----- | | |
|---------------------|--------------------------|----------|-----------|---------------------------|----------|-----------|
| | # Hd | Lbs/head | Price | # Hd | Lbs/head | Price |
| Bred cows & heifers | 42 | 1,158 | \$ 839/hd | 41 | 1,169 | \$ 864/hd |
| Open cows | 2 | 1,180 | 0.56/lb | 3 | 1,160 | 0.50/lb |
| Replacement heifer | 9 | 686 | 0.87/lb | 11 | 693 | 0.90/lb |
| Service bulls | 2 | 1,554 | 0.74/lb | 2 | 1,631 | 0.73/lb |
| Other bulls | 2 | 619 | 0.77/lb | 2 | 783 | 0.72/lb |
| Feeder cattle | 14 | 590 | 0.81/lb | 13 | 545 | 0.79/lb |
| Finish cattle | 2 | 1,076 | 0.76/lb | 2 | 1,058 | 0.71/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 \$ 569 decrease in the physical inventory of cattle and a \$ 437 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, 1991 and Dec. 31, 1991),
Average of Twenty-four Northeast Beef Farms, 1991

| | Beg. of year value | + Change in inv. w/o appreciation | + Appreciation | End of year value |
|----------------------------|-----------------------|--------------------------------------|----------------|----------------------|
| Pregnant Cows & Heifers | \$ 36,119 | \$ (2,319) | \$ 554 | \$ 34,354 |
| Open Cows | 1,045 | 1,351 | (151) | 2,245 |
| Rep. Heifers | 5,383 | 923 | 255 | 6,561 |
| Service Bulls | 2,516 | (799) | (51) | 1,666 |
| Other Bulls | 898 | 372 | (45) | 1,225 |
| Feeder Cattle | 5,947 | (213) | (111) | 5,623 |
| Finish Cattle | 1,142 | 116 | (14) | 1,244 |
| TOTAL | \$ 53,050 | \$ (569) | \$ 437 | \$ 52,918 |

Performance Measures: Farms in Higher and Lower 1/2 Profitability Groups

The twenty-four farms were sorted by the profitability measure net farm income without appreciation. The average performance factors for the 12 farms with the highest net farm income are shown in the first column of numbers under the heading Higher 1/2. The performance factors for the 12 farms in the lower profitability group were averaged and appear in the right hand column.

Although it is a small sample set, table 19 shows some interesting trends. In these 24 farms, profitability is more closely related to per cow costs and investment than reproductive performance or quantity of product produced. The higher profit group produced only 1,022, or 5 percent more total pounds weaned. The higher profit group did have more cows with 51 head to the lower group's 37 head.

Reproductive success was not necessarily a precursor to profitability. The lower profit group actually had better conception rates and percent calves weaned per cows wintered values. This is possibly because they generally had smaller herd sizes and could give each cow-calf pair more attention. However, the average weaning weight and hay yields were considerably better on the higher profit farms.

Cost control was a strong indicator of profitability. Those farms with the lowest costs/cow tended to have the highest net farm income. Of the eight selected cost control measures, seven were lower for the higher profit group. 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 group must have receipts per cow greater than \$ 754 to cover operating expenses. The producers in the lower profit group must receive income/cow of over \$ 965 to cover operating expenses plus replacement of machinery, purchased breeding stock and other capital purchases. Overhead expenses, such as repairs, depreciation, interest, taxes and insurance, were 2.7 times greater for the lower profit group than for the higher profit group.

Table 19.

Selected Performance Factors, 1991
Average of Farms in Higher and Lower One Half Profit
Group When Sorted by Net Farm Income Without Appreciation

| | Higher 1/2 | Lower 1/2 |
|--|------------|------------|
| Number farms in Group | 12 | 12 |
| Size of Business | | |
| Average Number of Cows | 51 | 37 |
| Total lbs. Weaned | 20,417 | 19,395 |
| Rates of Production | | |
| Conception Rate % (pregnant/exposed) | 90 | 92 |
| Calves weaned as % cows wintered | 85 | 91 |
| Average weaning weight, lbs. | 515 | 348 |
| Tons hay crop dry matter/acre | 2.2 | 1.5 |
| Cost Control | | |
| Purchased cash feed cost/cow | \$ 66 | \$ 95 |
| Direct crop expenses/crop acre | 23 | 18 |
| Hired Labor & Mach. cost/cow | 168 | 267 |
| Hired Labor, mach. & crop cost/cow | 220 | 304 |
| Total Depreciation Expenses/cow | 82 | 148 |
| Total Accrual Overhead Expenses/cow | 180 | 488 |
| Total Operating Expenses/cow | 402 | 754 |
| Total Accrual Expenses/cow | 524 | 965 |
| Capital Efficiency | | |
| Farm Capital Investment/cow | \$ 4,044 | \$ 10,640 |
| Real Estate Investment/cow | 1,874 | 8,034 |
| Machinery & Equip. Inv./cow | 736 | 969 |
| Capital Turnover, years | 6.8 | 15.6 |
| Rate of return on Equity (%) | (5.1) | (12.5) |
| Profitability | | |
| Net cash farm income | \$ 9,459 | \$ (5,386) |
| Net farm income without appreciation | 5,797 | (11,861) |
| Net farm income with appreciation | 6,762 | (10,187) |
| Return to Oper. Labor, Management & Real Estate Ownership | (3,299) | (18,147) |
| Return to Oper. Labor & Management | (7,049) | (26,414) |
| Debt Payment & Cashflow | | |
| Total Farm Debt/cow (12/31) | \$ 189 | \$ 953 |
| Farm Debt Payment/cow | 37 | \$ 106 |
| Net Farm Cashflow | 3,134 | (10,529) |
| Marketing | | |
| Number of Feeder cattle sold | 20 | 23 |
| Average Feeder Price Received/cwt | \$ 88.74 | \$ 83.21 |
| Number of Finish cattle sold | 28 | 4 |
| Average Finish Cattle Price/cwt | \$ 77.21 | \$ 80.78 |

Capital efficiency is also directly related to the profitability of these farms. Total capital and real estate investment per cow were much lower in the higher profit groups. The average farm in the lower profit group had more than four times greater per cow real estate investment than those in the higher profit group. This is probably due to the larger herd size of the higher profit group. Producers in the lower profit group had more than twice the capital turnover than those in the higher profit group. In other words, it took the average producer in the higher profit group about 7 years to earn the equivalent of his or her investment in the farm with farm receipts. It took the producer in the lower profit group 15.6 years to "buy back" the farm assets.

It is not surprising that the profit measures are greater for the higher profit group as the farms are sorted by net farm income without appreciation. The producers in the lower profit group had a much greater farm debt per cow and farm debt payment per cow. Again, this may be due partially to a smaller average herd size. The net cash flow for the two profit groups was dramatically different. Those in the lower profit group contributed an average of \$ 10,529 to the farm business from non-farm sources. Those in the higher profit group were able to take an average of \$ 3,134 out of the farm business.

The higher profit group tended to sell more finish cattle than the lower group. The lower profit group sold slightly more feeder calves per farm than the higher profit group but at a lower price.

Conclusion

The average farm in the 1991 Northeast Beef Farm Business Summary has a negative or just break-even profit margin depending on the profitability measure used. This finding is consistent with the results of the last six Northeast Beef Farm Business Summaries. A study done by the USDA analyzing the beef cow-calf industry from 1964-1987 reports that nationally, over the past two decades, the average cow-calf producer has not generated sufficient income to cover variable and replacement costs and to provide a competitive return to labor, management and investment. The author, Kenneth Krause suggests that the average cow-calf producer accepts low returns as long as the beef herd provides positive returns above cash costs. In many cases the beef herd's out of pocket costs on mixed enterprise farms is low.¹

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. Krause points out that "A break-even or positive return after replacement costs and a return to labor, management and investment were possible over the past two decades. The entrepreneur needed to be a manager who obtained better than average results and started or expanded the herd just prior to several positive cash flow years in a row."²

In 1991 the participating farmers received net farm incomes (without appreciation) that varied between positive \$ 20,000 and negative \$ 65,000. Of the 24 farms participating in the summary, ten farms had positive net farm incomes, six had positive returns to labor, management and real estate ownership and four had positive returns to operator labor and management.

Table 19 gives some indication what these farms have in common. The most profitable farms in the summary had very good productivity. Excellent productivity is a prerequisite but not always a guarantee of profitability. A very productive farm can be unprofitable under the following conditions: Small herd size, too much capital investment per cow, and/or poor cost control.

On a national basis, USDA data showed higher 18 year average returns to owned inputs for larger herds. The 500 head or more cow-calf producers had average returns of \$ 38, the 100-499 herd size owners \$ 25, while the 100 head and fewer cow calf owners had 18 year average losses of \$ 26.³ This is primarily due to economies of size. Any type of farm enterprise requires substantial capital investment. If the farm does not have the production base, in this case, herd size, sufficient to cover this capital investment, the farm cannot be profitable.

¹. Krause, Kenneth R. The Beef Cow-Calf Industry, 1964-87. USDA ERS Agricultural Economic Report No. 659. June 1992.

² Krause. Ibid.

³. Krause. ibid.

The optimum herd size for any given farm depends on the farm's physical resources, land, machinery and capital available for investment, as well as the goals of the farm family. However, it is difficult to cover land capital costs with the cow herd. A large number of producers who own beef herds have them to utilize the land on their farm that has little alternative value either because it is their principal residence or it is not suitable to cropping and they are holding it as an investment. Because of low and irregular cash flows, and the fact that many of the herds in the U.S. are on farms where many of the machinery costs are covered by other enterprises, machinery costs to the cow herd must be kept minimal. Keeping the investment per cow low in the cow herd involves buying at the right time, growing into it carefully and expanding when prices are low.

In the 1991 Northeast beef farm business summary, higher profitability farms had lower total, operating and overhead costs per cow than lower profitability farms. The greatest operating expense on the average farm in the summary was feed for the cow herd. Good pasture management is the key to lowering cow herd feed costs. Grazing must account for a high proportion of the feed costs. In the midwest, crop residues provide a considerable portion of the feed for the cow herd. A cropping and pasture management program that will provide harvested and grazed forage of a quantity and quality necessary to meet the needs of the cow herd with minimal supplementation is critical.

Overhead expenses (depreciation, repairs, interest, insurance and taxes) per cow were 34% of the accrual expenses for the higher profit group and more than 50% of accrual expenses for the lower profit group. In many cases, high overhead costs are associated with small herd size. This may also be a problem with allocation of costs between the beef and other enterprises or family living. However, producers must be realistic about allocation these costs when evaluating profitability of the beef enterprise and attempt to minimize the "real" beef herd costs.

As in all businesses, good producers exploit their strengths and minimize their weaknesses. They are 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.

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.