BEEF FARM
BUSINESS SUMMARY

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NORTHEAST BEEF FARM BUSINESS SUMMARY 1986-1992

Presentation and Analysis of Seven Years of Annual Farm Financial and Production Performance.

Caroline Nowak Rasmussen
Ted Perry
Danny G. Fox

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

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OVERVIEW

An annual analysis of business performance (Beef Farm Business Summary or BFBS) was completed for participating Northeast cow-calf farms for each of the years from 1986 to 1992. One hundred and fifty four of these annual summaries were compiled and studied. Records were not adjusted for inflation or any year to year variation. Many of the farms whose annual performance is summarized participated in the BFBS multiple years. The 154 summaries represent 72 unique farms. Sixty-five of the farms providing farm records were located in thirty counties in New York State. Three farms from Vermont and four farmers from New Hampshire participated. Summaries were collected from farms with a variety of resources and management objectives. All of the producers had a cow-calf enterprise

Values are presented concerning the average annual business characteristics, land and labor resources, income, expenses and profitability, equity position, debt repayment, capital use, cash flow, and crop and livestock productivity in tables 1 through 13. The "average" farm participating in the "average" year had negative net farm income of about $ 4,000 without appreciation and a positive $ 4,000 return when appreciation of assets was included in the profitability measure.

Even though the aggregated median values of all participants are fairly consistent from year to year, the financial performance reported in the individual summaries varied dramatically from producer to producer. Between 1986 and 1992, the participating farmers received annual net farm incomes (without appreciation) that varied between positive $ 72,000 and negative $ 81,000. Figure 3 shows how widely one profitability measure, net farm income without appreciation varied from summary to summary. Considering the large variability of the data it is difficult to make any definitive statements concerning the participant's average economic performance. To study the factors resulting in the variable economic performance of these farms, the data is sorted and analyzed by herd size, business type, primary income source and profitability level, tables 15, 16, 17, 18 and 19.

When the summaries are sorted by net farm income without appreciation, the summaries in the top 1/3 group made $255 per cow (table 18). The most profitable 10 % of all summaries earned a net farm income without appreciation of $ 464 per cow per year. Almost all of the summaries reported very good to excellent herd productivity. Yet profitability was extremely variable. Excellent productivity is a prerequisite but not a guarantee of profitability.

Reasonable per cow input costs and capital investment were the best indicators of farm profitability. The single largest expense item on the average summary was machinery depreciation, followed by feed purchases and then machinery repairs. Two of the major expense categories, machinery repairs and machinery depreciation were highest for the low profit group and lowest for the high profit group. A problem on many of the farms in this study is cost allocation. For many of the participants, the farm is primarily a rural residence. Yet, when the beef business is analyzed, all or a disproportionate percentage of costs which would be incurred without the beef cattle, such a mortgage interest, property taxes and insurance, are allocated to the beef enterprise.

The data is sorted by herd size into three groups. See table 15 and figure 4. The group with the smallest herd size (average 16 cows) is the least profitable. But the middle size herd (average 34 cows) is more profitable than the largest herd size group (82 cows). Large beef herds are not more profitable by virtue of their size alone. An increase in herd size will only increase farm profit if the beef enterprise has a positive return over variable costs.

Of the 154 summaries compiled, 70 of the summaries represent farms which are full time businesses and eight-four are described by the producer as part time. The producers who considered the beef enterprise a part-time business achieved a similar level of productivity and profitability as those considering it a full-time business.

The farms participating in the Beef Farm Business Summary Program from 1986-1992 had four major sources of cash income: sale of feeder calves, breeding cattle, finish cattle and crops. When records are sorted by the major source of cash farm income, those with the major proportion of income from finish cattle sales had the highest net farm income.

In a six state survey conducted in 1976, Northeast beef producers attributed their selection of a beef enterprise to a desire to utilize existing land and buildings, increase income, keep the land open, use family labor, and take advantage of tax management opportunities[1]. The producers surveyed had a mixture of goals and motivations. The profit motive (increasing income) was ranked as the second among several objectives. The 72 farms participating in the Beef Farm Business Summary over the seven year study period expressed to the authors a similar mix of business and family goals. For many of the Business Summary cooperators, the farm in primarily a rural residence. Since a beef cattle enterprise makes good use of existing land and buildings and family labor while being compatible with off farm work, it is a common choice.

For most part time beef producers, the true economic success of the beef herd cannot be determined unless costs business and personal costs are carefully allocated and the business performance is viewed in the context of the family's overall objectives. The small beef cow-calf enterprise is commonly viewed as being unprofitable and a hobby which must be supported with outside income. This perception limits support for beef producers from local extension, farm credit institutions and agribusiness. Beef farms of all sizes can have a positive impact on their community. Beef farms help keep the rural landscape open and generate income for businesses in rural communities.

To increase our understanding of the strengths and weaknesses of beef herd enterprises in our region, we must continue to study the goals and motives as well as the economic performance of these producers. This data can then be used to help individual beef producers analyze their business and provide an understanding of the niche cow-calf farms fill in the Northeast region's economy.

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1 Schwab, G. and E. Garst. "A Description of Beef Cow-Calf Producers in Six States - Their Enterprise, Motivation, and Sources of Information." Beef Production Reference Manual Fact Sheet 001, Cornell University, 1976.

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Table of Contents **Page**

List of Tables   Page

List of Figures   Page

Introduction

An annual analysis of business performance with the Beef Farm Business Summary (BFBS) was completed for participating Northeast cow-calf farms for each of the years from 1986 to 1992. Over the seven years, 165 individual farm business summaries were collected. Of these 165 summaries, 11 have less than 10 cows and are excluded from the seven year data set. These farms are excluded because the authors feel that these very small herds diminish the usefulness of the compiled data. There are 154 summaries included in this 7 year analysis which have a herd size of 10 cows or greater. Many of the farms whose annual performance is summarized participated in the BFBS multiple years. The 154 summaries represent 72 unique farms.

The primary objective of the BFBS over the seven year study period has been to provide information about the beef farm business. 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 primary summary data is collected by an extensive survey completed at the end of the calendar year. Participating farmers working with cooperative extension agents and Cornell University personnel completed farm income, expense and production check-in forms at the end of each year. This data was then entered into a computer program that summarized and analyzed the records.

Data was collected for each calendar year from 1986 to 1992. Of the summaries used in this 7 year compilation, 10 are from 1986; 17 from 1987; 20 from 1988; 29 from 1989; 41 from 1990; 23 from 1991 and 14 from 1992. Records were not adjusted for inflation or any year to year variation.

Sixty-five of the farms providing farm records were located in New York State. These farms were located in thirty different counties across the state. Three farms from Vermont and four farmers from New Hampshire participated. Summaries were collected from farms with a variety of resources and management objectives. All of the producers had a cow-calf component in their operation.

These 154 summaries (72 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 data which may be useful to other beef producers and cooperative extension agents.

Accrual procedures have been used to provide the most accurate accounting of farm receipts and farm expenses for measuring farm profits. Throughout the document key phrases are underlined to help the reader locate specific information in the text.

Business Characteristics and Resources Used

Major business characteristics are shown in Table 1. Seventy of the summaries represent farms which are full time businesses and eighty-four were described by the producers as part time. However, this is somewhat misleading. Many of the farms described as "full-time" are full-time in the sense that one or more operators do not work off the farm. However, the farm family may receive income from savings, retirement benefits or a family member's off-farm employment. See Table 18, Selected Performance Factors, Average of Part-time and Full-time Businesses.

Table 1.
Business Characteristics of Beef Farm Business Summary Farms, 1986-1992

Item	Number of Summaries
Full time business	70
Part time business	84
Beef primary enterprise	147
Beef not primary enterprise	7
Business Type	
Single proprietor	131
Partnership	17
Corporation	6

Land, labor and animal resources used in the farm business are listed in Table 2. 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. Labor is shown in hours and months. In this analysis 200 hours is considered one month of labor, and 13.9 months of labor were required per year to operate the average beef enterprise. This value is equivalent to one full time person working 200 hours each month of the year and a second person working 200 hours/month for almost 2 months. Family paid and unpaid labor is family labor <u>other than</u> the operator. The average breeding herd size, 57 head, is the average number of cows, replacement heifers and bulls on the farm at the beginning and end of the year. Some of the tillable acres are used for crop production and some are used for pasture. If the land is potentially tillable it is defined here as "tillable". The tillable land permanent pasture acres devided by the average cow herd size resulted in 5.9 acres of land used per cow-calf unit.

Table 2.
Resources Used on Northeast Beef Farms, 154 Summaries, 1986-1992

Item	Average		
Land Used			
Acres	Tillable	Rented	Total
Tillable land	80	77	157
Pasture	60	42	102
Woods & other nontillable	70	6	76
Total	210	125	335
Herd Size			
Average Number Cows		44	
Average Breeding Herd Total		57	
Labor Force		Hours	Months
Operators(s)		1,891	9.4
Family paid		95	.5
Family unpaid		389	2.0
Hired		409	4.0
Total		2,784	13.9

Farm Income and Expenses

Farm Income: Definitions

The income statement categories for all 154 annual summaries over seven year study period were aggregated. The average cash receipts, change in inventory, change in accounts receivable, accrual receipts and accrual receipts per cow are listed in Table 3. 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 each calendar 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 changes in accounts receivable column adjusts accrual income to exclude cash received in the calendar year for goods which changed ownership in a previous year and includes income from the current years sales that were received in a subsequent year. An increase in accounts receivable increases the accrual receipts accordingly. A decrease in accounts receivable decreases accrued receipts.

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.

Table 3.
Annual Farm Income, Average of 154 Beef Farm Summaries, 1986-1992

Item	Cash Rec	Chn. in Inventory	Chn.Acct. Rec'bl	Accrual Receipts	Accrual Rec/cow
Feeder calf sales	$7,605	$189	$14	$7,809	$190
Finished cattle	6,143	(103)	29	6,069	125
Breeding stock	4,064	2,098	30	6,191	148
Cull cattle	3,056	0	0	3,056	70
Other livestock	447	(1)	3	449	20
Crop sales	2,469	155	8	2,631	93
Custom machine work	339	0	0	.339	6
Government payments	1,672	242	0	1,914	31
Misc. receipts	1,543	0	6	1,550	35
Total Cash Receipts	$27,339				
Total Accrual Receipts		$2,579	$90	$30,008	$718

Analysis of Farm Income

The largest average receipt item is feeder calf sales with accrual income of $ 190 per cow. Breeding stock sales and finished cattle sales are also an important source of income. Income from the beef enterprise, feeder, finished, breeding cattle and cull cattle sales generated an average annual income of $ 533 per cow. To be profitable, the average producer in this study needed to limit operating and ownership costs associated with the beef enterprise to $ 533 or less. To break-even on all other farm related enterprises, expenses had to be under $ 6434 for cash crop production, custom machine operation, participation in government programs and other miscellaneous sales.

Farm Expenses: Definitions

The annual expenses for the 154 summaries were compiled and the average cash expenses, change in inventories, change in accounts payable, total accrual expenses and accrual expenses per cow are presented in table 4. Cash Expenses are those farm expenses which were paid for in the calendar year studied. Accrual Expenses include the costs of inputs actually used in the annual 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 during the year, 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 the year the data was collected, decrease accrual expenses. 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 and beef cattle on feed. Hay and silage purchased for the beef herd is entered as beef roughage purchased. All feed purchased for non-beef livestock is included in other livestock feed.

Machinery costs represent all the operating costs of using power machinery on the farm. Ownership costs such as depreciation and interest on investment are excluded here but are included in the machinery cost measures in Capital and Labor Efficiency Analysis, Table 8.

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

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

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

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

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

Table 4.

Annual Farm Expenses, Average of 154 Beef Summaries, 1986-1992					
Item	Cash Expenses	Chng in Inventory	Chn Acct Payable	Accrual Expenses	Accrual Exp/cow
Hired labor	$ 2,956	$ 0	$ 0	$ 2,956	$ 49
Feed					
Beef grain purchased	2,965	(95)	(6)	2,863	68
Beef roughage purchased	1,287	25		1,312	28
Other livestock feed	295	(4)		291	10
Machinery					
Gasoline & oil	1,640	(4)		1,636	42
Machinery repairs	2,450	1		2,451	60
Farm auto expense	357			357	11
Machinery hire & lease	543			543	15
Livestock					
Vet & medicine	956	(25)	1	931	24
Breeding expense	357	(8)		349	10
Feeders & Stockers Purch.	823		15	838	22
Mktg & other beef exp.	1,106	(11)		1,096	34
Crops					
Fertilizer & lime	1,539	9	(3)	1,545	38
Seed, spray & oth.crop	940	(18)		922	23
Real Estate					
Land, bld & fence repair	1,233	(47)	3	1,189	31
Taxes (real estate)	1,959		2	1,959	51
Rent & lease	1,109			1,109	27
Other					
Insurance	1,302			1,302	29
Telephone	339			339	9
Electricity	762			762	21
Interest Paid	1,882			1,882	52
Misc. beef expenses	747	(2)		745	18
Other operating expense	452			452	11
Total Operating Expense	27,996	(181)	12	27,828	682
Breeding Stock Purchase	1,460			1,460	43
Machinery Depreciation				3,583	109
Building Depreciation				1,479	42
Total cash expenses	$ 29,457				
Total accrual expenses		$(181)	$ 12	$ 34,350	$ 875

Analysis of Farm Expenses

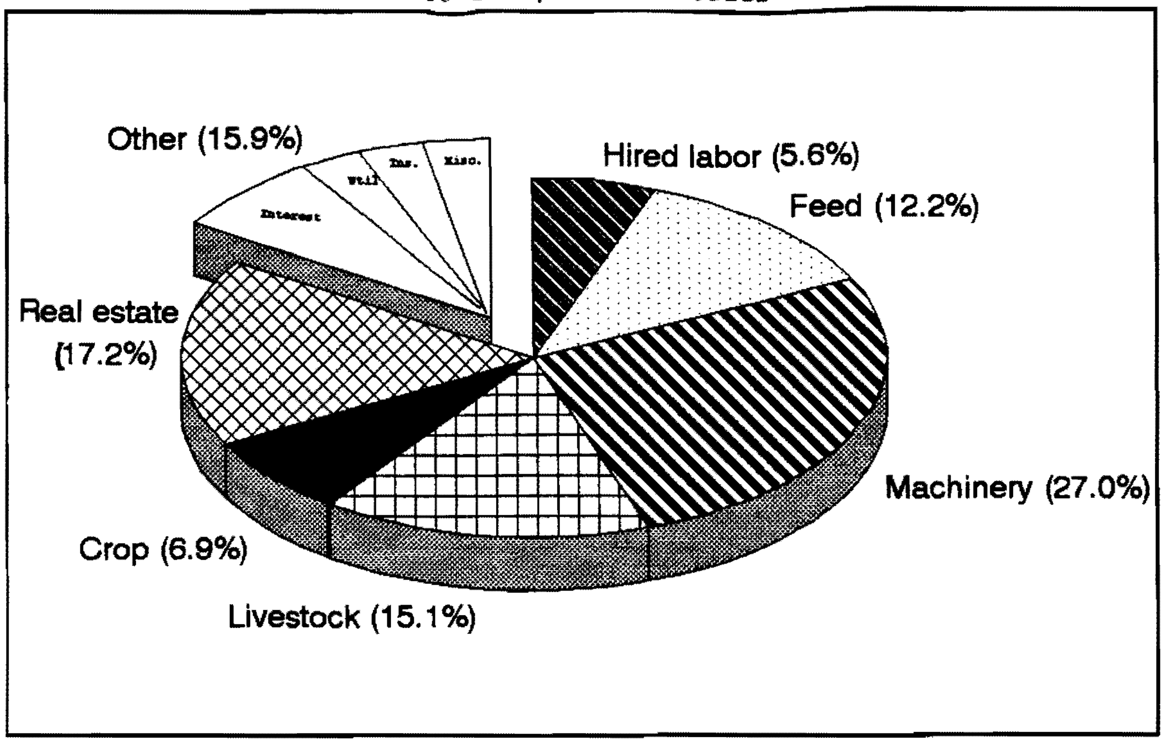
The single largest expense item on the average summary is machinery depreciation, followed by feed purchases and then machinery repairs. Machinery related expenses (machinery depreciation, gasoline and oil, machinery repairs, farm auto expense and machinery hire & lease) make up 27 percent of all farm expenses, see figure 1. Prudent machinery investment and use strategies could have a significant impact on overall farm costs. Cropping plans which require specialized machinery must be critically evaluated to determine their contribution to farm profitability.

The second largest expense category was feed purchased; the average summary reported grain purchases of $ 68 per cow and roughage $ 28 per cow. Feed purchased for feeder and finish cattle was not separated until 1991. Average grain and roughage purchased for the cow herd in 1991 - 1992 (38 summaries) was $ 44 and $ 37. Good pasture management is the key to lowering cow herd feed costs. Grazing must account for a high proportion 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. Using by-product feeds and crop residue feeds such as corn stalks can also decrease the feed purchased expense.

"Other" expenses also make up a large part of total farm expenses. However, these items may be inflated due to poor cost allocation. Even though the farm may be primarily a residence and investment, a disproportionate amount of the mortgage interest, utilities and insurance may be allocated to the beef farm. In an average year the participating producers spent close to $ 30,000 (cash). Although this level of cash outlay may be good for the rural community, the average beef cow-calf herd is hard pressed to generate a corresponding income level. If all animals were sold as feeders in our "average farm" the price received for the 519 pound calf would need to be $1.79 ($34,350 average accrual expenses/ 19,206 average total pounds weaned) for the farm to break even.

Figure 1

Distribution of Annual Accrual Expenses, 1986-1992, 154 Summaries



Farm Profitability Measures

Farm Profitability Measures: Definitions

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 5.

Net cash farm income is total farm cash receipts less total farm cash expenses. Cash expenses include breeding stock purchased. Net farm income without appreciation is total accrual receipts less total accrual expenses. Physical changes in inventories are included in this value. Appreciation of capital items (livestock, machinery and real estate) is excluded. Net farm income including appreciation is total accrual income plus livestock, machinery and real estate appreciation, less total accrual expenses. Livestock, machinery and real estate appreciation from the beginning of the year to the end is estimated by each participating beef producer.

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.

Analysis of Farm Profitability

The average net cash farm income of the 154 summaries is negative $2,118. Net farm income without appreciation is negative $ 4,340. Net farm income with appreciation is $ 4,158. The difference between these two values, $ 8,498, is the appreciation in the value of farm assets. Change in market values were estimated by the participating producers. These producers benefitted especially from increases in real estate values and increases in the value and quantity of livestock held.

However, the benefit of appreciation to a farm business can not be realized until the assets held are sold. Holding farm assets solely for appreciation has some risks. The market values of farm real estate and livestock may decrease. Deferred state and federal income taxes must be paid on any gain realized when business assets are sold. These taxes are commonly at the highest marginal tax rate. Deferred taxes should be considered when including appreciation in farm profitability measures. Increasing farm asset quantities and value can act as a "savings account" for the farm investor. However relying on appreciation can cause cashflow problems in the short term and financial problems in the long term. Producers should strive to have a positive net farm income without appreciation if the farm is to be considered a long term investment. The opportunity costs of the appreciating farm assets also contributed to low returns to Labor, Management and Real Estate Ownership and to Operator Labor and Management (negative $ 11,051 and negative $ 18,447 respectively).

Table 5.

Measures of Farm Profitability,
Average of 154 Beef Summaries, 1986-1992

Item		Average
Total Farm Cash Receipts		$ 27,339
- Total Farm Cash Expenses	-	29,457
Net Cash Farm Income		(2,118)
Total Accrual Receipts		$ 30,008
- Total Accrual Expenses	-	34,348
Net Farm Income without appreciation		(4,340)
Accrual Receipts		$ 30,008
+ Livestock Appreciation	+	2,868
+ Machinery Appreciation	+	1,539
+ Real Estate Appreciation	+	4,092
- Accrual Expenses	-	34,348
Net Farm Income with appreciation		4,158
Net Farm Income without appreciation		($ 4,340)
- Family Labor Unpaid @ $ 650/month	-	1,848
- Interest on $ 97,305 average investment in Non-real estate equity capital @ 5 %	-	4,863
Return to Labor, Management & Real Estate Ownership		(11,051)
- Interest on $ 147,925 average investment in Real Estate equity capital @ 5%	-	7,396
Return to Operator Labor & Management		(18,447)

Solvency and Financial Position

Solvency and Financial Position: Definitions

Information about each farm's assets and liabilities was collected to construct a beginning and ending year statement of net worth. 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. Net worth is the amount farm assets exceed liabilities.

The change in net worth from the beginning to the end of each 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 values reported below, table 6 are the average annual increase in net worth benefiting the farms in the 154 summaries.

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. 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.

Table 6.

Net Worth Analysis,
Average of 154 Beef Summaries, 1986-1992

Item	Average
Average Year Equity	
Average value farm assets	$ 275,793
Average farm liabilities	27,773
Average farm net worth	247,820
Average annual change in net worth	
Without appreciation	$ 6,413
With appreciation	$ 13,929
Financial Ratios	
Percent equity	91 %
Debt to asset ratio	0.09
Debt Levels Per Cow, Year End	
Total farm debt	$ 602
Long-term debt	433
Short & intermediate debt	161
Operating debt and accounts payable	8
Debt Structure, Year End[1]	
Accounts payable and operating debt as % of total liabilities	4 %
Current & intermediate liabilities as % of total liabilities	39 %
Long term debt as % of total liab.	57 %

[1] Debt structure values include the 86 summaries with farm debt greater than zero and exclude the 68 summaries with no farm debt.

Analysis of Solvency and Financial Position

The farm net worth and equity position of the farms tended to be very strong. The average value of all farm assets for the 154 summaries was $ 275,593, average farm liabilities of $ 27,773 and with an average net worth $ 247,819. The average annual change in net worth for the 154 summaries compiled was $13,929 with appreciation and $ 6,413 without appreciation. Purchased land and machinery was accounted for the largest increase in assets. Appreciation of real estate and livestock increased net worth on many of the participating farms.

The financial ratios of the participating farms were also very good. Of the 154 summaries averaged, at year end, 91 % of the assets are owned outright by the owner and 9 % of the assets are financed by debt. Of the 154 summaries analyzed, 68 had no farm debt. The majority of the debt on these farms is structured as long term debt such as mortgages, figure 2.

Repayment analysis, table 7, shows the amount of principal, interest and total payments made on debt of various terms. 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.

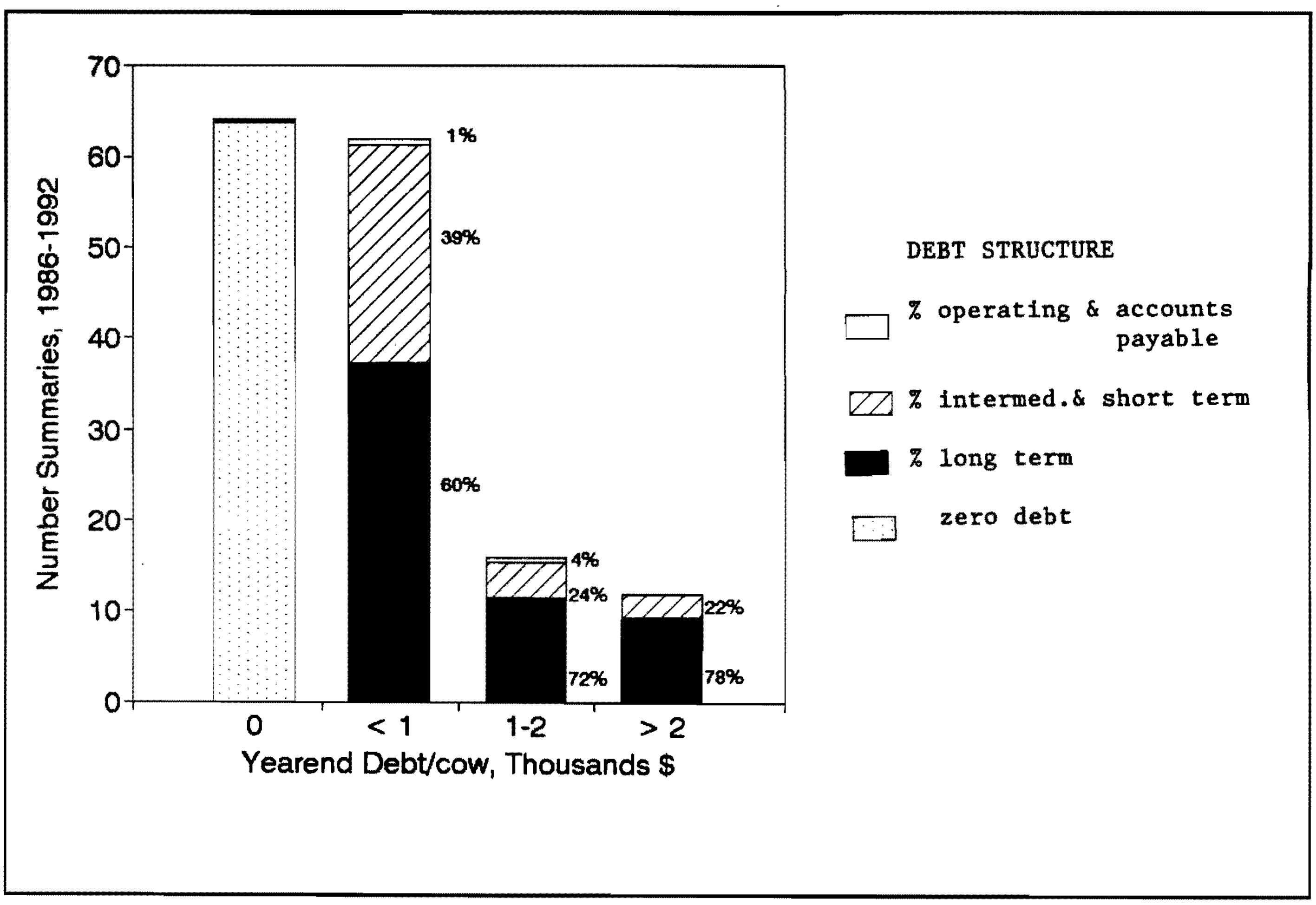
The average annual debt payment made by participating beef producers was $ 167 per cow. On the average, 31 percent of cash receipts is used to service debt. However, the range in debt as a percent of total receipts was 0 % to 748%. The average, 31 % is unusually large considering that about 44 % of the summaries had no farm debt at all. The large average real estate investment and the relatively high long term debt burden per cow indicate a land base that is greater than the economic needs of the beef herd is being charged against the beef enterprise.

Table 7.

Debt Repayment Analysis,
Average of 154 Beef Summaries, 1986-1992

Item	Principal	Interest	Total
Farm debt payments by term			
Long term	$ 1097	$ 1264	$ 2361
Intermediate term	2069	595	2664
Short-term	577	70	647
Operating* (net reduction)	42	32	74
Total	$ 3785	$ 1961	$ 5746
Total Debt Payment			
Per cow	$ 167		
Percent of total cash receipts	31 %		

Figure 2, Year-end Farm Debt/cow and Debt Structure, Average 154 Summaries, 1986-1992.



Capital and Labor Efficiency

Capital and Labor Efficiency: Definitions

Capital efficiency factors, table 8, measure how intensively the capital is being used in the farm business.

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 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. The value in table 8 is calculated: [(Net farm income without appreciation + interest paid - the value of operator(s) labor) divided by the average value of all farm assets for the year] multiplied by 100.

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 calculated: [(Net farm income without appreciation - the value of operator(s) labor) divided by the average farm net worth) * 100].

The value of the operators labor to the beef farm is estimated at $1,000 per month (one month of labor equals 200 hours). The operator estimates the number of hours spent on working and managing the beef farm. The value of the family unpaid labor is estimated at $ 700 per month.

Machinery costs are the sum of accrued machinery repair, farm auto, machinery hired 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.

Table 8.

Capital & Labor Efficiency Analysis,
Average of 154 Beef Summaries, 1986-1992

Capital Efficiency		
Total Farm capital (per cow)	$7,480	
Real estate capital (per cow)	$4,779	
Machinery & equipment (per cow)	$1,179	
Capital Turnover, years	11.5	
Rate of return on farm assets [1]	(6.02)	
Rate of return on farm equity [1]	(8.47)	
Labor and Machinery Costs		
Labor Cost	Total	Per Cow
Value of operator(s) Labor	$ 9,457	$ 314
Family unpaid	1,361	57
Hired	2,958	49
Total labor cost	$ 13,776	$ 363
Machinery Costs		
Machinery cost	$ 8,998	$ 255
Total labor & machinery costs	22,774	676
Hired labor & machinery costs	11,929	304

[1] Return on farm assets and equity calculated without appreciation.

Capital and Labor Efficiency Analysis

The average capital turnover for the 154 summaries is 11.5 years. The average annual rate of return for the 154 summaries was negative 6 percent. The primary reason for the negative return on assets was a negative net farm income. The average annual value of operator, hired and family labor used per farm was $13,776 or $ 363 per cow.

Average annual machinery costs of $ 255 per cow show that machinery operating and ownership costs are a large part of total farm expenditures. As discussed previously (Farm Expense Analysis), farm profitability depends on holding machinery costs to a economically efficient level.

Annual Cash Flow

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. All seven years and 154 farm summaries were compiled to provide average annual cash incomes and outlays made by the participating producers.

Cash Flow: Definitions

The cash flow statement, table 9, 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.

Table 9.

Annual Cash Flow Statement,
Average of 154 Beef Summaries, 1986-1992

Cash Inflows		
Beginning farm cash, checking & savings	$ 2,651	
Cash farm receipts	27,339	
Sale of assets : Machinery	289	
Real estate	120	
Money borrowed (intermediate & long-term)	3,451	
Money borrowed (short-term)	671	
Increase in operating debt	202	
TOTAL		$ 34,723
Cash Outflows		
Cash farm operating expenses	$ 27,675	
Capital purchases: Breeding livestock	1,451	
Machinery	4,211	
Real estate	5,247	
Other livestock	43	
Principal payments (intermediate & long-term)	2,071	
Principal payments (short-term)	1,438	
Decrease in operating debt	261	
TOTAL		$ 42,397
NET NONFARM CONTRIBUTION TO FARM		$ 7,674

Cash Flow: Analysis

For the 154 summaries, the average annual cash inflow was $34,723 and the average annual cash outflow is $ 42,397. The farm families contributed an average of $ 7,674 of non-farm income or savings to the farm. Besides operating expenses, the major farm cash outflows were real estate and machinery purchases. Although this level of transfer from non-farm sources to the farm business may be problematic in the long run, beef farms provide business to many rural businesses and communities. A problem with this personal to farm transfer is that it is not independently sustainable. When there is a financial stress on the farm family, the beef enterprise will be terminated.

Herd Management and Crop Production

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.

On many cow calf operations, decisions concerning the cropping program could make a big difference in profitability. A complete evaluation of available land resources, how they are being used, how well crops are producing and what it costs to produce them is required to evaluate alternative cropping and feed purchase choices. Average annual crop production statistics are shown in tables 10 and 11.

Crop Production: Definitions

In table 10, 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. Crop acres and yields compiled for the average represent only the number of farms reporting each crop. Of the 154 summaries, 141 produced dry hay or hay crop silage. Fifty-two reported corn silage production.

Direct crop expenses include the accrual expenses for fertilizer, lime, seed, spray and other crop expenses divided by the total number of crop acres.

Table 10.

Crop Production
Average of 154 Beef Summaries, 1986-1992

Item	# of summaries	# of acres	---- Production ---- Total	Per acre
Hay crop - total	141	103	181	
Dry hay	132		171	
Hay crop silage	28		95	1.9 ton DM
Corn silage (wet)	52	35	394	11.0 ton AF
Corn silage (dry)	52		138	3.8 ton DM
Other forage	7	12	55	2.5 ton DM
Total forage	141	117	270	2.3 ton DM
Corn grain	28	31	2535	70.7 bu.
Oats	12	18	448	33.7 bu.
Wheat	2	35	1134	28.6 bu.
Other crops	7	14		
Tillable pasture	109	102		
Crop residue pasture	31	64		

Table 11.

Crop Management Analysis Average of 154 Beef Summaries, 1986-1992		
Item	# of Summaries	Average
Tons hay crop dry matter per acre	141	1.9
Tons forage dry matter per acre	141	2.1
Tons forage dry matter harvested/cow	154	5.4
Direct crop expenses /crop acre	143	$ 20.64
Tillable acres per cow	154	4.4
Pasture acres per cow	154	3.1
Days on pasture	154	182

Crop Production Analysis

Forage yields, both hay crop and corn silage, were relatively low for the Northeast U.S. 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 include only one cutting of hay. Many cow calf producers graze the hay field after a single cutting is harvested.

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[1]. The average days on pasture was 182, which is typical of the Northeast. However, it is not known how productive the pasture was during the 182 days. A decline in pasture quality and quantity in late summer and fall can reduce calf gains by 1 to 2 lb/day[2]. 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.

Herd Management and Livestock Marketing: Definitions

Table 12 contains measures of livestock productivity and marketing information. The averages include only those farms reporting a given measure. Pregnancy percentage is the number of females confirmed pregnant divided by the number of females exposed to the bull or A.I. 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.

Calves born as % cows wintered is the number of calves born alive as a percentage of exposed cows 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 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.

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[1] Daryl L. Emmick and Danny G. Fox. Prescribed Grazing Management to improve pasture productivity in New York. USDA SCS and Cornell University Department of Animal Science Publication. September 1993.

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

Calves weaned as % calves born is the number of calves weaned as a percentage of the calves born alive. The number of cow-calf pairs sold or purchased before weaning are subtracted from or added to the denominator. Average weaning weight is indicative of genetic capability of the herd as well as pasture and feed management. The weaning weight is not adjusted for age at weaning. Age at weaning and Cow weight at weaning are also given to put weaning weight in context.

Table 12.

Herd Management and Livestock Marketing
Average of 154 Beef Summaries, 1986-1992

Item	# of Summaries	Average
Pregnancy percentage as % cows exposed to bull	154	94.9
Calves born as % cows wintered	154	92.6
Calves weaned as % calves born	154	95.1
Average weaning weight	154	518
Average calf weaning age, days	154	204
Average cow weight at weaning, lbs.	154	1,131
Number of bulls used	154	1.8
Number of feeders sold	129	21
Average weight / feeder sold, lbs.	129	524
Average feeder price received $.cwt.	129	$ 78.63
Number of finished cattle sold	71	16
Average weight / finished cattle sold, lbs.	71	987
Average finished cattle price received $/cwt.	71	$ 68.72

Herd Management and Livestock Marketing Analysis

The herd productivity tended to be very good. Average conception rate, percent born and percent weaned averages were all above 92 percent. The conception rate is the percentage of cows and heifers exposed to the bull who are confirmed pregnant. Average weaning weight is indicative of genetic capability of the herd as well as pasture and feed management.

Of the 154 individual summaries compiled, 129 reported selling an average of 21 feeder calves per year at $ 78.63 per hundredweight. An average of 16 finish cattle sales were reported on 71 of the summaries. The average finish cattle weight was 987 lbs. and the average price was $68.72 per hundredweight.

Selected Business 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 selected business factor values for each year are presented in Table 13.

Selected Business Factors: Definitions

The average number of cows is the mean number of open and bred cows held during each calendar 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 % 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 exposed cows held through the winter plus pregnant cows purchased less pregnant cows sold. The average wean age is the average number of days between birth and weaning. Cost control, capital efficiency, and profitability measures given on a per cow basis use the average number of cows (as defined above) as the denominator.

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

Net cash farm income is total farm cash receipts less total farm cash expenses. Cash expenses include breeding stock purchased. Net farm income without appreciation is total accrual receipts less total accrual expenses. Physical changes in inventories are included in this value. Appreciation of capital items (livestock, machinery and real estate) is excluded. Net farm income including appreciation is total accrual income plus livestock, machinery and real estate appreciation, less total accrual expenses. Livestock, machinery and real estate appreciation from the beginning to the end of each year is estimated by the participating beef producer.

Year end net worth is the market value of assets less liabilities as of the end of each year. The debt to asset ratio is the total number of dollars of debt per each dollar of assets. Farm debt per cow is the year end total liability value divided by the total number of open and bred cows in inventory at year end.

Table 13. Selected Business Factors, Average of 154 Farm Summaries, 1986-1992

Item	Year: 1986	1987	1988	1989	1990	1991	1992	1986 - 1992
Number of summaries	10	17	20	29	41	23	14	**154**
Size of Business								
Average number of cows	44.2	37.0	38.4	41.6	43.6	45.6	65.7	**44.1**
Average number of heifers	10.4	8.4	8.3	10.2	8.9	10.5	16.2	**10.0**
Average number of bulls	2.9	1.9	2.7	3.9	3.6	3.8	3.0	**3.3**
Total lbs. weaned	19,047	16,707	15,810	18,163	19,066	20,655	27,391	**19,206**
Rates of Production								
% Calves weaned	90	93	96	96	96	94	96	**95**
% Calves born	95	95	92	94	85	99	96	**93**
Ave. weaning weight, lbs.	525	494	535	508	513	524	540	**518**
Average wean age, days	204	195	207	205	203	208	202	**204**
Cost Control								
Purchased feed cost/cow	$86	$58	$117	$89	$110	$99	$ 79	**$ 95**
Hired labor & mach.cost/cow	$293	$565	$256	$296	$281	$212	$279	**$303**
Hired labor, machinery & crop cost per cow	$376	$711	$306	$344	$330	$257	$346	**$365**
Capital Efficiency (average for year)								
Machinery investment/cow	$1,013	$2,734	$1,050	$1,086	$943	$834	$1,024	**$1,177**
Real estate investment/cow	$2,847	$7,472	$3,865	$4,640	$5,352	$4,658	$3,001	**$4,779**
Total capital invest/cow	$4,944	$11,738	$6,433	$7,291	$7,916	$6,998	$5,537	**$7,481**
Profitability								
Net cash farm income	($10,550)	($1,713)	$1,228	($2,292)	($1,584)	$2,418	($10,020)	**($2,118)**
Net farm income w/o appr.	($3,917)	($9,395)	($4,468)	($576)	($4,113)	($2,546)	($9,733)	**($4,340)**
Net farm income w/appr.	$11,330	$11,574	$5,647	$7,289	$2,769	($1,391)	($5,398)	**$4,158**
Financial Summary								
End year net worth	$137,008	$244,256	$231,879	$291,187	$303,315	$218,719	$269,795	**$258,753**
Debt to asset ratio	0.20	0.09	0.12	0.08	0.07	0.03	0.11	**0.09**
Farm debt per cow	$1,207	$574	$805	$677	$541	$206	$592	**$602**

Analysis of Selected Business Factors

The selected business factors shown in Table 13 are a one page synopsis of the farm business's size, productivity and profitability. Averages are shown for each year and for all summaries collected over the 7 years. Be careful when comparing changes in business factors in Table 13 from one year to the next. Most year to year changes are due to the economic profiles of the individual farms participating in that year and not changes in the beef industry.

The average number of cows on all farms with 10 cows or greater was 44.1. The reproductive efficiency of the farms tended to be very good with Percent Calves weaned and Percent calves born averaging 95 % and 93 % respectively. In 66 of the annual summaries collected, 100% of the calves born were weaned. And on 65 summaries 100 % of the exposed cows wintered had live calves.

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 $28,749. Of the average total capital investment per cow of $7,481, 64 percent or $4,779 was real estate investment. The real estate investment per cow varied from $0 to $83,333.

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 annual net cash farm income for the 154 summaries was negative $2,118.

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 annual net farm income was negative $4,340.

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. Appreciation is included in net farm income in order to reflect the entire change in farm net worth. The average annual net farm income including appreciation was $4,158.

Farm net worth is the market value of all farm assets less all farm debt. The average farm net worth at the end of the "average" year for the 154 summaries was $ 258,753. The debt to asset ratio indicates that on the average for every $1.00 of farm assets there is $ .09 of farm debt.

The average farm debt per cow was $602. The debt level of the beef farms participating in the beef farm business is relatively low for an agricultural business.

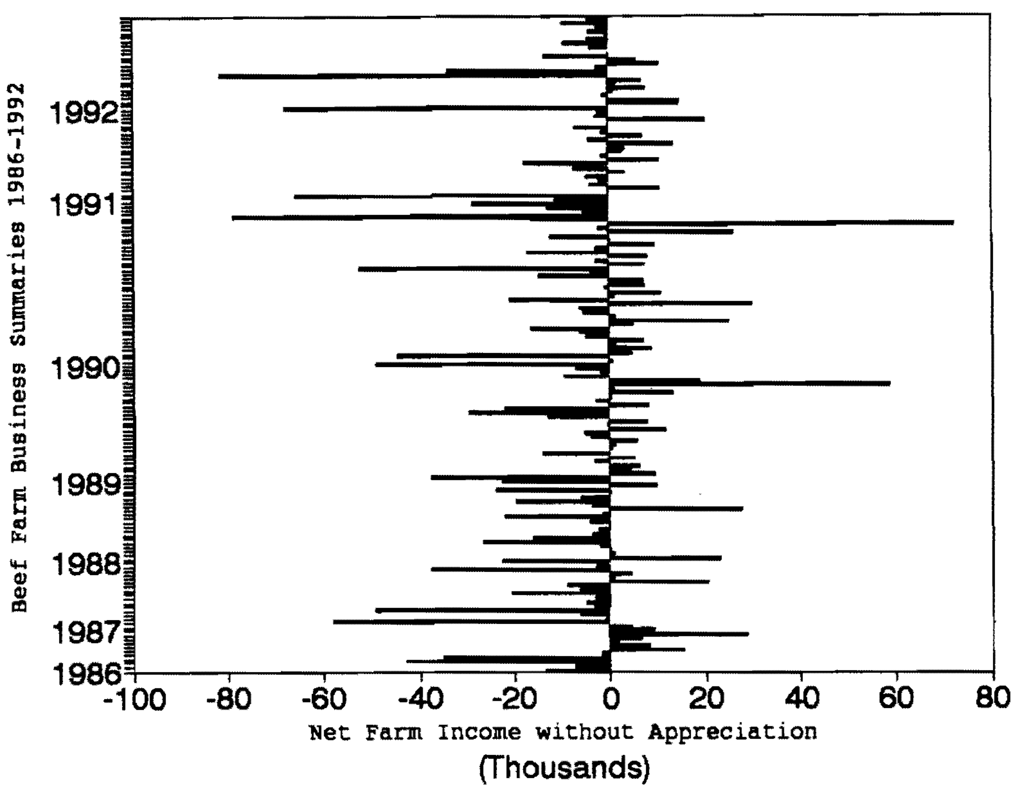
The average, minimum and maximum values collected along with the percent variance indicate the variability of the data for each factor, table 14. The percent variance measures the degree to which the individual values in the group vary from the average of that group. The lower the percent variance, the less individual values vary from the average and more representative the average is. The percent variance is the standard deviation divided by the mean average value.

There was a large variation between the annual summaries in the economic factors: cost control, capital efficiency, profitability and financial factors. The percent variance for the production factors was between 6 and 16 percent. In these measures the average value reported is fairly representative of the group. However the percent variance for the economic factors ranged from 113 to 884 percent. Net cash farm income ranged $ 133,680 from negative $ 78,020 to $ 55,660. The distribution of net farm income without appreciation for the 154 summaries over the seven year period is shown in Figure 3.

Table 14.
Average, Range and Percent Variance of Selected Business Factors, 154 Farm Summaries, 1986-1992

	Average	------- Range ----- Min	Max	Percent Variance
Size of Business				
Average number of cows	44	11	149	71
Average number of heifers	10	0	50	93
Average number of bulls	3	0	37	164
Total lbs. weaned	19,206	3,430	99,450	79
Rates of Production				
% Calves weaned	95	75	105	6
% Calves born	93	41	106	12
Ave. weaning weight, lbs.	518	276	771	16
Average wean age, days	204	135	270	11
Cost Control				
Purchased feed cost/cow	$ 95	$ 0	$ 793	113
Hired labor & mach.cost/cow	303	14	5,206	145
Hired labor, machinery & crop cost per cow	365	14	7,018	158
Capital Efficiency (aver. for year)				
Machinery investment/cow	$ 1,177	$ 31	$ 28,749	207
Real estate investment/cow	4,944	0	83,333	175
Total capital invest/cow	7,481	1,099	87,216	124
Profitability				
Net cash farm income	$ (2,118)	$(78,020)	$ 55,660	884
Net farm income w/o appr.	(4,340)	(81,348)	72,104	477
Net farm income w/appr	4,158	(75,010)	165,465	606
Financial Summary				
End year net worth	$ 258,753	$ 26,160	$1,823,148	114
Debt to asset ratio	0.09	0.00	0.63	141
Farm debt per cow	$ 602	$ 0	$ 7,419	181

Figure 3. Net Farm Income without Appreciation for 154 Beef Farm Business Summaries, 1986-1992



Considering the large variability of the data it is difficult to make any definitive statements concerning the averages of these factors. If the productivity of the farms involved in the analysis do not vary much, why do the economic factors, specifically profitability, vary so greatly ? To further analyze this fundamental question, the data has been sorted and analyzed by herd size, business type, primary income source and profitability level. See tables 15, 16, 17, 18 and 19.

Selected Business Factors: Farms sorted by Total Pounds of Feeder Calves Weaned

In table 15, selected performance measures are presented for the 154 summaries sorted into three groups based on the total weight of calves weaned. The same results are obtained when the data is sorted by average number of cows. The smaller group has an average of 16 cows, the middle group has 34 cows and the group with the larger herd size has an average of 82 cows. The interesting aspect of this table is what it doesn't show.

The theory of economies of size holds that as the number of units produced increases, the per unit total cost (total marginal cost) of production decreases. All business costs are categorized as "variable" or "fixed". Variable costs are those costs related to the level of production. Examples of variable costs are feed, supplies and marketing expenses. Fixed costs are those costs that do not increase due to increasing production levels. Examples of fixed costs are taxes, depreciation, repairs, insurance, and interest. Assuming the market does not give a better or worse price based on production size, the larger producers would be expected to be more profitable due to the lower total costs. However, this does not seem to be the case with the 154 annual business records aggregated here.

By definition, variable costs should be similar across herds despite size. In this case variable costs are more for the smaller sized herds than the middle sized herds. But the larger herds have higher variable costs than the middle sized herds. Fixed costs and total costs would be expected to decrease as herd size increased. The middle herd size group does have lower fixed and variable costs than the smaller herd size group. But the middle and bigger herd size groups have essentially the same fixed and total costs per cow. In this data set there were no evident economies of size over a herd size of 50 cows. This is also demonstrated in Table 15. The lowest 1/3 profit group had 49 cows and the highest 1/3 profit group had 56 cows.

If a farm has higher variable costs than returns per unit (per cow), economies of size are not going to increase that farm's profitability. In the situation where variable costs is greater than income, the more cows the farm has, the larger its losses will be. This is apparent in the farm profitability measures. Net farm income without appreciation is better (less negative) for the middle sized farms than the smaller ones but also better than the higher cost larger farms. However, the averages are difficult to interpret. Figure 2. shows the somewhat variable distribution of net farm incomes across herd sizes. Each point on the figure is an annual summary. Most of the net farm incomes are grouped around the break-even point with total pounds weaned of 5,000 to 20,000 lbs. (about 20-40 cows). The net farm income of farms weaning over 30,000 (about 60 cows) tend to be scattered widely. Some large herds are very profitable and others are very unprofitable.

The larger herds had greater net farm income with appreciation because they had more assets to benefit from appreciation. However, this same factor caused this group to have much lower returns to the operator(s) labor and management as an interest charge on the equity is greater.

Like fixed costs, theoretically, machinery and real estate investment per cow should decrease as herd size increases. This reflects the fixed component of investment in machinery required for a farming operation. This does happen from the smaller herd size group to the middle group. But again, with this data set, there doesn't seem to be an advantage to increasing the herd size past a certain point as the real estate investment per cow increases and the machinery investment per cow decreases only slightly between the middle and larger herd size.

Table 15.

Selected Performance Factors, 1986-1992, Average of 154 Summaries
Sorted by Total Calf Pounds Weaned into Smaller, Middle and Bigger One Third Groups

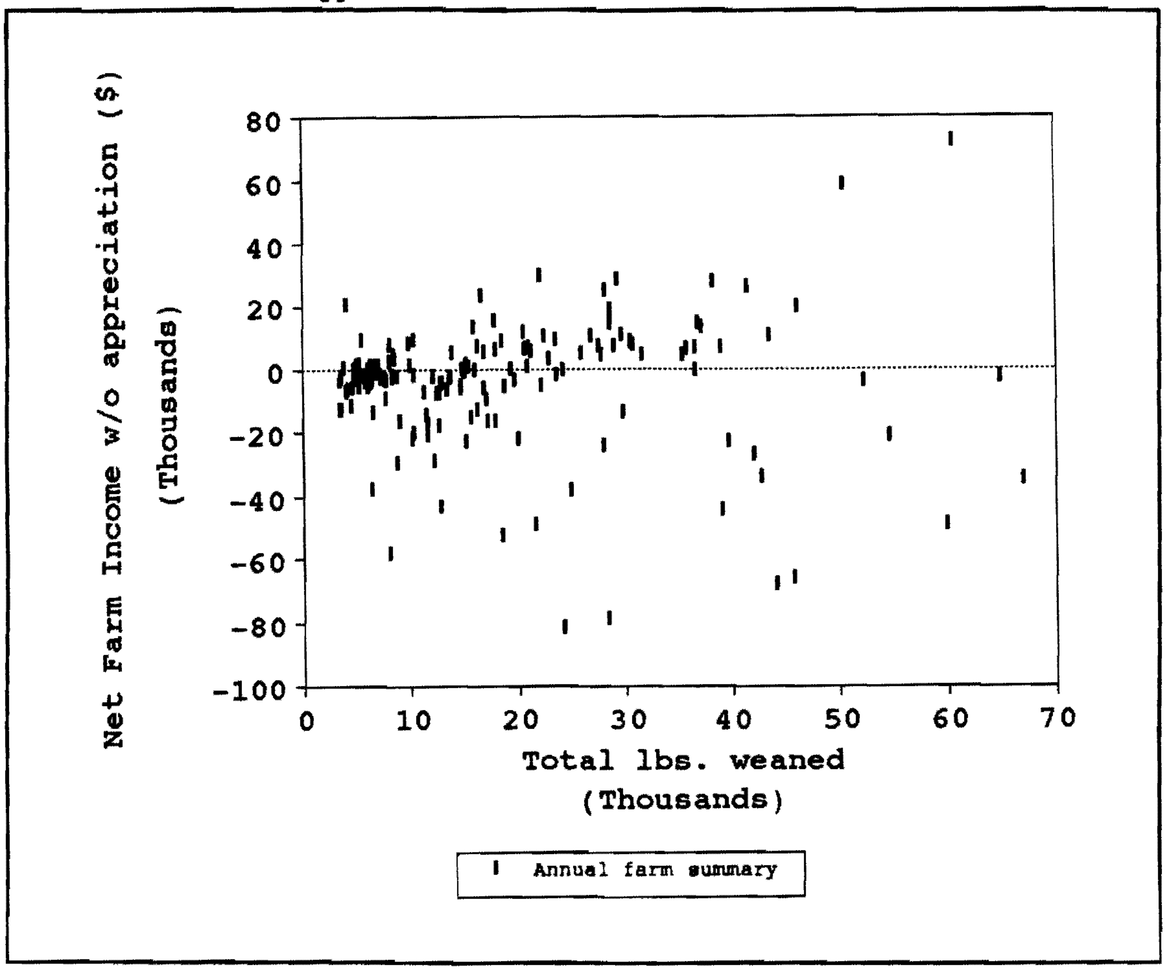
Item Group:	Smaller 1/3	Middle 1/3	Larger 1/3
Number of summaries in group	51	52	51
Size of Business			
Average number of cows	16	34	82
Breeding herd size	21	44	108
Total lbs. weaned	6,739	15,515	35,437
Rates of Production			
Conception Rate %	94	96	95
Calves born as % cows wintered	92	93	93
Calves weaned as % calves born	96	95	94
Average weaning weight, lbs	496	534	523
Tons hay crop (DM)/acre	2.1	1.6	2.1
Cost Control			
Purchased feed cost/cow	$ 107	$ 83	$ 96
Labor & machinery cost/cow	$ 423	$ 231	$ 255
Variable expenses[1]/cow	$ 544	$350	$ 422
Fixed expenses[2]/cow	518	296	305
Livestock purchased[3]/cow	96	58	41
Total accrual exp./cow	1,158	703	768
Capital Efficiency			
Total capital investment/cow	$ 11,170	5,289	6,026
Real estate investment/cow	7,523	3,133	3,712
Machinery & Equip Inv./cow	1,982	814	743
Capital turnover, years	14.3	9.8	10.4
Return on equity	(12.5)	(7.7)	(5.2)
Profitability			
Total accrual income/cow	$ 807	$ 612	$ 736
Net cash farm income	(3,170)	(1,938)	(1,249)
Net farm income w/o appreciation	(5,766)	(3,149)	(4,129)
Net farm income w/ appreciation	(1,699)	3,033	11,163
Return to oper.labor, management & real estate ownership	(9,655)	(8,239)	(15,313)
Return to oper.labor & mngt.	(13,583)	(13,073)	(28,791)
Debt Payment and Cashflow			
Farm debt /cow	$ 781	$ 359	$ 672
Debt payment /cow	267	94	142
Net farm cashflow	(8,313)	(5,495)	(9,265)
Marketing			
Number farms selling feeder calves	36	48	46
Average number of feeders sold	11	21	30
Average feeder price ($/cwt.)	$ 75.19	$ 77.98	$ 82.00
Number farms selling finish cattle	24	22	27
Average number of finish cattle sold	7	4	34
Average finish price ($/cwt.)	$ 66.97	$ 69.82	$ 74.63

[1] /The following accrual expenses/cow are included in this value: hired labor, beef grain purchased, beef roughage purchased, other livestock feed, gas and oil, farm auto expense, machinery hire and lease, vet & medicine, breeding expense, marketing & other beef expenses, fertilizer & lime, seed, spray & other crop, rent & lease, telephone, electricity, miscellaneous beef expenses and other operating expenses.

[2] /The following accrual expenses/cow are included in this value: machinery repairs, land, building and fence repair, real estate taxes, insurance, interest, machinery and building depreciation.

[3] /The following accrual expenses/cow are included in livestock purchased: feeder and livestock cattle purchased and breeding livestock purchased.

Figure 4 Influence of Total Pounds Weaned on Net Farm Income without Appreciation



<u>Selected Business Factors: Farms sorted by Full-time / Part-time Status</u>

As described in the Business Characteristics section, page 2, seventy of the summaries represent farms which are full time businesses and eighty-four are described by the producer as part time. Many of the farms described as "full-time" are full-time in the sense that one or more operators do not work off the farm. However, the farm family may receive income from savings, retirement benefits or a family member's off-farm employment. In the average year, part-time and full-time producers are contributing $ 6,867 and $ 8,648, respectively, to the farm business from non-farm sources.

Like the selected performance factors sorted by pounds weaned, table 16 is surprising for what it doesn't show. The assumption that full time producers are much more profitable and productive than part-time producers does not appear to be the case with these 154 summaries. The full-time producers did have better average hay crop yields than the part-time producers. But the livestock production measures were essentially the same for the two groups.

The full time producers are more profitable when profit is measured by net farm income with and without appreciation. But since the full time farms tend to be larger (average 61 cows versus 30 and 136 acres crop production compared to 96 acres), their total capital investment was greater. The higher equity charge associated with this capital investment causes the full-time farms to actually have a lower return to operator, labor, management and real estate ownership and return to operator, labor and management. The "average" participating beef producer had a negative net income both with and without appreciation. The benefit of having a full time operator did not dramatically change the average negative return.

Table 16.

Selected Performance Factors, 1986-1992
Averages for Part-time and Full-time Businesses

Item Business Type:	Part-time	Full-time
Number of farms in Group	84	70
Size of Business		
Average number of cows	30	61
Total acres crop production	97	136
Rates of Production		
Calves weaned as % calves born	96	95
Average weaning weight, lbs	519	517
Tons hay crop (DM)/acre	1.86	2.05
Cost Control		
Purchased feed cost/cow	$101	$ 88
Direct crop expenses/acre	$ 20	$ 22
Labor & machinery cost/cow	$282	$327
Depreciation exp./cow	$146	$155
Accrual overhead exp./cow	$382	$360
Total operating exp./cow	$667	$700
Total accrual exp./cow	$857	$897
Capital Efficiency		
Total capital investment/cow	$7,277	$7,726
Real estate investment/cow	$4,743	$4,822
Machinery & Equip Inv./cow	$1,099	$1,272
Capital turnover, years	11	12
Return on equity	(9.3)	(7.5)
Profitability		
Total accrual income/cow	$ 660	$ 786
Net cash farm income	$(1,461)	$(2,906)
Net farm income w/o appreciation	$(5,027)	$(3,515)
Net farm income w/ appreciation	$ (45)	$ 9,202
Return to oper.labor, management & real estate ownership	$(10,423)	$(11,804)
Return to oper.labor & mngt.	$(15,547)	$(21,926)
Debt Payment and Cashflow		
Farm debt /cow	$ 677	$ 513
Debt payment /cow	$ 200	$ 128
Net farm cashflow	$(6,867)	$(8,648)
Marketing		
Number farms selling feeder calves	65	65
Average number of feeders sold	18	24
Average feeder price ($/cwt.)	$ 77.68	$ 79.58
Number farms selling finish cattle	44	29
Average number of finish cattle sold	10	26
Average finish price ($/cwt.)	$ 70.13	$ 71.51

Selected Business Factors: Farms sorted by Major Source of Cash Farm Income

Table 17 presents selected performance factors for farms receiving the majority of their income from crop, breeding livestock, feeder calf and finish cattle sales. All 154 summaries were sorted by their cash income. If a farm's greatest annual cash income source was in the category crop sales, the summary was labeled "crop", even though the summary may also have income from other sources. Two of the summaries had no cash income and were excluded from this table.

Feeder cattle sales were the largest cash income category on more than one half of all the summaries (82); 33 of the summaries had a majority of income from finish cattle sales; 26 from breeding cattle sales and 11 from crop sales. Most of the participants sold more than one commodity. Of the 82 summaries selling mostly feeder cattle, 31 sold only feeder cattle. Only 6 of the 33 summaries with the majority of their sales as finish cattle sold only finish cattle.

All four business types had about the same herd size. However, the farms with the majority of their cash income from crop sales had about 100 more tillable acres and total acres of crop production than the other groups. This makes sense; the farms with the most crop acres have excess production available for sale. But, do these farms produce crops for sale because that is the most profitable use of that resource ? Or do they grow crops for sale because they own the tillable land ?

The 11 summaries which had the majority of their cash income from crop sales had lower profitability, higher costs, a poorer cashflow, larger farm debt and larger capital investments per cow than any of the other groups. Notice that these 11 summaries also have the highest gross farm income of the four groups. The average cash crop sales for these summaries was about $25,000. But, their higher operating costs and capital investment offset the higher income. This does not imply that crop farms do not make money or are a bad investment. Rather that these 11 beef farm summaries whose major cash income source was crop sales have some financial problems. All farmers with more than one farm enterprise, should construct budgets for each enterprise to determine how much each is contributing to farm profitability.

The summaries in which most of the cash income was received for breeding stock sales had the highest average weaning weight but also the highest purchased feed expense and the highest total expenses. Although gross accrual receipts were greater for this group, net farm income without appreciation was about the same as for those selling mostly feeder cattle.

Producers receiving the majority of their cash income from finish cattle sales had the highest profit margin of any of the groups. The finish, feeder and breeding stock groups all had about the same net farm income with appreciation. However, those selling mainly finished cattle had better net farm income without appreciation and return to labor and management than the other three groups by a wide margin.

Table 17.

Selected Performance Factors, 1986-1992 for
Summaries with the Largest Source of Cash Income from Crop,
Breeding Cattle, Feeder Cattle or Finish Cattle Sales

	Crop	Breeding	Feeder	Finish
Number of Summaries in Group	11	26	82	33
Size of Business				
Average number of cows	37	43	45	46
Breeding herd size	48	62	58	57
Total tillable acres	250	151	154	143
Total acres crop production	214	107	111	101
Rates of Production				
Calves weaned as % calves born	95	94	95	95
Average weaning weight, lbs	485	594	505	494
Tons hay crop (DM)/acre	2.4	2.0	1.7	2.3
Cost Control				
Purchased feed cost/cow	$ 58	$170	$ 69	$108
Direct crop expenses/acre	$ 27	$ 17	$ 18	$ 29
Labor & machinery cost/cow	$843	$310	$237	$284
Accrual operating exp./cow	$1,402	$ 871	$535	$671
Depreciation/cow	$ 531	$ 124	$116	$135
Accrual overhead exp./cow	$1,021	$ 391	$305	$323
Total accrual exp./cow	$1,964	$1,127	$676	$824
Capital Efficiency				
Total capital investment/cow	$27,959	$7,810	$5,518	$5,314
Real estate investment/cow	$21,369	$4,911	$3,418	$2,564
Machinery & Equip Inv./cow	4,230	$1,095	$ 841	$1,081
Capital turnover, years	15	16	11	8
Return on equity	(5.1)	(8.6)	(9.5)	(7.1)
Profitability				
Total accrual income/cow	$1,566	$ 806	$ 566	$ 752
Net cash farm income	$(4655)	$1,585	$(4,700)	$2,581
Net farm income w/o appr.	$(16,104)	$(4,565)	$(4,837)	$ 750
Net farm income w/ appr.	$(8,975)	$5,405	$5,176	$5,099
Return to oper.labor, mngt. & real estate ownership	$(28,742)	$(11,186)	$(11,143)	$(5326)
Return to oper.labor & mngt.	$(48,272)	$(22,553)	$(17,683)	$(7,960)
Debt Payment and Cashflow				
Farm debt /cow	$1,391	$ 593	$ 461	$ 735
Debt payment /cow	$ 389	$ 160	$ 136	$ 187
Net farm cashflow	$(21,434)	$(1,041)	$(9,906)	$(2,791)
Marketing				
# farms selling feeder calves	8	20	82	20
Average number of feeders sold	17	13	26	13
Average feeder price ($/cwt.)	$ 77.90	$ 81.87	$ 77.81	$ 79.06
# farms selling finish cattle	6	12	24	33
Aver. # of finish cattle sold	8	8	5	30
Average finish price ($/cwt.)	$ 66.65	$ 74.82	$ 70.87	$ 69.59

Selected Business Factors: Farms in Low 1/3, Middle 1/3 and High 1/3 Profitability Groups

The 154 farm summaries were sorted by net farm income without appreciation. The performance results of the 51 farms with the lowest net farm income appear in the first column. The performance factors for the 52 summaries in the middle profitability group were averaged and appear in the middle column. The average performance factors for the 51 summaries with the highest net farm income are shown in the right hand column of numbers under the heading High 1/3.

Table 18 shows some interesting trends. In these 154 cases, profitability is not strictly related to business size. The highest profit group had the largest average number of cows but the middle group had fewer cows than the lowest profit group. The total number of crop acres followed the same trend. The approximate range in net farm income without appreciation for each profit group was $ 72,000 to $ 1,900 (higher 1/3), $1,600 to negative $ 5,100 (middle 1/3) and negative $5,200 to negative $81,000 (lower 1/3).

Reproductive success was essentially the same for each profit group. However, average weaning weight and hay yield were both slightly higher in the top group.

Cost control was a strong indicator of profitability. Those summaries with the lowest costs per cow tended to have the highest net farm income. All of the cost control measures calculated except "Direct crop expenses/cow" are lower for the farms in the highest 1/3 profit group than those in the middle group and lower for the middle group than farms in the lower profit group. Two of the major expense categories, machinery repairs and machinery depreciation were highest for the low profit group and lowest for the high profit group. Machinery ownership costs are a major part of farm expenditures. To keep these costs in check the producer must limit machinery investment to the minimum necessary for the farming operations.

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 per cow and total accrual expenses per cow. The producers in the lower 1/3 group must have receipts per cow greater than $1,036 to cover operating expenses, including variable expenses such as feed and veterinary and overhead expenses such as taxes and interest. The producers in the lower 1/3 profit group must receive income/cow of over $ 1,354 to cover operating expenses plus replacement of machinery, purchased breeding stock and other capital purchases. The most profitable farms only needed to generate income of $ 452 per cow to cover operating expenses and $ 551 per cow to cover all farm expenses.

Capital efficiency is also related to profitability. The more profitable business have less capital investment per cow. However, the biggest difference in capital investment per cow is between the lower and middle profit groups. Even though they had less crop acres, the machinery investment per cow was three times greater in the lower profit group than the higher profit group.

Most dramatic is capital turnover. This is the average farm assets divided by the farm accrual receipts. It shows the number of years of income required for the farmer to "buy back" his or her asset base. The combination of higher income and relatively less capital investment allowed the higher profit group to recoup their assets in 6.4 years while the lower profit group required 17 years.

Table 18.

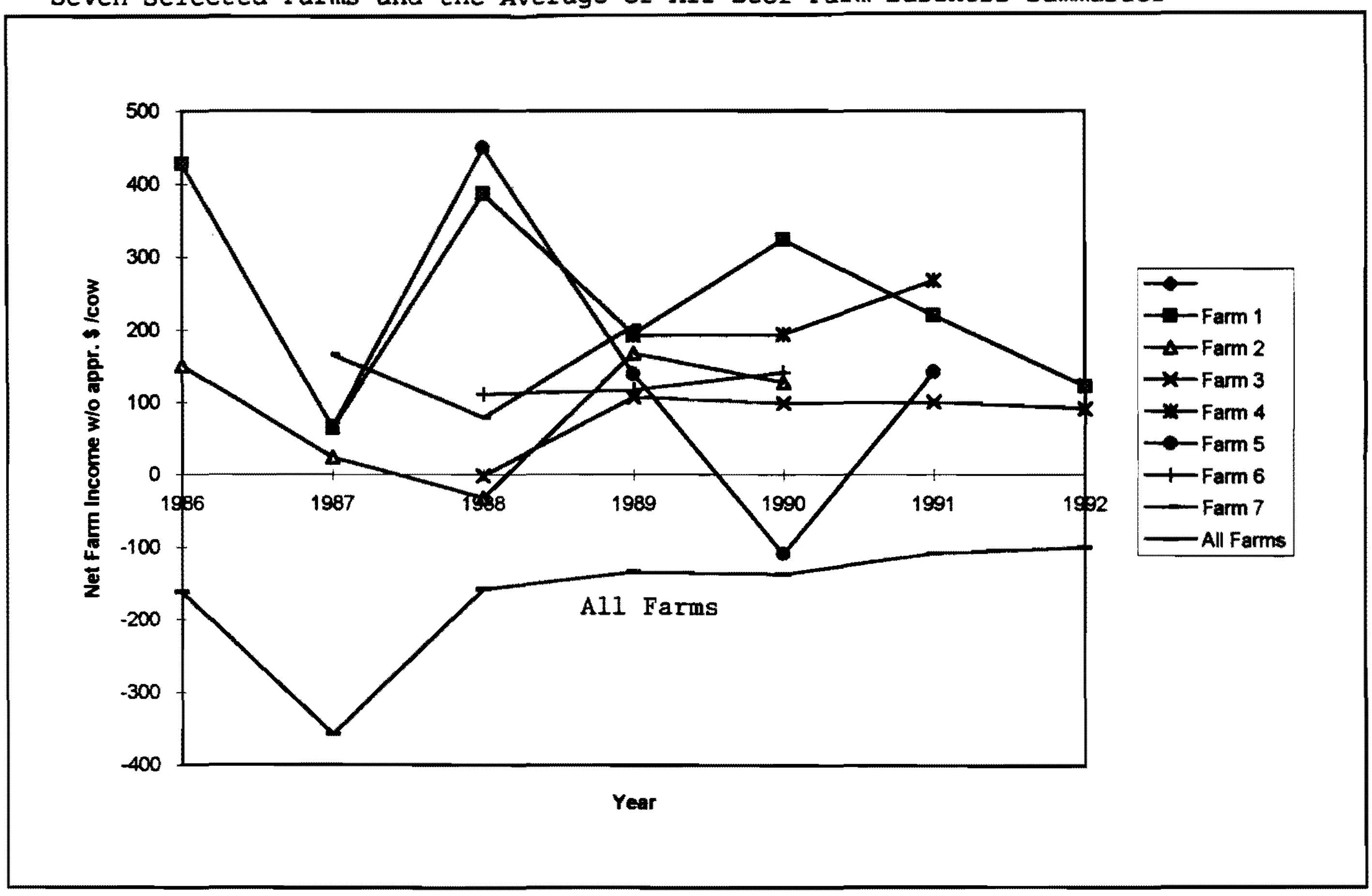
Selected Performance Factors, 1986-1992
Average of Summaries in Lower, Middle and Higher One Third Profit
Group When Sorted by Net Farm Income Without Appreciation

	Lower 1/3	Middle 1/3	Higher 1/3
Number of summaries in group	51	52	51
Size of Business			
Average number of cows	49	28	56
Breeding herd size	63	36	74
Total lbs. weaned	19,596	13,020	25,123
Total crop acres	111	88	145
Rates of Production			
Conception Rate %	94	94	96
Calves born as % cows wintered	96	95	94
Calves weaned as % calves born	92	93	93
Average weaning weight, lbs.	513	512	528
Tons hay crop (DM)/acre	2.0	1.8	2.1
Cost Control			
Purchased feed cost/cow	$ 153	$ 74	$ 60
Direct crop expenses/acre	$ 28	$ 14	$ 21
Labor & machinery cost/cow	$ 506	$240	$163
Mach.Repairs & Mach.Depr.exp./cow	$ 266	$140	$ 98
Depreciation exp./cow	$ 242	$131	$ 79
Accrual overhead exp./cow	$ 577	$307	$233
Total operating exp./cow	$1,036	$560	$452
Total accrual exp./cow	$1,354	$725	$551
Capital Efficiency			
Total capital investment/cow	$ 9,595	$ 6,652	$ 6,213
Real estate investment/cow	$ 6,047	$ 4,219	$ 4,081
Machinery & Equip Inv./cow	$ 1,921	$ 971	$ 644
Capital turnover, years	17.1	10.8	6.4
Return on equity	(13.8)	(10.5)	(1.1)
Profitability			
Total accrual income/cow	$ 696	$ 653	$ 806
Net farm income w/o appr. /cow	(658)	(72)	255
Net cash farm income	($17,050)	$ 499	$10,146
Net farm income w/o appreciation	($24,789)	($1,487)	$13,200
Net farm income w/ appreciation	($ 8,624)	$3,219	$17,898
Return to oper.labor, management & real estate ownership	($32,962)	($ 6,186)	$ 5,901
Return to oper.labor & mngt.	($45,420)	($10,665)	$ 592
Debt Payment and Cashflow			
Farm debt /cow	$ 1,113	$ 353	$ 347
Debt payment /cow	$ 282	$ 134	$ 86
Net farm cashflow	($27,953)	($2,448)	$ 7,269
Marketing			
Number farms selling feeder calves	43	41	46
Average number of feeders sold	25	19	20
Average feeder price ($/cwt.)	$76.11	$80.80	$79.06
Number farms selling finish cattle	21	25	27
Average number of finish cattle sold	11	8	28
Average finish price ($/cwt.)	$69.78	$68.27	$68.38

It is not surprising that the profit measures are linear from the higher to lower profit groups as the summaries are sorted by net farm income without appreciation. One interesting fact is that the gross accrual income per cow is $ 100 to $ 150 more for the higher profit group than the other two profit groups. The higher profit groups did not receive more per pound for their feeder or finish cattle sales but tended to sell more finish cattle that the other groups.

Note that averages for the higher 1/3 profit group were positive for all of the profitability measures, including return to operator, labor and management. These operators were able to maintain a return that exceeded all accrual expenses, a draw for unpaid family labor and a charge on farm equity.

Figure 5. Annual Net Farm Income without Appreciation, 1986 - 1992, for Seven Selected Farms and the Average of All Beef Farm Business Summaries



The same participating farms tend to be consistently profitable year after year. Figure 5 shows the annual net farm incomes without appreciation for seven farms between 1986 and 1992. These seven farms were selected because they had at least three summaries in the top 1/3 profit group. All of the collected values are shown on the graph for the seven selected farms even if a particular year's summary was not in the top 1/3 profit group. Even though the profit levels of the individual farms moved up and down from year to year, 5 of the 7 seven farms had positive net farm incomes for every year that they participated.

Table 19 shows the average annual income and expenses per cow for these same seven farms. The income statement format is adjusted to separate variable and fixed costs and the cost of livestock held for sale and breeding.

These averages are of 31 summaries between 1986 and 1992. Not all farms participated all years. The average summary had 65 cows, 187 acres tillable land, 140 acres pasture, 41 acres woods and other land and 368 acres total land base. With this land base, approximately 156 acres of crops were produced annually. The average summary had a machinery investment of $ 480 per cow and a total capital investment of $ 3,300 per cow. Mean net farm income without appreciation was $ 9,837 per year.

Accrual receipts from the beef enterprise ($ 578) covered both variable and fixed expenses. The variable costs per cow are $ 291. The average grain purchased, $ 60, may be higher than that experienced by producers selling all calves at weaning. Twelve of the 31 summaries earned the majority of their cash income from selling finished cattle. If these summaries are taken out, the average grain purchased per cow is $ 20. Total fixed expenses per cow are $ 190 and the total expenses per cow including livestock purchases is $ 497 per cow. The net farm income without appreciation is $ 145 per cow.

Even though these summaries had a positive net farm income, the calculated break-even prices for calves weaned was higher than common market prices. Of all cows exposed to the bull, 84 % wean a calf. The average weaning weight is 543 lbs. The break-even price to cover variable costs is ($291/(543 lb* .84), $ .64/lb. The break-even price to cover fixed and variable costs is $ 1.05/lb. In this case, the "average" producer is overcoming the high break-even price by adding value to the calves through feeding them to a finish weight or marketing them as breeding stock.

Table 19.

Annual Farm Income and Expenses per Cow, Average of 7 Selected Beef Farms 1986-1992[1]

Item	Accrual $ /cow	
Feeder calf sales	$ 149	
Finished cattle	241	
Breeding stock	114	
Cull cattle	74	
Accrual Receipts from Beef Enterprise	$ 578	
Other livestock	7	
Crop sales	24	
Custom work	4	
Government payments	45	
Misc. receipts	7	
Accrual Receipts from Other Sources	87	
Total Accrual Receipts	665	
less Cost feeder calves purchased for resale		23
Gross Margin		$ 642
Variable Operating Expenses		
Hired labor	$ 23	
Beef grain purchased	60	
Beef roughage purchased	5	
Other livestock feed purchased	6	
Gasoline & oil	29	
Farm auto expense	8	
Machinery hire & lease	7	
Vet & medicine	15	
Breeding expense	5	
Mktg & other beef	16	
Fertilizer & lime	30	
Seed, spray & other crop expenses	23	
Rent & lease	26	
Telephone	5	
Electricity	14	
Misc. beef expense	13	
Other operating expenses	6	
Total Variable Expenses	$ 291	
Return over Variable Expenses		$ 351
Fixed Expenses		
Machinery repairs	$ 45	
Land, building & fence repair	26	
Taxes (real estate)	20	
Insurance	15	
Interest Paid	26	
Machinery Depreciation	35	
Building Depreciation	23	
Total Fixed Expenses	$ 190	
Return over Fixed and Variable Expenses		$ 161
Breeding Livestock Purchased	16	
Total Farm Expense	$ 497	
Net Farm Income without appreciation		**$ 145**

[1] Annual average accrual income and expenses per cow of the 31 summaries collected for seven selected farms between 1986 and 1992. These summaries had an average herd size of 65 open and bred cows.

Farm Business Chart

The Farm Business Chart, table 20, is a tool which can be used in analyzing the farm business. The figure at the top of each column is the average of the top 20 percent of the 154 summaries. The second figure in the column is the average for the second 20 percent, the third for the third 20%, etc. The farms in the top 20 percent for one factor would not necessarily be the same farms which make up the top 20 percent for any other factor. Each factor is independent of all others.

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

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

Table 20. Farm Business Chart for Northeast Beef Producers[1], 1986-1992

Size of Business		Rates of Production				
Aver. # Cows	Total lbs. weaned	Conception % Rate	Calves born	Weaned/cow wintered	Aver. wean weight (lbs)	Hay Crop dm/acre
96	43,532	100	100	102	633	3.2
56	23,878	100	100	100	561	2.1
34	15,288	98	98	97	512	1.8
21	9,059	93	93	89	475	1.4
14	5,057	84	85	75	412	0.9

Cost Control						
Purch. feed cost/cow	Direct crop expense/ crop acre[2]	Hired lab&mach. cost/cow	Depr. exp. /cow	Over- head /cow	Total oper. exp/cow	Total accrual exp/cow
$ 10	$ 0	$ 76	$ 12	$ 102	$ 244	$ 320
32	6	161	55	194	398	516
65	13	228	100	274	548	682
110	26	320	164	398	717	918
266	57	720	416	883	1,498	1,923

Capital Efficiency				Financial Analysis		
Capital inv./cow	Real Est. inv./cow	Mach inv./cow	Capital turnover	Percent Equity	Average Equity	Return on Equity
$ 1,953	$ 226	$ 255	3.15	100	$ 697,987	3.31
3,623	1,648	450	5.91	100	237,667	(3.0)
5,160	2,923	719	8.81	97	160,983	(7.4)
7,430	4,651	1,063	12.24	89	107,298	(11.6)
19,060	14,299	3,369	27.85	70	49,683	(24.2)

Profitability Measures					
Tot.Acc. Inc./cow	Net Cash Farm Income	--- Net Farm Income --- w/o apprec.	w/apprec.	Return Oper., Lab,Mang&RE	Return Oper. Labor&Mnt
$ 1,458	$20,042	$ 18,583	$ 35,729	$ 11,199	$ 6,839
819	2,840	4,126	9,510	(698)	(3,518)
608	(1,059)	(1,422)	3,336	(5,590)	(10,535)
443	(4,643)	(7,193)	(2,034)	(13,209)	(20,256)
285	(27,054)	(35,055)	(24,732)	(46,238)	(63,949)

Farm Debt & Cashflow			Marketing	
Farm Debt /cow	Total Debt Payment/cow	Net Farm Cashflow	Aver. Feeder price/cwt.[3]	Aver. Finish price/cwt.[4]
$ 0	$ 0	$ 20,685	$ 96.29	$ 89.99
0	0	1,446	84.51	80.34
146	30	(3,306)	80.79	69.52
552	111	(9,923)	73.54	62.53
2,295	690	(46,369)	58.02	52.22

[1] 154 farms split into 4 groups of 31 and one group of 30 farms.
[2] 141 farms with crop production greater than 0 acres.
[3] 130 farms with feeder calf sales greater than $ 0.
[4] 71 farms with finish cattle sales greater than $ 0.

Conclusion

Over seven years from 1986 to 1992, 154 farm summaries were collected which had a herd size of 10 cows or more. These 154 farm summaries represented 71 individual farms. The "average" farm participating in the "average" year had negative net farm income of about $ 4,000 without appreciation and a positive $ 4,000 return when appreciation of assets was included in the profitability measure. Even though the aggregated median values of all participants are fairly consistent from year to year, the financial performance reported in the individual summaries varied dramatically from producer to producer.

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 or to provide a competitive return to labor, management and investment.[1] 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.

It may be true that in any industry as competitive as the beef industry, the <u>average</u> producer will not be profitable. In this highly competitive business only the <u>above average</u> producers are profitable. Krause points out that "A break-even or positive return after replacement costs and a positive 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]

Between 1986 and 1992, the participating farmers received annual net farm incomes (without appreciation) that varied between positive $ 72,000 and negative $ 81,000. The percent variance of the profitability measures were from 477 to 884 percent. Table 14 and Figure 3 show how widely one profitability measure, net farm income without appreciation varied from summary to summary. The majority of participants had break-even or slightly negative net farm income, a few summaries had very negative net farm incomes and a few summaries had very favorable net farm incomes. When the data was sorted by net farm income, many of the same farms were in the most profitable group consistently year after year.

Almost all of the summaries reported very good to excellent herd productivity. Yet profitability was extremely variable. Excellent productivity is a prerequisite but not 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.

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[1] Krause, Kenneth R. <u>The Beef Cow-calf Industry, 1964-87</u>. USDA ERS Agricultural Economic Report No. 659. June 1992.

[2] Krause. Ibid.

The 154 summaries in our study had a unexpected relationship between business size and profitability. The smallest businesses (as measured by total pounds weaned or average number of cows) had the lowest average profitability measures. Farm enterprises require substantial capital investment. If the farm does not have the production base sufficient to cover the capital investment, the farm cannot be profitable. However, surprisingly, the largest herds in this analysis were not as profitable as the middle sized herds. Increasing business size will only increase profitability if the business has a positive return over variable costs. In this data set, several of the summaries submitted which had large herds did not have farm income sufficient to cover variable costs. Increasing herd size in this case results in increasing losses.

Reasonable per cow input costs and capital investment were the best indicators of farm profitability. All farm inputs must be kept to a minimum while retaining high production levels. Producers must recognize that nationally beef cattle are byproducts of excess land and available operator and family labor. The profit margin is narrow under the best conditions. To be profitable, the producer must be able to economically justify every farm cost outlay.

The single largest expense item on the average summary was **machinery depreciation**, followed by **feed purchases** and then **machinery repairs**. Two of the major expense categories, **machinery repairs and machinery depreciation were highest for the low profit group and lowest for the high profit group.** Machinery ownership costs are a major part of farm expenditures. Many of the beef herds in the U.S. are on farms where beef is a secondary enterprise. On these farms, the machinery costs are covered by other enterprises. This is not the case on the majority of Northeast beef farms. **To keep these costs in check the producer must limit machinery investment to the minimum necessary for the farming operations.**

The second largest expense category was feed purchased. The average summary reported grain purchases of $ 68 per cow and roughage $ 28 per cow. Good pasture management is the key to lowering cow herd feed costs. Grazing must account for a high proportion of the feed for the cow herd. In competing beef production regions, 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.

A problem on many of the farms in this study is cost allocation. For many of the participants, the farm is primarily a rural residence. Yet, when the beef business is analyzed, all or a disproportionate percentage of costs which would be incurred without the beef cattle, such a mortgage interest, property taxes and insurance, are allocated to the beef enterprise. Careful allocation of costs between non-farm and farm uses will result in more accurate records. Accurate records lend themselves to better farm management decisions. Farm financial analysis can also promote understnding of the contribution of the beef herd to asset appreciation and gain in net worth.

Producers who considered the beef enterprise a part-time business achieved the same level of herd productivity as those considering it a full-time business. Part-time beef farms has slightly lower net farm income on average than full-time business. However, full-time status did not necessarily generate profitable businesses. The average full-time beef farm summary had a net farm income without appreciation of negative $ 3,515.

The farms participating in the Beef Farm Business Summary Program from 1986-1992 had four major sources of cash income: sale of feeder calves, breeding cattle, finish cattle and crops. When records are sorted by the major source of cash farm income, those with the major proportion of income from crop sales have the lowest net farm income and those with the major proportion of income from finish cattle sales had the highest net farm income. The summaries which had the largest share of cash income from crop sales also had the most tillable acres available. Are these producers raising and selling crops because it is the best economic use of that land ? Would the producers who sell their cattle at feeder weights be more profitable if they fed the calves to a backgrounded or finished weight ?

The only way to determine the answers to these questions is by constructing enterprise budgets for each crop and livestock enterprise on each unique farm. An enterprise is a segment of the farm which produces a product. Example enterprises are hay, corn, cow-calf, and feedlot. The goal in enterprise analysis is to determine as accurately as possible how much it costs to produce a product (a feeder calf, a ton of hay, etc.)

Enterprise budgets can help make informed decisions that can be critical to the success of the business. When machinery operating and ownership costs are allocated to the appropriate enterprise, the production of crops on small acreage becomes very expensive. Northeast beef producers should take a serious look at their crop enterprises. In many cases custom hiring the crop production, purchasing the feed, or substituting high quality pasture will be a more economic means of feeding the beef herd than farm produced feeds.

In addition to enterprise budgets, a goal oriented whole farm business plan is necessary to run a profitable farm business. The producer must analyze the relationship between fixed and variable farm expenses and determine if the business has a positive return over variable costs before increasing business size. To objectively critique their farm, producers must have accurate records.