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Financial Management on Large Dairy Farms

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Financial Management on Large Dairy Farms

Eddy L. LaDue[1]

Thank you Don. I would first like to say how happy I am to be here. This group sets the standard for lending to agriculture in the Northeast. It is always an honor to talk with you about one of my favorite subjects.

What I would like to do in the next few minutes is to talk with you about a couple of financial management issues. First, I would like to look at the issue of maximum debt levels. There is a lot of talk about maximum debt per cow and minimum equity levels. I would like to look at those issues.

Then, I would like to think with you about the financial management process. Farmers, lenders, and professors have developed an appreciation for production management and some of the numbers to monitor that process. Everyone talks about milk per cow. However, we need to develop that same awareness and level of monitoring for financial management.

Maximum Debt Per Cow

Debt per cow is an easy number to obtain and an easy number to understand. It would really be nice if we could have a neat little rule of thumb that says the most debt a farm should have is $2,000 per cow and most farms can handle about that amount. If you are willing to state such a rule of thumb, you will be quoted by every farm magazine that is published. The real question is, does such critical value exist? Does it exist for large farms?

To look at this issue, I used our Dairy Farm Business Summary data for farms with herds over 100 cows. My basic principle in this analysis is that the maximum debt that a farm can handle is the amount of debt on which the farm can make the payments. I started by calculating the amount of funds that were available for debt service, basically net farm income plus depreciation and interest, minus family living expenses. I then took the typical credit terms that farmers could get in that year[2] and calculated the debt service for an average dollar of debt. Dividing the amount available for debt service by the amount required to service an average dollar of debt gives the maximum debt on which the farm can make the payments. Dividing that by the number of cows gives the maximum debt per cow that farm can handle. Figure 1 presents a scatter diagram of the maximum debt per cow by herd size.

Now, if there were a natural maximum debt per cow or a magic maximum debt per cow, there should be some clustering of the values at some level. If $2,000 were the natural maximum, we should see a clustering of the values around or just under $2,000. However, that is not what we observe. The graph looks almost random. Regardless of the size of farm, some farms can make the payments on a much higher level of debt than others. With our rule set at any reasonable number, there are some farmers who could make the payments on a much higher level of debt. These farmers are going to be unhappy that you are limiting their growth and may consider going elsewhere for financing. There are another group of farms that in reality cannot make payments on much debt. These farmers will be happy with you that you are willing to lend them so much money. But, will likely end up being problem loans that use a lot of your time and

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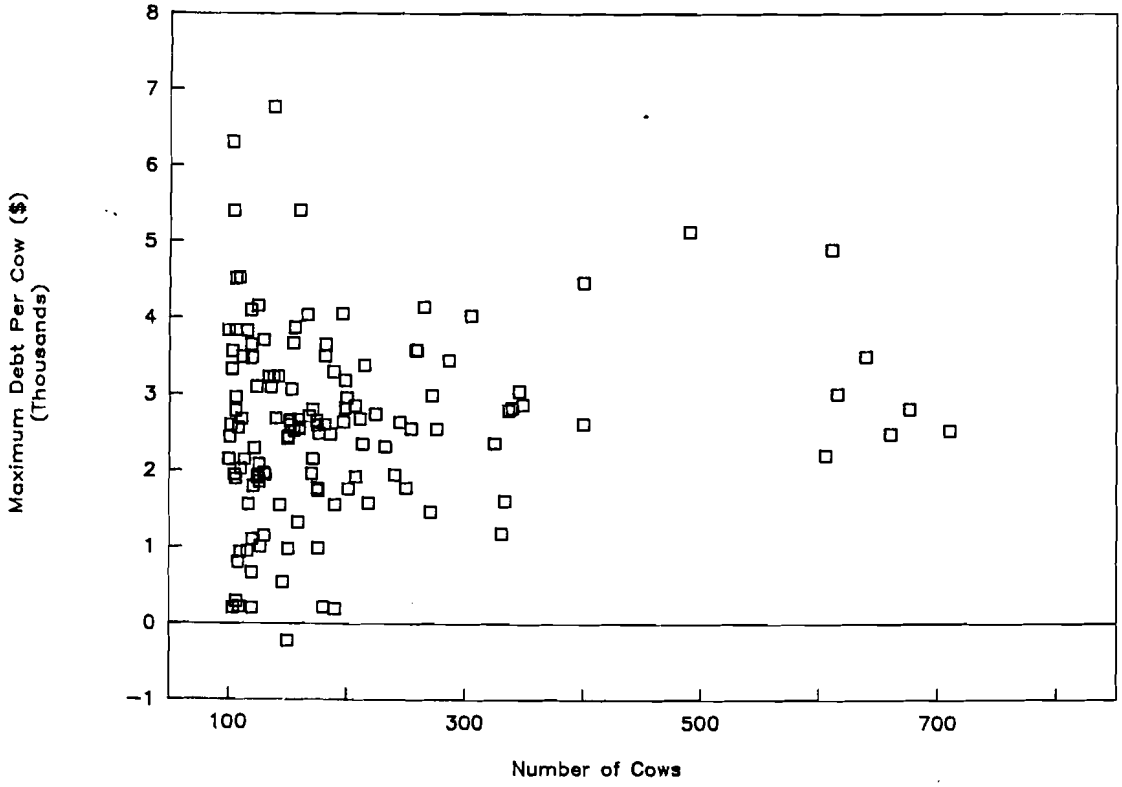
[1] Professor of agricultural finance, Department of Agricultural Economics, Cornell University. This paper was presented at the Large Dairy Farm Seminar and Tour sponsored by the Springfield Farm Credit Banks at the Sheraton Inn, Ithaca, New York, June 29, 1993.

[2] Credit terms were 45 percent nonreal estate debt financed over five years and 55 percent real estate debt financed over 25 years. Interest rates for 1991 and 1992 were 8.5 and 8.0 percent for nonreal estate debt and 9.0 and 8.25 for real estate debt, respectively. Debt service payments per $1,000 of loan were $166.18 for 1991 and $161.53 for 1992.

may find their way into your adversely classified or high risk lists. In fact, the biggest problem with use of a rule of thumb on maximum debt per cow is that if you set the level at any reasonable level, there will always be a number of people who cannot handle that much debt. Some farms cannot handle even $500 of debt per cow.

Figure 1. **Maximum Debt Per Cow by Herd Size**
133 New York Farms With 100 or More Cows, 1992



However, we all know that maximum debt carrying capacity is not a random number. There are some general relationships between some frequently used management factors and the maximum debt that a farm can carry. When we sort these farms by production level (Figure 2), we find that those with higher levels of milk per cow can handle higher debt levels. However, notice the 1991 data for farms with over 21,000 sold. Getting this higher level of production was not worth the cost at 1991 milk prices. It did provide some modest gain at 1992 prices. At least some people are paying too much to get to those higher levels. Some farmers get caught in the "holy grail" of higher milk production and it is not profitable for them.

Labor efficiency is also related to maximum debt (Figure 3). Farms selling less than 600,000 pounds per worker can handle less debt per cow than those with higher efficiency. Cost control is also related to maximum debt (Figure 4). Farms with over $5.50 in feed and crop costs per hundredweight of milk are less profitable and, thus, can handle less debt. Based on the results of these calculations for the last several years, I would take the 1992 results for farms with less than $3.50 with a grain of salt. In most years the debt capacity level is fairly flat for costs under $5.00.

Herd size has little effect on the maximum debt **per cow** (Figure 5). There may be a little gain for those over 200 cows, but it is modest. Those large farms can handle more debt per farm, but not much more per cow. Once you get farm size up to 100 cows there are a variety of ways to make efficient use of capital investment. There is not much relationship between capital efficiency as measured by the asset turnover ratio and the maximum debt a farm can handle (Figure 6).

Figure 2. **Maximum Debt Per Cow by Production Level**
Farms With Over 100 Cows

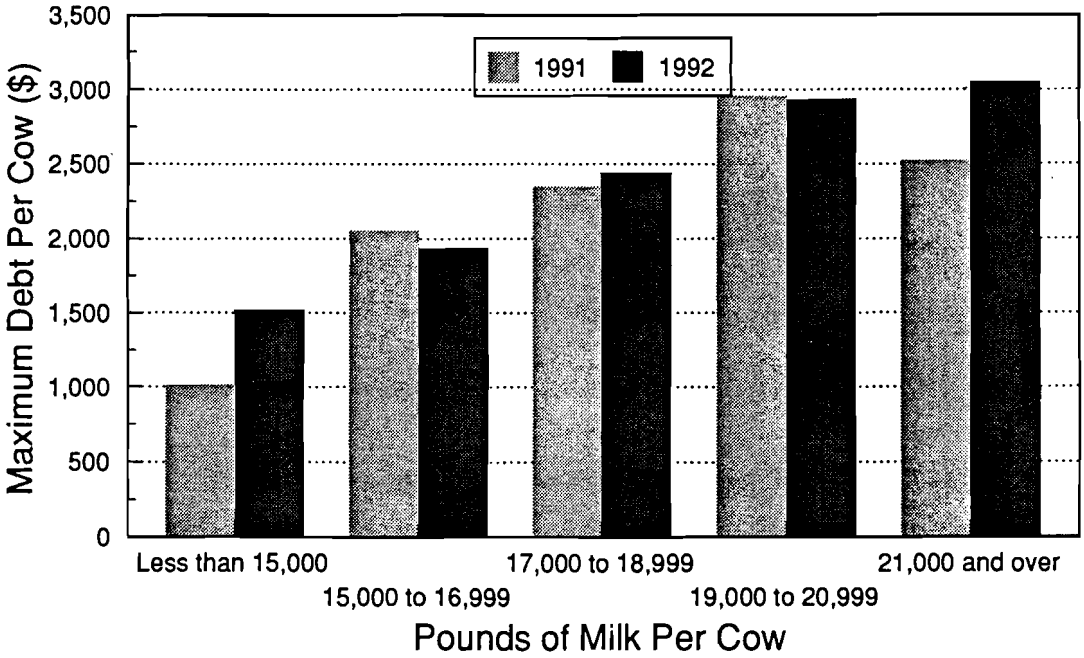


Figure 3. **Debt Capacity Per Cow by Labor Efficiency Level**
Farms With Over 100 Cows

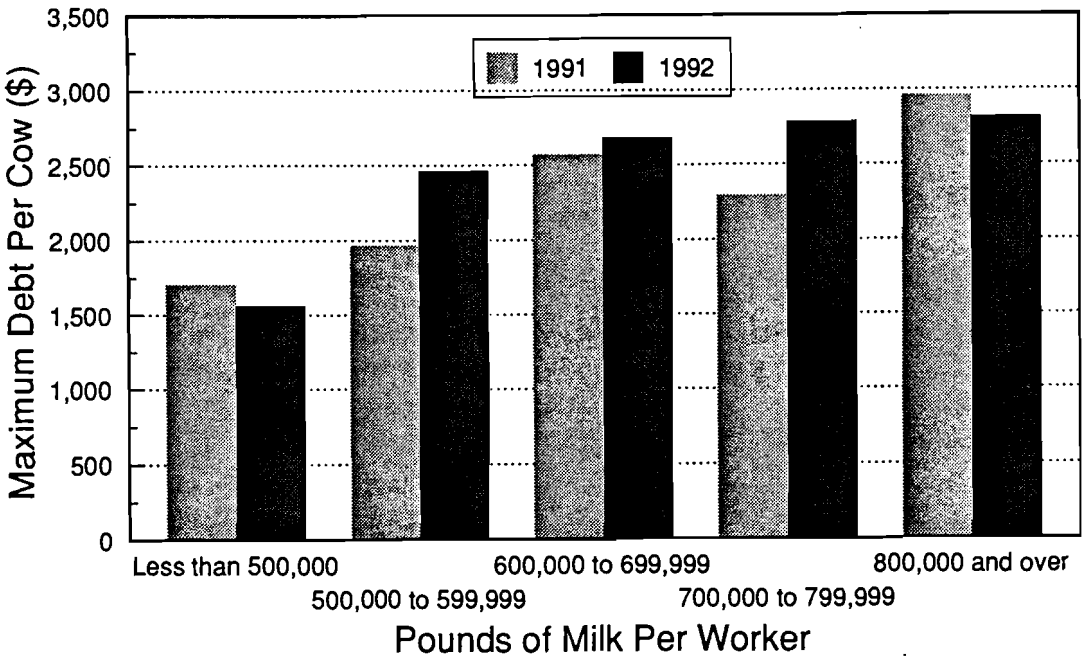


Figure 4. **Debt Capacity Per Cow by Cost Control Level**
Farms With Over 100 Cows

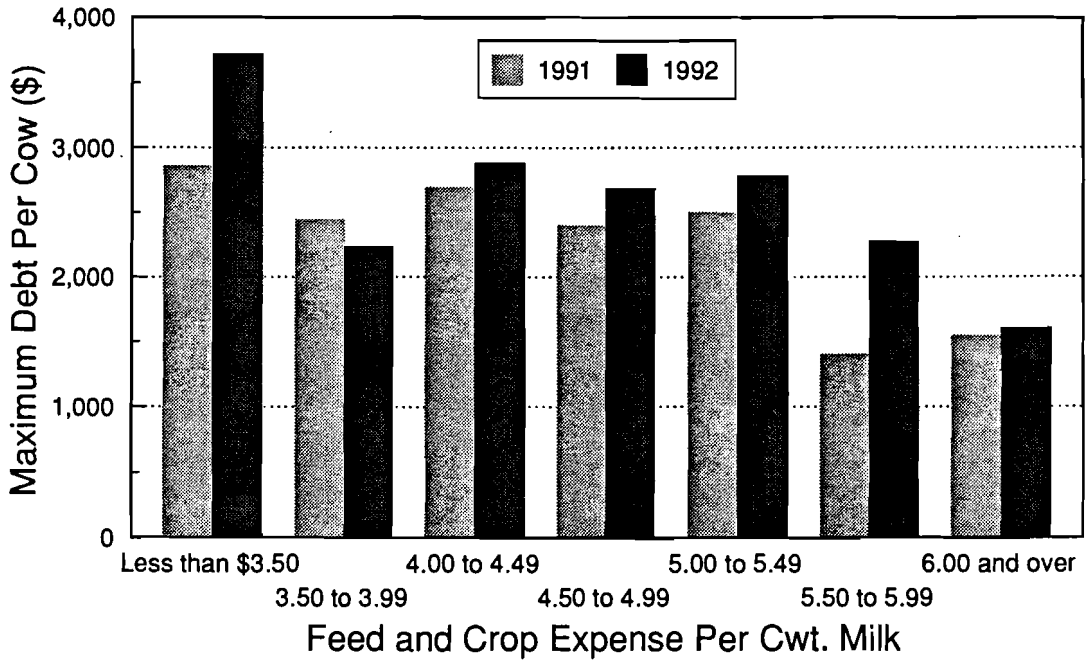


Figure 5. **Debt Capacity Per Cow by Size of Business**
Farms With Over 100 Cows

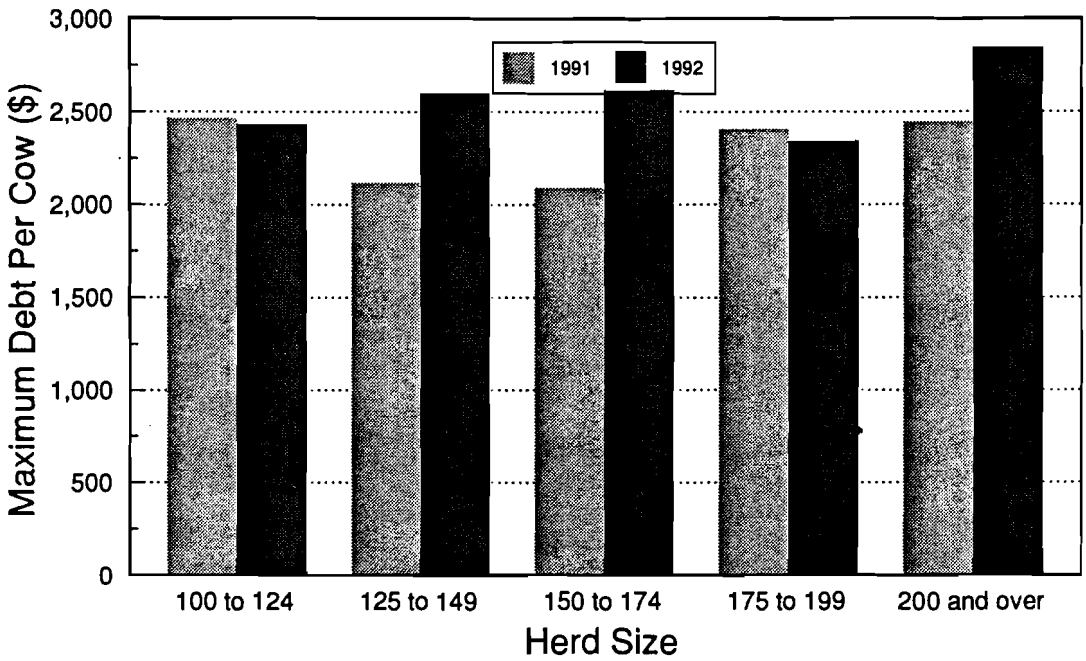


Figure 6. **Debt Capacity Per Cow by Capital Efficiency Level**
Farms With Over 100 Cows

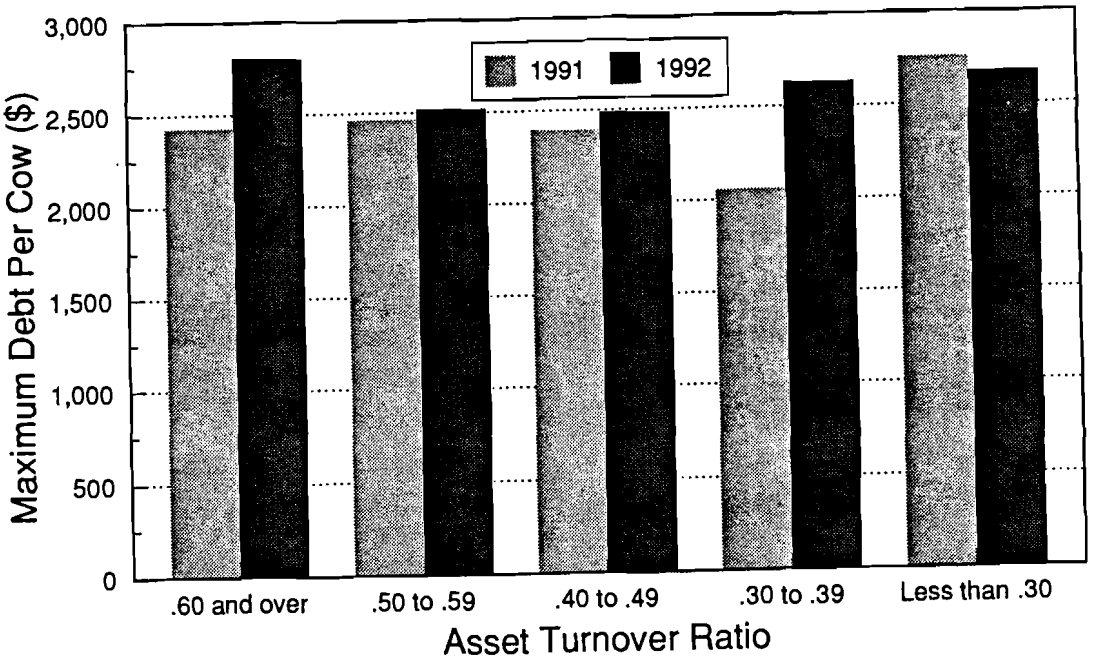
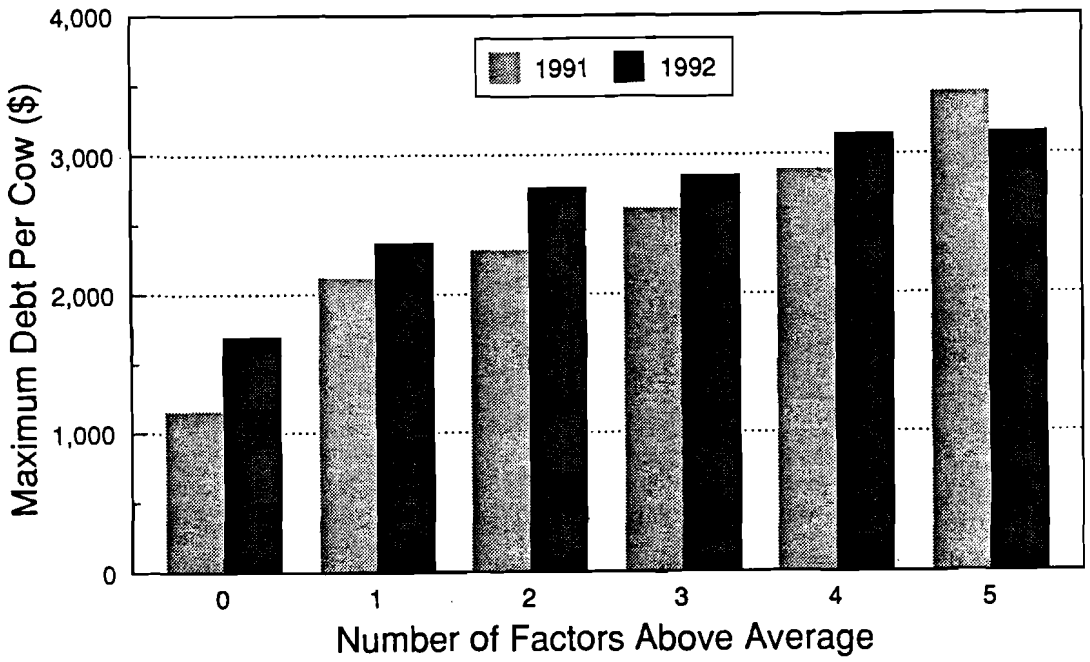


Figure 7 measures overall management ability in a rather weak way by just counting the number of those factors looked at in Figures 2 through 6 that are above average. That is, milk per cow, milk per worker, herd size, feed and crop expense per hundredweight of milk, and asset turnover ratio. When we put all these factors together and look at different levels of management we see that well managed farms can handle over twice as much debt per cow as less well managed farms.

Figure 7. **Debt Capacity Per Cow by**
Combined Management Performance
Farms With Over 100 Cows



Where does all of this lead me? It leads me to say that you should avoid lending, or not lending, based on debt per cow. To decide how much debt a farm can handle, we need to calculate it for the farm in question. This means calculating it for prior years from actual data and estimating it for the future when a change is being made. For major expansions estimates should be made for next year (the transition year) and for an average future year after the expansion is completed, under the assumption that no other changes take place in the business. And, as part of this analysis, sensitivity analysis should be conducted. Can the business make the payments with a five or 10 percent decrease in milk price or production? Can it handle a three percent increase in interest rates?

Preferably the farmer should develop his or her own budget. This gets them involved in thinking about what the future is really going to be financially, and gets them more committed to meeting the budget and using the budget to monitor progress of the business. Realistically, the best you can do on some farms, at least in the short run, it to get them involved with you in preparing the budgets for the future. I will have more to say about this in a few minutes.

Minimum Equity

I will now move on to my second topic, minimum equity. The farmer's equity in his or her business is the farmer's cushion against failure of the business and it is the lender's cushion against loan losses. You do not lose your first dollar until the farmer loses his or her last dollar. As the level of equity declines, the risk to both parties increases.

One of the elements of that equity position that has frequently been ignored is the deferred taxes. That is, the income taxes that the farmer would have to pay if that farm were sold (either voluntarily or involuntarily).

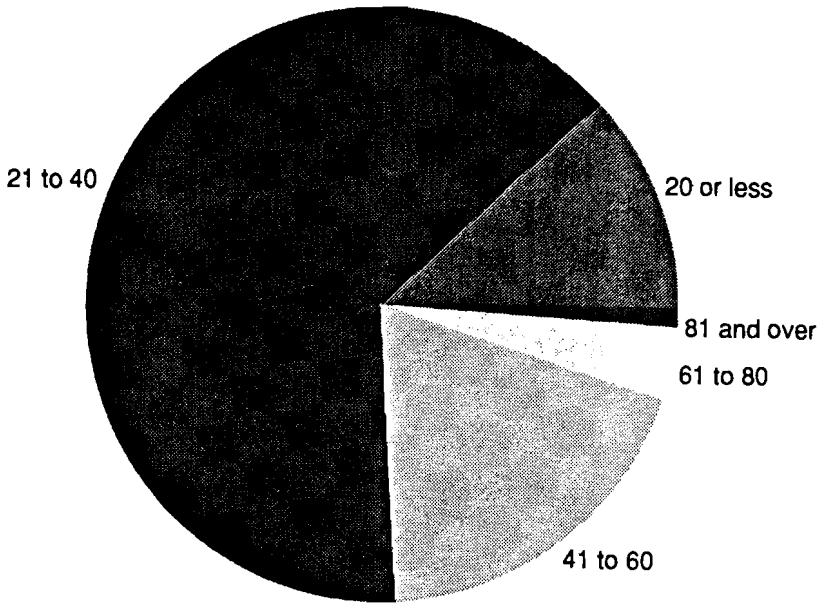
Last summer we collected data on a group of farms that would allow us to calculate the tax that would have to be paid if those businesses were sold on the date of the balance sheet. We estimated the increase in taxes that would be paid for the year with sale for each farm. The basic results are shown in Table 1. Some self employment taxes would have to be paid. This results from the sale of current assets, like feed and crops, that result in ordinary earned income. State taxes are important in a state like New York. If you are from New Hampshire, state taxes are not important, but for the high tax states like New York or Massachusetts, they are very important. Federal taxes, of course, represent the large tax liability. Clearly, deferred taxes are important. It is not a small number. It is a large number that significantly influences the amount of equity the farmer really has.

Table 1. Deferred Taxes by Farm Size
81 New York Dairy Farms, December 1991

Total Farm Assets	No. of Farms	Self Employment Tax	State Tax	Federal Tax	Total Deferred Tax
Less than 400,000	16	2,541	10,418	34,167	47,126
400,000 to 599,999	22	4,405	21,808	73,177	99,391
600,000 to 799,999	16	5,667	28,192	100,508	134,367
800,000 to 999,999	9	8,852	42,254	141,220	192,326
1,000,000 or more	18	8,506	74,039	251,587	334,132

For the average farm in this group, deferred taxes amounted to one-third (33 percent) of the total equity calculated without consideration of the deferred taxes. That is one-third of what the we and the farmer have been calling equity is really money that would be paid to Billery, Mario, and for self employment tax. About two-thirds of the farmers would lose 20 to 40 percent of their equity to taxes (Figure 8). Another fifth (19 percent) would lose about half, and a few would lose most of their equity.

Figure 8. **Distribution of Deferred Taxes as a Percent of Farm Net Worth Without Deferred Taxes 81 New York Dairy Farms, December 31, 1991**



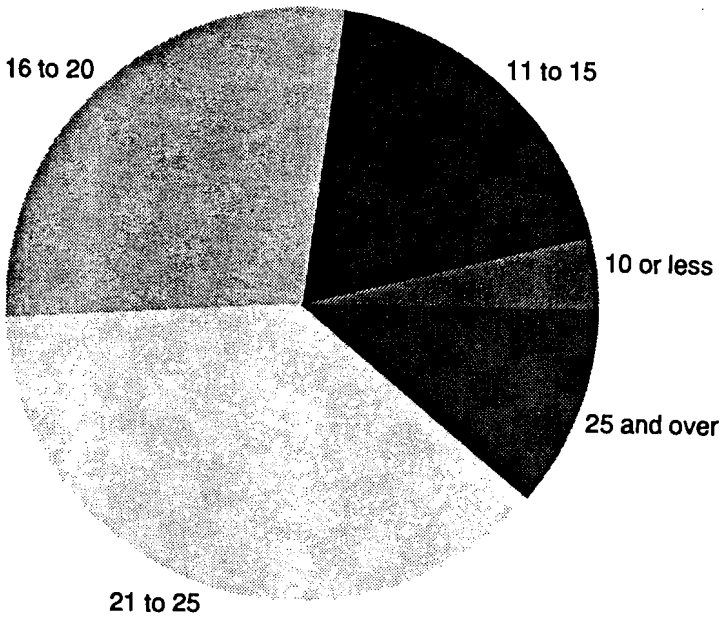
Deferred Taxes as Percent of Net Worth	Percent of Farms
20 or less	12
21 to 40	64
41 to 60	19
61 to 80	4
81 and over	1
	Average Deferred Tax as Percent of Net Worth
All Farms	33

The worst situation, in terms of deferred taxes wiping our equity, is a farm that has been in business for a long time, so that assets have increased in value, but the business has not been very profitable so that the family has borrowed against and used up the equity gain from appreciation. These people end up with a low tax basis and very little equity.

Data on equity loss is, of course, looking at the effect of two variables, the amount of debt used in the business and the tax basis of the assets. A somewhat more stable way of looking at

the magnitude of deferred taxes is to compare the tax to the value of total assets (Figure 9). For these farms, average deferred taxes represented 19 percent of the value of total assets. Further, for two-thirds of the farms deferred taxes represented between 16 and 25 percent of assets and for 85 percent of the farms they represented between 10 and 25 percent. Thus, as a short cut we might say that deferred taxes are likely to represent about 20 percent of asset values on most farms.

Figure 9. **Distribution of Deferred Taxes as a Percent of Farm Assets 81 New York Dairy Farms, December 31, 1991**



Deferred Taxes as Percent of Assets	Percent of Farms
10 or less	4
11 to 15	19
16 to 20	28
21 to 25	38
26 and over	11
	Average Deferred Tax as Percent of Assets
All Farms	19

One of the things that we learned doing this study is that farmers are aware of the contingent liability that taxes represent and were very interested in getting an estimate of its magnitude. For the most part, they can avoid these taxes only by dying. The amount of the tax can be minimized by selling to the next generation over time or splitting the farm sale into two years in order to stay in low tax brackets, but the tax cannot be avoided.

Now I know that most of you have had the opportunity to learn taxes and do taxes, so you know just how much work it would be to estimate the taxes for individual farms if you went through

all the forms and made all the calculations. Thus, you are likely setting there thinking, no way are we going to go through that for every balance sheet. I do not think you need to. You could use the 20 percent of assets rule for a rough guide or you could use a brief form like Table 2 with approximate values to get good enough estimates. Table 2 takes the market value of the major assets that would generate taxes, combines that with the tax basis and estimates the tax. I have a table that should let you make a closer estimate of the average total tax rate. In some cases the rate gets into the 35 percent range. But, the 30 percent number is a decent estimate for many farms. What we need is an approximation of deferred taxes, not an exact calculation. The issue is whether the value is approximately $472,000 or $372,000, not whether it is $472,500 or $472,400.

Table 2. Rough Estimate of Deferred Taxes

	Market Value	Tax Basis	Taxable Income
Accounts Receivable	100,000		100,000
Crops and Feed	270,000		270,000
Supplies	25,000		25,000
Livestock	750,000	120,000	630,000
Machinery	445,000	275,000	170,000
Real Estate	1,350,000	900,000	450,000
Other			
Sub-Total			1,645,000
Residences in R.E.	75,000	35,000	(-) 40,000
Accounts Payable	30,000		(-) 30,000
TOTAL			1,575,000
Approximate Average Total Tax Rate			.3
Deferred Tax			472,000

Now I will finally get to my real point on deferred taxes. That is, do not lend the farmer into a negative or near zero real equity position. If you have assets listed at market value without subtracting selling costs and you do not list deferred taxes on the balance sheet, a farmer with 30 percent equity could very easily have a real equity of zero or worse. That is a very risky position for the farmer and it is a very risky situation for you, the lender. There is really no cushion to fall back on in case of a natural calamity or a run of bad luck, such as drought, a 1992 style flood, a disease problem or a sharp dip in milk prices. A lot of people with 20 to 40 percent equity really have zero equity. Some of the "giant step" expansions will put farmers into a zero or negative real equity position. These farms should develop an expansion plan that spreads the expansion over a number of years. A series of "small steps of progress" may be a lot less risky for all involved.

Financial Management

I would now like to turn to a discussion of some thoughts on financial management per se. Over the past several years, or few decades, farmers have become more familiar with production management measures, such as milk per cow, services per conception and calving interval. Farmers know what these numbers mean, they are generally accepted as indicating something

important to the farm business, and farmers generally know the values of these variables for their farms. If you ask a farmer what this milk production per cow is, he will not usually ask, why do you want to know that? He will usually give you a number, either from memory of the actual current number or an estimate.

Because of this level of understanding and acceptance, these production ratios have become useful as indicators of performance. The farmer will adopt practices that are expected to improve production per cow. He or she will evaluate production practices based on the influence the practice has on production per cow. It provides a short cut language for talking about the effect of making changes in the business.

These have been, and continue to be, very important measures for the business. A great deal of progress has been made through their use. The major problem, of course, is that they only relate to part of the business; the dairy herd itself. All of the rest of the business, the cropping program, the marketing program and the financing program are completely excluded when we use these ratios. They are not true indicators of the success of the business.

What we need to do is raise the level of understanding and awareness of important financial ratios or measures to the same level as milk per cow. We need to get farmers to understand important financial measures. We need to get farmers to thinking about important financial measures. We need to get farmers to the position where they know those important variables for their farm; and make decisions based, at least in part, on how the change will influence those important financial variables.

In order to accomplish this, I think we need to do three things. First, decide which financial ratios are really the most important and how they are to be calculated. In analyzing businesses, we have developed a large number of measures and ratios to help in the financial analysis of a business. They are all useful in some instances. But, some are generally more useful for most farms. We need to identify the most important ones.

Second, cull this list of ratios down to few enough measures that they will fit in one head that also has some other things in it. I know that if this group sat down to identify the important ratios, it would be a long list. We have to say to ourselves, if the farmer is going to know and remember only one ratio, or three ratios, or at the outer limit, five ratios, which should he or she know. That means we are all going to have to relegate one or two of our pet ratios to the second string, and all agree to focus on the same starting five, or three, or one.

Third, we must start focusing on and using these ratios ourselves. We need to calculate these ratios for each farm situation. We need to talk to the farmer about these ratios when we are analyzing a loan, talking about possible changes in the business or discussing the progress made by other farmers.

The Fabulous Five

To get the process started, I would like to give you my nominations for the short list. The Farm Financial Standards Task Force was given the task of identifying the important ratios used in the United States and developing standardized ways for calculating those ratios. What I am suggesting will take off from their recommendations. The Task Force recommended five ratio categories for financial analysis. They are repayment capacity, solvency, profitability, financial efficiency and liquidity. My strategy is to select the most useful and used ratio for each of those categories. In fact we are seeing a convergence nationwide on selection of the most used ratios.

Since there are five categories, my short list is called my fabulous five or my starting five. Hopefully this starting five is good enough that they would be able to achieve at least a three-peat in financial management. But, at least it is a place to start. In what follows I will present for each ratio (1) the name and definition of the ratio (to be sure we are really talking about the same ratio),

(2) an example calculation for Three-Peat Farms, (an example large dairy farm, see Table 3 for summary data on Three-Peat Farms), and (3) some data on strong and weak values for these ratios from Cornell's Dairy Farm Business Summary program. You also have data from Agrifax and your benchmarks to provide similar guidance. In fact, your sample may be a little better in that the Cornell sample likely has a higher proportion of farms with problems than your samples, and certainly your benchmarks, would have.

Table 3. Summary Financial Data Three-Peat Farms, 1992

Gross Receipts (accrual)		$1,575,000
Total Accrual Operation Expenses	$1,200,000	
Depreciation	130,000	
Interest	110,000	
Total Expenses		$1,440,000
Net Farm Income		$135,000
Net Nonfarm Income		0
Family Living (including taxes)		75,000
Value of Family Labor & Mgt.		60,000
Annual Debt Payments (on term debt)		$250,000
Current Assets	425,000	
Non-Current Assets	2,575,000	
Total Assets		3,000,000
Prin. Due in 12 Months	$140,000	
Other Current Liabilities	150,000	
Total Current Liabilities	290,000	
Non-Current Liabilities	1,110,000	
Total Liabilities		$1,400,000
Total Equity		$1,600,000

Debt Coverage Ratio (Repayment Capacity)

The most important financial characteristic of a farm business is whether it can make its payments or not. If there is excess repayment ability, this can often overcome most other shortcomings. The debt coverage (term debt and capital lease coverage) ratio is the best measure of repayment ability because it is a direct measure of exactly whether payments can be made and how much cushion or excess the farm has. Thus, the Michael Jordan of my fabulous five, is the debt coverage ratio.

Certainly, one critical value for this ratio is one. That is necessary for the farm to make its payments from operation of the business rather than further borrowings. However, most people do

not feel very comfortable unless the ratio is above 1.1. A value of 1.5 would generally be considered strong. Hopefully, you do not have anyone in your portfolio from the bottom half of our Dairy Farm Business Summary Cooperators (Table 4).

$$\text{(Term) Debt (and capital lease) = Coverage Ratio} = \frac{\text{Net Farm Income and Nonfarm Income plus Depreciation and Interest minus Taxes and Family Living}}{\text{Principal and Interest on Term Debt plus Lease Payments}}$$

Example: 3-Peat Farms

$$\frac{135{,}000 + 0 + 130{,}000 + 110{,}000 - 75{,}000}{250{,}000} = 1.2$$

Table 4. Quartile Average Debt Coverage Ratio for Dairy Farm Business Summary Farms, 1992

	100-199 Cows	200+ Cows
1. Top 25%	1.96	2.80
2.	.99	1.06
3.	.68	.87
4. Bottom 25%	.14	.44

Percent Equity (Solvency)

Everyone can agree that solvency is important. You could use the debt/asset ratio, leverage ratio or the percent equity. They all give you the same information. I chose the percent equity because it is something that most farmers understand and use (Table 5). It is an old stand-by for people in the eastern part of the United States

Most people like to see values above 50 percent. Values below 30 when deferred taxes are not on the balance sheet are frequently in reality zero, and thus, represent high risk. Those in the 30 to 50 percent range need careful attention. There is, of course, a trade-off here. You can not lend much money to a farmer and keep the percent equity very close to 100 percent! Expansions, and particularly the lost capital in large buildings, can really give percent equity a hit.

$$\text{Percent Equity (equity/asset ratio) =} \frac{\text{Total Farm Equity}}{\text{Total Farm Assets}}$$

Example: 3-Peat Farms

$$\frac{1{,}600{,}000}{3{,}000{,}000} = 53$$

Table 5. Quartile Average Percent Equity for Dairy Farm Business Summary Farms, 1992

	100-199 Cows	200+ Cows
1. Top 25%	92	77
2.	71	60
3.	58	51
4. Bottom 25%	38	37

Operating Expense Ratio (Financial Efficiency)

I vacillate on the best financial efficiency measure to use. Historically, I have recommended the asset turnover ratio. However, the operating expense ratio appears to be gaining ground in a lot of the country. The operating expense ratio indicates the proportion of income used for operating expenses; that is, how efficiently does the business use operating inputs. It has the advantage of being easier for farmers to understand. It can be calculated and have meaning on a monthly or quarterly basis.

The operating expense ratio does not account for operator labor, and thus, tends to increase slightly as farm size increases because operator labor represents a smaller proportion of the total expense (Table 6). However, it tends to decline as the number of operators increases. It is easier to get a lower value with more operator labor. For example, the average values are generally significantly lower for farms with more that 2.5 operator/manager equivalents than those with essentially one operator. This is something you need to be aware of when interpreting the value of the ratio.

In total, however, an operating expense ratio of under 65 is very good. A value over 80 is often the sign of trouble.

$$\text{Operating Expense Ratio} = \frac{\text{Total Accrual Operating Expenses (excluding interest and depreciation)}}{\text{Gross Revenue (accrual)}}$$

Example: 3-Peat Farms

$$\frac{1{,}200{,}000}{1{,}575{,}000} = 76$$

Table 6. Quartile Average Operating Expense Ratios From Dairy Farm Business Summary Data, 1992

			Operating/Manager Equivalent (≥ 100 Cow Farms)		
	100-199 Cows	200+ Cows	< 1.5	1.5 - 2.5	>2.5
1. Top 25%	63	64	65	62	61
2.	71	73	74	70	68
3.	77	78	79	76	75
4. Bottom 25%	86	86	89	80	85

Return on Assets (Profitability)

Most other businesses talk about return on assets. In my opinion, it is the best measure of total financial performance. We should encourage farmers to think more about it. Some investment hot-shots that go around the country telling people how to become millionaires focus on ROE (return on equity). I think this is dangerous. Many farmers who focused on ROE in the 1970's went out of business in the 1980's. We have to be careful in comparing farm and nonfarm ROA's, however, since those other businesses usually talk about return on book value and farmers

talk about return on market value of assets. As a rough rule of thumb, multiplying the farm value by two gives a value to compare to nonfarm businesses[3].

There are really two ROA's that we can look at. The normally used one that results from the definition I have used here is really the ROA from operation of the business. It does not include the return from owning the business. If the farmer invested the money in the stock market instead of the farm, we would expect the change in the value of the stock would be a very important part of the total return. Historically, increases in the prices of assets have been very important to the wealth of farmer. Our experience with the 1980's indicates that even farm assets do not always increase in price. But, if the prices of capital assets do increase or decrease, that is part of the return to owning the farm business. Therefore, a ROA that includes the change in asset values is useful in assessing the farm as an investment.

All that said, however, I think we should focus the farmer's attention on the return from operating the business. Thus, the reason for selecting this definition. We are concerned if this ROA falls below one or two percent and should be happy if we get numbers of eight percent or above.

$$\text{ROA (return on assets)} = \frac{\text{Net Farm Income plus Interest minus Unpaid Family Labor and Management}}{\text{Average Total Assets}}$$

Example: 3-Peat Farms

$$\frac{135{,}000 + 110{,}000 - 60{,}0000}{250{,}000} = 6.2\%$$

Table 7. Quartile Average ROA for Dairy Farm Business Summary Farms, 1992

	100-199 Cows	200+ Cows
1. Top 25%	10	13
2.	5	7
3.	2	4
4. Bottom 25%	-3	-3

Current Ratio (Liquidity)

The final member of my starting fabulous five is the current ratio. This is likely the most used ratio in the nonfarm community. It is likely the best measure of ***balance sheet*** liquidity. To have a representative of each of the financial analysis categories, we would include it in our set. It frequently has been found to be a good indicator of repayment of loans.

[3]Our deferred tax study found the average tax basis to be 33 percent of market value. This would imply a multiple of three to equate market value returns to book value returns for dairy farms. However, this low tax basis is strongly influenced by importance of raised livestock, which have a zero tax basis, on the balance sheet. Average book value as a percent of market value for livestock, machinery and farm real estate were 8, 45 and 57 percent, respectively. When some form of cost accumulation or base value approach is used in determining book values of raised livestock, the multiple moves back towards two. A multiple of two is often quite appropriate for nonlivestock farms which make up a large proportion of U.S. agriculture.

For normal operating dairy farms with some debt, we usually like to see the current ratio above 1.0 and are quite happy if it is above 1.5. One problem with this ratio is that when there is little or no debt, the ratio takes off and we get values like 35 or more. This causes the high values for the top 25 percent group in the Dairy Farm Business Summary data shown (Table 8)[4].

I will admit that if you want to limit your short list of financial variables to four, this is the one I would omit for livestock farms. If we think about what the farmer could do to improve this ratio, they are not necessarily things we want him or her to do. For example, look at the asset side. How do we get current assets higher? Allow accounts receivable to increase; not necessarily a good idea. Keep cash on hand instead of paying down debt; not necessarily a good idea. Have more crops on hand, buy feed ahead; well, maybe good, maybe not. Now lets look at the debt side. The farmer could lengthen debt terms so that less principal is due in the next 12 months; not necessarily a good idea. The farmer could reduce accounts payable. Now, there is one we could go for. At the risk of being thrown out of the financial community, I would suggest that maybe a more important ratio might be payables as a percent of total expenses. However, that would not be a liquidity ratio, would it? But, given the wide use of the current ratio, we should likely use it and focus the farmer's attention on the effect of payables on its value.

$$\text{Current Ratio} = \frac{\text{Total Current Farm Assets}}{\text{Total Current Farm Liabilities (including principal due in 12 months on term debt)}}$$

Example: 3-Peat Farms

$$\frac{425{,}000}{290{,}000} = 1.5$$

Table 8. Quartile Average Current Ratio for Dairy Farm Business Summary Farms

	100-199 Cows			200+ Cows		
	1989	1990	1991	1989	1990	1991
1. Top 25%	29.4	7.9	20.7	10.0	5.2	8.8
2.	3.3	2.8	2.6	3.9	2.7	2.4
3.	2.2	1.9	1.8	3.0	1.9	2.0
4. Bottom 25%	1.8	1.5	1.2	1.2	1.4	1.3

Now, once we have selected a short list of important financial variables, we need to continually discuss them with the farmer and get the farmer to incorporate them into his or her vocabulary and normal thinking process. When we ask a farmer how things are going, most farmers now would respond "production is up, the crops look pretty good". We need to get them to responding "my operating expense ratio has improved a little, it looks as if we may get an ROA of eight percent this year, debt coverage is up a little".

[4]The Dairy Farm Business Summary data include estimated principal due within the next twelve months on term debt. The principal due data were not collected but were estimated from debt payment and principal outstanding data. Data were provided by Mike Novak.

One way to help in this process is to use graphics. They say a picture is worth a thousand words. If we developed a financial picture of the business like that shown in Figure 10, it might be useful for all of us. It provides a pictorial view of the financial performance of the business for the past five years. My original conception of this graph was one graph with five lines. However, the labels on the axes became difficult. With a little imagination I am sure you could do better. With modern graphics tied to your financial records analysis system you could print out a picture like this with the push of one button.

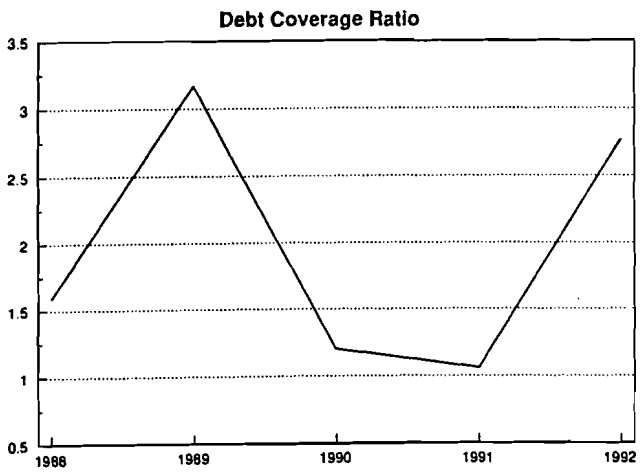
An alternate would be to develop blank graphs and have the farmer maintain a picture for his or her farm by adding each year's data. They might feel a little closer to the picture, and understand it a little better, if they helped make it.

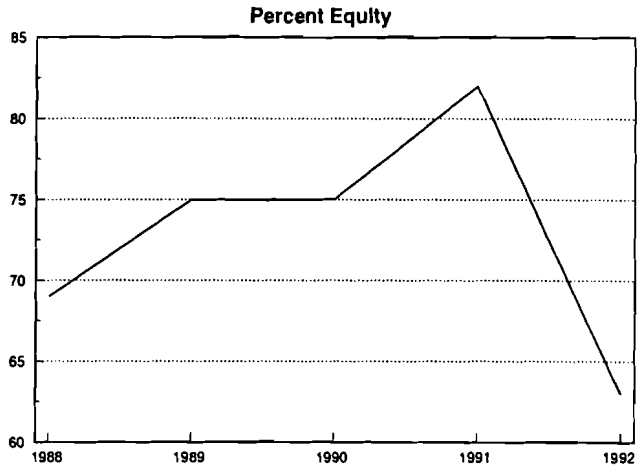
Financial Analysis Charts like those shown on Tables 9 and 10 have been useful in showing farmers where they stand compared to other farmers. Possibly, these data, or the standards that I referred to when discussing the individual ratios could be used in the graphs to show farmers where their performance compares to their own historical performance and some sort of standard in the same graph.

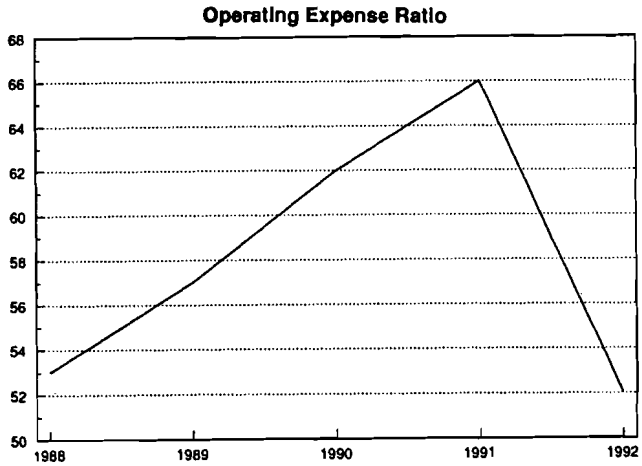
As we look at Big Green Farms (Figure 10) we see that debt coverage has been above 1.0 for each of the last five years. It got quite low in 1991, likely due to milk price; but was also low in 1990. 1992 saw a strong recovery. Equity increased until 1992 when investment and borrowing took place. The current ratio also reflects the changes in the debt, and thus principal due in the next twelve months. ROA has been excellent throughout the five years, but was declining throughout the period until 1992. The operating expense ratio is at an excellent level with modest deterioration throughout the period until the 1992 recovery.

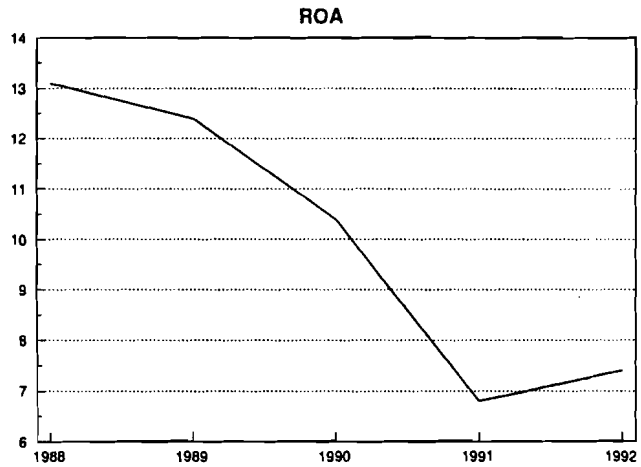
The most important job of the operators of large dairy farms is to manage the farm; not milk the cows or feed the cows or harvest the crops; but manage the farm. An important part of that management function is financial management. As a financial advisor you need to keep them focused on financial management issues and help teach them how to do it. Starting out with a strong focus on a few important variables and then expanding as their abilities improve is one way to do it. Even in the long run, the number of variables used to monitor the financial performance of the business has to be small in order to keep the total number of variables tractable. That is, keep the total number of variables small enough that they will fit in one normal sized head, or even two or three heads where more than one manager is involved. I would urge you to consider my fabulous five for your team and consider graphing as a method of communicating.

Figure 10. **Financial Performance Picture**
Big Green Farm









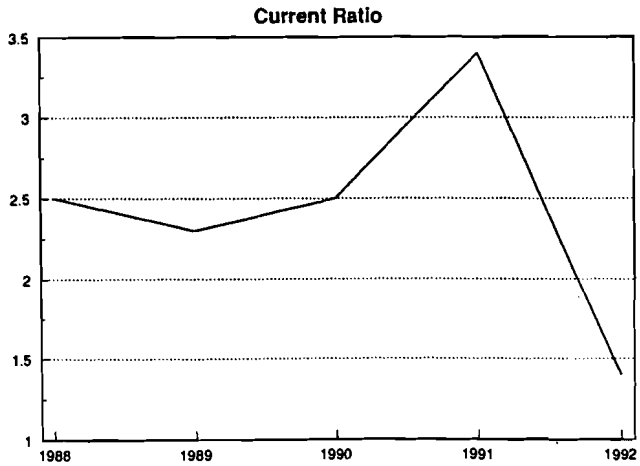


Table 9. FINANCIAL ANALYSIS CHART
110 New York Dairy Farms with 100-199 Cows, 1991

Repayment Capacity

Scheduled Debt Payments Per Cow	Available for Debt Service Per Cow	Debt Coverage Ratio	Debt Payments as Percent of Milk Sales	Debt Per Cow
$118	$649	2.59	7	$571
384	440	.96	18	1,784
555	326	.66	23	2,782
753	109	.22	33	3,801

Solvency				*Profitability*	
Debt/Equity Ratio	Percent Equity	Debt/Asset Ratio (%)		% Rate of Return on	
		Current & Intermediate	Long Term	Equity	Investment
.10	90	.06	.02	12	10
.29	70	.27	.26	5	6
.42	57	.38	.48	1	3
.60	40	.64	.81	-9	-2

Financial Efficiency

Asset Turnover Ratio	Operating Expense Ratio	Real Estate Investment Per Cow	Machinery Investment Per Cow	Total Farm Assets Per Cow
.59	.62	$1,631	$727	$4,755
.47	.71	2,396	1,077	5,935
.40	.78	3,080	1,378	6,779
.33	.89	4,527	2,019	8,878

Table 10. FINANCIAL ANALYSIS CHART
43 New York Dairy Farms with 200 Cows, 1992

Repayment Capacity

Scheduled Debt Payments Per Cow	Available for Debt Service Per Cow	Debt Coverage Ratio	Debt Payments as Percent of Milk Sales	Debt Per Cow
$214	$653	2.02	9	$693
400	487	.97	16	1,821
498	344	.68	20	2,557
813	109	.33	35	3,953

Solvency				*Profitability*	
Debt/Equity Ratio	Percent Equity	Debt/Asset Ratio (%)		% Rate of Return on	
		Current & Intermediate	Long Term	Equity	Investment
.11	87	.09	.04	16	13
.36	63	.30	.30	7	7
.45	54	.44	.50	2	4
.62	37	.63	.80	-8	0

Financial Efficiency

Asset Turnover Ratio	Operating Expense Ratio	Real Estate Investment Per Cow	Machinery Investment Per Cow	Total Farm Assets Per Cow
.80	.68	$1,369	$549	$4,342
.55	.74	2,239	854	5,603
.46	.79	2,815	1,158	6,353
.36	.88	3,992	1,692	7,828

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