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TO EXPAND OR NOT EXPAND-WHICH STRATEGY PAYS?

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Executive Summary

This analysis says if after careful and lengthy planning you've decided to expand a conventional, confined dairy system with stored feed, maximizing profit from that strategy is your most important goal, and (most importantly) your management abilities are adequate, then you should expand as quickly and as large as you can expand, **but only if you use assets at full capacity at whatever size you reach.** For herd sizes up to 300 cows in the study, using a low cost, low efficiency parlor was more economically attractive. For larger herd sizes, the medium cost, parlors were more economically attractive. What is important about the parlor is its cost and capacity—not what we call it.

Ironically, of the twelve scenarios depicted in the study, the one of choice for many Wisconsin farm families could be the one ranked tenth in terms of profitability. In the author's observation, a high percent of farm families temper their desire for profit with other factors such as reduced risk and volatility. Scenario ten is the least aggressive scenario in which expansion from 50-300 cows occurs in two steps in 11 years using a low capital, low efficiency parlor. While scenario ten forfeits returns to equity and management and some of the returns to operator labor, the remaining returns to operator labor in all years might be judged to be acceptable by many Wisconsin farm families.

While expanding herd size may capture what economists call "economies of scale", expansion does not embody any magic. The act of expanding will not overcome the ill effects of inadequate management, poor planning or bad luck. To the contrary, expansion is likely to magnify the undesirable results of such factors. The expansion scenarios that performed best in the study were those in which a desirable relationship was maintained between income generation, operating cost control and level of investment. In such cases, facilities were used to capacity, production levels were high and performance was consistent. Mastering these performance characteristics can turn an expansion into a dream. Failure to master those characteristics can turn the dream into a nightmare.

The biggest question to answer when deciding whether to expand beyond a family sized operation is, how well can you manage? Can you adapt from the hands on, self-focused style of a family farm to the more delegated, people oriented style required when the manager must rely on others to do much of the labor? There is no sure-fire way of knowing how well any individual manager will adapt. We've all seen some successful family farm managers adapt as managers of much larger operations while others fail to adapt quickly enough to succeed. Unfortunately, the only way to know for sure if you can successfully adapt is to try it. Only a few fortunate people are able to test themselves in someone else's operation before trying it on their own.

Here's a crude rule of thumb that may help you decide if you don't possess the personality traits to manage an expanded operation. If, in your current operation, you gain your greatest satisfaction from labor tasks and you avoid doing management tasks even when time is ample, chances are that you won't be happy with a greatly expanded management role in an expanded operation.

Finally, not even the large number of scenarios performed for this study will include one that will fit you perfectly. Use these scenarios and examples to help you zero in on a strategy and then fine-tune the analysis to your own circumstances before you decide to expand.

Introduction

Rapid changes in the dairy industry are causing many Wisconsin farm families to question what they should do to poise themselves and their families for future success in dairy farming. Dairy farm families in Wisconsin are trying a variety of strategies - some more successfully than others.

What style of dairying should they pursue?

Should they convert to management intensive rational grazing (MIRG)? Should they continue operating a conventional, confined dairy system with stored feed? Should they contract, stay the same size, or expand? If the choice is to expand, how far and how quickly should they expand? What kind of facilities should be built? What do they do with the manure that a large operation generates? The final answer to these questions must be answered by the families themselves. The staff at the UW Center for Dairy Profitability has analyzed these questions to help farm families answer these questions to their advantage.

The remainder of this paper will focus on strategies to expand conventional, confined dairy systems with stored feed, not to advocate that choice above others, but rather to keep the scope of the paper manageable.

Analyses

Dozens of example farm spreadsheet scenarios were examined to analyze the viability of various expansion scenarios. Most examples looked at expansion, starting from a conventional 50 cow stanchion operation with moderate production, and no debt and increasing to 300 cows. All cases assumed free stall housing that costs $900 per cow ($270,000 for 300 cows). One set of scenarios assumed that a six unit 12 stall flat barn parlor costing $54,000 could be used to milk 300 cows (flat barn parlor cost was assumed to be $18,000 for 100 cows and $36,000 for 200 cows). Another set of scenarios assumed that a new and ("more standard") double eight herring bone milking parlor costing from $156,920 for 100 cows up to $270,000 for 300 cows is needed. In all cases, the cost of added or remodeled facilities was based on design criteria acceptable to Agricultural Engineers.

Scenarios using the flat barn parlor are referred to as "low capital", and considered low capacity at 43 cows per hour. Scenarios using the double eight herringbone parlor are referred to as "medium capital" scenarios using the above listed costs and are assumed to be medium capacity parlors with throughputs of 62 to 65 cows per hour. The "high capital" parlor assumes costs that are double those of the medium capital parlor. High capacity parlors have throughputs of 92-95 cows/hour. Again, what matters most about the parlor is its cost and capacity—not what we call it. There is no investment in cropland or field equipment and all feed is purchased in the study. Feed is priced at levels similar to the cost of raising feed.

In both sets of scenarios (low cost, low capacity and medium cost, medium capacity parlors) rapid (50 - 300 cows in one year), and medium speed (50 - 300 cows in steps over five years) and slow (50-300 cows in 11 years) expansions were examined closely. Other options were examined less extensively.

Since most of the scenarios up to 300 cows looked unattractive but still suggested some economy of scale, additional scenarios were examined for herd sizes that use each efficiency level of the parlors for eleven hours each milking. These herd sizes were 542 cows for the low efficiency parlor, 780 for the medium and 1160 for the high efficiency parlors.

(See Appendix A for more information about assumptions and Appendix B for dairy cow enterprise budgets used in this study)

Which Expansion Strategy Is Best?

It all depends upon the assumptions that are used and the objectives of those asking that question. In terms of objectives, the study assumes that maximizing profitability in the long run is the most important one. But while profitability measures are used to rank the scenarios, other objectives are acknowledged as being important in discussing the desirability of various options throughout this paper.

Measures of Profitability used in the Study

1. The Rate of Return On Assets (ROROA) is the single most important measure of profitability but shares the spotlight with the following three measures:
2. Net Cash Flows (NCF)
3. Cumulative Net Cash Flows (CNCF) - the sum of all previously completed years' NCF
4. Cumulative Net Cash Flows per Cow (CNCF/C) - CNCF divided by the number of cows. This measure helps detect economies of scale when comparing different herd sizes.

All four of these profitability measures are compared each year for each scenario.

(For a more detailed discussion of profitability measures 1,3, and 4, see Appendix C)

2. Net Cash Flow (NCF)

The summary budgets found in Appendix F[1] contain a calculated value called Net Cash Flow. Because of the way these budgets are designed, NCF is the amount left after paying all costs except for the opportunity cost of equity. All the other costs include, a modest charge for management, all labor (including family labor), interest and depreciation (depreciation is assumed to be equal to principle in this case). (Please refer to Appendix C for a more thorough discussion of returns to management. Appendix D contains information about the impact of changing labor, forage, and milk prices)

NCF minus the opportunity cost of equity equals economic profit (what a fortune 500 company or economist would call profit). Making depreciation equal to principle in these budgets insures that (as long as the operation is profitable) every asset is paid for prior to being worn out. It also makes positive cash flow nearly equal to economic profit. While tax depreciation and loan payment structures discourage farmers from handling their financial records so that their cash flow is nearly equal to their economic profit, they could choose to do so with some forethought and effort. This design feature of the budgets greatly simplifies their interpretation by anyone who will want to use this study to help them make decisions. (See Appendix E for a more complete explanation of how principle payments were made equal to the amount of depreciation taken)

The assumed beginning equity level of each expansion scenario is $150,000. A $15,000 NCF in the first year could represent a 10% return to equity, or a 9% return to equity plus an economic profit of $1,500 (an economic profit is any return higher than a fair return to labor, management and equity). A 9% return to equity results in the Return on Equity (ROROE) and the Return on Assets (investment) (ROROA) to be equal.

When NCF is zero, ROROE will be zero and ROROA will be between zero and the average interest rate on borrowed money. In other words, when NCF is zero, the owners and their families are paid a fair wage but receive no Return to Equity. Alternatively, when the NCF is slightly negative, (minus $2,000 for example), the owners can choose to cover the deficit by reducing their wages by an

[1] Budgets in Appendix F are listed in the following order: Low Capital quickest to slowest, Low Capital maximum use, Medium Capital quickest to slowest, Medium Capital 542 & 780, High Capital medium & high efficiency.

amount equal to the negative NCF. While not a desirable business practice, farm families often do this to compensate for a negative ROROE.

Don't assume this "nice" relationship between NCF and ROROE for any scenarios where depreciation doesn't equal principal payments and management "costs" are not deducted in calculating the NCF. Equity increases over time in most scenarios where NCF is positive and therefore takes more than $13,500 of NCF for the ROROE to be at least as high as the ROROA in later years. For rule of thumb purposes, in scenarios where the average NCF is positive, the owner will likely have enough family living funds for the typical farm family to be comfortable, even if the ROROE is less than ROROA.

With an interest rate of 9% on all borrowed money in the study, any ROROA less than 9% means that ROROE will be less than 9% and lower than ROROA.

Table 1: Ranking of Scenarios
(Based on the highest CNFC/C at the end of Year 10)

	End of Year			
Parlor Scenario	**1**	**5**	**10**	**15**
1. MCHE 50-780 Cows in 1 Yr.	$92	-$65	$1278	$2621
2. MCME 50-780 Cows in 1 Yr.	$48	-$299	$805	$1910
3. HCHE* 50-780 Cows in 1 Yr.	$41	-$319	$770	$1859
4. MCME** 50-542 Cows in 1 Yr.	$29	-$348	$672	$1691
5. LCLE 50-542 Cows in 1 Yr.	-$5	-$495	$383	$1261
6. HCME 50-780 Cows in 1 Yr.	-$3	-$383	$297	$1148
7. LCLE*** 50-300 Cows in 1 Yr.	-$30	-$543	$232	$1006
8. MCME 50-300 Cows in 1 Yr.	-$25	-$543	$225	$993
9. LCLE 50-300 Cows in 6 Yrs.	-$98	-$403	-$396	$379
10. LCLE 50-300 Cows in 11 Yrs.	-$98	-$482	-$406	$-102
11. MCME 50-300 Cows in 6 Yrs.	-$225	-$526	-$526	$242
12. MCME 50-300 Cows in 11 Yrs.	-$225	-$1146	-$903	-$434

* HCHE = High Capital High Efficiency
** MCME = Medium Capital Medium Efficiency
***LCLE = Low Capital Low Efficiency

Scenario one may be the only one that profit oriented managers might get excited about. All of the "one year" scenarios performed better than the slower expansions. Although the top four scenarios have positive NCF's in the first year, none of them show a positive NCF or CNCF for all years. Even the best performing scenario (MCHE) experiences significant negative NCF's in years two through

five. However, because of a substantial positive first year NCF, the CNCF for the top ranked scenario doesn't fall below -$50,660 in any year. CNCF reaches that level in year five but jumps to a CNCF of +$150,851 in year six and remains positive thereafter. Only the top scenario achieved a positive CNCF in year 6. Scenarios two through four return to positive CNCF territory in year 7. Scenario five restores a positive CNCF in year 8.

Managers of lower ranked scenarios have larger deficits to overcome in the first six years. Deficits in most of these scenarios are too large to overcome for the size of the operation. For example, the second ranked scenario (MCME) has a negative CNCF of -$188,609 at the end of year five. It improves to -$78,080 in year six before turning to a positive $32,449 in year seven.

For a better understanding of the progress of CNCF for the top six scenarios, examine the summary in Table 2 below. Then decide if you and your lender would be comfortable in the year (five) CNCF reaches its lowest point in any of the scenarios. Keep in mind that a CNCF of zero means, up to that point, the owners are paid for their labor but not for equity; nor is there a management bonus. In other words, when CNCF is negative, the owner has not only given up returns to equity and management bonuses but wages for labor as well. If the CNCF deficit is large enough, the owner may not even be paid for labor. Since owner's wages are about $35,000 per year, a CNCF of -$35,000 means that the owners have given up one year's worth of wages as well as returns to equity and management during the accumulation period.

Table 2: Comparing CNCF in the Top Six Scenarios

Scenario and Rank	Lowest CNCF	Year CNCF turned positive	CNCF end of year when Restored to positive
1. MCHE 780	-$50,600	6	+$158,851
2. MCME 780	-$233,600	7	+$111,142
3. HCHE 780	-$248,790	7	+$90,980
4. MCME 542	-$188,609	7	+$32,449
5. LCLE 542	-$268,462	8	+$17,111
6. HCME 780	-$431,730	9	+$99,250

Scenario 10 (LCLE, 50-300 cows in eleven years) is interesting in that it may be the scenario with the greatest amount of consistency. While it's ranking and profitability is low, it may be the strategy of choice for many farm families who are much more sensitive to risk and volatility than they are to profitability. Even though the scenario doesn't have a positive NCF until year 12, the lowest that any annual NCF falls is -$9,768. At this level, the owners are forfeiting all returns to equity and management and are reducing the wages for their own labor from about $35,000 to $25,000 per year. If someone in scenario 10 could eliminate their annual manure storage costs of $7148 without increasing other costs, their annual labor wage reduction would be fairly small. However, they would still forfeit ROROE and any management bonuses.

First Year Phenomenon.

The first year of most scenarios usually had higher NCFs than each of the next four years. Similarly, the expansion years typically had higher NCFs than the year after. This may be surprising at first when one realizes that the farm sells 18,000 lbs. of milk per cow in expansion years and 20,000 lbs. in all the other years. The explanation is found in the financing details. This study assumes that the cost of new cows and all their replacements during the expansion year is amortized over five years. In contrast, in non-expansion years, the cost of the replacements for cows on hand at the end of the previous year is charged against current year earnings. As a result, only 20% of the capital investment cost of expansion cows and replacements were paid in the expansion year. Years two to five in all scenarios were required to pay 100% of the capital investment cost of replacements purchased that year in

addition to 20% of the capital investment cost of expansion cows that were acquired in the first expansion year.

General Conclusions

1. We did not find any get rich easy and quick schemes. In fact, most were not attractive.

2. We confirmed that "one size, style, or strategy is not the perfect one to fit all".

3. *Using assets to capacity is critical for expansion to be economically viable. Minimizing capital investment within reason (only as much as needed to obtain performance) is one way of trying to use assets to capacity. The more you invest, the more you must use what you invested*.

   Compared to the low capital, low efficiency parlor, the medium capital, medium efficiency parlor increased annual fixed cost more than its "efficiencies" decreased variable costs for herd sizes up to 300 cows. Annual per cow parlor ownership costs increased by a range of $66 at 300 cows to $198 at 100 cows in exchange for annual labor cost savings of $64 at 300 cows to roughly $71 per cow at 100 cows. This is a poor and significant economic tradeoff. Because of this trade off, *all low cost, low efficiency* (LCLE) *parlor scenarios up to 300 cows in size were more profitable than their same sized medium cost, medium efficiency* (MCME) *parlor counterparts.* For herd sizes between 300 and 542 cows, the LCLE parlor scenario offers less risk even while the profitability advantage to the MCME parlor increases with increasing herd size. (Note: 542 is the largest number of cows that could theoretically be physically milked in the LCLE parlor, and have one hour of down time per milking). The financial performance advantage to the LCLE parlor was greatest at smaller herd sizes and decreased to nearly break even at the 300 cow level).

These first three conclusions didn't surprise us, nor should they surprise anyone else, but the following observations will likely surprise some.

4. Scenarios where replacements were purchased, out performed those where replacements were raised. This is because the study assumes that it costs more to raise replacements than it costs to buy them.

5. This analysis says that if after careful and lengthy planning you've decided to expand a conventional, confined dairy system with stored feed, maximizing profit from that strategy is your most important goal, and (most importantly) your management abilities are adequate, then you should expand as quickly and as large as you can expand, but only if you use assets at full capacity at whatever size you reach. For herd sizes up to 300 cows in the study, using a low capital, low efficiency parlor is more economically attractive. For larger herd sizes, the standard parlor is more economically attractive if its investment level is matched to its capacity. None of the scenarios of less than 542 cows were very appealing.

6. Most of the scenarios below the top one are extremely unattractive to any manager desiring a decent level of family living, let alone desiring profit. Scenario 10 is likely to be chosen by managers that are determined to change as little as they have to. It is the author's opinion that a high percent of farm families temper their desire for profit with other factors, such as reduced risk and volatility. Because of this, scenario 10 could be one of the more popular choices of all the scenarios. Even though it will yield no returns to equity or management for at least the first 15 years, it may consistently reimburse owners for enough of their labor each year to appear more attractive than the other scenarios that provide more of a roller coaster ride.

These conclusions were reached even though some very important assumptions in the scenarios favored slow expansions in a way that seldom occurs in the real world. In all the scenarios it was assumed that the number of free stalls would be equal to the number of complete lactations during the

year. Thus, in the three step expansions from 50 to 300 cows, free stalls were added only when cows were added. Furthermore, while the LCLE parlor in all scenarios had a maximum capacity of 542 cows and the standard parlor had a maximum capacity of 780 cows, bulk tank space was added as needed, similar to the treatment of free stalls. In the real world, people often build to a certain desired size in all facilities and whether by design or default, take several years to reach the capacity of the facilities. Because unused capacity is extremely expensive, this analysis says if expansion is the right decision, it should be done quickly.

In this study, six more assumptions/conditions were made that make the fast expansion scenarios more profitable than their slower versions in this study.

a. Management capabilities are assumed to be excellent and equal at all rates and sizes of expansion. This is not usually true in real life and the challenge to management tends to increase with size.

b. The fast expansions have more completed lactations at any comparable point in future time. When the herd is expanded to 300 cows in the first year, it has 1800 lactations in the first six years. When the herd is expanded in three steps in six years, it has two years of 100 lactations, two years of 200 lactations and two years of 300 lactations for a total of 1200 lactations in six years.

c. The fast expansions have a higher percent of the 20,000 lb. lactations versus 18,000 lb. lactations in the first six years. When the herd is expanded to 300 cows in the first year, only the first 300 lactations are at 18,000 lbs. (one sixth of the six year total). When the expansion takes three steps in six years, half or 600 of the total lactations are at the lower production level.

d. If facilities are sized properly, each cow generates enough income to cover all of her costs. Anytime this assumption is true, more cows mean more profit. When it's not true, more cows mean bigger losses.

e. All herd sizes 100 cows and larger have enough invested in manure storage to store all the manure produced by 100 cows for one year at an annual ownership cost of $7148. This causes the annual fixed cost per cow for manure storage to be higher for smaller versus the larger herds examined in the study. Other studies have shown that an investment in manure storage usually experiences low returns.

f. In practice, especially in the "rougher" parts if Wisconsin, the per cow variable cost of manure handling and disposal is likely to increase for very large herds. This is because more cows means more manure, which means more acres are needed for disposal if the manure is spread on land in a way to take best advantage of its' nutrients and properties to grow crops and to minimize environmental problems. This usually means more effort is needed to find the acres. Ultimately this often leads to a higher per cow cost for disposal than assumed for the larger, faster growing herds in the study. This study pretends that this isn't the case, that manure spreading area can be expanded as easily in rapid expansions as in the slower scenarios, and that the variable cost of manure disposal on a per cow basis is the same for all herd sizes.

Management

An Important Factor to Consider when Choosing An Expansion Strategy

All of the scenarios assumed that management was not a limiting factor. In other words, it was assumed that the management would be able to produce 18,000 lbs. of milk per cow in the expansion years and 20,000 lbs. in all other years whether the expansion increase was from 50 to 780 cows or somewhere in between. In the real world, management ability often becomes a limiting factor. The manager needs to change from a person who does most of the physical work plus manages to someone who does little/no physical labor and concentrates on managing all family and non-family labor. In other words, from the viewpoint of the manager's adaptation, expanding from 50 to 100 cows may be more difficult and perilous than expanding from 100 to 500 or 1000 cows. Managers that are able to succeed in making

that first critical adaptation in management style are likely to succeed in future expansion steps. Conversely, those who slowly or never make the transition in management style will have a significantly reduced likelihood of successful expansion.

Final Conclusion

While expansion may offer the potential of economies of scale, these economies are not automatic. Just getting bigger any old way won't do it! Economies of scale are only achieved via careful thinking and planning accompanied by an ability to adapt and to limit investments to primarily assets that really pay for themselves.

A small struggling operation that only changes its size will become a large struggling operation, with a high likelihood of failure. It is far more likely for a small thriving operation to become a larger struggling operation after expansion than it is for a small struggling operation to become a larger successful operation. Actual expansion should only occur after much careful thinking and planning spread out over many months.

APPENDIX A
Assumptions for Financial Analysis of Dairy Expansion

1. All scenarios assumed that expansion occurred on the first day of the expansion year. All assumed a 30% cull rate. This means that 30 replacements must be purchased each year for every 100 lactations to maintain the same herd size. For example, to expand from 100 to 200 cows requires the purchase of 160 head that year----the first 100 are purchased to expand and 60 more are purchased to replace the cows that are culled. In practice, the number of needed replacements is often underestimated.

   In the budgets, the cost of replacements for the cows added in the expansion year is amortized along with the cost of the original "expansion" cows. Replacements for the cows on hand prior to that expansion step are paid for from operating income. To do a five year amortization for the replacement of existing cows could not be justified unless the cull rate was less than 20%--in other words, unless cows remained in the herd longer than five lactations. If one always buys heifers, the cull rate could be less than 30%, but in practice cull rates less than 30% are rare.

   To reflect the reality that expansions never are as smooth as desired, it was assumed that the pounds of milk produced per cow would be 10% less in the expansion years than in other years of the operation. All scenarios assumed an average production of 18,000 lbs. per cow during expansion years and 20,000 lbs. in all other years. In each scenario it was assumed there were as many full lactations as the average herd size for the year.

2. Milk price is $12.50 per cwt.

3. Calves and cull cows are sold at prices of $125 and $500 respectively. If other livestock were to be sold, the following prices would be used, $500 for yearling heifers, $1,000 for bred heifers, and $1,100 for a cow sold for milk or breeding purposes. The cost of replacements may conservative. We used an equally conservative estimate of $1063 to raise one's own replacements.

4. All replacement are purchased as near springing heifers at $1,000 each. The replacements needed for expansion are paid for with a 9% interest loan amortized over five years.

5. All forage, whether raised or purchased, costs $120.00 per ton dry matter.

6. All corn, whether raised or purchased, costs $3.00 per bushel.

7. Soybean oil meal costs $250.00 per ton.

8. There is no cost specifically allocated to feed storage (built into feed price).

9. Bedding costs $50.00 per ton.

10. Skilled labor is hired at a total cost of $15.00 per hour including fringe benefits. Each scenario also pays $15.00 per hour for the owner's labor. Because owner's labor is included as a cost, any positive cash flow in any analysis is a return to equity and, (if high enough), management. Labor requirements were set at 17.88 hours per cow per year for care and feeding and ranged from 6.87 to 7.08 hours per cow per year for milking (including parlor cleanup etc) with the high efficiency parlor, 10.56 to 13.43 hours with the medium efficiency parlor, and 14.76 hours to 17.74 hours with the low efficiency parlor.

11. The per cow investment in free stalls is $900.00. It was assumed that at each herd size there is one free stall per cow.

12. The investment in the low cost (six unit, 12 stall flat barn) parlor is $18,000 for 100 cows, $36,000 for 200 cows, $54,000 for 300 cows, and $97,560 for 542 cows. The investment increases in this case are for larger bulk tanks and associated accessories.

13. The investment in the medium cost (conventional double 8 herringbone parlor) ranges from $156,920 to $192,357 for 100 to 300 cows and to $235,236 and $277,406 for 542 and 780 cows respectively.

14. The investment in the high cost parlors is double the cost of the medium cost parlors at any given size.

15. Parlor throughput is 43 cows per hour in the flat barn parlor (low efficiency) , 62 cows per hour in the medium efficiency parlor and 92 cows per hour in the high efficiency parlor.

16. Buildings are depreciated over 20 years and the budget assumes that the amount of depreciation equals the amount of principle paid. This is a long time for these kinds of facilities to remain functional and for lenders to commit to. On the other hand, the budget assumes that two percent of new cost is spent annually to repair these facilities. Taxes and insurance claim one and one-half percent, respectively of new cost annually.

    Changing the facility useful life assumptions and pay back period to 10 years is the same as saying that the facilities would have to be replaced after ten years for the operation to continue. Such conditions would increase annual costs about this much:

	Number of Cows			
	100	300	542	780
With a High Capital Parlor	$26,200	$44,896	$68,088	$106,528
With a Medium Capital Parlor	$13,100	$22,448	$34,044	$53,264
With a Low Capital Parlor	$6,958	$18,147	$27,938	

    If the facilities only had a ten year life, none of the scenarios would be attractive.

17. Depreciation and interest are included in the 9% amortized payments over 20 years for facilities and 5 years for cows. The other three typical ownership costs were calculated with the factors listed below:

    Repairs = .02 of new cost
    Taxes = .01 of new cost
    Insurance = .005 of new cost

18. $50,000 is invested in a manure storage system for all scenarios regardless of cow numbers. $50,000 will buy 12 months storage for 100 cows, 6 months storage for 200 cows or 4 months storage for 300 cows. Other studies have shown that manure storage usually pays a very low ROROA. Investing in 12 months manure storage for all cows in all scenarios would limit margins about half as much as caused by a ten year life assumption for all the other facilities. (see point 16).

19. No manure credits are taken. Doing so would slightly increase margins.

20. All new investments are made with borrowed money with an interest rate of nine percent.

APPENDIX B
Dairy Cow Enterprise Budgets

Expansion Years - 18,000 lbs. Milk/Cow

Gross Returns

	Quantity	Unit	Unit Value	Per Cow Total
Milk	180	CWT	$12.50	$2,250.00
Calf	0.95	HD	$125.00	$118.75
Total Gross Returns				$2,368.75

Variable Costs

	Quantity	Unit	Unit Value	Total
Forage	6.35	TON	$120.00	$762.00
Corn	94	BU	$3.00	$282.00
Soybean Meal	1100	LBS	$0.13	$137.50
Dical	135	LBS	$0.22	$29.70
T.M. Salt	80	LBS	$0.07	$5.60
Milk Hauling	180	CWT	$0.30	$54.00
Bedding	1.25	TON	$50.00	$62.50
Vet & Medicine	$49.00	$	1.00	$49.00
Power & Fuel	$60.00	$	1.00	$60.00
Supplies	$40.00	$	1.00	$40.00
Overhead	$60.00	$	1.00	$60.00
Total Variable Costs				$1,542.30

Non-Expansion Years - 20,000 lbs. Milk/Cow

Gross Returns

	Quantity	Unit	Unit Value	Per Cow Total
Milk	200	CWT	$12.50	$2,500.00
Calf	0.95	HD	$125.00	$118.75
Total Gross Returns				$2,618.75

Variable Costs

	Quantity	Unit	Unit Value	Total
Forage	6.35	TON	$120.00	$762.00
Corn	104	BU	$3.00	$312.00
Soybean Meal	1400	LBS	$0.13	$175.00
Dical	155	LBS	$0.22	$34.10
T.M. Salt	85	LBS	$0.07	$5.95
Milk Hauling	200	CWT	$0.30	$60.00
Bedding	1.25	TON	$50.00	$62.50
Vet & Medicine	$49.00	$	1.00	$49.00
Power & Fuel	$60.00	$	1.00	$60.00
Supplies	$40.00	$	1.00	$40.00
Overhead	$60.00	$	1.00	$60.00
Total Variable Costs				$1,620.55

APPENDIX C
Measures of Profitability used in the Study

1. The rate of return on assets (ROROA)

   Managers who wish to maximize profitability have to optimize the relationship between three main factors: Investment (asset) control, Operating cost control, and Income generation.

   The Rate of Return on Assets (ROROA) and the Rate of Return on Equity (ROROE) are variations of the single most important financial measurement for any business because they focus on the interrelationships between all three factors above, and they provide more information than any other single measure. In addition, since these measures are in a percentage form, they can be used to compare the performance of any business with any other kind of business of any size. Since ROROA and ROROE are very similar, they tell a very similar story and once one is calculated, the other is easy to calculate. A desired value for both, regardless of the size or type of business is to be higher than the interest rate on borrowed money and higher than the rate of inflation. ROROE should be higher than ROROA.

   While the percentage form of ROROA has some real advantages in comparing financial performance of one scenario to another, it has a disadvantage in that it doesn't show an absolute amount of money. A very high ROROA from a very small operation may not provide enough funds for adequate family living. ROROA also may or may not include the cumulative impact of previous year's profits or lack thereof. In this study, ROROA is influenced by the method of valuing assets and assumptions.

   Here's a unique way that ROROA is influenced in this study. Each year's ending Cumulative Net Cash Flow (CNCF) is multiplied by 9% which is the interest rate used for all borrowed money. Therefore, in years when the CNCF is negative, the effect is the same as borrowing and paying interest on the amount of the CNCF. In years when the CNCF is positive, the effect is the same as earning interest or saving interest payments by prepaying principle in an amount equal to the CNCF.

   In the years where other assets in the operation earned more than a 9% ROROA, the above assumption has a dampening effect on the potential ROROA that could have been attained. In other years, the assumption enhances the calculated ROROA. The CNCF in some of the scenarios in later years is sufficiently large to distort the calculated ROROA a bit.

2. Net Cash Flow (NCF)

   NCF is explained in detail in the body of the paper.

3. Cumulative Net Cash Flow (CNCF)

   CNCF is the sum of all previously completed years' NCFs. The CNCF for all scenarios was compared for the end of years 1, 5, 10 and 15. This measurement provides a way of totaling the cumulative impact of the profitability of all of the years to supplement the perspective provided by ROROA.

4. Cumulative Net Cash Flow Per Cow (CNCF/C)

   CNCF is divided by the number of cows in the herd to calculate CNCF/C. Cumulative Net Cash Flow Per Cow (CNCF/C) is used as the main profitability comparison measure in Table 1. CNCF/C allows us to compare the profitability and cash flow status of one scenario to others of various sizes, using numbers that are easy to understand. It helps us detect economies of scale when comparing different herd sizes, even though the method of calculation widens the performance gap that occurs between the fast and slow scenarios in the 10 and 15 year comparison. This "widening of the gap" occurs because in all scenarios the CNCF in the later

years is divided by the final number of cows on the farm that year to calculate CNCF/C, even though the CNCF in the earlier years may have been generated by a smaller number of cows. In some of the scenarios, this effect begins in year seven. Dividing the CNCF by the average number of cows on the farm up to the calculation date would result in a slightly more favorable CNCF/C in years where the CNCF is positive but less favorable in years where the CNCF is negative. In either case, its effect on the ranking of scenarios is minimal.

APPENDIX D
Impact of Changing Labor, Forage, and Milk Prices

	Number of Cows			
	100	300	542	780
Reducing the forage cost from $120 to $90/ton would increase annual NCF by:	$19,050	$57,150	$103,251	$148,590
Reducing labor cost from $15 to $10/hour would increase annual NCF by:				
Low Efficiency Parlor	$17,810	$49,786	$88,460	
Medium Efficiency Parlor	$15,655	$29,485	$76,775	$97,325
High Efficiency Parlor				$109,705
A one dollar change in milk price would change annual revenue and annual NCF by $200/cow/year and annual NCF per herd of:	$20,000	$60,000	$108,400	$156,000

APPENDIX E
Matching Principle Payments to Depreciation

The annual cash outflow requirements for all loans were determined by amortizing the original loan amount based on monthly payments and nine percent interest. (Amortizing means that each payment is an equal dollar amount but the proportion of principle and interest varies with each payment. Interest is the biggest part of the first payment and a very small part of the last payment). The amortization or pay back period was assumed to be 20 years for facilities and equipment and five years for cows. To simplify the study, the annual depreciation and principle payment amounts were assumed to be equal to five percent of the original cost of the facilities and equipment (for a 20 year depreciation period), and 20 percent of the original cost of the cows (for a five year depreciation period).

Therefore, the full amortized payment amounts (principle/depreciation and interest) were considered an expense in the year they were paid for cows as well as for facilities.
Technically, we don't depreciate the dairy herd in cases where the herd size remains constant or grows, regardless of what is claimed on income tax returns. We also include cull cow sales as income and the cost of replacements as an expense in non-expansion years.

Having handled the ownership costs of depreciation and interest in this way, the other three typical ownership costs were calculated for equipment and facilities with the factors listed below.

Repairs = .02 of new cost
Taxes = .01 of new cost
Insurance = .005 of new cost

APPENDIX F
Expansion Summary Budgets[2]

LCLE - 1 Year

Selected Performance From Expanding From 50 to 300 Cows In One Year
Low Capital,12 Stall, 6 Unit, 43 Cow/Hr, Flat Barn Parlor, 1 Year Manure Store For 100 Cows
20 Year Building Amortization

	Year 1	Years 2-5	Years 6-20	End Yr 10	End Yr 15
# Of Cows	300	300	300	300	300
Revenue	756,750	831,750	831,750	831,750	831,750
Variable Cost	462,990	486,465	486,465	486,465	486,465
Labor Cost	149,340	149,340	149,340	149,340	149,340
Repairs, Taxes, Insurance	13,090	13,090	13,090	13,090	13,090
Building Depreciation & Interest (Amortization)	40,380	40,380	40,380	40,380	40,380
Cow Amortization step 1	84,943	84,943	0	0	0
Cow Amortization step 2	0	0	0	0	0
Cow Amortization step 3	0	0	0	0	0
Cash Cow Purchases	15,000	96,000	96,000	96,000	96,000
Total Cash Outflow	765,743	870,218	785,275	785,275	785,275
Net Cash Flow (NCF)	-8,993	-38,468	46,475	46,475	46,475
NCF per Cow	-30	-128	155	155	155
Cum NCF Year End	-8,993	-162,865	-116,390	69,510	301,885
Cum NCF per Cow	-30	-543	-388	232	1006
NCF w/o Manure Storage	-1,845	-31,320	53,623	53,623	53,623
Milking Labor Hours	4,592	4,592	4,592	4,592	4,592
Feeding & Care Labor Hrs	5,364	5,364	5,364	5,364	5,364
Hours Milking Labor/Cow/Year	15.31	15.31	15.31	15.31	15.31
Hours Feeding & Care Labor/Cow/Year	17.88	17.88	17.88	17.88	17.88
Annual Labor Cost /Cow	497.8	497.8	497.8	497.8	497.8
Total Parlor Investment	54,000	54,000	54,000	54,000	54,000
Total Freestall Investment	270,000	270,000	270,000	270,000	270,000
Total Manure Storage Investment	50,000	50,000	50,000	50,000	50,000
Parlor as % of Total Building Investment	0.14	0.14	0.14	0.14	0.14
Yearly Parlor Owner Costs/cow	25.73	25.73	25.73	25.73	25.73
Yearly Parlor + Labor Costs/cow	523.53	523.53	523.53	523.53	523.53
Cow Investment/Cow	1,000	1,000	1,000	1,000	1,000
Parlor Investment/Cow	180	180	180	180	180
Freestall Investment/Cow	900	900	900	900	900

[2] Budgets are listed in following order: Low Capital quickest to slowest, Low Capital maximum use, Medium Capital quickest to slowest, Medium Capital 542 & 780, High Capital medium & high efficiency.

Manure Storage Investment/Cow	167	167	167	167	167
Land Investment/Cow	?	?	?	?	?
Total Investment /Cow	2,247	2,247	2,247	2,247	2,247

Selected Performance From Expanding From 50 to 300 Cows In One Year
Low Capital,12 Stall, 6 Unit, 43 Cow/Hr, Flat Barn Parlor, 1 Year Manure Store For 100 Cows
20 Year Building Amortization

Balance Sheet	End Yr 1	End Yr 5	End Yr 6	End Yr 10	End Yr 15
Cash (Cum NCF Yr End)	-8,993	-162,865	-116,390	69,510	301,885
Feed	0	0	0	0	0
Livestock	300,000	300,000	300,000	300,000	300,000
Machinery	45,000	45,000	45,000	45,000	45,000
Facilities	355,300	280,500	261,800	187,000	168,300
Land and Old Facilities	55,000	55,000	55,000	55,000	55,000
Total Assets	746,307	517,635	545,410	656,510	870,185
Oper. Loans					
Cow Loans	264,800	0	0	0	0
Facility Loans	355,300	280,500	261,800	187,000	168,300
Total Debts	620,100	280,500	261,800	187,000	168,300
Equity	126,207	237,135	283,610	469,510	701,885
% of Debt	0.83	0.54	0.48	0.28	0.19

	End Yr 1	End Yr 5	End Yr 6	End Yr 10	End Yr 15
Oper. Interest Paid	0	0	0	0	0
Cow Interest Paid	18,743	18,743	0	0	0
Facility Interest Paid	21,680	21,680	21,680	21,680	21,680
NCF	-8,993	-38,468	46,475	46,475	46,475
Int Earned on Cum NCF	-809.37	-14,657.9	-10,475.1	6,255.9	27,169.65
Int Earned/Paid + NCF	30,620.63	-12,702.9	57,679.9	74,410.9	95,324.65
ROROA	0.041	-0.025	0.106	0.113	0.110
Cwt. Milk Sold	54,000	60,000	60,000	60,000	60,000
Total Income /Cwt. Milk Sold		14.01	13.86	13.86	13.86
Total Cost/Cwt. Milk Sold	14.18	14.50	13.09	13.09	13.09

LCLE - 6 Years

Selected Performance From Expanding From 50 to 300 Cows In Three Steps In Six Years
Low Capital,12 Stall, 6 Unit, 43 Cow/Hr, Flat Barn Parlor, 1 Year Manure Store For 100 Cows
20 Year Building Amortization

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8-10	Yrs 11-15
# Of Cows	100	100	200	200	300	300	300	300	300
Revenue	252,250	277,250	504,500	554,500	756,750	831,750	831,750	831,750	831,750
Variable Cost	154,330	162,155	308,660	324,310	462,990	486,465	486,465	486,465	486,465
Labor Cost	53,430	53,430	101,385	101,385	149,340	149,340	149,340	149,340	149,340
Repairs, Taxes, Insurance	5,530	5,530	9,310	9,310	13,090	13,090	13,090	13,090	13,090
Building Depreciation & Interest (Amortization)	17,059	17,059	28,720	28,720	40,380	40,380	40,380	40,380	40,380
Cow Amortization Step 1	16,690	16,690	16,690	16,690	16,690	0	0	0	0
Cow Amortization step 2	0	0	32,882	32,882	32,882	32,882	32,882	0	0
Cow Amortization step 3	0	0	0	0	32,882	32,882	32,882	32,882	0
Cash Cow Purchases	15,000	32,000	32,000	64,000	62,000	96,000	96,000	96,000	96,000
Total Cash Outflow	262,039	286,864	529,647	577,297	810,254	851,039	851,039	818,157	785,275
Net Cash Flow (NCF)	-9,789	-9,614	-25,147	-22,797	-53,504	-19,289	-19,289	13,593	46,475
NCF per Cow	-98	-96	-126	-114	-178	-64	-64	45	1,550
Cum NCF Yr End	-9,789	-19,403	-44,550	-67,347	-120,851	-140,140	-159,429	-118,650	113,725
Cum NCF per Cow	-98	-194	-223	-337	-403	-467	-531	-396	379
NCF W/O Manure Storage	-2,641	-2,466	-17,999	-15,649	-46,356	-12,141	-12,141	20,741	53,623
Milking Labor Hours	1,774	1,774	3,183	3,183	4,592	4,592	4,592	4,592	4,592
Feeding & Care Labor Hours	1,788	1,788	3,576	3,576	5,364	5,364	5,364	5,364	5,364
Hours Milking Labor/Cow/Year	17.74	17.74	15.92	15.92	15.31	15.31	15.31	15.31	15.31
Hrs Feeding & Care Labor/Cow/Year	17.88	17.88	17.88	17.88	17.88	17.88	17.88	17.88	17.88
Annual Labor Cost/cow	534.3	534.3	506.925	506.925	497.8	497.8	497.8	497.8	497.8
Total Parlor Investment	18,000	18,000	36,000	36,000	54,000	54,000	54,000	54,000	54,000
Total Freestall Investment	90,000	90,000	180,000	180,000	270,000	270,000	270,000	270,000	270,000
Total Manure Storage Investment	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Parlor as % of total Building Investment	0.11	0.11	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Yearly Parlor Owner Costs/cow	25.73	25.73	25.73	25.73	25.73	25.73	25.73	25.73	25.73
Yearly Parlor + Labor Costs/cow	560.03	560.03	532.66	532.66	523.53	523.53	523.53	523.53	523.53
Cow Investment/Cow	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Parlor Investment/Cow	180	180	180	180	180	180	180	180	180
Freestall Investment/Cow	900	900	900	900	900	900	900	900	900
Manure Storage Investment/Cow	500	500	250	250	167	167	167	167	167
Land Investment/Cow	?	?	?						
Total Investment /Cow	2,580	2,580	2,330	2,330	2,247	2,247	2,247	2,247	2,247

Selected Performance From Expanding From 50 to 300 Cows In Three Steps In Six Years
Low Capital,12 Stall, 6 Unit, 43 Cow/Hr, Flat Barn Parlor, 1 Year Manure Store For 100 Cows
20 Year Building Amortization

Balance Sheet	Begin	End Yr 1	End Yr 2	End Yr 3	End Yr 4	End Yr 5	End Yr 6	End Yr 7	End Yr 10	End Yr 15	
Cash (Cum NCF Yr End)		-9,789	-19,403	-44,550	-67,347	-120,851	-140,140	-159,429	-118,650	113,725	-566,434
Feed	0	0	0	0	0	0	0	0	0	0	0
Livestock	50,000	100,000	100,000	200,000	200,000	300,000	300,000	300,000	300,000	300,000	2,150,000
Machinery	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	450,000
Facilities Expansion # 1		150,100	142,200	134,300	126,400	118,500	110,600	102,700	94,800	86,900	1,066,500
Facilities Expansion # 2				102,333	96,947	91,561	86,175	80,789	75,403	70,017	603,225
Facilities Expansion # 3						102,333	96,947	91,561	86,175	80,789	457,805
Land and Old Facilities	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	550,000
Total Assets	150000	340,311	322,797	492,083	456,000	591,543	553,582	515,621	537,728	751,431	
Oper. Loans	0	0	0	0	0	0	0		0	0	
Cow Loan # 1		53,600	40,200	26,800	13,400	0	0		0	0	
Cow Loan # 2				107,200	80,400	53,600	26,800		0		
Cow Loan # 3						107,200	80,400	53,600	26,800	0	
Facility Loan #1	0	150,100	142,200	134,300	126,400	118,500	110,600	102,700	94,800	86,900	
Facility Loan # 2	0			102,333	96,947	91,561	86,175	80,789	75,403	70,017	
Facility Loan # 3	0					102,333	96,947	91,561	86,175	80,789	
Total Debts	0	203,700	182,400	370,633	317,147	473,194	400,922	328,650	283,178	237,706	
Equity	150,000	136,611	140,397	121,450	138,853	118,349	152,660	186,971	254,550	513,725	
% of Debt	0	0.60	0.57	0.75	0.70	0.80	0.72	0.64	0.53	0.32	

	Begin	End Yr 1	End Yr 2	End Yr 3	End Yr 4	End Yr 5	End Yr 6	End Yr 7	End Yr 10	End Yr 15
Oper. Interest Paid		0	0	0	0	0	0	0	0	0
cow Interest Paid #1		3,298	3,298	3,298	3,298	3,298				
cow Interest Paid #2				6,082	6,082	6,082	6,082	6,082		
cow Interest Paid #3						6,082	6,082	6,082	6,082	6,082
Facility Interest Paid #1		9,159	9,159	9,159	9,159	9,159	9,159	9,159	9,159	9,159
Facility Interest Paid #2				5,387	5,387	5,387	5,387	5,387	5,387	5,387
Facility Interest Paid #3						5,387	5,387	5,387	5,387	5,387
NCF		-9,789	-9,614	-25,147	-22,797	-53,504	-19,289	-19,289	13,593	46,475
Int Earned on Cum NCF		-881.01	-1746.27	-4009.5	-6061.23	-10876.6	-12612.6	-14348.6	-10678.5	10,235.25
Int Earned/Paid + NCF		1786.99	1096.73	-5230.5	-4932.23	-28985.6	195.4	-1540.61	28929.5	82,725.25
ROROA		0.005	0.003	-0.011	-0.011	-0.049	0.000	-0.003	0.054	0.110
Cwt. Milk Sold		18,000	20,000	36,000	40,000	54,000	60,000	60,000	60,000	54,000
Total Income /Cwt. Milk Sold		14.01	13.86	14.01	13.86	14.01	15.40	13.86	13.86	15.40
Total Cost/Cwt. Milk Sold		14.56	14.34	14.71	14.43	15.00	15.76	14.18	13.64	14.54

LCLE - 11 Years

Selected Performance From Expanding From 50 to 300 Cows In Three Steps In Eleven Years
Low Capital,12 Stall, 6 Unit, 43 Cow/Hr, Flat Barn Parlor, 1 Year Manure Store For 100 Cows
20 Year Building Amortization

	Year 1	Year 2-5	Year 6	Year 7-10	Year 11	Year 12-15	Year 16
# Of Cows	100	100	200	200	300	300	300
Revenue	252,250	277,250	504,500	554,500	756,750	831,750	831,750
Variable Cost	154,330	162,155	308,660	324,310	462,990	486,465	486,465
Labor Cost	53,430	53,430	101,385	101,385	149,340	149,340	149,340
Repairs, Taxes, Insurance	5,530	5,530	9,310	9,310	13,090	13,090	13,090
Building Depreciation & Interest (Amortization)	17,059	17,059	28,720	28,720	40,380	40,380	40,380
Cow Amortization step 1	16,690	16,690				0	0
Cow Amortization step 2	0	0	32,882	32,882			
Cow Amortization step 3	0	0	0	0	32,882	32,882	
Cash Cow Purchases	15,000	32,000	32,000	64,000	62,000	96,000	96,000
Total Cash Outflow	262,039	286,864	512,957	560,607	760,682	818,157	785,275
Net Cash Flow (NCF)	-9,789	-9,614	-8,457	-6,107	-3,932	13,593	46,475
NCF per Cow	-98	-96	-42	-31	-13	45	155
Cum NCF Year End	-9,789	-48,245	-56,702	-81,130	-85,062	-30,690	15,785
Cum NCF per Cow	-98	-482	-284	-406	-284	-102	53
NCF W/O Manure Storage	-2,641	-2,466	-1,309	1,041	3,216	20,741	53,623
Milking Labor Hours	1774	1774	3183	3183	4592	4592	4592
Feeding & Care Labor Hours	1788	1788	3576	3576	5364	5364	5364
Hours Milking Labor/Cow/Year	17.74	17.74	15.92	15.92	15.31	15.31	15.31
Hrs Feeding & Care Labor/Cow/Year	17.88	17.88	17.88	17.88	17.88	17.88	17.88
Annual Labor Cost /Cow	534.3	534.3	506.925	506.925	497.8	497.8	497.8
Total Parlor Investment	18,000	18,000	36,000	36,000	54,000	54,000	54,000
Total Freestall Investment	90,000	90,000	180,000	180,000	270,000	270,000	270,000
Total Manure Storage Investment	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Parlor as % of total Building Investment	0.11	0.11	0.14	0.14	0.14	0.14	0.14
Yearly Parlor Owner Costs/cow	25.73	25.73	25.73	25.73	25.73	25.73	25.73
Yearly Parlor + Labor Costs/cow	560.03	560.03	532.66	532.66	523.53	523.53	523.53
Cow Investment/Cow	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Parlor Investment/Cow	180	180	180	180	180	180	180
Freestall Investment/Cow	900	900	900	900	900	900	900
Manure Storage vestment/Cow	500	500	250	250	166.6667	166.66667	166.6667
Land Investment/Cow	?	?	?				
Total Investment /Cow	2,580	2,580	2,330	2,330	2,247	2,247	2,247

Selected Performance From Expanding From 50 to 300 Cows In Three Steps In Eleven Years
Low Capital, 12 Stall, 6 Unit, 43 Cow/Hr, Flat Barn Parlor, 1 Year Manure Store For 100 Cows
20 Year Building Amortization

Balance Sheet	Begin	End Yr 1	End Yr 5	End Yr 6	End Yr 10	End Yr 11	End Yr 15	End Yr 16
Cash (Cum NCF Yr End)		-9,789	-48,245	-56,702	-81,130	-85,062	-30,690	15,785
Feed	0	0	0	0	0	0	0	0
Livestock	50,000	100,000	100,000	200,000	200,000	300,000	300,000	300,000
Machinery	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000
Facilities Expansion # 1		150,100	118,500	110,600	79,000	71,100	39,500	31,600
Facilities Expansion # 2				102,600	81,000	75,600	54,000	48,600
Facilities Expansion # 3						102,600	81,000	75,600
Land and Old Facilities	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000
Total Assets	150,000	340,311	270,255	456,498	378,870	564,238	543,810	571,585
Oper. Loans	0	0	0	0	0	0	0	0
Cow Loan # 1		53,600	0	0	0	0	0	0
Cow Loan # 2				107,200	0	0	0	0
Cow Loan # 3						107,200	0	0
Facility Loan #1	0	150,100	118,500	110,600	79,000	71,100	39,500	31,600
Facility Loan # 2	0			102,600	81,000	75,600	54,000	48,600
Facility Loan # 3	0					102,600	81,000	75,600
Total Debts	0	203,700	118,500	320,400	160,000	356,500	174,500	155,800
Equity	150,000	136,611	151,755	136,098	218,870	207,738	369,310	415,785
% of Debt	0	0.60	0.44	0.70	0.42	0.63	0.32	0.27

	Begin	End Yr 1	End Yr 5	End Yr 6	End Yr 10	End Yr 11	End Yr 15	End Yr 16
Oper. Interest Paid		0	0	0	0	0	0	0
cow Interest Paid #1		3,298	3,298					
cow Interest Paid #2				6,082	6,082			
cow Interest Paid #3						6,082	6,082	
Facility Interest Paid #1		17,210	17,210	17,210	17,210	17,210	17,210	17,210
Facility Interest Paid #2				5,387	5,387	5,387	5,387	5,387
Facility Interest Paid #3						5,387	5,387	5,387
NCF		-9,789	-9,614	-8,457	-6,107	-3,932	13,593	46,475
Int Earned on Cum NCF		-881	-4,342	-5,103	-7,302	-7,656	-2,762	1,421
Int Earned/Paid + NCF		9,837.99	6,551.95	15,118.82	15,270.3	22,478.42	44,896.9	75,879.65
ROROA		0.029	0.024	0.033	0.040	0.040	0.083	0.133
Cwt. Milk Sold		18,000	20,000	36,000	40,000	54,000	60,000	60,000
Total Income /Cwt. Milk Sold		14.01	13.86	14.01	13.86	14.01	13.86	13.86
Total Cost/Cwt. Milk Sold		14.56	14.34	14.25	14.02	14.09	13.64	13.09

LCLE - 542

Selected Performance From Expanding From 50 to 542 Cows In One Year
Low Capital,12 Stall, 6 Unit, 43 Cow/Hr, Flat Barn Parlor, 1 Year Manure Store For 100 Cows
20 Year Building Amortization

	Year 1	Years 2-5	Years 6-20	End Yr 10	End Yr 15
# Of Cows	542	542	542	542	542
Revenue	1,366,750	1,502,250	1,502,250	1,502,250	1,502,250
Variable Cost	836,469	878,880	878,880	878,880	878,880
Labor Cost	265,380	265,380	265,380	265,380	265,380
Repairs, Taxes, Insurance	22,210	22,210	22,210	22,210	22,210
Building Depreciation & Interest (Amortization)	68,589	68,589	68,589	68,589	68,589
Cow Amortization Step 1	161,666	161,666			
Cow Amortization Step 2	0	0	0	0	0
Cow Amortization Step 3	0	0	0	0	0
Cash Cow Purchases	15,000	172,000	172,000	172,000	172,000
Total Cash Outflow	1,369,314	1,568,725	1,407,059	1,407,059	1,407,059
Net Cash Flow (NCF)	-2,564	-66,475	95,191	95,191	95,191
NCF per Cow	-5	-123	176	176	176
Cum NCF Year End	-2,564	-268,462	-173,271	207,495	683,452
Cum NCF per Cow	-5	-495	-320	383	1,261
NCF W/O Manure Storage	4,584	-59,327	102,339	102,339	102,339
Milking Labor Hours	8,001	8,001	8,001	8,001	8,001
Feeding & Care Labor Hours	9,691	9,691	9,691	9,691	9,691
Hours Milking Labor/Cow/Year	14.76	14.76	14.76	14.76	14.76
Hrs Feeding & Care Labor/Cow/Year	17.88	17.88	17.88	17.88	17.88
Annual Labor Cost /Cow	489.63	489.63	489.63	489.63	489.63
Total Parlor Investment	97,560	97,560	97,560	97,560	97,560
Total Freestall Investment	487,000	487,000	487,000	487,000	487,000
Total Manure Storage Investment	50,000	50,000	50,000	50,000	50,000
Parlor as % of total Building Investment	0.15	0.15	0.15	0.15	0.15
Yearly Parlor Owner Costs/cow	25.76	25.76	25.76	25.76	25.76
Yearly Parlor + Labor Costs/cow	515.39	515.39	515.39	515.39	515.39
Cow Investment/Cow	1,000	1,000	1,000	1,000	1,000
Parlor Investment/Cow	180	180	180	180	180
Freestall Investment/Cow	899	899	899	899	899
Manure Storage Investment/Cow	92	92	92	92	92
Land Investment/Cow	?	?	?	?	?
Total Investment /Cow	2,171	2,171	2,171	2,171	2,171

Selected Performance From Expanding From 50 to 542 Cows In One Year
Low Capital,12 Stall, 6 Unit, 43 Cow/Hr, Flat Barn Parlor, 1 Year Manure Store For 100 Cows
20 Year Building Amortization

Balance Sheet	Begin	End Yr 1	End Yr 5	End Yr 6	End Yr 10	End Yr 15
Cash (Cum NCF Year End)		-2,564	-268,462	-173,271	207,495	683,452
Feed	0	0	0	0	0	0
Livestock	50,000	542,000	542,000	542,000	542,000	542,000
Machinery	45,000	45,000	45,000	45,000	45,000	45,000
Facilities		603,592	476,520	444,752	317,680	158,840
Land and Old Facilities	55,000	55,000	55,000	55,000	55,000	55,000
Total Assets	150,000	1,243,028	850,058	913,481	1,167,175	1,484,292
Oper. Loans						
Cow Loans		519,200	0	0	0	0
Facility Loans		603,592	476,520	444,752	317,680	158,840
Total Debts	0	1,122,792	476,520	444,752	317,680	158,840
Equity	150,000	120,236.4	373,538	468,729.4	849,495	1,325,452
% of Debt	0	0.90	0.56	0.49	0.27	0.11

	Begin	End Yr 1	End Yr 5	End Yr 6	End Yr 10	End Yr 15
Oper. Interest Paid		0	0	0	0	0
cow Interest Paid		31,866	31,866	0	0	0
Facility Interest Paid		36,821	36,821	36,821	36,821	36,821
NCF		-2,564	-66,475	95,191	95,191	95,191
Int Earned on Cum NCF		-231	-24,162	-15,594	18,675	61,511
Int Earned/Paid + NCF		65,892.68	-21,949.2	116,418.05	150,687	193,523.1
ROROA		0.053	-0.026	0.127	0.129	0.130
Cwt. Milk Sold		97,560	108,400	108,400	108,400	108,400
Total Income /Cwt. Milk Sold		14.01	13.86	13.86	13.86	13.86
Total Cost/Cwt. Milk Sold		14.04	14.47	12.98	12.98	12.98

MCME - 1 Year

Selected Performance From Expanding From 50 to 300 Cows In One Year
Medium Capital, Double 8 Parlor, 62-65 Cows/Hr, 1 Year Manure Store For 100 Cows
20 Year Building Amortization

	Year 1	Years 2-5	Years 6-20	End Yr 10	End Yr 15
# Of Cows	300	300	300	300	300
Revenue	756,750	831,750	831,750	831,750	831,750
Variable Cost	462,990	486,465	486,465	486,465	486,465
Labor Cost	127,980	129,960	129,960	129,960	129,960
Repairs, Taxes, Insurance	17,932	17,932	17,932	17,932	17,932
Building Depreciation & Interest (Amortization)	55,318	55,318	55,318	55,318	55,318
Cow Amortization step 1	84,943	84,943	0	0	0
Cow Amortization step 2	0	0	0	0	0
Cow Amortization step 3	0	0	0	0	0
Cash Cow Purchases	15,000	96,000	96,000	96,000	96,000
Total Cash Outflow	764,163	870,618	785,675	785,675	785,675
Net Cash Flow (NCF)	-7,413	-38,868	46,075	46,075	46,075
NCF per Cow	-25	-130	154	154	154
Cum NCF Year End	-7,413	-162,885	-116,810	67,490	297,865
Cum NCF per Cow	-25	-543	-389	225	993
NCF W/O Manure Storage	-265	-31,720	53,223	53,223	53,223
Milking Labor Hours	3,168	3,300	3,300	3,300	3,300
Feeding & Care Labor Hours	5,364	5,364	5,364	5,364	5,364
Hours Milking Labor/Cow/Year	10.56	11.00	11.00	11.00	11.00
Hrs Feeding & Care Labor/Cow/Year	17.88	17.88	17.88	17.88	17.88
Annual Labor Cost /Cow	426.6	433.2	433.2	433.2	433.2
Total Parlor Investment	192,357	192,357	192,357	192,357	192,357
Total Freestall Investment	270,000	270,000	270,000	270,000	270,000
Total Manure Storage Investment	50,000	50,000	50,000	50,000	50,000
Parlor as % of total Building Investment	0.38	0.38	0.38	0.38	0.38
Yearly Parlor Owner Costs/cow	91.67	91.67	91.67	91.67	91.67
Yearly Parlor + Labor Costs/cow	518.27	524.87	524.87	524.87	524.87
Cow Investment/Cow	1,000	1,000	1,000	1,000	1,000
Parlor Investment/Cow	641	641	641	641	641
Freestall Investment/Cow	900	900	900	900	900
Manure Storage Investment/Cow	167	167	167	167	167
Land Investment/Cow	?	?	?	?	?
Total Investment /Cow	2,708	2,708	2,708	2,708	2,708

Selected Performance From Expanding From 50 to 300 Cows In One Year
Medium Capital, Double 8 Parlor, 62-65 Cows/Hr, 1 Year Manure Store For 100 Cows
20 Year Building Amortization

Balance Sheet	Begin	End Yr 1	End Yr 5	End Yr 6	End Yr 10	End Yr 15
Cash (Cum NCF Yr End)		-7,413	-162,885	-116,810	67,490	297,865
Feed	0	0	0	0	0	0
Livestock	50,000	300,000	300,000	300,000	300,000	300,000
Machinery	45,000	45,000	45,000	45,000	45,000	45,000
Facilities		485,739	379,267	352,649	246,177	113,087
Land and Old Facilities	55,000	55,000	55,000	55,000	55,000	55,000
Total Assets	150,000	878,326	616,382	635,839	713,667	810,952
Oper. Loans						
Cow Loans		264,800	0	0	0	0
Facility Loans		485,739	379,267	352,649	246,177	113,087
Total Debts	0	750,539	379,267	352,649	246,177	113,087
Equity	150,000	127,787	237,115	283,190	467,490	697,865
% of Debt	0.00	0.85	0.62	0.55	0.34	0.14

	Begin	End Yr 1	End Yr 5	End Yr 6	End Yr 10	End Yr 15
Oper. Interest Paid		0	0	0	0	0
Cow Interest Paid		18,743	18,743	0	0	0
Facility Interest Paid		29,700	29,700	29,700	29,700	29,700
NCF		-7,413	-38,868	46,075	46,075	46,075
Interest Earned on Cum NCF		-667.17	-14,659.7	-10,512.9	6,074.1	26,807.85
Interest Earned/Paid + NCF		40,362.83	-5,084.65	65,262.1	81,849.1	102,582.9
ROROA		0.046	-0.008	0.103	0.115	0.126
Cwt. Milk Sold		54,000	60,000	60,000	60,000	60,000
Total Income /Cwt. Milk Sold		14.01	13.86	13.86	13.86	13.86
Total Cost/Cwt. Milk Sold		14.15	14.51	13.09	13.09	13.09

MCME - 6 Years

Selected Performance From Expanding From 50 to 300 Cows In Three Steps In Six Years
Medium Capital, Double 8 Parlor, 62-65 Cows/Hr, 1 Year Manure Store For 100 Cows
20 Year Building Amortization

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8-10	Yrs 11-15
# Of Cows	100	100	200	200	300	300	300	300	300
Revenue	252,250	277,250	504,500	554,500	756,750	831,750	831,750	831,750	831,750
Variable Cost	154,330	162,155	308,660	324,310	462,990	486,465	486,465	486,465	486,465
Labor Cost	46,305	46,965	87,150	88,455	127,980	129,960	129,960	129,960	129,960
Repairs, Taxes, Insurance	10,392	10,392	14,162	14,162	17,933	17,933	17,933	17,933	17,933
Building Depreciation & Interest (Amortization)	32,056	32,056	43,685	43,685	55,318	55,318	55,318	55,318	55,318
Cow Amortization step 1	16,690	16,690	16,690	16,690	16,690	0	0	0	0
Cow Amortization step 2	0	0	32,882	32,882	32,882	32,882	32,882	0	0
Cow Amortization step 3	0	0	0	0	32,882	32,882	32,882	32,882	0
Cash Cow Purchases	15,000	32,000	32,000	64,000	62,000	96,000	96,000	96,000	96,000
Total Cash Outflow	274,773	300,258	535,229	584,184	808,675	851,440	851,440	818,558	785,676
Net Cash Flow (NCF)	-22,523	-23,008	-30,729	-29,684	-51,925	-19,690	-19,690	13,192	46,074
NCF per Cow	-225	-230	-154	-148	-173	-66	-66	44	154
Cum NCF Year End	-22,523	-45,531	-76,260	-105,944	-157,869	-177,559	-197,249	-157,673	72,697
Cum NCF per Cow	-225	-455	-381	-530	-526	-592	-657	-526	242
NCF W/O Manure Storage	-15,375	-15,860	-23,581	-22,536	-44,777	-12,542	-12,542	20,340	53,222
Milking Labor Hours	1,299	1,343	2,234	2,321	3,168	3,300	3,300	3,300	3,300
Feeding & Care Labor Hours	1,788	1,788	3,576	3,576	5,364	5,364	5,364	5,364	5,364
Hours Milking Labor/Cow/Year	12.99	13.43	11.17	11.61	10.56	11.00	11.00	11.00	11.00
Hrs Feeding & Care Labor/Cow/Year	17.88	17.88	17.88	17.88	17.88	17.88	17.88	17.88	17.88
Annual Labor Cost /Cow	463.05	469.65	435.75	442.28	426.6	433.2	433.2	433.2	433.2
Total Parlor Investment	156,920	156,920	174,639	174,639	192,357	192,357	192,357	192,357	192,357
Total Freestall Investment	90,000	90,000	180,000	180,000	270,000	270,000	270,000	270,000	270,000
Total Manure Storage Investment	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Parlor as % of total Building Investment	0.53	0.53	0.43	0.43	0.38	0.38	0.38	0.38	0.38
Yearly Parlor Owner Costs/Cow	224.33	224.33	124.83	124.83	91.67	91.67	91.67	91.67	91.67
Yearly Parlor + Labor Costs/Cow	687.38	693.98	560.58	567.11	518.27	524.87	524.87	524.87	524.87
Cow Investment/Cow	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Parlor Investment/Cow	1569	1569	873	873	641	641	641	641	641
Freestall Investment/Cow	900	900	900	900	900	900	900	900	900
Manure Storage Investment/Cow	500	500	250	250	166.67	166.67	166.67	166.67	166.67
Land Investment/Cow	?	?	?						
Total Investment /Cow	3,969	3,969	3,023	3,023	2,708	2,708	2,708	2,708	2,708

Selected Performance From Expanding From 50 to 300 Cows In Three Steps In Six Years
Medium Capital, Double 8 Parlor, 62-65 Cows/Hr, 1 Year Manure Store For 100 Cows
20 Year Building Amortization

Balance Sheet	Begin	End Yr 1	End Yr 2	End Yr 3	End Yr 4	End Yr 5	End Yr 6	End Yr 7	End Yr 10	End Yr 15
Cash (Cum NCF Yr End)		-22,523	-45,531	-76,260	-105,944	-157,869	-177,559	-197,249	-157,673	72697
Feed	0	0	0	0	0	0	0	0	0	0
Livestock	50,000	100,000	100,000	200,000	200,000	300,000	300,000	300,000	300,000	300,000
Machinery	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000
Facilities Expansion # 1		282,074	267,228	252,382	237,536	222,690	207,844	192,998	178,152	163,306
Facilities Expansion # 2				102,333	96,947	91,561	86,175	80,789	75,403	70,017
Facilities Expansion # 3						102,333	96,947	91,561	86,175	80,789
Land and Old Facilities	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000
Total Assets	150,000	459,551	421,697	578,455	528,539	658,715	613,407	568,099	582,057	786,809
Oper. Loans	0	0	0	0	0	0	0		0	0
Cow Loan # 1		53,600	40,200	26,800	13,400	0	0		0	0
Cow Loan # 2				107,200	80,400	53,600	26,800		0	
Cow Loan # 3						107,200	80,400	53,600	26,800	0
Facility Loan #1	0	282,074	267,228	252,382	237,536	222,690	207,844	192,998	178,152	163,306
Facility Loan # 2	0			102,333	96,947	91,561	86,175	80,789	75,403	70,017
Facility Loan # 3	0					102,333	96,947	91,561	86,175	80,789
Total Debts	0	335,674	307,428	488,715	428,283	577,384	498,166	418,948	366,530	314,112
Equity	150,000	123,877	114,269	89,740	100,256	81,331	115,241	149,151	215,527	472,697
% of Debt	0.0	0.73	0.73	0.84	0.81	0.88	0.81	0.74	0.63	0.40

	Begin	End Yr 1	End Yr 2	End Yr 3	End Yr 4	End Yr 5	End Yr 6	End Yr 7	End Yr 10	End Yr 15
Oper. Interest Paid		0	0	0	0	0	0	0	0	0
cow Interest Paid #1		3,298	3,298	3,298	3,298	3,298				
cow Interest Paid #2				6,082	6,082	6,082	6,082	6,082		
cow Interest Paid #3						6,082	6,082	6,082	6,082	6,082
Facility Interest Paid #1		17,210	17,210	17,210	17,210	17,210	17,210	17,210	17,210	17,210
Facility Interest Paid #2				5,387	5,387	5,387	5,387	5,387	5,387	5,387
Facility Interest Paid #3						5,387	5,387	5,387	5,387	5,387
NCF		-22,523	-23,008	-30,729	-29,684	-51,925	-19,690	-19,690	13,192	46,074
Int Earned on Cum NCF	0	-2,027.07	-4,097.79	-6,863.4	-9,534.96	-14,208.21	-15980.31	-17752.41	-14190.57	6,542.73
Int Earned/Paid + NCF		-4,042.07	-6,597.79	-5,615.4	-7,241.96	-22,687.21	4,477.69	2,705.59	33,067.43	86,682.73
ROROA		-0.009	-0.016	-0.010	-0.014	-0.034	0.007	0.005	0.057	0.110
Cwt. Milk Sold		18,000	20,000	36,000	40,000	54,000	60,000	60,000	60,000	60,000
Total Income /Cwt. Milk Sold		14.01	13.86	14.01	13.86	14.01	13.86	13.86	13.86	13.86
Total Cost/Cwt. Milk Sold		15.27	15.01	14.87	14.60	14.98	14.19	14.19	13.64	13.09

MCME - 11 Years

Selected Performance From Expanding From 50 to 300 Cows In Three Steps In Eleven Years
Medium Capital, Double 8 Parlor, 62-65 Cows/Hr, 1 Year Manure Store For 100 Cows
20 Year Building Amortization

	Year 1	Years 2-5	Year 6	Years 7-10	Year 11	Years 12-15	Year 16
# Of Cows	100	100	200	200	300	300	300
Revenue	252,250	277,250	504,500	554,500	756,750	831,750	831,750
Variable Cost	154,330	162,155	308,660	324,310	462,990	486,465	486,465
Labor Cost	46,305	46,965	87,150	88,455	127,980	129,960	129,960
Repairs, Taxes, Insurance	10,392	10,392	14,162	14,162	17,932	17,932	17,932
Building Depreciation & Interest (Amortization)	32,056	32,056	43,685	43,685	55,318	55,318	55,318
Cow Amortization step 1	16,690	16,690				0	0
Cow Amortization step 2	0	0	32,882	32,882			
Cow Amortization step 3	0	0	0	0	32,882	32,882	
Cash Cow Purchases	15,000	32,000	32,000	64,000	62,000	96,000	96,000
Total Cash Outflow	274,773	300,258	518,539	567,494	759,102	818,557	785,675
Net Cash Flow (NCF)	-22,523	-23,008	-14,039	-12,994	-2,352	13,193	46,075
NCF per Cow	-225	-230	-70	-65	-8	44	154
Cum NCF Year End	-22,523	-114,556	-128,595	-180,573	-182,925	-130,155	-84,081
Cum NCF per Cow	-225	-1146	-643	-903	-610	-434	-280
NCF W/O Manure Storage	-15,375	-15,860	-6,891	-5,846	4,796	20,341	53,223
Milking Labor Hours	1,299	1,343	2,234	2,321	3,168	3,300	3,300
Feeding & Care Labor Hours	1,788	1,788	3,576	3,576	5,364	5,364	5,364
Hours Milking Labor/Cow/Year	12.99	13.43	11.17	11.61	10.56	11.00	11.00
Hrs Feeding & Care Labor/Cow/Year	17.88	17.88	17.88	17.88	17.88	17.88	17.88
Annual Labor Cost /Cow	463.05	469.65	435.75	442.28	426.6	433.2	433.2
Total Parlor Investment	156,920	156,920	174,639	174,639	192,357	192,357	192,357
Total Freestall Investment	90,000	90,000	180,000	180,000	270,000	270,000	270,000
Total Manure Storage Investment	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Parlor as % of total Building Investment	0.53	0.53	0.43	0.43	0.38	0.38	0.38
Yearly Parlor Owner Costs/cow	224.34	224.34	124.83	124.83	91.67	91.67	91.67
Yearly Parlor + Labor Costs/cow	687.39	693.99	560.58	567.11	518.27	524.87	524.87
Cow Investment/Cow	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Parlor Investment/Cow	1,569.2	1,569.2	873.195	873.195	641.19	641.19	641.19
Freestall Investment/Cow	900	900	900	900	600	600	600
Manure Storage Investment/Cow	500	500	250	250	166.67	166.67	166.67
Land Investment/Cow	?	?	?				
Total Investment /Cow	3,969	3,969	3,023	3,023	2,408	2,408	2,408

Selected Performance From Expanding From 50 to 300 Cows In Three Steps In Eleven Years
Medium Capital, Double 8 Parlor, 62-65 Cows/Hr, 1 Year Manure Store For 100 Cows
20 Year Building Amortization

Balance Sheet	Begin	End Yr 1	End Yr 5	End Yr 6	End Yr 10	End Yr 11	End Yr 15	End Yr 16
Cash (Cum NCF Yr End)		-22,523	-114,556	-128,595	-180,573	-182,925	-130,155	-84,081
Feed	0	0	0	0	0	0	0	0
Livestock	50,000	100,000	100,000	200,000	200,000	300,000	300,000	300,000
Machinery	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000
Facilities Expansion # 1		282,074	222,690	207,844	148,460	133,614	74,230	59,384
Facilities Expansion # 2				102,333	80,789	75,403	53,859	48,473
Facilities Expansion # 3						102,333	80,789	75,403
Land and Old Facilities	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000
Total Assets	150,000	459,551	308,134	481,582	348,676	528,425	478,723	499,179
Oper. Loans	0	0	0	0	0	0	0	0
Cow Loan # 1		53,600	0	0	0	0	0	0
Cow Loan # 2				107,200	0	0	0	0
Cow Loan # 3						107,200	0	0
Facility Loan #1	0	282,074	222,690	207,844	148,460	133,614	74,230	59,384
Facility Loan # 2	0			102,333	80,789	75,403	53,859	48,473
Facility Loan # 3	0					102,333	80,789	75,403
Total Debts	0	335,674	222,690	417,377	229,249	418,550	208,878	183,260
Equity	150,000	123,877	85,444	64,205	119,427	109,875	269,845	315,919
% of Debt	0	0.73	0.72	0.87	0.66	0.79	0.44	0.37

	Begin	End Yr 1	End Yr 5	End Yr 6	End Yr 10	End Yr 11	End Yr 15	End Yr 16
Oper. Interest Paid		0	0	0	0	0	0	0
Cow Interest Paid #1		3,298	3,298					
Cow Interest Paid #2				6,082	6,082			
Cow Interest Paid #3						6,082	6,082	
Facility Interest Paid #1		17,210	17,210	17,210	17,210	17,210	17,210	17,210
Facility Interest Paid #2				6,243	6,243	6,243	6,243	6,243
Facility Interest Paid #3						6,243	6,243	6,243
NCF		-22,523	-23,008	-14,039	-12,994	-2,352	13,193	46,075
Int Earned on Cum NCF		-2,027	-10,310	-11,574	-16,252	-16,463	-11,714	-7,567
Int Earned/Paid + NCF		-4,042.288	-12810.24	3922.052	289.08075	16962.23	37256.528	68203.23
ROROA		-0.009	-0.042	0.008	0.001	0.032	0.078	0.137
Cwt. Milk Sold		18,000	20,000	36,000	40,000	54,000	60,000	60,000
Total Income /Cwt. Milk Sold		14.01	13.86	14.01	13.86	14.01	13.86	13.86
Total Cost/Cwt. Milk Sold		15.27	15.01	14.40	14.19	14.06	13.64	13.09

MCME - 542

Selected Performance From Expanding From 50 to 542 Cows In One Year
Medium Capital, Double 8 Parlor, 62-65 Cows/Hr, 1 Year Manure Store For 100 Cows
20 Year Building Amortization

	Year 1	Years 2-5	Years 6-20	End Yr 10	End Yr 15
# Of Cows	542	542	542	542	542
Revenue	1,366,750	1,502,250	1,502,250	1,502,250	1,502,250
Variable Cost	836,469	878,880	878,880	878,880	878,880
Labor Cost	227,160	230,325	230,325	230,325	230,325
Repairs, Taxes, Insurance	27,056	27,056	27,056	27,056	27,056
Building Depreciation & Interest (Amortization)	83,460	83,460	83,460	83,460	83,460
Cow Amortization Step 1	161,666	161,666			
Cow Amortization Step 2	0	0	0	0	0
Cow Amortization Step 3	0	0	0	0	0
Cash Cow Purchases	15,000	172,000	172,000	172,000	172,000
Total Cash Outflow	1,350,811	1,553,387	1,391,721	1,391,721	1,391,721
Net Cash Flow (NCF)	15,939	-51,137	110,529	110,529	110,529
NCF per Cow	29	-94	204	204	204
Cum NCF Yr End	15,939	-188,609	-78,080	364,036	916,681
Cum NCF per Cow	29	-348	-144	672	1,691
NCF W/O Manure Storage	23,087	-43,989	117,677	117,677	117,677
Milking Labor Hours	5,453	5,664	5,664	5,664	5,664
Feeding & Care Labor Hours	9,691	9,691	9,691	9,691	9,691
Hours Milking Labor/Cow/Year	10.06	10.45	10.45	10.45	10.45
Hrs Feeding & Care Labor/Cow/Year	17.88	17.88	17.88	17.88	17.88
Annual Labor Cost /Cow	419.11	424.95	424.95	424.95	424.95
Total Parlor Investment	235,236	235,236	235,236	235,236	235,236
Total Freestall Investment	487,800	487,800	487,800	487,800	487,800
Total Manure Storage Investment	50,000	50,000	50,000	50,000	50,000
Parlor as % of total Blding Investment	0.30	0.30	0.30	0.30	0.30
Yearly Parlor Owner Costs/cow	62.05	62.05	62.05	62.05	62.05
Yearly Parlor + Labor Costs/cow	481.16	487.00	487.00	487.00	487.00
Cow Investment/Cow	1,000	1,000	1,000	1,000	1,000
Parlor Investment/Cow	434	434	434	434	434
Freestall Investment/Cow	900	900	900	900	900
Manure Storage Investment/Cow	92	92	92	92	92
Land Investment/Cow	?	?	?	?	?
Total Investment /Cow	2,426	2,426	2,426	2,426	2,426

Selected Performance From Expanding From 50 to 542 Cows In One Year
Medium Capital, Double 8 Parlor, 62-65 Cows/Hr, 1 Year Manure Store For 100 Cows
20 Year Building Amortization

Balance Sheet	Begin	End Yr 1	End Yr 5	End Yr 6	End Yr 10	End Yr 15
Cash (Cum NCF Yr End)		15,939	-188,609	-78,080	364,036	916,681
Feed	0	0	0	0	0	0
Livestock	50,000	542,000	542,000	542,000	542,000	542,000
Machinery	45,000	45,000	45,000	45,000	45,000	45,000
Facilities		734,384	579,776	541,124	386,520	193,260
Land and Old Facilities	55,000	55,000	55,000	55,000	55,000	55,000
Total Assets	150,000	1,392,323	1,033,167	1,105,044	1,392,556	1,751,941
Oper. Loans						
Cow Loans		636,100	0	0	0	0
Facility Loans		734,384	579,776	541,124	386,520	193,260
Total Debts	0	1,370,484	579,776	541,124	386,520	193,260
Equity	150,000	21,839	453,391	563,920	1,006,036	1,558,681
% of Debt	0	0.98	0.56	0.49	0.28	0.11

	Begin	End Yr 1	End Yr 5	End Yr 6	End Yr 10	End Yr 15
Oper. Interest Paid		0	0	0	0	0
cow Interest Paid		31,866	31,866	0	0	0
Facility Interest Paid		44,808	44,808	44,808	44,808	44,808
NCF		15,939	-51,137	110,529	110,529	110,529
Int Earned on Cum NCF		1,435	-16,975	-7,027	32,763	82,501
Int Earned/Paid + NCF		94,047.51	8,562.19	148,309.8	188,100.2	237,838.3
ROROA		0.068	0.008	0.134	0.135	0.136
Cwt. Milk Sold		97,560	108,400	108,400	108,400	108,400
Total Income /Cwt. Milk Sold		14.01	13.86	13.86	13.86	13.86
Total Cost/Cwt. Milk Sold		13.85	14.33	12.84	12.84	12.84

MCME - 780

Selected Performance From Expanding From 50 to 780 Cows In One Year
Medium Capital, Double 8 Parlor, 62-65 Cows/Hr, 1 Year Manure Store For 100 Cows
20 Year Building Amortization

	Year 1	Years 2-5	Years 6-20	End Yr 10	End Yr 15
# Of Cows	780	780	780	780	780
Revenue	1,967,500	2,162,500	2,162,500	2,162,500	2,162,500
Variable Cost	1,203,774	1,264,809	1,264,809	1,264,809	1,264,809
Labor Cost	323,940	329,115	329,115	329,115	329,115
Repairs, Taxes, Insurance	36,029	36,029	36,029	36,029	36,029
Building Depreciation & Interest (Amortization)	111,176	111,176	111,176	111,176	111,176
Cow Amortization Step 1	240,133	240,133			
Cow Amortization Step 2	0	0	0	0	0
Cow Amortization Step 3	0	0	0	0	0
Cash Cow Purchases	15,000	249,000	249,000	249,000	249,000
Total Cash Outflow	1,930,052	2,230,262	1,990,129	1,990,129	1,990,129
Net Cash Flow (NCF)	37,448	-67,762	172,371	172,371	172,371
NCF per Cow	48	-87	221	221	221
Cum NCF Yr End	37,448	-233,600	-61,229	628,255	1,490,110
Cum NCF per Cow	48	-299	-78	805	1,910
NCF W/O Manure Storage	44,596	-60,614	179,519	179,519	179,519
Milking Labor Hours	7,650	7,995	7,995	7,995	7,995
Feeding & Care Labor Hours	13,946	13,946	13,946	13,946	13,946
Hours Milking Labor/Cow/Year	9.81	10.25	10.25	10.25	10.25
Hrs Feeding & Care Labor/Cow/Year	17.88	17.88	17.88	17.88	17.88
Annual Labor Cost /Cow	415	422	422	422	422
Total Parlor Investment	277,406	277,406	277,406	277,406	277,406
Total Freestall Investment	702,000	702,000	702,000	702,000	702,000
Total Manure Storage Investment	50,000	50,000	50,000	50,000	50,000
Parlor as % of total Blding Investment	0.27	0.27	0.27	0.27	0.27
Yearly Parlor Owner Costs/cow	50.86	50.86	50.86	50.86	50.86
Yearly Parlor + Labor Costs/cow	466.17	472.80	472.80	472.80	472.80
Cow Investment/Cow	1,000	1,000	1,000	1,000	1,000
Parlor Investment/Cow	356	356	356	356	356
Freestall Investment/Cow	900	900	900	900	900
Manure Storage Investment/Cow	64	64	64	64	64
Land Investment/Cow	?	?	?	?	?
Total Investment /Cow	2,320	2,320	2,320	2,320	2,320

Selected Performance From Expanding From 50 to 780 Cows In One Year
Medium Capital, Double 8 Parlor, 62-65 Cows/Hr, 1 Year Manure Store For 100 Cows
20 Year Building Amortization

Balance Sheet	Begin	End Yr 1	End Yr 5	End Yr 6	End Yr 10	End Yr 15
Cash (Cum NCF Yr End)		37,448	-233,600	-61,229	628,255	1,490,110
Feed	0	0	0	0	0	0
Livestock	50,000	780,000	780,000	780,000	780,000	780,000
Machinery	45,000	45,000	45,000	45,000	45,000	45,000
Facilities	0	977,936	772,056	720,586	514,706	257,356
Land and Old Facilities	55,000	55,000	55,000	55,000	55,000	55,000
Total Assets	150,000	1,895,384	1,418,456	1,539,357	2,022,961	2,627,466
Oper. Loans						
Cow Loans	0	723,867	0	0	0	0
Facility Loans	0	977,936	772,056	720,586	514,706	257,356
Total Debts	0	1,701,803	772,056	720,586	514,706	257,356
Equity	150,000	193,581	646,400	818,771	1,508,255	2,370,110
% of Debt	0	0.90	0.54	0.47	0.25	0.10

	Begin	End Yr 1	End Yr 5	End Yr 6	End Yr 10	End Yr 15
Oper. Interest Paid		0	0	0	0	0
cow Interest Paid		47,333	47,333	0	0	0
Facility Interest Paid		59,706	59,706	59,706	59,706	59,706
NCF		37,448	-67,762	172,371	172,371	172,371
Int Earned on Cum NCF		3,370	-21,024	-5,511	56,543	134,110
Int Earned/Paid + NCF		147,857.3	18,253	226,566.39	288,620	366,186.9
ROROA		0.08	0.01	0.15	0.14	0.14
Cwt. Milk Sold		140,400	156,000	156,000	156,000	156,000
Total Income /Cwt. Milk Sold		14.01	13.86	13.86	13.86	13.86
Total Cost/Cwt. Milk Sold		13.75	14.30	12.76	12.76	12.76

HCME - 780

Selected Performance From Expanding From 50 to 780 Cows In One Year
High Capital, Double 8 Parlor, 62-65 Cows/Hr, 1 Year Manure Store For 100 Cows
20 Year Building Amortization

	Year 1	Years 2-5	Years 6-20	End Yr 10	End Yr 15
# Of Cows	780	780	780	780	780
Revenue	1,967,500	2,162,500	2,162,500	2,162,500	2,162,500
Variable Cost	1,203,774	1,264,809	1,264,809	1,264,809	1,264,809
Labor Cost	323,940	329,115	329,115	329,115	329,115
Repairs, Taxes, Insurance	45,738	45,738	45,738	45,738	45,738
Building Depreciation & Interest (Amortization)	141,093	141,093	141,093	141,093	141,093
Cow Amortization Step 1	240,133	240,133			
Cow Amortization Step 2	0	0	0	0	0
Cow Amortization Step 3	0	0	0	0	0
Cash Cow Purchases	15,000	249,000	249,000	249,000	249,000
Total Cash Outflow	1,969,678	2,269,888	2,029,755	2,029,755	2,029,755
Net Cash Flow (NCF)	-2,178	-107,388	132,745	132,745	132,745
NCF per Cow	-3	-138	170	170	170
Cum NCF Year End	-2,178	-431,730	-298,985	231,995	895,720
Cum NCF per Cow	-3	-554	-383	297	1,148
NCF W/O Manure Storage	4,970	-100,240	139,893	139,893	139,893
Milking Labor Hours	7,650	7,995	7,995	7,995	7,995
Feeding & Care Labor Hours	13,946	13,946	13,946	13,946	13,946
Hours Milking Labor/Cow/Year	9.81	10.25	10.25	10.25	10.25
Hrs Feeding & Care Labor/Cow/Year	17.88	17.88	17.88	17.88	17.88
Annual Labor Cost /Cow	415	422	422	422	422
Total Parlor Investment	544,812	544,812	544,812	544,812	544,812
Total Freestall Investment	702,000	702,000	702,000	702,000	702,000
Total Manure Storage Investment	50,000	50,000	50,000	50,000	50,000
Parlor as % of total Blding Investment	0.42	0.42	0.42	0.42	0.42
Yearly Parlor Owner Costs/cow	100.63	100.63	100.63	100.63	100.63
Yearly Parlor + Labor Costs/cow	515.94	522.57	522.57	522.57	522.57
Cow Investment/Cow	1,000	1,000	1,000	1,000	1,000
Parlor Investment/Cow	698	698	698	698	698
Freestall Investment/Cow	900	900	900	900	900
Manure Storage Investment/Cow	64	64	64	64	64
Land Investment/Cow	?	?	?	?	?
Total Investment /Cow	2,663	2,663	2,663	2,663	2,663

Selected Performance From Expanding From 50 to 780 Cows In One Year
High Capital, Double 8 Parlor, 92 Cows/Hr, 1 Year Manure Store For 100 Cows
20 Year Building Amortization

Balance Sheet	Begin	End Yr 1	End Yr 5	End Yr 6	End Yr 10	End Yr 15
Cash (Cum NCF Yr End)		32,202	-248,790	-78,905	600,635	1,450,060
Feed	0	0	0	0	0	0
Livestock	50,000	780,000	780,000	780,000	780,000	780,000
Machinery	45,000	45,000	45,000	45,000	45,000	45,000
Facilities	0	1,241,471	980,107	914,766	653,402	326,697
Land and Old Facilities	55,000	55,000	55,000	55,000	55,000	55,000
Total Assets	150,000	2,153,673	1,611,317	1,715,861	2,134,037	2,656,757
Oper. Loans						
Cow Loans	0	723,867	0	0	0	0
Facility Loans	0	1,241,471	980,107	914,766	653,402	326,697
Total Debts	0	1,965,338	980,107	914,766	653,402	326,697
Equity	150,000	188,335	631,210	801,095	1,480,635	2,330,060
% of Debt	0	0.91	0.61	0.53	0.31	0.12

	Begin	End Yr 1	End Yr 5	End Yr 6	End Yr 10	End Yr 15
Oper. Interest Paid		0	0	0	0	0
cow Interest Paid		47,333	47,333	0	0	0
Facility Interest Paid		75,753	75,753	75,753	75,753	75,753
NCF		32,202	-70,248	169,885	169,885	169,885
Int Earned on Cum NCF		2,898	-22,391	-7,101	54,057	130,505
Int Earned/Paid + NCF		158,186.2	30,446.9	238,536.6	299,695.2	376,143.4
ROROA		0.07	0.02	0.14	0.14	0.14
Cwt. Milk Sold		140,400	156,000	156,000	156,000	156,000
Total Income /Cwt. Milk Sold		14.01	13.86	13.86	13.86	13.86
Total Cost/Cwt. Milk Sold		13.78	14.31	12.77	12.77	12.77

HCHE - 780

Selected Performance From Expanding From 50 to 780 Cows In One Year
High Capital, Double 8 Parlor, 92 Cows/Hr, 1 Year Manure Store For 100 Cows
20 Year Building Amortization

	Year 1	Years 2-5	Years 6-20	End Yr 10	End Yr 15
# Of Cows	780	780	780	780	780
Revenue	1,967,500	2,162,500	2,162,500	2,162,500	2,162,500
Variable Cost	1,203,774	1,264,809	1,264,809	1,264,809	1,264,809
Labor Cost	289,560	291,975	291,975	291,975	291,975
Repairs, Taxes, Insurance	45,738	45,738	45,738	45,738	45,738
Building Depreciation & Interest (Amortization)	141,093	141,093	141,093	141,093	141,093
Cow Amortization Step 1	240,133	240,133			
Cow Amortization Step 2	0	0	0	0	0
Cow Amortization Step 3	0	0	0	0	0
Cash Cow Purchases	15,000	249,000	249,000	249,000	249,000
Total Cash Outflow	1,935,298	2,232,748	1,992,615	1,992,615	1,992,615
Net Cash Flow (NCF)	32,202	-70,248	169,885	169,885	169,885
NCF per Cow	41	-90	218	218	218
Cum NCF Yr End	32,202	-248,790	-78,905	600,635	1,450,060
Cum NCF per Cow	41	-319	-101	770	1,859
NCF W/O Manure Storage	39,350	-63,100	177,033	177,033	177,033
Milking Labor Hours	5,358	5,519	5,519	5,519	5,519
Feeding & Care Labor Hours	13,946	13,946	13,946	13,946	13,946
Hours Milking Labor/Cow/Year	6.87	7.08	7.08	7.08	7.08
Hrs Feeding & Care Labor/Cow/Year	17.88	17.88	17.88	17.88	17.88
Annual Labor Cost /Cow	371	374	374	374	374
Total Parlor Investment	544,812	544,812	544,812	544,812	544,812
Total Freestall Investment	702,000	702,000	702,000	702,000	702,000
Total Manure Storage Investment	50,000	50,000	50,000	50,000	50,000
Parlor as % of total Blding Investment	0.42	0.42	0.42	0.42	0.42
Yearly Parlor Owner Costs/cow	100.63	100.63	100.63	100.63	100.63
Yearly Parlor + Labor Costs/cow	471.86	474.96	474.96	474.96	474.96
Cow Investment/Cow	1,000	1,000	1,000	1,000	1,000
Parlor Investment/Cow	698	698	698	698	698
Freestall Investment/Cow	900	900	900	900	900
Manure Storage Investment/Cow	64	64	64	64	64
Land Investment/Cow	?	?	?	?	?
Total Investment /Cow	2,663	2,663	2,663	2,663	2,663

Selected Performance From Expanding From 50 to 780 Cows In One Year
High Capital, Double 8 Parlor, 62-65 Cows/Hr, 1 Year Manure Store For 100 Cows
20 Year Building Amortization

Balance Sheet	Begin	End Yr 1	End Yr 5	End Yr 6	End Yr 10	End Yr 15
Cash (Cum NCF Yr End)		-2,178	-431730	-298,985	231,995	895,720
Feed	0	0	0	0	0	0
Livestock	50,000	780,000	780,000	780,000	780,000	780,000
Machinery	45,000	45,000	45,000	45,000	45,000	45,000
Facilities	0	1,241,471	980,107	914,766	653,402	326,697
Land and Old Facilities	55,000	55,000	55,000	55,000	55,000	55,000
Total Assets	150,000	2,119,293	1,428,377	1,495,781	1,765,397	2,102,417
Oper. Loans						
Cow Loans	0	723,867	0	0	0	0
Facility Loans	0	1,241,471	980,107	914,766	653,402	326,697
Total Debts	0	1,965,338	980,107	914,766	653,402	326,697
Equity	150,000	153,955	448,270	581,015	1,111,995	1,775,720
% of Debt	0	0.93	0.69	0.61	0.37	0.16

	Begin	End Yr 1	End Yr 5	End Yr 6	End Yr 10	End Yr 15
Oper. Interest Paid		0	0	0	0	0
cow Interest Paid		47,333	47,333	0	0	0
Facility Interest Paid		75,753	75,753	75,753	75,753	75,753
NCF		-2,178	-107,388	132,745	132,745	132,745
Int Earned on Cum NCF		-196	-38,856	-26,909	20,880	80,615
Int Earned/Paid + NCF		120,712	-23,157.7	181,589.4	229,377.6	289,112.8
ROROA		0.06	-0.02	0.12	0.13	0.14
Cwt. Milk Sold		140,400	156,000	156,000	156,000	156,000
Total Income /Cwt. Milk Sold		14.01	13.86	13.86	13.86	13.86
Total Cost/Cwt. Milk Sold		14.03	14.55	13.01	13.01	13.01

MCHE - 780

Selected Performance From Expanding From 50 to 780 Cows In One Year
Medium Capital, Double 8 Parlor, 92 Cows/Hr, 1 Yr Manure Store For 100 Cows
20 Yr Building Amortization

	Year 1	Years 2-5	Years 6-20	End Yr 10	End Yr 15
# Of Cows	780	780	780	780	780
Revenue	1,967,500	2,162,500	2,162,500	2,162,500	2,162,500
Variable Cost	1,203,774	1,264,809	1,264,809	1,264,809	1,264,809
Labor Cost	289,560	291,975	291,975	291,975	291,975
Repairs, Taxes, Insurance	36,029	36,029	36,029	36,029	36,029
Building Depreciation & Interest (Amortization)	111,176	111,176	111,176	111,176	111,176
Cow Amortization Step 1	240,133	240,133	0	0	0
Cow Amortization Step 2	0	0	0	0	0
Cow Amortization Step 3	0	0	0	0	0
Cash Cow Purchases	15,000	249,000	249,000	249,000	249,000
Total Cash Outflow	1,895,672	2,193,122	1,952,989	1,952,989	1,952,989
Net Cash Flow (NCF)	71,828	-30,622	209,511	209,511	209,511
NCF per Cow	92	-39	269	269	269
Cum NCF Yr End	71,828	-50660	158,851	996,895	2,044,450
Cum NCF per Cow	92	-65	204	1278	2621
NCF W/O Manure Storage	78,976	-23,474	216,659	216,659	216,659
Milking Labor Hours	5358	5,519	5,519	5,519	5,519
Feeding & Care Labor Hours	13946	13946	13946	13946	13946
Hours Milking Labor/Cow/Year	6.87	7.08	7.08	7.08	7.08
Hrs Feeding & Care Labor/Cow/Year	17.88	17.88	17.88	17.88	17.88
Annual Labor Cost /Cow	371	374	374	374	374
Total Parlor Investment	277,406	277,406	277,406	277,406	277,406
Total Freestall Investment	702,000	702,000	702,000	702,000	702,000
Total Manure Storage Investment	50,000	50,000	50,000	50,000	50,000
Parlor as % of total Blding Investment	0.27	0.27	0.27	0.27	0.27
Yrly Parlor Owner Costs/cow	50.86	50.86	50.86	50.86	50.86
Yrly Parlor+labor Costs/cow	422.09	425.18	425.18	425.18	425.18
Cow Investment/Cow	1,000	1,000	1,000	1,000	1,000
Parlor Investment/Cow	356	356	356	356	356
Freestall Investment/Cow	900	900	900	900	900
Manure Storage Investment/Cow	64	64	64	64	64
Land Investment/Cow	?	?	?	?	?
Total Investment /Cow	2,320	2,320	2,320	2,320	2,320

Selected Performance From Expanding From 50 to 780 Cows In One Year
Medium Capital, Double 8 Parlor, 92 Cows/Hr, 1 Yr Manure Store For 100 Cows
20 Yr Building Amortization

Balance Sheet	Begin	End Yr 1	End Yr 5	End Yr 6	End Yr 10	End Yr 15
Cash (Cum NCF Yr End)		71,828	-50660	158,851	996895	2044450
Feed	0	0	0	0	0	0
Livestock	50000	780000	780000	780000	780000	780000
Machinery	45000	45000	45000	45000	45000	45000
Facilities	0	977936	772056	720586	514706	257356
Land and Old Facilities	55000	55000	55000	55000	55000	55000
Total Assets	150000	1,929,764	1601396	1,759,437	2391601	3181806
Oper. Loans						
Cow Loans	0	723867	0	0	0	0
Facility Loans	0	977936	772056	720586	514706	257356
Total Debts	0	1701803	772056	720586	514706	257356
Equity	150000	227961	829340	1038851	1876895	2924450
% of Debt	0	0.88	0.48	0.41	0.22	0.08

	Begin	End Yr 1	End Yr 5	End Yr 6	End Yr 10	End Yr 15
Oper. Interest Paid		0	0	0	0	0
cow Interest Paid		47,333	47,333	0	0	0
Facility Interest Paid		59,706	59,706	59,706	59,706	59,706
NCF		71,828	-30,622	209,511	209,511	209,511
Int Earned on Cum NCF		6,465	-4,559	14,297	89,721	184,001
Int Earned/Paid + NCF		185331.5	71857.6	283513.59	358937.6	453217.5
ROROA		0.10	0.04	0.16	0.15	0.14
Cwt. Milk Sold		140400	156000	156000	156000	156000
Total Income /Cwt. Milk sold		14.01	13.86	13.86	13.86	13.86
Total Cost/Cwt. Milk Sold		13.50	14.06	12.52	12.52	12.52