A.E. FILE COPY

BEEF FARM BUSINESS SUMMARY

November 1988

A.S. Mimeo 111
A.E. Ext. 88-26

1987 Northeast Beef Cow-Calf Farm Business Summary

Caroline Nowak Rasmussen
Stuart F. Smith
Danny G. Fox

Department of Animal Science
and
Department of Agricultural Economics
New York State College of Agriculture and Life Sciences
A Statutory College of the State University
Cornell University, Ithaca, New York 14853

1987 NORTHEAST BEEF COW-CALF FARM BUSINESS SUMMARY

Table of Contents

List of Tables and Figures

Introduction

The Beef Farm Business Summary is a compilation and analysis of business records from participating cow-calf farms. The primary purpose of this program is to provide participating farms with information that can be used to improve their profitability and competitiveness. In addition, the farm summary provides the basis for setting priorities for 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. Each participating producer receives an analysis for their own farm similar to the one presented here.

This farm business summary was compiled in 1988 by the Department of Animal Science in conjunction with the Department of Agricultural Economics, using data submitted by seventeen farms. Of the seventeen farms providing farm records, four are located in New Hampshire and thirteen are located in New York State. The New York State producers represent seven counties. Summaries were collected from farms with a variety of resources and management objectives. Data was collected for the calendar year 1987. All of the producers have a cow-calf component to their operation. Some sell all calves at weaning, others feed out some or all of their calves to a finished cattle weight.

These seventeen farms are not a scientific sample and are not necessarily representative of Northeastern beef farms. The averages published in this report are not intended to represent the average of all beef farms and should not be interpreted at such. The averages are calculated to provide the cooperators with a comparison when analyzing their own records.

The Beef Farm Business Summary was made possible by help from Cooperative Extension agents, Craig Trowbridge, Varon Blackburn and Joan Petzen and Dr. Zweigbaum of University of New Hampshire, who collected farm data. The authors would like to thank Bill Greene, who contributed conceptually to the project. 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 12 and 13. Five measures of farm profits are calculated on page 16. The balance sheet and cash flow statement are featured on pages 17 through 21. 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.

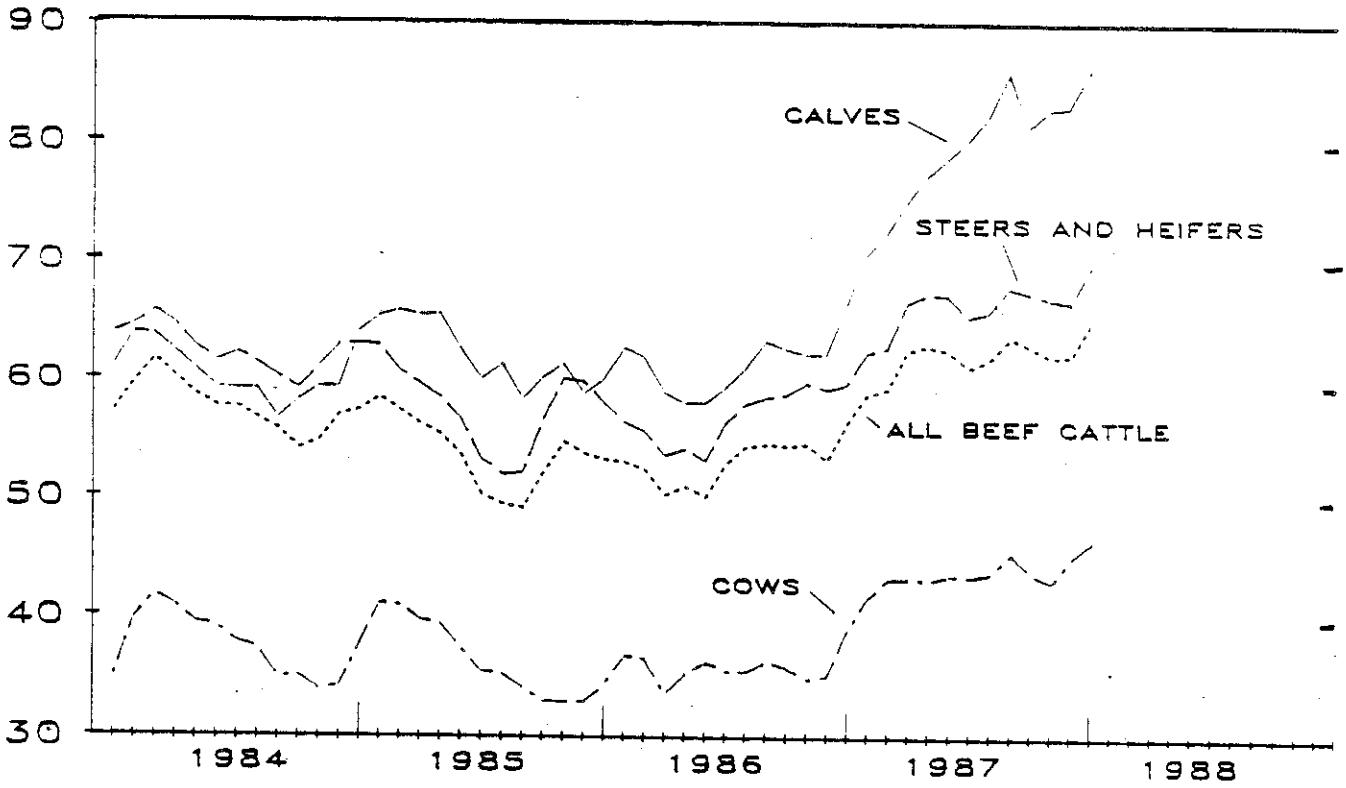
The cattle cycle is a result of the highly competitive structure of the beef industry. Many small producers acting independently create the cycle. The length of the cycle depends on both biologic and psychological factors. It takes at least two years from the time a heifer is first bred until her calf 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.

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.

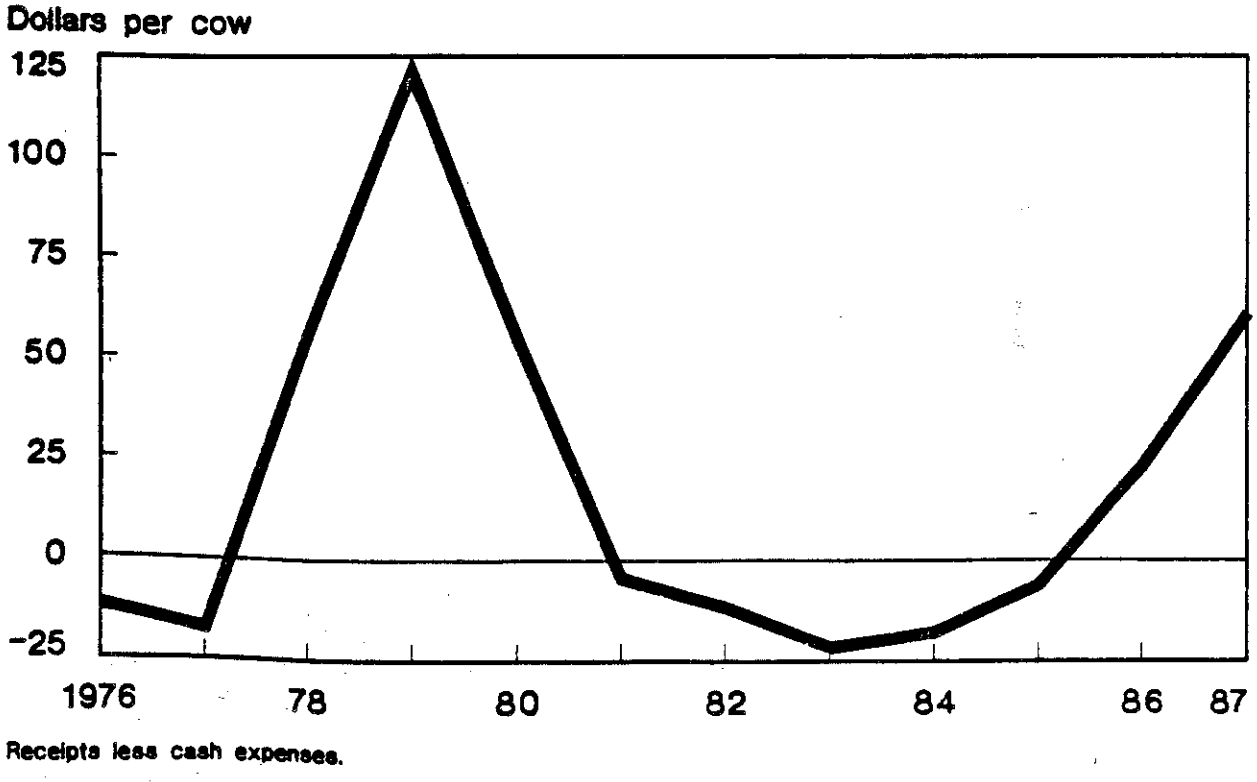
Nationally, 1987 was a year on the upside of the cattle cycle. As shown in Figure 1., the prices received by farmers for calves, steers and heifers and all beef cattle were solidly on the upswing during 1987. Due to these price increases and relatively low feed prices, the returns to U.S. cow calf producers were on the upswing in 1987, as shown in figure 2. The Northeast Beef industry also appears to be in the up phase of the cattle market. The New York State inventory of cattle kept for beef has been increasing since 1986 (figure 3).

Dollars Per Cwt.



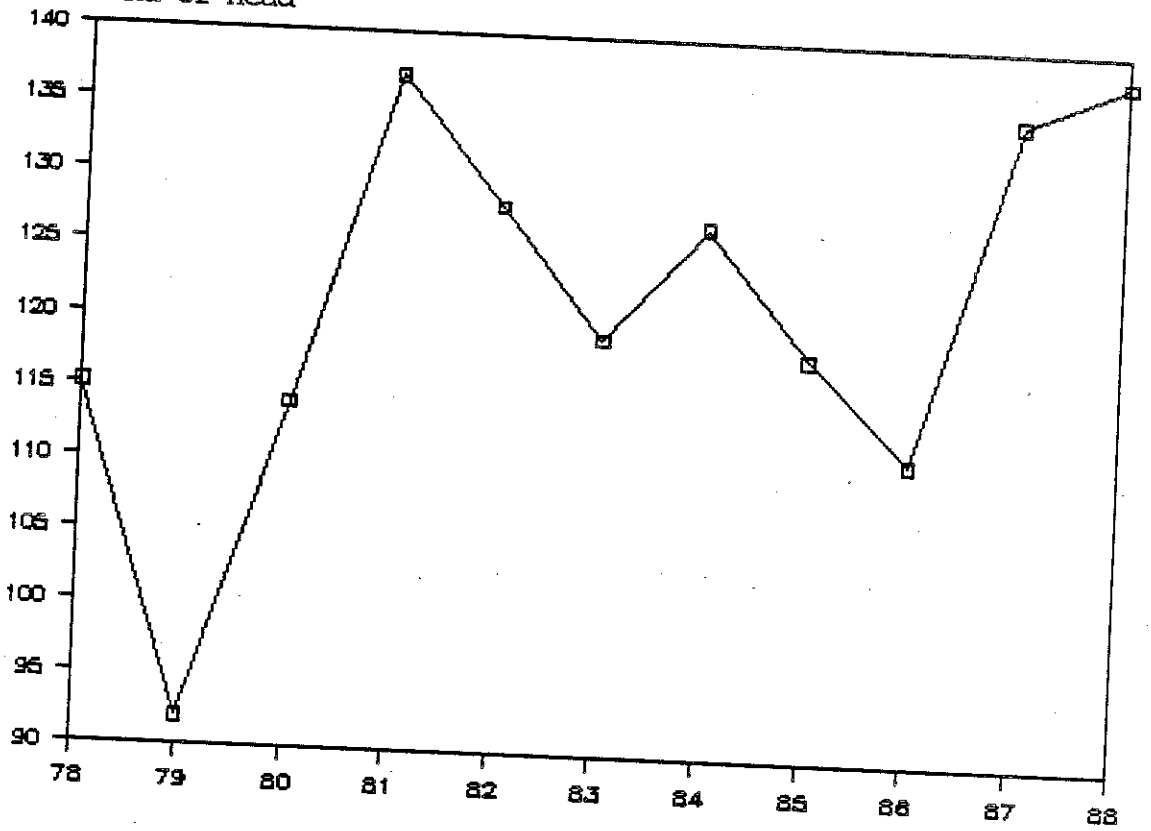
Source: Agricultural Prices. January 1988. Ag. Statistics NASS, USDA

Figure 2. Returns to U.S. Cow-calf Producers



Source: USDA, ERS. January 1988. Outlook '88 Charts.
64th Annual Agricultural Outlook Conference.

Figure 3. Cows & Heifers Kept for Beef In New York State, Number on Farms



January 1, 1978-1988

Source: New York Agricultural Statistics, 1987

The beef cycle is also affected by changes in the demand for beef. The per capita consumption of beef has decreased from 78 pounds in 1979 to 76 pounds in 1987[1]. New York State marketed 255,000 head of cattle in 1987 and 656,000 head of calves for a gross income of 198 million dollars[2]. New York State Ag & Markets estimates that there were 25,000 cattle and calf operations in 1987. This number has decreased by 9,000 farms since 1978. In 1987, 15,000 or sixty percent of these operations had 49 cows or less.

In summary:

1) The national and regional beef markets were on the upswing side of the cattle cycle in 1987. Beef herd inventories were up, number of cattle slaughtered had declined, and in response, the price was increasing.

2) The demand for beef has decreased and may be contributing to the decreased slaughter numbers.

3) The number of beef farms in New York State has decreased since 1978. However, the number of cattle kept for beef was about the same in 1987 as it was in 1979.

4) The majority of the cow-calf farms in New York State are under 49 cows.

---

[1] United States Department of Agriculture Economic Research Service. January 1988. Outlook '88 Charts 64th Annual Agricultural Outlook Conference. January 1988.

[2] 1987 New York Agricultural Statistics. New York State Agriculture Statistics Service. 1988.

Summary of the Farm Business - Selected Factors

Factors useful in evaluating the productive efficiency and economic health of the beef farm business 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 in values for selected business factors are presented in Table 1. Average values for 1986 data and average and range values for 1987 data are shown.

Definitions of Selected Business Factors

The average number of cows is the mean number of open and bred cows held during the year•([open and bred cows as of January 1 plus 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 Percent Calves weaned/cow wintered is calculated as the total number of calves weaned divided by the number of breeding cows wintered. This value includes open cows wintered but does not include yearling replacement heifers or bulls wintered. Average cow age is the average of all breeding cows wintered and does not include yearling replacement heifers. 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 ending of the year. Assets are valued on a market value basis for calculation of capital efficiency measures. The profitability measures are calculated in table 6. Details concerning profitability analysis are in the "Profitability Measures" text. Farm net worth is the total market value of farm assets less farm liabilities as of December 31. The debt to asset ratio is the total number of dollars of debt per each dollar of asset. Farm debt per cow is the December 31 total farm liability value divided by the total number of open and bred cows as of December 31.

Table 1.

Selected Business Factors, 1986 and 1987

Item	1986 Average	1987 Average	1987 Range
Number of Farms	10	17	
Size of Business			
Average number of cows	44.2	37.0	12.0 - 122.5
Average number of heifers	10.4	8.4	0 - 25.0
Average number of bulls	2.9	1.9	0 - 7.5
Total lbs. weaned	19,049	16,707	4,000 - 59,955
Rates of Production			
% Calves weaned/cow wintered	90.0	93.2	81 - 100
% Calves born/cow wintered	95.4	95.1	81 - 100
Average weaning weight,lbs.	525	494	276 - 640
Average cow age,yrs.	5.7	5.90	4.2 - 7.5
Cost Control			
Purchased feed cost/cow	$ 86	$ 58	$ 0 - 124
Hired Labor & Mach. cow/cow	267	565	51 - 5,206
Hired Labor,mach.& crop cost/cow	336	711	95 - 7,018
Capital Efficiency (average for year)			
Mach.& equip. investment/cow	$ 1,013	$ 2,734	$ 123 - 28,749
Real estate investment/cow	2,847	7,472	0 - 83,333
Total capital investment/cow	4,944	11,738	1,348 - 87,216
Profitability			
Net cash farm income	$ (10,550)	$ (1,713)	$ (24,257) - 28,267
Net farm income w/o appr.	*	(9,395)	(57,863) - 20,616
Net farm income w/ appr.	(2,689)	10,585	(65,561) - 165,465
Financial Summary			
Farm Net Worth (12/31)	$ 137,208	$ 244,256	$ 34,593 - 1,047,559
Debt to asset ratio	.20	.10	0 - .33
Farm debt per cow	$ 1,205	$ 574	$ 0 - 5,528

* This value not calculated for the 1986 Beef Farm Business Summary.

Analysis of Selected Business Factors

The selected business factors shown in Table 1 are a one page synopsis of farm business size, productivity and profitability. Averages are shown for the 10 farms participating in the 1986 summary and averages and ranges shown for the 17 farms participating in the 1987 business summary. Seven of the same farms participated in both studies. Be careful when comparing changes in business factors from one year to the next. With the small number of farms involved, most large changes between 1986 and 1987 are due to the change in size and mix of the farms in the sample and not changes in the beef industry.

In 1987, the average number of cows on the seventeen farms was 37 with a range of 12 to 122. The reproductive efficiency of the farms tended to be very good with Percent calves born and Percent Calves weaned averaging 95.1% and 93.2% respectively. Six farms had 100 % calves weaned. The range in weaning weights was surprisingly large: varying between 276 and 640 pounds (uncorrected for age).

There was also a large variation in the economic factors: cost control, capital efficiency and profitability. This variation was evident in the cost control measures where purchased feed varied from $0 to $124 per cow and hired labor and machinery cost varied form $51 to $5,206 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 $123 to $28,749.

On several farms, the beef enterprise was secondary to cropping enterprises. Since machinery and equipment investment per cow is calculated as all machinery divided by the average number of cows, the farms which are primarily crop farms had an unusually high value for this measure. Ten of the seventeen farms had no income from crop sales. These 10 farms had an average machinery investment per cow of $829 as compared to an average investment per cow of $6,301 for those farms which had income from crop sales.

Of the average total capital investment per cow of $11,738, 64 percent or $7,472 was real estate investment. This is an especially high percentage considering that five of the farm's operators did not own the primary farm real estate. The average real estate investment per cow for the twelve real estate owners was $ 10,585.

Net cash farm income, which is farm cash receipts less cash farm expenses and purchased breeding stock, is the money available to make principal payments, capital purchases and contribute toward family living and savings. Average net cash farm income (loss) for the 1987 participating farms was $ (1713). Net farm income, calculated on an accrual basis, includes depreciation of buildings and machinery and changes in inventory. Average net farm income (loss) for the seventeen farms was $ (9395). 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 cased by changes in prices during the year. Appreciation is included in the Net Farm Income in order to reflect the entire change in farm net worth. The average Net Farm Income including appreciation was $ 10,585 per farm.

Farm net worth is the market value of all farm assets less all farm debt. The average farm net worth for the seventeen beef farms was $ 244,256. The debt to asset ratio indicates that on the average for every $1.00 of farm asset there is $ .09 of farm debt. The average farm debt per cow on December 31, 1987 was $574. 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 1987 New York State Dairy Farm Business Summary was .34 and $2,012 respectively[3].

Business Characteristics and Resources Used

Some major business characteristics are shown in Table 2. Eight of the farms are part time business and nine are full time. The average farm tenure is over 11 years and seven of the seventeen producers use artificial insemination for part or all of their herd breeding. Fifteen of the producer's primary farm enterprise was beef production.

Table 2.
Business Characteristics of Seventeen Northeast Beef Farms, 1987

Item	Number of Farms	Item	Average Years
Full Time Business	9	Farmer has operated farm	11.8
Part Time Business	8	Has owned beef herd	11.3
Business Type			
Single Proprietor	15		
Partnership	1		
Record Keeping System			
Agrifax	1		
Account Book	9		
Check-Write System	4		
On-farm Micro Computer	3		
AI Used	7		

Table 3 lists land, labor and animal resources used in the farm business. 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 is of all farms. The total worker equivalent of 16.5 is the months of labor per year required to operate the average beef enterprise in the 1987 study. This value is equivalent to 1.4 full time people working 200 hours each month of the year.

[3] Dairy Farm Business Summary New York 1987. Stuart F. Smith, Wayne A. Knoblauch, Linda D. Putnam. A.E. Res. 88-8. Department of Agricultural Economics Cornell University. July 1988.

Table 3.
Resources Used on Seventeen Northeast Beef Farms, 1986 and 1987

Item	-- 1986 -- Average	--------- 1987 --------- Average	Range
Number of farms	10	17	
Land Used			
Total Acres			
Owned	276	96	0 - 525
Rented	221	103	0 - 500
Tillable Acres			
Owned	74	96	0 - 525
Rented	102	97	0 - 305
Total Tillable	134	147	40 - 525
Herd Size			
Average Number Cows	44.2	37.0	12.5 - 122.5
Average Number of Cows, Bulls & Heifers	57.5	47.3	12.5 - 155.0
Labor (months)			
Operator(s)	10.27	10.38	2.08 - 25.69
Hired Labor	1.65	3.29	0 - 26.00
Family Unpaid	3.97	2.68	0 - 26.00
Total Worker Equivalent	15.88	16.53	2.75 - 36.80

Farm Income

Cash receipts, changes 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). 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 17) and Value of Beef Inventory (page 26) present the details of change in inventory.

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 to 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 accrual receipts. Accrual receipts per cow is calculated by dividing the sum of accrued receipts from all farms by the total number of cows.

Non-farm receipts such as non-farm income are excluded from the farm income statement. Gas lease payments and other payments attributed to the farm land base are included as miscellaneous receipts.

Five of the farms sold only feeder calves, two farms sold only finished beef, four of the farms sold both feeder calves and finished beef, one farm sold only breeding stock and five farms sold breeding stock in addition to feeders. The accrual receipts are less than the cash receipts because of the inventory adjustment reflecting decreases in the cattle and farm produced feed inventories.

Table 4.

Farm Income, Average of Seventeen Northeast Beef Farms, 1987

Item	Cash Receipts	Change in Inventory	Change in Acct's Rec'bl	Accrual Receipts	Accrual per cow *
Feeder calf sales	$ 7,640	$ (928)	$ 49	$ 6,761	$ 183
Finished cattle	3,914	(264)	0	3,650	99
Breeding stock	2,960	145	348	3,453	93
Cull cattle	2,409		0	2,409	65
Other livestock	258	59	28	345	9
Crop Sales	6,366	(541)	0	5,825	157
Custom work	0		0	0	0
Government payments	1,420		0	1,420	38
Misc. receipts	1,242		0	1,242	34
Total Cash Receipts	$ 26,209				
TOTAL ACCRUAL RECEIPTS		$ (1,529)	$ 425	$ 25,105	$ 678

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

Farm Expenses

Cash Expenses are those farm expenses which were paid for in 1987. 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 1987, 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 1987, decrease accrual expenses. Accrual expenses/cow is 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.

Table 5.

Farm Expenses, Average of Seventeen Northeast Beef Farms, 1987

Item	Cash Expenses	Change in Inventory	Change in Acct's Pay'bl	Accrual Expenses	Accrual Exp./cow
Hired labor	$ 3,602	$	$	$ 3,602	$ 97
Feed					
Beef grain purchased	1,869	(174)	(113)	1,582	43
Beef roughage purchased	295	57		352	10
Other livestock feed	357			357	10
Machinery					
Gasoline & oil	1,476	58		1,534	41
Machinery repairs	2,420	6		2,426	66
Farm auto expense	367			367	10
Machinery hire & lease	470			470	13
Livestock					
Vet & medicine	746	(4)		742	20
Breeding expense	397	31		428	12
Feeders purchased	683			683	18
Stockers purchased	0			0	0
Mktg & other beef exp.	1,371	(44)		1,327	36
Crops					
Fertilizer & lime	2,100	101		2,201	59
Seed, spray & oth crop	1,345	(19)		1,326	36
Real Estate					
Land, bld & fence repair	817	(186)		631	17
Taxes (real estate)	1,585			1,585	43
Insurance	1,699			1,699	46
Rent & lease	1,232			1,232	33
Other					
Telephone	356			356	10
Electricity	834			834	23
Interest Paid	1,228			1,228	33
Misc. beef expenses	541			541	15
Other operating expenses	849			849	23
Total Operating Exp.	$ 26,639	$ (174)	$ (113)	$ 26,352	$ 712
Breeding Stock Purch.	1,283			1,283	35
Machinery Depreciation				4,454	120
Building Depreciation				2,411	65
Total Cash Expenses	$ 27,922				
TOTAL ACCRUAL EXPENSES		$ (174)	$ (113)	$ 34,500	$ 932

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

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 costs of cattle 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 farmland 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 is 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 is 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 was hired labor, followed by machinery repairs and grain purchased. The total accrual income per cow was $ 678. The accrual operating expense per cow was $ 712 and the total accrual farm expenses per cow $ 932.

Farm Profitability Measures

Farm owner/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 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. Beef livestock is valued at a standard beginning and ending year price as reported by New York State Ag & Markets: see Livestock Market Values and Stock Numbers, table 15.

Table 6.

Measures of Farm Profitability,
Average of Seventeen Northeast Beef Farms, 1987

Item	---- Average ----
Total Farm Cash Receipts	$ 26,209
- Total Farm Cash Expenses	27,922
Net Cash Farm Income	$ (1,713)
Total Accrual Receipts	$ 25,105
- Total Accrual Expenses	34,500
Net Farm Income w/o Appreciation	$ (9,395)
Total Accrual Receipts	$ 25,105
+ Livestock Appreciation	6,158
+ Machinery Appreciation	1,044
+ Real Estate Appreciation	12,778
- Accrual Expenses	34,500
Net Farm Income w/appreciation	$ 10,585
Net Farm Income w/o Appreciation	$ (9,395)
- Family Labor Unpaid @ $ 650 /month	1,742
- Interest on $ 105,631 average investment in Non-Real Estate equity capital @ 5%	5,281
Return to Labor, Management & Real Estate Ownership	$ (16,418)
- Interest on $ 75,867 average investment in Real Estate equity capital @ 5%	3,793
Return to Operator Labor & Management	$ (20,211)

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 follows: 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 seventeen summary farms is negative $ 1,713. Net farm income without appreciation is negative $ 9,395. Net farm income with appreciation is $ 10,585. The difference between these two values, $19,980, is the appreciation in the value of farm assets. These producers especially benefitted from increases in the value of livestock and real estate. 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 $ 16,418 and negative $ 20,211 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 both in price and changes in inventory quantities. Beef livestock is valued at the Federal-State Livestock Market News quoted prices. For details concerning beef livestock values, see Value of Beef Inventory on page 26.

Financial lease obligations are also included in the balance sheet. The present value of all future payments are listed as liabilities since the farmer (lessee) is committed to make the payments. The present values are also listed as assets, representing the future worth the item has to the business. Farm net worth is the difference between farm assets and farm liabilities.

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 strong with an average net worth of $ 234,440. The average farm net worth increased from the beginning to the end of the year by $ 19,634. Farm assets increased by $ 18,676 and farm liabilities decreased $ 958.

Table 7.

Farm Statement of Net Worth,
Average of Seventeen Northeast Beef Farms, 1987

Item	Jan 1, 1987	Dec. 31, 1987	Change
ASSETS			
Current			
Farm cash, checking, savings	$ 2,851	$ 3,302	$ 451
Accounts receivable	401	381	(20)
Stocks & certificates	62	163	101
Feed & Supplies	10,296	9,929	(367)
Intermediate			
Cows	$ 21,722	$ 28,010	$ 6,288
Heifers	3,411	3,547	136
Bulls	1,181	1,348	167
Finish Cattle	4,727	4,235	(492)
Other Livestock	2,056	2,115	59
Machinery & Equipment	59,079	59,248	169
FLB/PCA Stock	0	12	12
Long-term			
Land & buildings	$ 135,350	$ 147,522	$ 12,184
Total Farm Assets	$ 241,136	$ 259,812	$ 18,676
LIABILITIES & NET WORTH			
Current			
Accounts Payable	$ 266	$ 154	$ (113)
Operating debt	2,235	2,235	0
Short term debt	0	103	103
Intermediate debt	806	1,014	208
Long-term debt	13,206	12,049	($1,157)
Total Farm Liabilities	$ 16,513	$ 15,555	$ (958)
FARM NET WORTH	$ 224,623	$ 244,257	$19,634

Balance Sheet Analysis

The balance sheet analysis examines 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.

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 seventeen participating farms was $ 19,634 with appreciation and negative $ 346 without appreciation. Increasing net worth on many of these farms is due primarily to increasing cattle and real estate markets. The majority of the debt on these farms is structured as long term debt such as mortgages. Six of the seventeen farms reported no farm liabilities.

Table 8.

Balance Sheet Analysis,
Average of Seventeen Northeast Beef Farms, 1987

Item	Average
Financial Ratios,	
Percent equity	91 %
Debt to asset ratio	0.09
Change in Net Worth	
Without appreciation	$ (346)
With appreciation	19,634
Debt Analysis	
Accounts payable as % of total liabilities	1 %
Operating Debt as % of total liabilities	14 %
Current & intermediate liabilities as % of total liabilities	17 %
Long-term liabilities as a % of total liabilities	77 %
Debt Levels Per Cow	
Total farm debt	$ 574
Long-term debt	482
Intermediate debt	84
Operating debt	8

Farm Inventory

The farm inventory 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, page 26.

Table 9.
Farm Inventory, Average of Seventeen Northeast Beef Farms, 1987

	Real Estate	Machinery & Equipment	Beef & Other Livestock	Feed & Supplies
Beginning of Year	$ 135,350	$ 59,079	$ 33,097	$ 10,296
+ Purchases	1,854	3,743		
+ Nonfarm Noncash Transfers	0	0		
- Lost Capital	50			
- Sales	0	165		
- Depreciation	2,411	4,454		
= Net Investment	$ 134,743	$ 58,203	$ 33,097	
+ Appreciation	12,778	1,044	6,158	
= End of Year	$ 147,522	$ 59,247	$ 39,255	$ 9,929

Repayment Analysis

Repayment analysis 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 available to make debt payments. The average debt payment is $ 125 per cow. An average eleven percent of cash receipts is used to service debt.

Table 10.
Repayment Analysis, Average of Seventeen Northeast Beef Farms, 1987

Debt Payments	Principal	Interest	Total
Long term	$ 1,159	$ 942	$ 2,101
Intermediate term	259	269	528
Short-term	73	3	76
Operating (net reduction)	135	0	135
Total	$ 1,626	$ 1214	$ 2840
Total Debt Payment Per Cow			$ 125
Percent of total cash receipts			11 %

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 included 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. If the difference between cash inflow and cash outflow is positive, the amount is listed next to the heading "Farm Contribution to Family Living". If cash outflow is greater than cash inflow, the difference is listed next to the heading "Net Nonfarm Contribution to Farm".

For the seventeen Northeast beef farms, the average cash inflow in 1987 is $29,893 and the average cash outflow is $ 35,010. The farm families contributed an average of $ 5,117 of non-farm income or savings to the farm.

Table 11.

Annual Cash Flow Statement,
Average of Seventeen Northeast Beef Farms, 1987

Cash Inflows		
Beginning farm cash, checking & savings	$ 2,851	
Cash farm receipts	26,209	
Sale of assets : Machinery	165	
Real estate	0	
Money borrowed (intermediate & long-term)	469	
Money borrowed (short-term)	199	
Increase in operating debt	0	
TOTAL		$ 29,893
Cash Outflows		
Cash farm operating expenses	$ 26,639	
Capital purchases: Breeding livestock	1,283	
Machinery	3,743	
Real estate	1,854	
Other	0	
Principal payments (intermediate & long-term)	1,418	
Principal payments (short-term)	73	
Decrease in operating debt	0	
TOTAL		$ 35,010
NET NONFARM CONTRIBUTION TO FARM		$ 5,117

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.

1987 Crop Production:

In 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 information for evaluating alternative cropping and feed purchase choices.

In table 12, forage crop yields are reported as total ton 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 wheat are measured in dry bushels. The acreage devoted to pasture and crop residue pastured is also shown. Crop acres and yields compiled for the average represent only the farms reporting each crop. All of the seventeen farms produced dry hay or hay crop silage. Seven also produced corn silage.

Table 12.
1987 Crop Production, Average of Northeast Beef Farms Reporting Crops

Crop	Farms	Acres	Production	
			Total	Per Acre
Hay crop	17	69	153 tn DM	2.3 tn DM
Corn silage	7	21	257 tn	10.2 tn
			86 tn DM	3.2 tn DM
Total forage	17	81	198 tn DM	2.5 tn DM
Corn grain	2	77	7477 bu	78.3 bu
Wheat	1	20	733 bu	27.5 bu
Other crops	4	6		
Tillable pasture	7	51		
Crop residue pastured	2	31		

Table 13 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.

Percentage calves weaned indicates herd reproductive efficiency, which reflects percent of cows kept that settled and raised calves. This measure is indicative of herd health and nutritional management prior to breeding as well as bull fertility. In herd reproductive efficiency, those at the low end of the range compare with the average for the United States (81% calf crop) and those at the upper end compare with the top five percent (90 % calf crop or better)[4].

[4] National Cattlemen's Association estimates. Personal communication.

Table 13.

Herd and Crop Management Analysis,
Average and Range of Seventeen Northeast Beef Farms, 1987

Item	Average	Range
Calves weaned/cow wintered %	93.3	80.6 - 100
Calves born/cow wintered %	95.2	81.3 - 100
Average weaning weight		
First calf heifers	470	179 - 595
Second calf and mature cows	500	297 - 634
Average age cows, years	5.9	4.2 - 7.5
Number of bulls used	1.6	1 - 3
Number of feeders sold	23.8	2 - 115
Average weight / feeder sold	473	397 - 603
Avg. feeder price received/cwt.	$ 73.00	$ 46.40 - 99.82
Number of finished cattle sold	15.6	1 - 68
Average weight / finished cattle sold	885	560 - 1100
Ave. finished cattle price received/cwt.	$ 56.30	$ 35.82 - 65.63
Tons hay crop dry matter per acre	2.3	1.3 - 7.2
Tons forage dry matter per acre	2.5	1.4 - 6.3
Tons forage dry matter harvested/cow	6.7	.6 - 36.2
Direct crop expenses /crop acre	$ 28.70	$ 4.17 - 89.12
Tillable acres /cow	5.2	1.8 - 29.2
Pasture acres /cow	3.0	.2 - 8.3
Days on pasture	191	105 - 220

Average weaning weight is indicative of genetic capability of the herd as well as pasture management. Weaning weights for the low end if the range are below a U.S. average of approximately 400 lbs. and the high end is above an average of 525 lbs. or higher for the top 5 percent. Cow longevity is important because of the time needed to overcome the cost of heifer rearing. A cow doesn't reach maturity and maximum productivity until four to five years of age.

On the average, 24 calves were sold as feeders at an average price of $73.00 per hundredweight and 16 were sold as finished cattle at an average price of $56.30 per hundredweight. As discussed in Economic Factors Affecting Northeast Beef Producers, page 4, the demand for feeder calves was especially strong in 1987. 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 weight per cow maintained and spreading price risk over two phases of beef production.

Average crop yields reported were typical of Northeast conditions. The range of hay crop yields was large: 1.3 dry tons/acre to 7.2 dry tons/acre. The direct crop expenses/crop acre also varied widely. Direct crop expenses include the accrued expenses for fertilizer, lime, seed, spray and other crop expenses divided by the total number of crop acres.

It is difficult to evaluate the importance of acres/cow kept because of variations in land and production costs/acre. 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 costs[5]. The average days on pasture was 191, which is typical of New York State. However, it is not known how productive the pasture was over the 191 days. A decline in pasture quality and quantity in late summer and fall can reduce calf gains by 1 to 2 lb/day[6]. An important measure which should be considered when measuring productivity is total feed cost/cow. 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. However, increasing the stocking rate can help dilute fixed overhead costs, especially machinery costs.

Capital and Labor Efficiency Analysis

Capital efficiency factors 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. A value is given to the operator and farm family's unpaid labor.

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 17 farms is 14.5 years. Capital turnover varied between 2.3 and 78.5 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.

---

[5] Philip Teague, Soil Conservations Service Economist. Personal communication.

[6] Dan G. Fox, Fact Sheet 1300B. Cornell Beef Production Manual. Cornell University 1986.

Table 14.

Capital & Labor Efficiency Analysis,
Average of Seventeen Northeast Beef Farms, 1987

Capital Efficiency (Average for Year)	Per Cow	
Farm capital	$ 11,743	
Real estate	7,472	
Machinery & equip.	2,734	
Capital Turnover, years	14.5	
Labor Force	**Hours**	
Operator(s)	2,077	
Family paid	35	
Family unpaid	536	
Hired	658	
Total	3,271/200	= 16.35 Months Labor

Labor cost	Total	Per Cow
Value of Operator(s) Labor ($900/month)	$ 9,345	$ 369
Family unpaid ($650/month)	1,742	84
Hired	3,630	128
Total Labor	$ 14,717	$ 581
Machinery Cost	$ 10,754	$ 446
Total Labor & Machinery Costs	$ 25,472	$ 1,027
Hired Labor & Machinery Costs	$ 14,385	$ 574

Beef Herd Analysis

Livestock Market Values

The average number of head, weight and price assigned to the classes of beef livestock at the beginning and end of the year is shown in table 15. The price of pregnant cows and heifers is calculated on a per head basis. All other prices are in dollars per pound. Beef livestock prices are based on Federal-State Livestock Market News quoted values[7]. Unlike machinery, real estate and other farm assets, all of the beef livestock in the Beef Farm Business Summary are given the same market values. This is done to avoid bias in the comparative values due to discrepancies in farmer estimated livestock values.

[7] Livestock Market News. New York State Department of Agriculture and Markets. Volume 6. Issue 1 and Volume 7. Issue 1.

Table 15.

Livestock Market Values and Stock Numbers,
Average of Seventeen Northeast Beef Farms, 1987*

Cattle Type	Jan. 1, 1987 # Hd	Jan. 1, 1987 Lbs/head	Jan. 1, 1987 Price	Dec. 31, 1987 # Hd	Dec. 31, 1987 Lbs/head	Dec. 31, 1987 Price
Bred cows & heifers	35.8	1,080	$ 600.00/hd	36.8	1,087	$ 750.00/hd
Open cows	.6	1,174	0.38/lb	.8	883	0.43/lb
Replacement heifer	9.2	616	0.60/lb	7.6	603	0.73/lb
Service bulls	1.2	1,523	0.45/lb	1.2	1,577	0.55/lb
Other bulls	.8	900	0.45/lb	.5	764	0.55/lb
Feeder cattle**	5.5	443	0.62/lb	3.2	475	0.75/lb
Finish cattle (800 lbs or less)	6.6	580	0.62/lb	5.4	530	0.75/lb
Finish cattle (greater than 800 lbs)	.9	925	0.60/lb	1.5	833	0.70/lb

* Data sources: Federal-State Livestock Market News quoted values and estimates by Peter Comerford, New York State Department of Ag. & Markets.

** Feeder and finish cattle weighing 800 pounds or less are valued at $.62/lb, January 1 and $.75 December 31. Feeder and finish cattle weighing more than 800 pounds are valued at $.60 January 1 and $.70 December 31.

VALUE OF BEEF INVENTORY

The change in value of the beef inventory is shown on table 16. 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 decrease in the physical inventory of cattle, but an increase in the value of the inventory due to increasing cattle prices.

Table 16.

Value of Beef Inventory (Jan. 1, 1987 and Dec. 31, 1987),
Average of Seventeen Northeast Beef Farms, 1987

	Beg. of year value	+ Change in inv. w/o appreciation	+ Appreciation	= End of year value
Pregnant Cows & Heifers	$ 21,459	$ 635	$ 5,523	$ 27,618
Open Cows	263	83	46	392
Rep. Heifers	3,411	(495)	632	3,547
Service Bulls	850	46	199	1,095
Other Bulls	331	(124)	46	253
Feeder Cattle	1,758	(928)	172	1,001
Finish Cattle	2,969	(264)	528	3,234
TOTAL	$ 31,041	$ (1,047)	$ 7,146	$ 37,140