



Introduction

As much as dairy producers and their advisors may try to eliminate the risks associated with dairy expansions, it cannot be done. The key to a successful dairy expansion is to anticipate, reduce and control those risks. Developing a strategic business plan can help producers and their advisors accomplish this. Careful planning reduces risk. However, any business plan is only as good as the information used to develop it. It is therefore important to have a systematic approach to evaluating an expansion plan to determine how effectively it has addressed the above issues. The areas to evaluate include:

1. The business owners' reasons for expansion.
2. The existence of a strategic business plan, including the business vision, a mission statement, and well-defined objectives and goals, organizational structure, etc.
3. The historical performance of the business.
4. Operational plans, including the bio-security protocols, nutrient management and environmental plans.
5. Financial projections.

Current Situation

Owners of an expanding dairy business should be doing so for the right reasons. Those reasons might include:

1. Improve standard of living for owners.
2. Expand a profitable business to meet personal goals.
3. Incorporate *committed* family members.
4. Achieve economies of scale and spread fixed cost over more production units.

An assessment of the management level of the owners of the expanding business should be included in the expansion plan. The expanding business should have a vision statement, a mission statement and a well-defined set of objectives and goals. The plan should address nutrient management and environmental issues. An assessment of current facilities and how they may fit into the expansion plan is recommended. Are the current facilities an asset or a liability?

It is extremely important to evaluate the expansion plan in the context of historical performance. Projections based on anything else are meaningless. The expansion plan should include a trend analysis of at least three, preferably five, years of historical data, including production trends, milk price, income and expenses, cash flow and equity position. In addition, the trend analysis should include trends in important ratios, production costs per hundred pounds of milk and other pertinent performance indicators, which examine various aspects of business management and herd performance. It is helpful to itemize expenses on a per cwt. and per cow basis. It is also important to document the management and labor history.



Components of an Expansion Plan

A comprehensive expansion plan should include all of the following. Examine each component to determine if it has been adequately addressed.

1. A determination of how the optimal herd size was determined.
2. A site plan, which provides the details of the layout of the new buildings and other structures.
3. A description of additional facilities, including animals housing, special needs area, the milking center and replacement facilities.
4. An itemized listing of future feed needs and cropping program changes.
5. Additional feed storage structures.
6. Nutrient management plans and additional nutrient management structures.
7. A summary of bio-security measures to be implemented. The bio-security plan should address vaccination protocols for the existing herd and the testing, isolation and vaccination protocols for the purchased animals. This is one area where many expansions fall short.
8. Financial Projections.

Plan Projections

Prior to developing the final set of projections, a feasibility analysis should be done to examine a number of alternatives. What herd size is optimal for the expanding business? How large should the parlor be? Make cow numbers the focal point of the expansion, not the facilities, as cows pay the bills. Determine how much capital is available for the expansion. Then, determine a herd size range that can be reached with the available capital and plan facilities to accommodate the herd size. Examine how each alternative will affect the profitability, liquidity and solvency of the business.

The most important component of any expansion plan is the financial projections section. Projections can be developed and presented in a number of different ways. Computer programs, such as FINPACK or Excel spreadsheets are good tools to develop projections. Projections should be developed for the following areas.

1. **Capital needs**-Project the investment required for animal housing, milking center, special needs area, replacement facilities, feed storage and nutrient management facilities. Review the figures to determine that they are accurate and in line with the size of the expansion. Examine the investment in the milking center to determine if it has been sized correctly.
2. **Labor needs** – Have the owners accurately projected the additional labor and management needs. An organizational chart and job descriptions will help to define the labor and management situation.
3. **Feed needs** – Include calculations of feed requirements, based on projected feeding rates, feeds supplied by the cropping program, based on average yields, and purchased feeds. How does the expansion affect purchased feed costs per



- cow and per hundred pounds (cwt.) of milk? Will more feed be purchased or will the operation increase the size of the cropping operation.
4. **Cow flow** – One of the major pitfalls of any dairy expansion is the inability to maintain cow flow. Therefore, it is extremely important to project monthly cow numbers through the first 1-2 years of the expansion. In most cases, additional replacements must be purchased in that time period to ensure cow numbers will not decline. This is the kiss of death for most expansions.
 5. **Annual Budget** – Include an annual budget for the first three years of the expansion. Check to see that projections of production levels, cull rate, and key expenses are realistic numbers based on the trends of historical data. Certain expenses, such as vet, supplies and breeding will be comparable on a per cow basis. Others, such as feed, must be evaluated on a per cwt. basis. Others such as labor and cropping expenses must be calculated based on number of employees and number of acres farmed. Still other expenses such as repairs, rent, taxes and insurance will change, but there may be little relationship between herd size or milk production. Be sure to include a line item for replacement expenses. If there is a difference between projections and historical data, explain why in the assumptions and justifications section. The projections should examine profitability as well as cash flow.
 6. **Cash flow & replacement needs**-Include monthly cash flow projections for the first 12-24 months of the expansion. Base production on historical data, unless the differences can be justified. Base prices on the futures markets. This will help determine when the operation will need to borrow additional cash from lines of credit and when the operation will reach the point of positive cash flow. Overlooking this important aspect of an expansion plan can increase the possibility that the owners will run out of capital prior to reaching the point of positive cash flow. Lenders hate surprises and are much less likely to put money into an expansion that did not anticipate its cash flow needs.
 7. **Equity accumulation**- Include proforma balance sheets that will show how the equity position of the business changes over the first three years of the expansion. All dairy businesses that expand will see a considerable decrease in equity, due to increased borrowing and lost capital. By examining future equity trends the business owners can see when they will reach a comfort level or when they can implement the next phase of their expansion
 8. **Sensitivity Analysis** – Even the best plans can hit bumps in the road. Milk prices may go lower than projected in the plan. Production levels may not reach projections for a multitude of reasons. Therefore it is important to include some sort of sensitivity analysis that examines the cash residual at various production levels and milk prices.
 9. **Theoretical Debt Repayment** – Examining the theoretical debt repayment period is a helpful analysis to determine if the expansion is a sound investment. This analysis examines the cumulative cash surplus generated by the expanded business in comparison to the declining liability balances. Assuming that all



accumulated cash surplus could be applied to reduce debt at an accelerated rate, how quickly could the business pay off the capital borrowed for the expansion? If the TDR is less than ten years, the expansion is a good investment

Assumptions & Justifications

Although developing projections based on historical data is recommended, there are circumstances where the expansion may have a positive impact on production, other herd performance measures and/or business efficiency measures. If projections are significantly different from historical data, be sure to include the assumptions and justifications that were made in developing the projections. For example, if the current operation is significantly overcrowded and the owners feel strongly that improving cow comfort levels will improve production, they should cite any data that would support their case in this section.

Key Benchmarks -Financial

Evaluate the production efficiency and financial performance of the expanded business. Although the plan is only a set of projections they should be evaluated to determine:

1. How profitable will the expanded business be?
2. Will the expanded business cash flow?
3. Will the expanded business build equity?
4. How financially efficient is the expanded business?
5. How capital efficient is the expanded business?

We can use several key ratios to evaluate the business performance, both before and after the expansion. Table 1 lists the criteria for evaluating financial performance of the business, the ratios used to do so and some guidelines for where the ratios should be. The formulas for these ratios are listed in Table 3.

Table 1. Key Ratios for Evaluating Financial Performance

Criteria	Ratio	Pre-Expansion	After Expansion
Profitability	Return on Assets	?????	8-10%
Cash Flow	TDLCR ¹	>1.15	1.0/>1.5
Equity Position	% Equity	60-70 %	>30 %
Financial Efficiency	Operating Exp Ratio	.65-.70	.65-.70
Capital Efficiency	Asset Turnover Ratio	.4-.45 ??	.6-.65
Debt	Debt/Cow	<\$2,500-\$3,000	<1.5 x GI/Cow

¹ TDLCR – Term Debt and Lease Coverage Ration

In some instances a dairy may not be all that profitable, but may still need to expand. For example, a partnership that operates a 150-cow dairy may not be very profitable due to the fact that two or more operators are trying to make a living from the business. Returns to unpaid family labor and owner labor and management significantly impacts the return



on assets of a business. Therefore it is not really sufficient to evaluate return on assets as an indicator of whether a dairy should expand. However, it is critical to examine the projected return on assets the expanded business will generate to ensure that the decision to expand is a sound one. A successful dairy business should generate a return on assets of 8-10 percent within three years.

Many expanding dairies will experience cash flow problems and some will experience severe cash flow problems during the expansion process. The challenge is to minimize the possibilities that this will happen. If the business does not cash flow prior to expanding, it most likely should not expand. Again, the only exception might be where owner draws are creating the cash flow problem. Increasing herd size will spread those fixed costs out over more units. We can evaluate cash flow using the term debt and lease coverage ratio (TDLCR). Prior to expanding a dairy business should have a positive cash flow. A TDLCR of at least 1.15, (preferably higher) over the five-year period prior to the expansion is desirable. It is more important to evaluate the cash flow potential of the dairy expansion. In the initial year of the expansion the business might be lucky to generate a TDLCR of 1.0. However, within 2-3 years the business should generate a TDLCR of at least 1.25 and 1.5 or greater within five years.

The business should have a sound financial base before considering expansion. The equity position, as measured by percent equity, will determine how much the business can expand. Banks are only willing to lend a certain amount of money based on the equity and collateral position of the business. A greater percent equity will permit the business to expand to a larger scale. The business should have 60-70 percent equity prior to the expansion and greater than 30 percent after the expansion.

Profitability, cash flow and the ability to build equity are driven by financial efficiency. This is evaluated by the operating expense ratio (OER). This ratio indicates how efficient the business is at spending money to make money. An OER of 70 percent means the business spends 70 cents to make \$1.00. The 70 cents does not include capital costs (interest or depreciation). A profitable dairy business will spend 65-70 cents (or less) to make \$1.00, and thus should have an operating expense ratio of 65-70 percent or less.

Finally, the business must be efficient in the use of capital. This can be evaluated using the asset turnover ratio (ATR). This ratio is an expression of how much gross income is generated in relation to the assets owned by the business. A typical ATR for many dairy businesses that raise crops to feed the herd is .40-.45, which means these businesses will generate \$400,000-\$450,000 of income with \$1,000,000 in assets. Larger dairies tend to be more capital efficient and should generate an ATR of .60-.65 or greater. Dairy businesses that do not raise crops can generate an ATR of 1.0 or greater. Over-investing in facilities, especially the milking center can reduce the capital efficiency of the expanding business and reduce profitability.



We should also be concerned with debt per cow in an expanding dairy business. Many dairies have exceeded the recommendation of \$2,500-\$3,000 debt per cow. Higher production and lower interest rates have enabled businesses to borrow larger amounts for dairy expansions. One recommendation is to limit debt to 1.5 times the gross income per cow or less. However, with higher debt levels comes increased risk and dairies with higher debt loads will struggle to cash flow when milk prices are low, as they were in 2002.

We must also evaluate herd performance efficiency of the expanding dairy. Dairies that have not achieved a certain level of herd performance should strive to get better before they get larger. Table 2 contains several criteria for evaluating key dairy herd management areas. These indicators can be used as guidelines to determine if a herd is ready to expand and to evaluate the expansion projections and post expansion performance.

Table 2. Various Herd Performance indicators for Evaluating an Expanding Dairy

Management Area	Measure	Pre-Expansion	Post-Expansion
Production	Milk/cow/day	68 / 80	+ 5-10 %
Reproductive Status	DIM	170-175	170-175
Repro Performance	21 Day PG Rate	.16 -.18	.20 -.24
Udder Health	SCC	<250,000	<200,000
Total Cow Mngmnt	Cull Rate	25-35%	≤ 30% (25-35%)
Labor Efficiency	Milk/FTWE	800K – 1M lbs	1-1.5 M lbs

If an operation has not achieved the levels of performance listed above, the business should evaluate the various management areas of the herd and focus on making improvements that would positively impact the profitability of the business. The only exception again may be a situation where facilities are so overcrowded or in such bad shape that herd performance is sacrificed and building new facilities would result in improved performance. Expanding herds should set goals to improve production by 7-10 percent over pre-expansion levels.

No matter what method is used, developing a strategic plan for an expanding dairy is a time consuming process. There are professionals that can help with the process, and in Pennsylvania, there is a program administered by the Pennsylvania Dairy Stakeholders to offset the cost of developing the plan. There is a new website, sponsored by the PA Dairy Stakeholders and Penn State University to guide producers and consultants through the expansion process. It can be accessed at <http://dairydevelopment.psu.edu>.



Conclusion

Careful planning is the key to reducing the risks inherent in dairy expansions. Developing a strategic business plan that includes well-defined objectives and goals, an historical trend analysis, cow flow analysis and financial projections based on historical trends. The financial projections should include three years of annual income statements, monthly cow flow and cash flow projection for the construction period and first year of the expansion, a sensitivity analysis and a theoretical repayment analysis. The plan should be evaluated using key financial ratios to determine if the expansion will improve the profitability, cash flow and equity position of the business. If careful planning is accomplished, producers can accomplish the objective of reducing the risks involved in expansion.

Table 3. Formulas for Evaluating Financial Performance

Evaluation Criteria	Ratio	Formula
Profitability	Return on Assets	$\frac{\text{NFI}^1 + \text{Interest} - \text{Return to Labor \& Management}}{\text{Avg. Assets}}$
Cash Flow	Term Debt and Lease Coverage Ratio	$\frac{\text{NFI} + \text{Interest} + \text{Depreciation} - \text{Owner Draws}}{\text{Annual Principal and Interest Payments}}$
Solvency	% Equity	$\frac{\text{Net Worth}}{\text{Total Assets}}$
Financial Efficiency	Operating Expense Ratio	$\frac{\text{Total Expenses} - \text{Interest} - \text{Depreciation}}{\text{Total Income}}$
Capital Efficiency	Asset Turnover Ratio	$\frac{\text{Total Income}}{\text{Average Assets}}$