

Planning for the Future: How Modernization Can Increase Your Farm's Profitability

Roger W. Palmer

University of Wisconsin Dairy Science Department, 1675 Observatory Drive, Madison, WI 53706-1284.

Email: rwpalmer@facstaff.wisc.edu

■ Introduction:

The role of the dairy manager is to plan strategically and to direct resources in a way that leads to a profitable and sustainable dairy enterprise. Management is the process of decision-making and has three major functions: planning, implementation and control. Tremendous development, adoption and management of new production enhancing technologies over the past few decades has led to rapid increases in herd size and milk production levels. The challenge to the managers of these modern dairy herds is to economically achieve high milk yield without sacrificing animal health and welfare, deterioration of the environment or human safety.

Existing dairyman must constantly monitor their operation in insure their facilities (production system), procedures (management system) and record keeping (monitoring system) support both the short term and long term goals of the business. The dairy producer must provide facilities, which support cow comfort and labor efficiency at a competitive price. Procedures for managing the operation must support a profitable production level while maintaining animal health and preserving the environment. Record keeping systems which monitor the operations productivity and profitability must be accurate, timely and cost effective.

To accomplish these objectives, dairy manager must constantly monitor their operation to insure that it has a long term operating plan in place that supports the lifestyle, retirement and profitability profile of the owners and operators. It must also conform to the environmental and animal welfare concerns of society. The dairy industry is going through a major transition as dairy operators' implement the latest technologies that help decrease their investment per animal and increase labor efficiency, while meeting society imposed objectives. The dairy manager must define and evaluate different strategies, and prioritize and implement the changes that will maximize the efficiency of the operation and insure its long-term viability.

■ **How to Evaluate and Affect Changes to Existing Dairy Systems:**

When the dairy manager is considering a change to an existing operation, the following steps are recommended. The manager's thoughts and planning should be organized so as to answer the following questions:

- ▶ Where are we today?
- ▶ Where do we want to go?
- ▶ Which strategy is the best to achieve this?
- ▶ How to implement this strategy?
- ▶ How to monitor the process to insure we're on track?

■ **Where Are We Today? - Evaluation of Current Operation.**

To evaluate what strategy is best for an individual dairy, a sound understanding of the operations current status is very important. A review of the following areas can provide this information:

Production performance.

DHI records, computerized herd production records and milk shipment receipts should be reviewed to determine information relating to the quality and quantity of milk produced. Milk shipment receipts indicate the level and variability of milk production and somatic level of the herd, but the number of cows milked each day must be retrieved from other sources if the production per cow (tank average) is desired. Knowing the average days-in-milk of the herd and individual groups of animals is valuable for identifying herd management problems relating to nutrition, breeding, etc. Somatic cell count levels provides insight into the herds overall udder health. A review of the herds calving patterns and culling rate can help explain herd production level changes. A high culling rate can be an indicator of poor herd health or aggressive culling to achieve a high milk output per milking animal. Reviewing the level and variability of milk production, somatic cell count, days-in-milk and culling rate will help identify the herd's status and management consistency.

Current Financial Performance.

Every farm seems to have a different method of keeping their financial records. It is very important to get a feeling for the profitability, liquidity, and solvency of

the operation. Indicators of profitability such as net farm income, return on assets, and return on investment can be found or calculated from values on the farms income statement. These profitability measures indicate the level of returns to the owners for their investments. These values should be reviewed knowing the relative price of milk, feed and other relevant variables at the time and the question should be asked "how good was this operations profitability considering the time period being evaluated?" Liquidity measures based on the operations current expected income and expense indicates the operations short-term financial situation. A large amount of accounts payable should be a warning flag that the operation is currently experiencing some cash flow problems. Solvency measures, such as debt per cow, total net worth and percent equity, can be found on the balance sheet and indicate the long-term financial strength of the operation. Knowing these values, a quick calculation will reveal the borrowing power of the operation because lenders normally want a dairy operation to have a maximum debt per cow of \$3000-3500 (\$4800-5600 Canadian) and a minimum equity position of 35-50% after any major change.

Growth of Assets and Equity over Time.

A quick review of the operations balance sheets for the past few years will indicate the growth and financial strength of the business over time. A consistent increase in total assets is a good indicator of the business's growth and a consistent increase in the operations net worth is an indicator of the operations profitability over time. Operations, which can demonstrate these traits, often are viewed positively by lenders, investors and suppliers.

History of Animal Health Problems.

Review of the dairy's veterinarian bills and health records can give insight into the animal comfort and animal management status of the operation. Knowing the average percent of the herd having ketosis, displaced abomasums, etc. can help identify the possible causes. If severe health related problems are suspected, a review of current vaccination and treatment protocols should be considered.

Amount And Quality Of Records.

As operations increase in size or production intensity, the need for good records increases. The advent of low cost personal computers and software programs makes this task easier than in the past. Both financial and production record keeping systems are needed. Manual records can provide the information needed to the producer and his support staff, but analysis of records is much more difficult than when a computer is used.

Efficiency of the Operation.

The efficiency of the operation is often based on measures of labor efficiency and profitability. Milk per worker, where worker numbers are calculated using full-time-equivalents (FTE) of 50-55 hours per week, is often used. Current dairy operators are encouraged to achieve a million pounds of milk per FTE per year and some of the more efficient modern dairies surpass this measure by a large amount. Cost per hundred pounds of milk sold is another common measure and reflects the operations efficiency of production. Net returns per cow standardizes the profitability of the operation on a per cow basis and should be looked at in combination with total net returns to insure there are sufficient dollars to cover family living expenses, etc.

Efficiency of Different Components of Existing System.

A dairy operation can be evaluated by the activities performed. What is the relative efficiency of the milking, feeding, animal handling, cropping, etc. activities? The biggest labor component of a dairy is milking. Determine the number of people involved with this process and how long it normally takes. From these values the number of cows per worker hour should be calculated and compared to industry norms. Tie-stall barns have been shown to average 30-35 cows per milker hour, whereas large automated parlors can achieve 100 or more

Analysis of Enterprises.

Dairy farms differ significantly in their level of specialization, from having only the single enterprise (milk cows), to several enterprises (milk cows, heifers, crops, steers, etc.). In order to make a judgment as to the best strategy for an existing operation, the relative profitability of each enterprise should be known. Although separation of costs by enterprise is often difficult, it is worth trying to estimate these values in a effort to get a basis for determining the best utilization of existing assets

Feed Quality, Inventory and Handling Practices.

High quality forage is a key ingredient for a high producing profitable dairy. Taking time to visually inspect the dairy's feedstuffs, feed storage facilities and handling practices is very important. After inspecting these items, ration balancing reports and feedstuff analysis reports should be reviewed to determine if the feedstuffs are of sufficient quality and that rations for different animal management groups are reasonable for meeting their nutrient needs.

Identification of Operating Weaknesses.

All of the above mentioned observations should be consolidated and a list of the weakest elements in the overall operation generated. This listing should be one input in the goal setting exercise that will come later.

Evaluation of Facilities.

Since the facilities are such a key element in the effectiveness of an operation, a significant amount of time and effort should be spent evaluating the current facility to determine their future value and use.

Current and Future Capacity.

What is the current capacity and potential capacity of the facility. Each housing, milking and other potentially useful facility (machine sheds, hog barns, etc.) should be evaluated. Often existing building can be converted to freestall housing by opening sidewalls, plus adding or changing feeding and resting areas. The ability to overstock facilities should be evaluated and can be influenced by ventilation, feed space, milking capacity and animal handling capabilities.

Physical Condition, Repairability, Expandability, Modifiability.

When existing facilities are evaluated attention should be paid to the structural aspect of the buildings. What is the condition of concrete floors, frame structure and roofs? Determining the best use for the structure depends on its size, location and condition. If barns of pole construction are to be used, the location and spacing of poles is important in deciding on the best use of the structure. If retro-fitting of an existing facility is contemplated, the owner should consider retro-fitting costs, useful life of the building and usefulness of it compared to a new structure. Experience has shown that retro-fitting of existing buildings is often more costly than originally estimated and that performance is less.

Growth Potential.

If an existing operation is to be expanded, its site is one of the most important considerations. If this site does not support the long-term growth anticipated by the owner, then a new site should seriously be considered. Some people in the past have built a new facility at the old farmstead knowing that there was no future growth potential. The logic used was that it would be used later for dry cows or heifers. Although, this may make sense in some instances, too often it results in inefficient use of resources and delays the move to a better site and the profits associated with it.

Ability to Group Animals by Reproductive Status and/or Nutritional Needs.

Does the existing facility currently or could it be modified to efficiently allow cows to be housed, managed and milked according to their production, health and reproductive status? As production levels of herds increase, it becomes more important to be able to house and handle far-off dry, pre-calving dry, maternity cows, post-calving cows, sick cows and milking cows separately.

Labor Efficiency of the Facilities.

What are the labor requirements of existing facilities and any proposed modifications. Initial cost should be combined with on going labor costs to arrive at an annualized cost per cow for any changes proposed.

Cow Comfort of the Facilities.

Cow comfort is a key element leading to high production of a dairy herd. Currently several herds in the U.S. have Rolling Herd Averages for milk in excess of 30,000 pounds per year. This coupled with the increases in genetic, nutritional and production enhancement technologies, that are being developed, will lead to higher herd production levels over the lifetime of the facilities being contemplated. The importance of and impact of facility choices on cow comfort makes it a critical area in the expansion decision process.

Worker Comfort and Safety.

A key objective of most dairy farms is to provide a comfortable and safe set of working conditions for the owner(s), family members and employees. Large labor turnover rates and family member leaving the farm are the results of not providing a desirable working environment.

Feed Storage and Handling System.

The type of feed storage needed for large and small herd sizes are quite different. Upright silos make sense for small operations, whereas flat feed storage makes sense as herd sizes increase. As herd sizes grow, it becomes a real challenge to determine when and how to use existing feed storage systems. Total Mixed Rations (TMR) have proven to be beneficial for herds of all sizes, but often are not used on small farm because of the cost of equipment. Larger herds use portable TMR mixers to mix and deliver feed to individual groups of animals. Any new or modification of existing facilities should consider using TMR's and this method of feed delivery.

Manure Management System.

What type of manure storage system currently exists, what is its location, capacity and is it approved according to current zoning rules and regulations? These are some of the key questions that must be asked. Will this system be usable for all or part of the operations manure storage needs, and if so, for how long?

Evaluation of Equipment.

When evaluating existing equipment, the age, condition and usefulness are important aspects to determine. Expanding herds in the past have attempted to “get by” with existing equipment. This has often led to poor quality feeds because the equipment either breaks down with the excessive use or insufficient harvesting capacity has resulted in delayed harvesting.

Evaluation of Land Resources.

The ultimate size of a dairy operation is limited by its ability to procure forage and to dispose of manure. When making a major investment in a dairy, the amount of land owned, rented and expected to be available in the future must be considered. The current nutrient loading of the land should be determined so animal numbers are balanced with the ability to dispose of the manure nutrients. The productivity of land should also be considered because highly productive land is normally more profitable in the long term. Another aspect of long term planning of a dairy is the relative cost of land ownership versus rental costs. The decision of ownership versus rental of land is complicated by the risks associated renting, the potential inflation possibilities with ownership and the expected current returns from an investment in land versus other dairy related assets.

Evaluation of Animals.

When a dairy herd is being evaluated, both the herd's genetic level and animal condition should be considered. Different breeds of cattle have different abilities for milk and component production. The level of artificial insemination, participation in breed development programs and the owners sire selection philosophy can give an indication of the genetic potential of the herd. For AI bred herds on DHI, processing centers summarize the genetic level of animal groups to show the genetic trends within the herd. Visual inspection of the animals for cleanliness, body condition, size and health problems (feet, legs, udders, etc.) can give an indication of the manager's animal management skills.

Evaluation of Current Labor Force.

This process starts by asking how many family members and hired workers currently are or want to be involved with the operation. The age, interests, skills and compensation needs of each member of this existing labor pool should be defined. One of the objects of the planning process is to create an operation large enough to fully utilize the skills and interests of these workers and to cover their income needs. Next an analysis of the local area, to determine the potential for additional employees and what compensation is being offered by other industries competition for that labor supply, should be done.

Evaluation of Management.

This is one of the most critical aspects of the evaluation process because, first and foremost, a dairy operation is a business and must be run by competent management. Several things can be observed that help identify the capability of the existing management team. Looking at the physical appearance of the operation, it's neatness, level of maintenance and any evidence of obvious waste can be warning flags. Asking questions, while talking with existing management, is useful to determine their ability to organize, set priorities and direct activities. Asking about what has been done and why can help identify a manager's decision-making ability, level of industry awareness and motivation. A successful dairy manager must have the skills to work with people. Asking managers about the amount of experience with hired help and their past experiences is useful for identifying their interest and prior success in this area. What is the manager's personality type, an introvert who like to work alone or an extrovert who likes to work with people? Does the manager have the interest in interacting with employees, sales and support people? Since record keeping is such an important part of the management process it is extremely important to determine the managers experience and interest in record keeping and records analysis. Knowing why records are kept and how to use them for decision making is extremely important. Asking question about key herd health, production and reproduction values for the herd will indicate the manages understanding of production record keeping. Asking questions relating to key economic measures, which need to be maintained and monitored, can indicate an understanding of the manger's competency with financial records. Asking the manager questions about the actions to take, if production or financial parameters vary from expected values, can demonstrate how the manager can use the information supplied by a good record keeping system.

■ Where Do We Want To Go?

The planning process should always start with an evaluation of the dairy industry. The planner should attempt to match the goals of the dairy operation with the perceived current and future structure and needs of the dairy industry. The idea should be to “skate to where the puke will be, not where it is now.”

Planning by its nature should start with the goals of its owners, their families and employees. Participants in the planning process should consider both personal and business goals for both the long term and short term. Each person involved should take time to define a comprehensive list of his or her personal goals and the goals for the business. This should be done independently of other people. The planning process should consider each member's desires and the business goals developed should support, compliment, and not violate the personal goals of the individuals involved. The resulting goals should follow the “S.M.A.R.T. ” format, i.e. they should be Specific, Measurable, Attainable, Relevant and Time related. The resulting goals should be documented and made available to everyone involved with the operation.

Another critical part of the planning process is determining the long-term potential size and level of specialization of the operation. The size of the operation short-term should cover the current income needs of the owners and family members, whereas, the long-term plan should be flexible and allow for potential changes. The plans developed should strive to fully utilize assets owned. As an example, if a producer plans to build a sixteen-stall milking parlor and milk the dairy herd three times per day, then normally it would support a herd of about 500 cows if the parlor is operated at full capacity. Based on this fact, all the planning associated with this decision should allow for this herd size in the future. The site selected should be of sufficient size and facilities constructed should reserve space for future housing, feed storage and manure storage needs of a herd of this size. Evaluation of the operations past performance, financial status and availability of custom operators should be used to determine the correct mixture of enterprises. In the past many operations had milking herd, heifer, steer and/or crop enterprises, but specializing currently offers some advantages to more fully utilize assets and management skills.

The plan that is developed during this planning process needs to be a road map of how management expects the operation to change over time to meet the long-term goals of the owner(s). Defining the different phases of growth and the assets to deploy at each step is important and should be planned within the limiting factors associated with the operation. The most important long-term limiting factors relate to the availability of inputs (feed, water, labor, etc.), waste disposal (manure, etc.), support (local infrastructure), marketing of outputs, external factors (urbanization, neighbors, etc.) and the long-term growth

potential of the site. Short-term limiting factors relate more to the physical and financial status of the resources controlled by the current operation. The long term expected size of the operation should be based on the availability of feed for the animals. If crops will be raised locally an estimate of the amount of feed and competition for it should be considered. Manure and nutrient management must be considered and planned for. Where will the wastes go and what will be the associated costs? Is there sufficient amount of quality water available at a reasonable cost? What is the long-term trend for land use at the operations current location? Is there, or will there be long term, problems with neighbors? What is the current and future potential for a local infrastructure needed to operate a modern dairy? What are the marketing advantages and/or risks of the operation's location? Answering these questions and any other questions relating to the long-term viability of the operation, limitations and feasibility of the plan should be considered at this point and form the basis for plans made.

Which Strategy is the Best to Achieve This?

After conducting a through evaluation of your operation and defined what you want to accomplish, it's time to look at the different routes or strategies that can be pursued to get there. This is the time to visit farms, talk with dairy producers and suppliers and to hire consultants. Remember that "direction is more important than speed", i.e. the size of the step is not as critical as knowing the correct direction to go. Don't be in a hurry to get through this decision-making phase, often a year or two of planning is time well spent, since the investment you make will have long-term impact. Don't be to quick to judge alternatives at this time, but add them to the list of approaches or strategies that could be pursued.

After investigating the different options collected at this phase, it's time to collect general costs and returns expected for each option. If you have not already hired a consultant, it would be good to consider doing it. A good consultant can help: 1) identify and locate information needed for making a decision; 2) evaluate and interpret information and proposed impacts; and 3) add a different perspective when making decisions. Recommendations from local dairy producers, suppliers and county extension personnel should help in finding such a consultant.

At this time, the operation's decision-makers and support staff should conduct a feasibility analysis for each potential strategy. Some potential strategies will be eliminated quickly for obvious reasons, but hopefully a few will remain that need to be evaluated in depth. This process starts with the collection of inputs required and outputs expected, i.e. the amount and cost of inputs and outputs. Once this has been accomplished, financial projections need to be made using realistic values. It is important to use accurate estimates for these financial projections to get a true picture of what financial returns can be expected. A sensitivity analysis should also be produced for each analysis, to determine the

associate risk, by varying key decision values and observing their impact. Yearly financial projections should be done to estimate the effects on cash flows and the financial status of the operation for five to seven years into the future. Monthly projections should be done for the first three years to help identify any times where cash flow supplementation will be required. After generating financial projections and sensitivity analysis, each remaining strategy should be evaluated to determine how it fits the goals of the owner(s) and operators. A critical part of this process will be the identification of the perceived advantages and risks associated with each choice. During this process, decision-makers must consider 1) legal, environmental and government risks; 2) physical output risks; 3) input price risks; 4) output price risks; and 5) human resource risks to determine the potential effects of each on the operation. The final decision should be discussed and agreed to by all participants so there is no misunderstanding or dissention in the future.

■ How to Implement This Strategy?

Once the decision is made, on what strategy will be pursued, efforts need to be focused on development of an action plan and writing a business plan which defines what, when and why things will be done. This business plan should identify important milestones, dates and the people responsible for them. It must explain the proposed changes to their facilities, procedures and record keeping systems that will support the selected strategy.

This business plan should start with an index of what is included in the document and an executive summary which states in general terms what you plan to do, how you plan to do it and explanation of why lenders and/or investors should help you make it happen.

A description of your business's current and proposed future legal entity should be included to show lenders and investors any types of legal entanglements that may exist. This document should attempt to answer the following questions:

- What is the legal form(s) of the business?
- What arrangements are there for dissolution of the business?
- What is the ownership of the assets used in the business?
- What lease and rental obligations exist?
- What life leases or trusts exist?
- How wills or other estate plans may affect the business?

Many farm businesses use real estate, machinery and livestock owned by a combination of other people and/or organizations through different legal entities. If this is your situation you need to define, who owns what? What obligations does that involve? Are there leases and other contracts?

To explain what facility changes are planned, before and after site plans should be created and included in the business plan document. It should show all proposed changes to the existing facility. A listing of all land, buildings, equipment and services needed for the project should be provided with copies of any written estimates.

If a phased implementation is planned an explanation of each phase and its associated target date would help explain the long-term plan.

The financial projections and sensitivity analysis done earlier should be summarized in the business plan write-up and included as an attachment. A summary of the proposed borrowing and repayment plan should also be included.

A forage acquisition plan should be included which summarizes the amount of feeds needed, where it will come from, how it will be handled and all expected costs. If crops are to be grown, a detailed map of the farmland should be included. The different fields, topography, and soil types should be identified, as well as, rotation schedules and indications if the land is irrigated. Include this map as an attachment. The productivity of this farmland and any information about current nutrient loading can be included to support the manure management plan.

A manure management plan, which summarizes the current status of the operation, and details how the nutrient management needs of the dairy will be accomplished should be included. Information relating to all zoning requirements and what has been done to address these rules and regulations should be shown.

A livestock plan which shows the current herd size (number of cows and replacements) and the number of livestock that will be purchased, born, sold, die and/or raised for the period of time covered by the financial projections should be provided.

A marketing plan, which indicates how the milk, extra animals, etc. will be marketed, should be included. This is especially true if any special arrangements have been made with a milk processor.

To explain how the operation will be managed, a definition of all key employees, their background and skills should be defined. An organizational chart, which shows how the dairy will be organized, is also worthwhile. A

summary of the procedures and protocols, to manage cows and people that have been or will be developed and followed, can help explain the philosophy of the management team.

Since monitoring of the plan is so important to its success, time should be spent explaining what has been done to avoid expansion pitfalls and an explanation of your contingency plans would also be important items to include.

■ **How to Monitor the Process to Insure We're On Track?**

A successful improvement to an existing dairy system requires both a well-thought-through action plan and a method to monitor its implementation to insure things are progressing as anticipated. To accomplish this, it is extremely important to select and use quality record keeping systems. Currently most progressive dairymen would chose computer based systems because they allow for easy summarization and analysis of the data retained by them.

Normally financial and production records are maintained by different computer programs, but the information from these sources need to be consolidated so the dairy's management team can monitor the production efficiency of the dairy. Many new systems are being developed to monitor animal production, status and behavior; equipment usage and its status; and/or employee effectiveness. Computer systems combining the information from these milking, feeding and labor reporting systems have the potential to greatly increase the manager's ability to monitor the performance of both equipment and employee performance.

One successful technique employed by large dairies is to develop an internal management team to make decisions and to enhance the communication between employees. Often, they also develop a support team composed of internal management people and outside support people. This board of directors type group includes all the key people involved with the dairy (lender, nutritionist, veterinarian, consultants, etc.). This group often meets frequently during the building and start-up phases of the expansion and monthly afterward. Their objective is to monitor all phases of the operation, share observations and help guide the operation and development of the business.

■ **What Do Producers, Who Have Modernized Their Operation, Say?**

Many existing producers have been reluctant to modernize their operations because of concerns about labor management, debt repayment and the overall management of a larger operation. Other producers have modernized because

they perceive the change will increase their overall quality of life through increased profits, better health and safety, and flexibility in their work routine.

The 1999 Wisconsin Dairy Modernization Project surveyed the Wisconsin dairy producers who had increased herd size by at least 40% between 1994 and 1998. The objective of the survey was to determine what changes the producers had made and how happy they were with their results. Since DHI information was available for these herds, milk production and production related factors could be correlated with different producer groups. Results of the survey showed the key reasons producers expanded were to increase profits, 89%; to improve labor efficiency, 73%; to improve physical working conditions for operators, 69%; to get time away from their farm, 61%; and to allow a family member to join the operation, 34%.

When asked, "Knowing what you know now, would you do it again?" only 6% said no; the remaining 94% said they would. Of those who were satisfied with their expansion choice, 51% would do it the same way, 29% would do it quicker and 23% would do it bigger.

DHI milk production and user satisfaction with quality of life favored those who had added some or all-new facilities over those who expanded without changing facility type. As final herd size increased, milk production levels and quality of life factors increased.

The average herd size of the 302 farms surveyed was 102 cows before expansion and 252 at the time of the survey. They had an average long-term goal of 453 cows per herd. The report summarized herds by final herd size and found that smaller herds, 60-105 cows after expansion, had doubled herd size from 47 to 86, whereas larger herds, >360 cows, tripled size from 197 to 597 cows per herd.

A complete summary of the results of this survey can be found on the University of Wisconsin-Dairy Science web page (<http://www.wisc.edu/dysci/>) under Management Publications. Call 608-265-8957 to have a copy sent. If you are considering modernizing your operation and have questions or concerns, you may gain some insight by reviewing the results of this survey which summarizes the feeling and advice of those who have expanded.

■ How Do You Begin The Planning Process?

Planning starts with defining your goals and understanding your options. Visiting farms, reading popular press articles and talking with local service people all provide information that can be used. The key thing to do during this process is to keep an open mind and try to develop a list of strategies or possible options. Don't disregard ideas until this list has been developed and

then work with family members and professional consultants to help select the options and approaches that are best for your business.

The planning process should start with a meeting of everyone directly or indirectly involved with the ownership and management of the business. Encourage member to come to this meeting prepared and insure that everyone's goals are heard. List the group's common goals and try to get consensus. These goals should identify how the operation will insure sufficient returns for labor and investment, retirement needs and continuity of the business.

■ Conclusion

The manager of a dairy business, like the manager of a large manufacturing company, must constantly monitor the status of their operation and make decisions which optimize its operating efficiency and profitability. Both must coordinate all the different types of information relating to their businesses to identify areas needing corrective actions. Both need to understand the production aspects of their business and the expected economic impact of any proposed change.

Dairy herd managers need to consider the financial impact of any strategic change to their operation. Prioritizing decisions based on the expected returns for implementing different changes should have the goal of optimizing the use of the business's resources. Selecting the right facility modifications or additions, development of animal management protocols to manage the animals and selection of record keeping systems to monitor the operation are critical to the long term viability of the operation.

When making a buying decision, the business manager must remember that spending money on new technology may or may not result in a lower cost of production. Dairies need to evaluate the costs and benefits of each new technology and adopt those that will provide a greater return than other competing opportunities, as well as, a positive cash flow over time.

■ References:

- Bewley, J., R.W. Palmer, and D.B Jackson-Smith. (2001) An Overview of Wisconsin Dairy Farmers Who Modernized Their Operations. JDS 84:717-729.
- Bewley, J., R.W. Palmer, and D.B Jackson-Smith. (2001) Modeling Milk Production and Labor Efficiency in Modernized Wisconsin Dairy Herds. JDS 84:05-716.

- Bewley, J., R.W. Palmer, and D.B Jackson-Smith. (2001) A Comparison of Free-Stall Barns Used by Modernized Wisconsin Dairies. JDS 84:528-541.
- Cropp, R. (1999) Milk Price Risk Management. Assessing Technology for Profits and Growth. Dairy Tech Forum '99. World Dairy Expo, Madison, WI. Sept 27-29.
- Eicker, S. W. and S. C. Stewart. (1998) Computerized parlor data collection and use: "Monitoring the cows, the people, and the parlor". National Mastitis Council Annual Meeting Proceedings.
- Fountain, F. M. (1999) Developing the optimum financial structure for your dairy operation -or- improving profitability & survivability through financial management: A lenders perspective. 4th Western Dairy Management Conference. Las Vegas, NV. April.
- Palmer, R.W. and G.G Frank. (1999) Preparing a Business Plan for a Farm Business. Fifth International Dairy Congress. David and Chitre, Panama, Feb 23-26. P 1-9.
- Palmer, R.W. (1999) Management Systems to Improve the Production and Financial Performance of Dairy Farms. Invited paper. 50th Annual Meeting of the European Association of Animal Producers. Zurich, Switzerland, August 22-26.
- Sumrall, D. P. (1999) Management strategies for dairy systems. 4th Western Dairy Management Conference. Las Vegas, NV. April.
- University of Wisconsin-Dairy Science web page (<http://www.wisc.edu/dysci/>), Management Publications
- Wagner, A., R. W. Palmer, J. Bewley, and D.B. Jackson-Smith. (2001) Producer Satisfaction, Efficiency and Investment Cost Factors of Different Milking Systems. JDS 84:1890-1898.

