

Financial Planning For
Expansion And Other
Major Adjustments

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Introduction:

Herd expansion and other major business adjustments are a common event for many dairy farm managers. The strength of the incentives for expansion can be underlined by noting that over the 10-year period, 1982-1991, U.S. dairy operations with more than 100 cows grew from 6.1% to 11.5%, while the cows represented by these units increased from 34.7% to 45.4% of the nation's dairy herd. The reasons for the popularity of expansion and the increased concentration of milk production into fewer but larger herds are numerous.

The continuing emergence of new, capital intensive technology with strong economies of size features has been a principal reason. Such technology (e.g., improved parlors, feeding, and waste handling systems), once adopted, may not be fully utilized. However, through herd expansion, fixed costs including depreciation, interest, and property taxes can be spread over more hundredweights of milk, resulting in lower per unit costs. Additionally, improved labor efficiency has been affiliated with most new dairy technology. In some cases, growth has occurred to more effectively utilize management resources. Finally, net income can be increased by expansion when the per-hundredweight milk price and cost relationship is favorable and constant at different levels of production.

Expansion has not always resulted in higher income. Many dairy farmers have experienced financial difficulty because of a decision to expand. In some cases, the timing has been unfortunate in that profit margins fell due to unanticipated rising costs, falling milk prices, and/or declining cow productivity. Others found they were unable to cope with the labor and management challenges associated with a larger business. Some used debt that was excessive, over priced, and/or inappropriately structured.

It is widely accepted that effective planning can contribute to better decision making about whether to expand or make other major adjustments in the business. The objective of this paper is to review selected management concepts relevant to effective financial planning and analysis. While the comments will focus on expansion planning, most are also appropriate when planning for other major business adjustments (e.g., change in milking, feeding, housing or waste handling system). A herd expansion example is used to illustrate the application of relevant management concepts.

Basic Planning And Analysis Considerations:

The starting point in considering herd expansion is reaching agreement among the owners and management that a larger operation is a desirable goal. Expansion often implies added financial risk. It may also mean increased personal stress due to heavier and perhaps new management responsibilities. If the relevant people are not willing to accept these challenges, no amount of planning and analysis will assure a successful expansion program.

Another prerequisite for successful expansion is the absence of major business weaknesses. Pre-expansion problems often become post-expansion crises. Related to this is the need for good records and their use in identifying weaknesses. This means a record system is in place that permits the timely preparation of a complete and accurate balance sheet, accrual income statement, statement of cash flows, statement of owner equity, enterprise reports, and a periodic and trend analysis of business profitability, liquidity, solvency, repayment capacity, and financial efficiency. Without this kind of financial information, the manager is handicapped in developing the understanding and control of the dairy business that is essential to effectively managing a larger operation.

With these prerequisites in mind, the next concern is planning the proposed expansion. Comprehensive planning is needed to convince the owner(s), management, and those outside of the business (for example, potential lender and/or outside equity investor) that the proposal is financially acceptable. Mistakes in decision making about outlays for capital assets (e.g., cows, buildings, equipment, and land) can have devastating and long-standing consequences, since they are often large, heavily debt financed, long-term, and made in an increasingly volatile economic environment.

The options for controlling a capital investment are quite limited once the funds have been committed. Thus, the key to improved investment decision making is identifying expansion projects with the potential for acceptable financial performance before the capital is committed. This can be done by subjecting the proposed investment to thorough financial planning and analysis. These efforts can be viewed as occurring in two phases: (1) long-range, and (2) transitional.

Long-Range Planning

The task with long-range planning is to evaluate financial performance when the expansion program has been fully implemented and is in full stride. This includes a financial analysis that addresses three key questions about the expansion proposal: (1) Will it be profitable?, (2) Will it cash flow?, and (3) Are the risks acceptable? The overriding concern about expansion is whether acquiring control of additional resources will generate a profit that is sufficient to compensate for the added risks. Since expansion generally requires a major capital investment, profitability needs to be measured in terms of capital performance (for example, rate of return on the added investment). Expansion may also imply an increase in operator labor and management and it is important to determine if sufficient income accrues to these personal resources.

Although profitability and cash flow are highly correlated, acceptable performance for one does not necessarily imply the same for the other. Thus, there is a need to analyze both. The intent of a cash flow analysis is to determine if the expanded business will generate sufficient cash receipts to meet its cash obligations in a timely manner without disrupting the operation. More specifically, one should determine if funds are available to pay operating expenses, income and social security taxes, retire term (over one-year maturity) debt, replace depreciable assets as they wear out, maintain a contingency reserve, and provide an acceptable living standard.

Risk is another issue that should be addressed by a long-range financial analysis. The ability of the business to withstand risk is referred to as its solvency position, measured by net worth and percent indebtedness (total debt ÷ total assets). A higher net worth and a lower percent indebtedness implies stronger solvency and an increased ability to withstand risk.

In addition to identifying the impact of expansion on net worth and percent indebtedness, risk may be evaluated by noting the effect of adverse events on projected profitability and cash flow. Several analytical techniques are available to evaluate these risks. One approach is to complete a profitability and cash flow analysis under a most likely set of assumptions for high risk variables (e.g., milk price, feed cost). Results may then be subjectively evaluated in terms of whether or not performance is sufficiently strong to compensate for the various risks. Another technique is a sensitivity analysis wherein you first do a base analysis assuming the most likely outcome. The analysis is then rerun adopting more pessimistic values for the important high risk variables. In this manner, the vulnerability of the expansion program to downside risk can be evaluated. Risk may also be evaluated by calculating break-even values for the more important, yet high risk variables. We may, for example, determine the milk price needed to meet our profit objective or to realize an acceptable cash flow. Once the break-even value is known, the investor must only determine whether the variable in question is likely to be greater than or less than the break-even rate. That decision involves less risk than basing the analysis entirely on a most likely value.

Transitional Planning

Planning and budgeting necessarily require specification of a point in time for which the operation is to be evaluated. Quite logically, the manager's initial concern will be with the business as it would be expected to perform at the time a new equilibrium is reached, i.e., when new facilities are fully utilized and major adjustment problems have subsided. This type of planning requires analyzing the business two to three years from the time the planned change has been implemented. The above discussion has focused on this long-term variety of planning. Consequently, the problems associated with making the transition from a smaller to larger herd were largely overlooked.

Additional planning efforts are needed to focus on the transitional period. For dairy farmers making a major expansion and or reorganization of their business, subsequent adjustment problems can be expected. While maintaining production levels during an expansionary period is partially a function of the existing herd's productivity and the quality of cows added, the initial managerial difficulties of properly caring for more cows may result in at least a temporary drop in per-cow milk production. Production decreases may result from problems encountered in such critical areas as feeding, breeding, and maintaining herd health. In addition, a change in work routines may lead to temporary labor productivity problems.

The strong likelihood of substandard business performance during the transitional period implies that there will likely be cash-flow problems not revealed by long-term budgeting. Careful budgeting of expected cash inflows and outflows during the first one to two years will be needed to identify additional credit needs. By knowing the extent of cash deficits in advance, the manager can do a more effective job of planning for credit needs, thus reducing the risk of experiencing loan payback problems and perhaps, failure to reach long-term goals.

The final phase of expansion management is monitoring and controlling the business as the expansion program is implemented. Records and transitional period cash flow projections are key control tools. A comparison of actual cash flows with projected cash flows as the transition period unfolds may reveal discrepancies between the two. The manager is, therefore, in a position to quickly address an emerging problem before it becomes a crisis threatening the entire expansion program. Adopting appropriate risk control strategies is another means of reducing the impact of unexpected adverse developments. The exact nature of these strategies will vary with the type of dairy farm and expansion program.

Case Farm

Current Situation: The following discussion uses a case farm to illustrate how a proposed expansion program may be analyzed. H. & O. Stein is a 400-cow dairy operated as a general partnership with the parents and an older son and daughter-in-law as partners. The dairy includes 120 acres that are primarily used for barns, corrals, and other facilities. All feed is purchased and replacement heifers are contract raised off the dairy. Average annual milk production has been about 21,000 pounds per cow during the past two years.

A second son and his family have expressed an interest in joining the partnership. The son wants to work full-time with the dairy business. Thanks to 25 years of hard work and good management, the Stein partnership is financially stable. However, the business is not large enough to provide adequate financial support for another family. Thus, if the second son joins the business, expansion will have to occur.

After several family discussions, agreement has been reached to allow the son and his family to join the business, provided a proposed expansion program is financially sound. The proposal is to add 200 cows, replace the old double-12 herringbone parlor with a new double-16 herringbone and expand or remodel several other facilities (i.e., waste handling, housing, parlor building, feed storage, and milk storage). Approximately \$260,000 is needed to purchase 200 head of cows and springer heifers. Estimates submitted by contractors and suppliers indicate an additional \$248,000 is needed to make the facility adjustments. A preliminary discussion with the Stein's lender suggests that the lending institution may be willing to finance expansion with a \$508,000 loan fully amortized over seven years at 9% interest. However, the lender wants to see substantial financial documentation, including an analysis of the investment, before making a final decision on the loan, including the interest rate and the repayment period. Finally, the Steins feel that the expanded business should generate about \$100,000 to support the three families.

Long-Range Financial Analysis

The Steins' initial concern is whether financial performance of the 600-cow business will be acceptable once the expansion program is fully implemented and transitional problems, if any, have subsided. To conduct a financial analysis of the expansion proposal, the Steins opt to use a computerized whole-farm budgeting tool called FINLRB. This program was developed by faculty at the University of Minnesota and is available through Cooperative Extension in many states (1). A summary of the financial analysis which represents a typical year after the expansion program has been fully implemented, appears in Table 1. As indicated, the analysis addresses three aspects of financial performance: (1) profitability, (2) cash flow, and (3) solvency (or risk).

Expanding from 400 cows to 600 cows is projected to increase annual gross cash receipts from \$1,082,000 to \$1,623,000 (line 1). This estimate is based on a herd average of 21,000 pounds of milk and a milk price of \$12 per hundredweight for both herd sizes. Also included are cull cow (30% annual herd turnover) and bull calf sales. Cash operating expenses are expected to rise from \$916,331 for the existing herd to \$1,351,000 for the 600-cow herd (line 2). After an allowance for depreciation (line 4), net farm income is projected to increase from \$120,669 for the 400-cow herd to \$204,649 for the 600-cow operation (line 5). Net farm income in this analysis should be interpreted as the return to the three families' labor, management, and farm net worth. No expense has been attributed to these resources at this point in the analysis; thus, net farm income is the residual return available for their compensation.

Although expansion is projected to increase net farm income by \$83,980, this is not a clear indication of acceptable compensation for the additional operator(s) and family labor, management, capital, and risk associated with the project. It is assumed the Steins want to take \$70,000 out of the business to support two families with the 400-cow herd and \$100,000 to support three families if the herd is expanded to 600 cows. If it is further assumed that these family draws are reasonable approximations of the cost of operator's labor and management, these amounts can be subtracted from net farm income, plus interest paid on debt (line 6), to obtain the returns to total (debt and net worth) assets (line 8). As indicated on line 10, these returns amount to an 8.6% and 12.4% rate of return on total assets for the 400- and 600-cow herds, respectively. Further, the rate of return on farm net worth (\$702,604) is projected to increase from 7.2% (400 cows) to 14.9% (600 cows, line 13). These improvements in capital returns strongly suggest a profitable investment.

However, the most critical profitability test is the rate of return on the added investment and a comparison of that rate with the interest rate reflecting the cost of the investment. As noted on line 16, the \$508,000 expansion investment is projected to earn an annual return of 20.5%. The interest rate on the \$508,000 loan is 9%, thus the investment is quite profitable.

The second phase of the financial analysis compares cash inflows with cash outflows. As noted before, net cash available obtained by subtracting cash operating expenses from gross cash receipts, is projected to increase from \$165,669 to \$271,649 (lines 3 and 19). This available cash must be used for family living (line 20), federal and state income taxes and social security taxes (line 21), payments on term (over one year) debt (25), and replacement of depreciable capital assets (line 27). The latter item does not include the replacement of the 200 cows purchased to expand the herd, since the Stein's long-run policy is to replace cows with retained (contract-raised) heifers. After meeting all cash needs a cash surplus of \$10,845 is projected for the pre-expansion business and \$6,990 after-expansion (line 30). Under the adopted assumptions, the expansion proposal barely cash flows and is likely to cause some deterioration in the farm's cash flow position.

Solvency (or the ability of the business to assume risk) is addressed in the third segment of the analysis. Since the entire \$508,000 investment is debt financed, the debt-to-asset percentage jumps from 35.4 to 56.0 (line 34), and the net worth is unchanged (line 33). Both of these solvency measures are projected at the beginning of the expansion program. Moreover, a subsequent larger annual increase in net worth is projected to occur with expansion (\$46,564) then with the smaller herd (\$20,308, line 35). These increases in net worth result from net farm income exceeding taxes (income and social security) and family living outlays.

Another risk dimension, not shown in Table 1, is the vulnerability of the proposed expansion investment to changing milk prices, feed costs, cow productivity, etc. The impact of changing milk prices and cow productivity on the rate of return on the \$508,000 expansion investment and on the expanded farm cash flow position is reported in Table 2. A drop in milk prices from the assumed base price of \$12 to \$11 per cwt., assuming 21,000 pounds of milk production, results in an investment that is still profitable (i.e., 11.9% return exceeds the 9% cost), but has a substantial cash flow deficit of \$68,831 per year.

Also, if milk production is 20,000 pounds instead of 21,000 pounds and the milk price remains at \$12 per cwt., the investment is profitable (15.3% return exceeds 9%) and has a \$30,112 annual cash flow deficit. These situations illustrate that profitability and cash flow are not the same thing. For example, principal payments on term debt affect cash flow, but are not considered in computing profitability. Depreciation affects profitability on a dollar-

for-dollar basis, but impacts cash flow only through tax savings. A comprehensive analysis will address both profitability and cash flow performance.

Another method of understanding the risks associated with the expansion investment is to compute break-even values for selected key, yet uncertain, variables. For example, the rate of return on the added expansion investment equals the cost of the capital used to finance the investment (9%) when the milk price is \$10.63. Thus, the investment is profitable if milk prices exceed that amount and unprofitable if prices fall below \$10.63. A breakeven cash flow for the expanded 600-cow dairy is realized with a milk price of \$11.88; thus, cash flow problems can be anticipated if milk prices fall below \$11.88.

Relative risks for the current and expanded business can also be identified by computing the change in net farm income and cash flow associated with a 10% change in gross receipts. Of course, gross receipts could vary due to changes in commodity price and/or cow productivity. A 10% change in gross receipts results in a change in net farm income of \$108,200 for the 400-cow herd and \$162,310 for the 600-cow herd. The variation in net cash flow is \$77,840 and \$104,498 for the current and expanded herds, respectively. These results underline the greater risks associated with the more heavily debt financed 600-cow herd.

In summary, the long-range analysis indicates the proposed expansion is very profitable under the base assumptions. Although the investment does cash flow, it is highly vulnerable to small reverses in milk prices, cow productivity, and other adversities. Due to the strong profitability of the investment, the Steins should be in a good position to negotiate debt repayment terms (e.g., interest rate and loan repayment period) that are consistent with the investment's cash flow. Clearly, the expanded business is more financially vulnerable than the current operation. Thus, the Steins will want to weigh very closely the trade-off between the increased profit and the added risk associated with the expansion investment. If the Steins and their lender are willing to accept the added risks, the proposal appears to make it financially feasible for the second son and his family to join the dairy partnership, a goal shared by the Stein families. It is likely the Steins will want to pursue further the expansion proposal.

Transitional Planning

Planning should now focus on the transitional period. The Steins are contemplating a major expansion and adjustment problems can be expected. Thus, the Steins should be encouraged to budget cash inflows and outflows over the first one to two years of the expansion to determine if transitional problems will result in capital needs not identified by the long-range analysis. An estimate of cash deficits should permit a more effective job of planning for cash needs, thus reducing the risk of experiencing loan payback difficulties, family living shortfalls, and perhaps failure to reach long-term goals.

Expansion Control

Assuming the funds needed to implement the expansion are forthcoming on terms consistent with the financial analysis and the investment is made, the Steins should use whatever management tools are available for controlling the expansion program. The challenge now becomes one of assuring that the projected favorable outcome is realized. Keeping good records, particularly cash flow records, and comparing actual performance with projected performance should be a helpful control tool. Also, the Steins should give close consideration to other options they may have for reducing risks, especially during the transition period. These may include an intensified herd health program, forward contracted feed purchases, forage testing, maintaining a higher level of financial liquidity, etc.

Summary

Some dairy farmers and their consultants may be reluctant to do the comprehensive planning and analysis suggested by the above discussion. Foremost among the reasons for this reluctance is the associated time, mental anguish, and frustration of predicting the future. However, it should be noted that as long as the payoff from planning and analysis exceeds the costs of the time and effort involved, it is a good investment. Given the heavily capitalized, highly competitive, low margin, and high risk nature of today's milk production industry, benefits from comprehensive expansion planning are likely to be considerable. Clearly, expansion and/or facility adjustment decisions based on thoughtful projections of profitability, cash flow, and risk will be superior to those where hunches, hope, and availability of funds are the primary criteria.

* Computer programs designed for the financial analysis of investments in agricultural capital assets have also been developed by faculty at Washington State University. A free brochure describing the programs and ordering procedures can be obtained from Gayle Willett, Department of Agricultural Economics, Washington State University, Pullman, WA 99164-6210.

Table 1: Financial analysis of the added investment required for herd expansion, H. & O. Stein.¹

	400 cows	600 cows
Plan Description:		
number of cows	400	600
change in investment	0	\$508,000
change in debt	0	\$508,000
Projected Profitability:		
1. gross cash receipts	\$1,082,000	\$1,623,000
2. cash operating expenses	916,331	1,351,000
3. net cash farm income (1-2)	165,669	271,649
4. depreciation	45,000	67,000
5. net farm income (3-4)	120,669	204,649
6. interest paid on debt	42,431	92,651
7. value of operator labor & mgmt.	70,000	100,000
8. return to total farm assets (5+6+7)	93,100	197,300
9. total farm assets	1,087,800	1,595,800
10. rate of return on assets (8/9)	8.6%	12.4%
11. total net worth (start of plan)	702,604	702,604
12. return to farm net worth (5-7)	50,669	104,649
13. rate of return to net worth (12/11)	7.2%	14.9%
14. returns to added investment (line 8) —	—	104,200
15. added capital investment —	—	508,000
16. rate of return on added investment —	—	20.5%

Projected Cash Flow:

17. net cash farm income		165,669	271,649
18. net non-farm cash income	—	—	
19. net cash available		165,669	271,649
20. family living		70,000	100,000
21. income & social security taxes		30,361	58,085
22. cash avail. for principal payments		65,308	113,564
23. farm interest paid		42,431	92,651
24. cash avail. for prin. & int. (22+23)	107,739	206,215	
25. total scheduled principal & interest	93,790	199,225	
26. cash avail. after loan payments		13,949	6,990
27. annual capital replacement		50,000	75,000
28. principal paid on non-R.E. term debt	46,895	102,110	
29. cash req. for capital replacement		3,105	—
30. cash surplus (deficit)		10,845	6,990

Projected Solvency (beginning of expansion):

31. total farm assets		1,087,800	1,595,800
32. total farm debt		385,196	893,196
33. farm net worth		702,604	702,604
34. debt:asset ratio	35.4%	56.0%	
35. annual change in net worth (5-20-21)		20,308	46,564

1: Adapted from FINLRB, a computer program designed for whole-farm financial long-range budgeting, Richard O. Hawkins, et al., center for Farm Financial Management, University of Minnesota, St. Paul.

Table 2: Rate of return (ROR) on the added investment and net cash flow (NCF) for herd expansion, selected milk prices, and milk production per cow, H. & O. Stein.

lbs. milk /cow	milk price (\$/cwt.)		\$11.00		\$12.00		\$13.00	
	%ROR	NCF(\$)	%ROR	NCF(\$)	%ROR	NCF(\$)	%ROR	NCF(\$)
20K	3	-246,925	7.8	-126,925	15.3	-30,112	22.8	30,366
21K	4.1	-186,925	11.9	-68,831	20.5	6,990	27.6	75,324
22K	7.8	-126,925	16.0	-22,718	24.3	43,496	32.5	120,252

ROR refers to the rate of return on the \$508,000 investment assumed to expand the herd from 400 cows to 600 cows. The investment is profitable if the ROR exceeds the 9% cows of the capital. NCF indicates the annual net cash flow for the expanded 600-cow business.

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