

CHAPTER 7: VALUE-ADDED PROCESSING



Cream top milk in glass bottles is one value-added option that has been a hit for some dairies in the Midwest.

Background

Several things can motivate farmers to consider on-farm processing of their milk. In some cases, family members are planning to join the farming venture and if adding land or cows is not an option, the farm somehow has to increase the value of products sold. In other situations, the dairy owner may be frustrated with price fluctuations in the conventional milk market and want to try selling to consumers who will pay more for a locally produced farmstead product. In still other cases, family members may be interested in food preparation and cooking and want to make and sell dairy-based food products.

Any of these reasons may lead a dairy producer to explore the possibility of producing and marketing added-value dairy products by bottling milk or making cheese, butter, yogurt, ice cream, or other dairy products.

The decision to begin processing dairy products requires careful consideration. If a farm begins an add-on company, the business will demand an entire new set of skills and facilities. An operator who is primarily looking for ways to improve returns to the farm is often encouraged to first consider other options such as boosting productivity and labor efficiency before adding the processing unit.

Some dairy producers have observed a trend toward increasing opportunities for this kind of venture. A growing number of consumers are seeking direct connections with the producers of the food they eat. Many consumers are very interested in what happens on the farm. As a result, there is a significant and growing niche market for products sold directly from the farm, even if the product reaches consumers in a specialty or health food grocery

Smalldairy.com – a revolutionary resource

By Jeremy Lanctot

In the last year, I have found a resource that may revolutionize the growth of small scale on-farm dairy processing: www.smalldairy.com. This site didn't show up in the first several pages of my internet searches. I had to dig to finally discover it. Most internet searches yielded sites for larger operations and/or advanced processing knowledge. Most farmers do not have the time and background to jump into on-farm processing on this scale, so it can be quite intimidating.

The Small Dairy site is built with small homestead and artisan processors in mind. There are links to suppliers of all sorts who sell processing equipment of all sizes and prices: cheese, yogurt, kefir and ice cream making supplies, etc. If you're interested in classes and workshops, there is information about when and where they are offered. One of the most useful references on this site is for publications that will aid in the

education of beginning dairy processors. This will be the place for most producers to start.

Through the Small Dairy site, I purchased two subscriptions for periodicals for on-farm processors. *The Home Dairy News* targets those who have a few dairy animals and just want to value-add for themselves and maybe a few friends.

...*Creamline* is the next step in dairy artisan reading. This periodical focuses on supporting the revival of the local creamery. In this publication, one will find in-depth information with the assumption that you are already doing some processing right now.

Contact information:

www.smalldairy.com – or – Creamline/Home Dairy News
P.O. Box 186-W
Willis, VA 24380

Reprinted with permission from *The CornerPost*, the newsletter of the Sustainable Farming Association of Minnesota. Spring, 2005.

store. Shoppers are interested in these items, and a number are willing to pay more for them. These customers are also willing to travel greater distances to obtain food that offers them a direct link with the farmer. Nonetheless, the farmer usually needs to make the first contact with those customers, and the customers must believe that the quality is very high.

Careful planning

Entrepreneurs in Wisconsin can seek the assistance of the Dairy Business Innovation Center, which is part of the Wisconsin Department of Agriculture, Trade and Consumer Protection. This Center encourages producers to link up with an agent at the department, who will guide the entrepreneur through every detail and provide technical assistance with plant design, processing advice, and marketing plans. Agents can also help create cash flow and debt retirement plans for fledgling businesses, and can help with market analyses.

There are also two other Wisconsin dairy programs that provide technical assistance, programs, short courses, and product testing for dairy artisans and specialty cheese makers. They are the Center for Dairy Research at the University of Wisconsin Madison www.cdr.wisc.edu/, and the University of Wisconsin River Falls Department of Animal and Food Science www.uwrf.edu/food-science/Institutes. Entrepreneurs outside of Wisconsin can access the same assistance for a fee commensurate with the cost of courses or product testing. There is also a Wisconsin Dairy Artisan Network www.wisconsin dairy artisan.com.

In Minnesota, the Agriculture Utilization Research Institute (AURI) www.auri.org works with value-added products from all kinds of farms. AURI aids in product development and helps individuals or groups test the feasibility of any plan. The institute also connects producers to people who can help with business and financial planning and market analysis. This is a free service to all agricultural businesses based in Minnesota. The Minnesota Department of Agriculture offers Dairy Business Planning grants to producers who want to explore the feasibility of making changes to their operations, including on-farm processing ventures.

Minnesota producers can also get help from the Minnesota Dairy Initiative www.mnmilk.org/mdihtm, which offers technical assistance to farms in order to improve productivity, profitability, and efficiency. In addition, the Minnesota Institute for Sustainable Agriculture's *Building a Sustainable Business: A Guide to Developing a Business Plan for Farms and Rural Businesses* (at www.misa.umn.edu) is a helpful publication.

The Michigan Department of Agriculture www.mda.state.mi.us provides counseling and helps dairies develop business plans. The staff also direct farmers to other sources of assistance. In Michigan, another significant resource is the Michigan State University Product Center for Agriculture and Natural Resources www.aec.msu.edu/product. Here, dairies can test recipes and procedures during the planning stage of an on-farm processing business.

Getting guidance from the state in which a farm is located is very important. State officials can link farmers with resources and advice that may prove invaluable as a processing business takes shape. Consulting with them early in the process can help make sure that the facility meets health and safety requirements. Grants are sometimes also available, including USDA Rural Development Value Added Producer Grants (www.rurdev.usda.gov), which provide planning grants and working capital.

Many farms seek advice from consultants and lenders in the first phases of their planning. These people can help the dairy owner carefully craft all of the details that will go into the new facility. Farmers who have successfully implemented similar types of businesses stress the importance of listing all the decisions that need to be made. Additionally, owners must consider the implications of all decisions carefully before proceeding with any plan.

Farmers can take classes, visit trade conferences, or attend seminars on making the products they are interested in offering. Food technologists can offer additional guidance on the processes and production of milk products (Frank, 2000).

Regulation

During the planning, construction, and operation of a plant, state inspectors will check to assure that facilities are up to regulatory requirements. Each state is responsible for the regulation of its own plants. Equipment, milk quality, and temperature testing continue throughout the life of the business. Facilities seeking an additional USDA inspection will usually work with two sets of regulatory officials — state and USDA.

Marketing plan

Simply making a product on your farm is not enough to assure that sales will follow. A detailed marketing plan is critical to locate and secure customers for any products and is an important first step in investing in a new enterprise. Many times, knowing what needs to be done and decided prior to starting a business simplifies any changes that may be necessary along the way. There are a number of important questions to consider as you develop this plan. They include:

- What product do you intend to sell?
- What is unique about your product that will attract customers?
- Who will buy your product? Consumers? Restaurants? Grocery stores or specialty food shops?
- If you sell direct, how many customers will regularly purchase your product?
- If you sell to shops and stores, how will your product reach those locales?
- Is your sales site conveniently located for shoppers?
- What are your costs, including overhead, ingredients, and labor?
- How much will your product cost?
- How much will the consumer pay for the product?
- How will you attract consumers to your product?
- How will you demonstrate the quality of the product?

(Frank, 2000; MDA, 2004; MISA, 2003)

Personnel

Anyone who will be working in the processing facility will need to acquire both knowledge and skills to use equipment and create the products that the farm will eventually offer for sale. The greater the number of products offered on the farm, the more equipment required to make these products, and the more complex skills workers will need.

Some farmers plan to create the products themselves, while others use hired labor. In the second situation, the dairy owner not only must train the workers, but also must supervise them. Depending on the size of the venture, employees may be a permanent addition to the processing business. In other cases, family members provide all the labor needed. Good communication is critical in either case.

Facility options

There are numerous choices for farmers when it comes to processing milk on the farm. First is the choice of products, which can include milk, cream, creamline milk (pasteurized but not homogenized, so the cream rises to the top), cheese, butter, yogurt, ice cream, and sour cream. Additional products can be added later, provided there is enough capital to invest in any additional equipment needed.

A producer needs to first decide whether to create a space on the farm for this effort. You can hire many cheese plants and dairy companies to follow your recipe and create your products under contract for a fee (this is commonly called “co-processing”). Storage space may still be necessary.

CHAPTER 7: VALUE-ADDED PROCESSING

When planning an on-farm facility, state department of agriculture and/or health inspectors may be helpful advisors. If the farm decides to add a site on its own property, local and state regulations will dictate how the facility must be designed. Equipment must be up to code. Food safety laws govern a number of decisions. Some states require that a plan be submitted to the department of agriculture before any construction or remodeling commences. You should also check with your insurance company about liability coverage.

The location of any on-farm processing unit must be carefully considered. All wastewater must be treated and handled so it does not overwhelm the system. In some cases, the city sewer may be available. If the farm will be shipping products to markets, trucks will need to access the facility. Farm odors and prevailing winds need to be considered, because they can taint the flavor of the dairy products. Insects and dust can also create difficulties. A construction engineer can help with the planning of any new structure, and is a valuable advisor (Frank, 2000).

The final costs of any processing facility and equipment vary dramatically. A new system handling a large amount of milk will cost more than a system made of reconditioned used components. Smaller farms have remodeled existing spaces for around \$65,000. Tremendous sweat equity goes into this type of facility. Larger sites with new equipment and numerous product offerings can cost \$1 million.

Studies show that new enterprises often fail. The following list of “keys to success” was generated by interviews with successful farmer food entrepreneurs:

- Start small and grow naturally
- Make decisions based on good records
- Create a high-quality product
- Follow demand-driven production
- Involve the whole family or partners
- Keep informed
- Plan for the future
- Evaluate continuously
- Provide adequate capitalization

(Born, 2001)

Adding a business to the farm will mean lifestyle changes. The tasks will also be different than those of farming, and add to the overall labor requirements of any farm. With careful planning and execution, the venture can be a lucrative addition to the farm business.

If you are considering adding or changing a facility, see the *Resources* section at the end of this book.

TABLE 12: Value-added Dairy Processing

START-UP COSTS	\$65,000 – \$1 million
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Sources: Francis Thicke, personal communication, 2004;
Norm Monsen, personal communication, 2004

CHAPTER 7: VALUE-ADDED PROCESSING

Resource people

The following people contributed information for this chapter. You will find complete contact information in the *Resources* section the end of this book.

Robert Craig, agriculture development director, Michigan Department of Agriculture

George Crave, grazing dairy and cheese maker, Waterloo, WI

Donna Gilson, public information officer for food safety and animal health issues, Wisconsin Department of Agriculture, Trade and Consumer Protection

C. Thomas Leitzke, food scientist and director, Bureau of Food Safety and Inspection, Wisconsin Department of Agriculture Trade and Consumer Protection

Florence and David Minar, organic grazing dairy with on-farm processing, New Prague, MN

Norm Monsen, Wisconsin Department of Agriculture, Trade & Consumer Protection and Wisconsin Dairy Artisan Network

H. Christopher Peterson, professor and director, Michigan State University Product Center for Agriculture and Natural Resources

Michael Sparby, project development director, Agricultural Utilization Research Institute

Francis Thicke, organic grazing dairy with value-added processing, Fairfield, IA

Cheese, Please!

Rick Adamski and Valerie Dantoin
Full Circle Farm
Seymour, Wisconsin

Adding a new business to a farm is not always the right choice. But for Rick Adamski and Valerie Dantoin, it was a fit that ultimately matched their goals and objectives. The business also improved the sustainability of their farm. Coupled with seasonal calving and grazing, the cheese-making venture capitalized on a special asset of the milk that was a result of the farm's grass-based production method.

The couple wanted to farm in the most environmentally friendly way possible, while also producing the best-quality food possible. They adopted managed grazing for their entire, 240-acre dairy farm. "I wanted to improve our pasture management and reduce our reliance on harvested crops in order to decrease our fuel and energy use, while also conserving soil," said Rick.

Valerie is enthusiastic about the human health benefits of the meat and milk from a grazed farm. "As farmers we have a responsibility to provide people with the most nutritious food we can produce," she explains. She also hopes to raise awareness that production method directly affects the quality of the food.

Cheese marketing

In the late 1990s, Valerie read about studies indicating that meat and milk from pastured cattle consuming little or no grain have very high levels of conjugated linoleic acid (CLA) and omega-3 fatty acids. Some research in test animals has indicated that both fatty acids have cancer-fighting properties and other health benefits.

In 2000, Valerie obtained a Wisconsin Agricultural Development Grant to test the CLA content of their farm's milk during the grazing season, and found that it was indeed substantially higher than the average for milk produced on confinement farms.

Rick and Valerie also saw this as an opportunity to help other grazing farms, and work with others to share ideas and risk. They invited some friends who graze their cattle to form a new organization, the

Wisconsin Dairy Graziers Cooperative, which now has four member farms.

"We don't want to be successful just by ourselves. The best thing about being in a cooperative is being on a team with a group of people you want to be with," Valerie explains.

The co-op requires that pasture make up at least 50 percent of all forage dry matter consumption by the milking herds during the grazing season, and prohibits use of antibiotics, synthetic fertilizers, and hormones. In 2001 the co-op received a USDA grant to test and compare members' pasture-produced milk with that of some confinement dairies. They found that co-op members' milk from grazed cows was substantially higher in CLA, omega-3, and vitamins A and E.

Valerie said the group wanted to make a cheese that capitalized on these healthful attributes, while returning a higher value for their milk. They found a cheesemaker who was willing to do the job on a contract basis, and located firms to cut, wrap, label, and store the cheese.

"That's the advantage of living in Wisconsin. You can find people to do the job for you," Valerie said.



This cheese won a first place award at a 2004 world championship cheese contest.

FARM PROFILE: CHEESE, PLEASE!

Wisconsin Dairy Graziers markets the cheese under the label “Northern Meadows.”

Valerie said she knew nothing about cheese marketing when she started the project. Wisconsin Dairy Graziers hired a cheese broker, a person who is paid to handle distribution and sales. The broker told Valerie that he could sell a substantial amount of cheese across the U.S., so the cooperative decided to have 70,000 pounds of cheddar made in 2001. However, the broker’s promises did not materialize.

The cooperative changed strategies, deciding to concentrate initially on Upper Midwest sales. Valerie hired a friend with a marketing background and a strong interest in the product to make sales contacts.

Next, the cooperative found a distribution firm serving hundreds of smaller food stores, an avenue that now accounts for half of the cooperative’s cheese sales. Smaller volumes are sold directly, including through a website. The co-op scaled back cheese production to 10,000 pounds per year in 2002 and 2003. Since tests

showed that CLA content of members’ milk was highest in late summer and early fall, cheese making does not start until July.

The cooperative has been successful in its goal of returning \$16 per hundredweight to members for the milk sold as Northern Meadows cheese. However, the group has a line of credit and a bank loan to finance its unsold cheese inventories, and unpaid labor is not included in the milk price figure.

Valerie is paid for the average of 10 hours of work she does for the cooperative each week. She said there is reason to believe that the business can continue to grow, but adds that selling cheese is a difficult and unpredictable business. Increasing sales too quickly can be a mistake, so she said the cooperative needs to plan for moderate growth. “The field is plowed. It’s a matter of how much seed we want to plant,” Valerie said.

For many years, Rick has treated cows with organic-approved remedies. He’s also avoided non-approved fertilizers. “We were always aware of the organic



Rick Adamski and Valerie Dantoin are dairy farmers and cheese entrepreneurs.

FARM PROFILE: CHEESE, PLEASE!

market, and we wanted to be prepared for that route when the opportunity came,” he explains. In 2003, Rick and Valerie joined Coulee Region Organic Producers Pool (CROPP), and started receiving a substantial organic price premium for their milk.

Words of advice

Decisions to graze cattle and make farm business changes have to be made on a case-by-case basis, Rick stressed. “People have to figure out why they’re in farming. They have to evaluate the options available,” he explains. For instance, Rick and Valerie said they chose to cut back their dairy herd and go to organic production because of their land base, life stage, and personal philosophies. They say that on the other hand, a younger person with a larger land base and a passion for farming can do well milking more cows.

Valerie thinks marketing pasture-based dairy products holds promise and should continue to be pursued by farmers. Grazing-based dairy products appear to have a bright future. She notes that the label “grass-fed” can attract buyers because of its special attributes such as high levels of CLA, omega-3, and additional vitamins.

Yet the cheese business is complex and full of pitfalls, Valerie warns, and newcomers need to be flexible. “Don’t be single-minded. Look around and see what

other people are doing, so you can change if you need to,” she said.

Valerie recommends that, to avoid financial risk, farmers not invest in processing equipment while learning cheese marketing. Do not base investments on plans to immediately sell large quantities of cheese at relatively high prices.

“Don’t tie up all your capital in one place. You need to expect the possibility of failure, but learn to fail cheaply,” Valerie said.

Farmers must also find a balance between doing too much and too little with a marketing enterprise. Wisconsin Dairy Graziers Cooperative members all operate farms and are raising families, and thus do not have the time to handle packaging, distribution, and sales efforts. At the same time, Valerie said she learned the hard way that farmers should not turn all tasks over to another party.

“The amount of cheese you sell is almost directly related to the amount of push the farmer puts into it,” Valerie she. She has found that in selling cheese, having a good-tasting product is just as important as proven health benefits. “We have found that people like the taste of our cheese, and we can charge a higher price based on that taste,” she said.

CHAPTER 8: MILKING CENTER OPTIONS

For some farms, the best way to improve labor efficiency, the health of the people milking cows, and sometimes even the farm's profitability and value, is to change the milking parlor. This can mean either building a new milking parlor or remodeling an existing building to create an upgraded milking parlor. The purpose of this section is to explore the options available for both remodeling and building new milking centers.

Because a significant investment is often required, a dairy operator must consider many factors before he or she decides to remodel a milking parlor or to build a new milking facility. A wide range of options is available, ranging from changing to low-cost swing parlors in an existing building to new construction with an automated milking system that includes individual animal ID and automatic gates. First and foremost, the dairy's current facility needs to be evaluated. Many parlors are not being used to capacity. A change of internal equipment may be all that is needed, and could reduce the costs of improving the milking system significantly.

Even if the current parlor is insufficient in terms of capacity or speed, the operator should plan and make allowances for the future of the dairy. Speaking with advisors, extension agents, engineers, and other farmers will help provide the best guidance for any farm looking for a new system that will work well both now and in the future.

Several things need to be considered as an operator plans to change the milking parlor either through a new construction or remodeling, including:

- How many people will be milking cows?
- How long should milking take?
- How will it affect the cost of milking on a per-cow basis?
- How will this parlor fit into the future of the farm?
- Will it improve cow and operator safety?
- Will cow care be part of the milking routine?
- Will employees be needed?
- Who will train employees?

Finances and function

Improved milking setup can often mean improved efficiency of labor and working conditions for those milking the cows. For example, in a tie stall barn one person can milk about 25 cows in an hour. In a remodeled flat barn, even one with fewer stalls, one person can milk about 40 to 50 cows in an hour. In a double-10 parlor arrangement a person can milk around 60 cows per hour (Davis et al., n.d.; Galton and Karszes, 2001; Winsten and Petrucci, 2003).

The amount of automation included in the facility shortens the milking time. Generally speaking, it is most efficient to use the parlor as much as possible. Some economists suggest that larger dairies milk around the clock in order to maximize return to investment (Bruce Jones, personal communication, 2004). However, on some farms that may not be a desirable choice.



Automated transponder ID systems, like the one worn by this cow, use computerized technology to feed individual rations and monitor milk production.

CHAPTER 8: MILKING CENTER OPTIONS



In a tie stall barn, one person can milk about 25 cows per hour. This increases to 40 to 50 cows per hour in a remodeled flat barn, 60 in a double-10 parlor, and as many as 100 per hour in a double-16 parlor.

Bankers, engineers, and consultants frequently suggest that the budget for the parlor be no more than 20 percent of a farm's annual gross milk sales. Costs can be significantly reduced if a farm remodels an existing structure, which eliminates a portion of the construction costs. For example, a new swing parlor can cost about \$6,000 per milking unit, whereas remodeled parlors can cost \$1,500–\$3,000 per milking unit (Kammel, 1999; Vance Haugen, personal communication, 2004).

Reducing costs

Whether building a new parlor or remodeling an existing building, costs can be reduced in many ways:

- Simplifying design
- Incorporating existing infrastructure
- Reusing equipment and the milk house from the previous facility
- Investing sweat equity

A dairy can spend \$20,000 per stall for a new double-8 parlor if working with a private dealer. The cost can be reduced dramatically by consulting an extension specialist with expertise in milking center design.

Remodeling

For dairies currently using a tie stall setup, the existing building can be recycled to provide an updated milking system that reduces the time per cow and reduces the physical strain on the milker. Remodeling also keeps the cost of an improved system low. Milking units, pipelines, bulk tanks, vacuum pumps, and the refrigeration system can all be taken from the old system and incorporated into a new or redesigned parlor. Costs can also be minimized by seeking and incorporating used equipment from other operations that are updating their own facilities or are liquidating. Grazer and Wisconsin county extension agent Vance Haugen encourages producers to plan carefully and think big, saying that after four or more years, many farmers end up regretting that they hadn't build a bigger parlor (Haugen, 2005).

In January, February, and March, 2005, *Graze* ran a series of articles by grazier and Crawford County Wisconsin Extension Agriculture Agent Vance Haugen offering practical tips about retrofitting parlors. Back issues of *Graze* are available at www.grazeonline.com.

CHAPTER 8: MILKING CENTER OPTIONS

Swing parlors are a popular option for a tie-stall barn renovation to a milking center. The tie stalls are removed and concrete is jackhammered for the construction of a pit where the cow alley was located, at the end of the barn nearest the milk room. The far end of the stable may be used for a holding area. The parlor is called swing because the milking equipment is located over the center of the pit and is moved from side to side as groups of cows enter to be milked and leave milking stalls on either side of the pit. Stall configurations are described under “Parallel” on the next page. Swinging the equipment reduces equipment investment with some loss of milking speed.



Rick Adamski and Valerie Dantoin (profiled in Chapter 7) reduced milking time and effort by building a New Zealand-style swing parlor at a cost of about \$70,000.

A modified flat barn is a low cost option when remodeling a tie stall barn. This arrangement allows for cows to be milked in headgates at floor level or step up onto a platform where extra concrete has been poured; however, this plan doesn't eliminate stooping. Cows enter headfirst and back out of the milking stall. It may be possible for them to exit through the stall, if space is available and supplemental feed is provided at another location. The milking process is faster than carrying milking units from cow to cow, as is typical in a traditional pipeline system; the cows come to the milker rather than the milker being moved to the cows. Much of the existing tie stall equipment can be reused in a flat barn, and the arrangement allows for incorporation of many of the technologies that speed milking (Reinemann et al., n.d.). However, concrete usually needs to be poured for any kind of remodeled parlor and milker safety may be greatly improved by creating a pit parlor (Haugen, 2001).

The space inside any remodeled barn needs to be divided into a holding area and a milking area. If a producer is skilled in welding or carpentry, he or she may be able to build stalls for the cost of materials. Investing sweat equity can further reduce the overall out-of-pocket costs for a remodeled parlor. Sweat equity invested in the remodeling process, along with simplified design of the planned parlor, can keep the cost low (Kammel, 1999). Haugen advises paying special attention to pit depth, kick and rump rail heights, sturdiness, heat, lighting, slope, and wiring (Haugen, 2005).

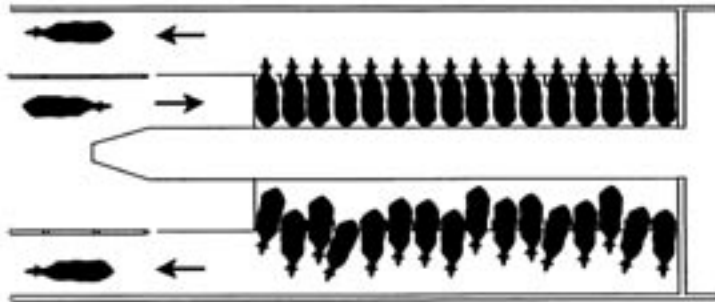
New construction

Location also needs to be considered, especially in the context of expansion that occurs in stages. The milking facility should be reasonably close to any cow housing that might be built in the future. This must be considered before any remodeling can be done.

Parlor styles

Parallel

For large herds, operators may opt for the parallel milking arrangement. The cows enter headfirst and stand side by side. This setup forces the first animal to walk all the way through to the furthest stall, and the others follow. The milking equipment is attached from behind the cow and all stalls have to be filled before the cow can be milked. The milker usually stands in a pit, with the cows perpendicular to the length of the pit.



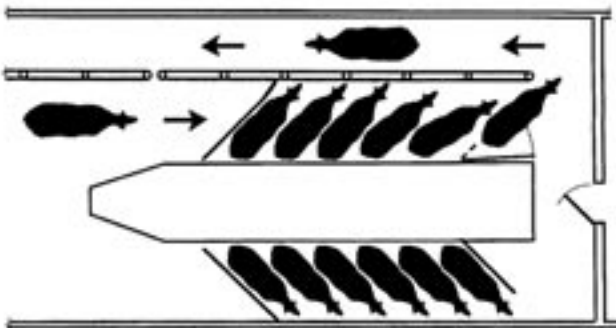
A parallel parlor decreases the distance between cows, which stand at a 90 degree angle facing away from the milker.

This style reduces the physical size of the parlor, and means less walking distance for the person milking to move from cow to cow. When parlors become large, the advantage of the parallel becomes more pronounced (Reinemann, 2003). The main advantage is that cows can exit the milking area rapidly. The main disadvantage is that the slowest cow in a set determines the milking rate of the entire group (Dennis Johnson, personal communication, 2005).

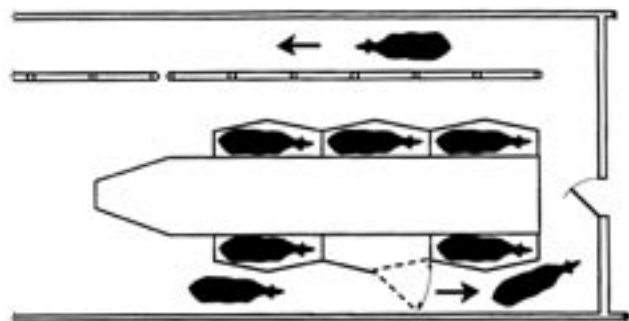
The parabone is a hybrid stall, with cows parked at about 70 degrees to the operator's area. There is little or no separation between the cows, and a minimal amount of steel provides breast rail, rump, and kick rails. Although cows stand at an angle, rather than perpendicular to the milker, the milking is still done from the rear of the cow. The advantage to this parlor is that it requires less exit space and therefore a smaller building (Kammel, 1999).

Herringbone and side-opening

In a herringbone setup, stalls are slanted at an angle of 45 degrees, allowing a side view of the udder and side access to attach milking equipment. In side-opening systems, the cows stand parallel to the milker. Some milkers who have previously been in a tie stall barn prefer these milking systems because they feel it provides them with a better view of the cow. Often, farms use this system if they plan to continue some individual cow management as part of their milking routine (Reinemann, 2003). Herringbone and side-opening systems were popular in the 1970s and 1980s and many are still in use. However, they have been largely replaced by the parallel and parabone styles, which can accommodate more cows per running foot of pit (Dennis Johnson, personal communication, 2005).



In a herringbone setup, the milking machine is attached from the side of the cow. In a parabone setup, the milking machine is attached from between the hind legs.



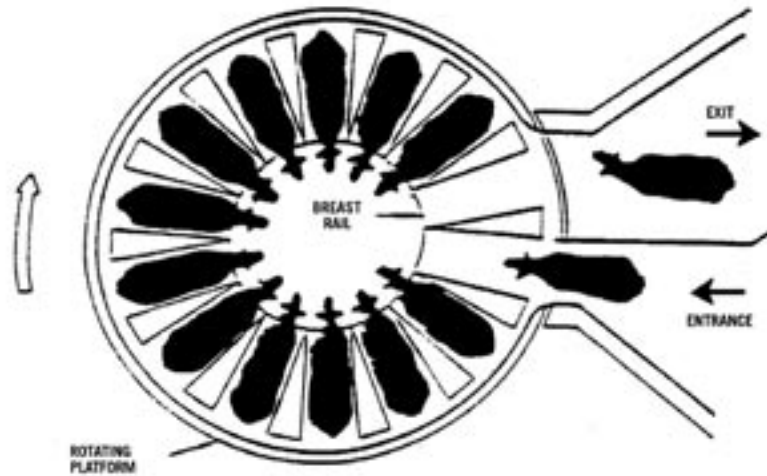
In a side-opening parlor, the cows stand parallel to the milker.

Parlor drawings from *Milking Parlor Types* used with permission from Douglas J. Reinemann and adapted by Amy Pressnall.

CHAPTER 8: MILKING CENTER OPTIONS

Rotary

In a rotary parlor, each cow steps onto a carousel and travels in a circle, usually facing inward, as she is milked. This system typically requires more labor. One worker performs pre-milking udder preparation and attaches the milking unit. Generally, automatic detachers take the milking unit off. Another worker does a post-milking dip treatment. The initial cost of a rotary unit is greater than the other parlor types and the units are not expandable. There are currently a few of these systems operating in the Midwest.



In a rotary parlor setup, cows stand on a rotating platform, usually facing inward, are milked as they travel around, and step off after traveling once around the circle.

Technology and labor efficiency

A number of technologies can enhance the speed of the milking system or improve herd management. Many of these can be retrofitted into an existing barn:

- Graziers sometimes feed grain or other supplements to the cow during milking.
- Milk meters allow dairy producers to track the productivity of each individual cow. These can be used with an auto identification system that reads the ear tag of each cow and stores production records.
- Automatic detachers can increase the speed of milking. They can shave about 10.2 to 15.6 seconds per cow from the milking time (Stewart et al., 2002).
- Holding area crowd gates encourage cows in the waiting area to move into the milking stations, reducing parlor loading time. Often the crowd gate is used in conjunction with a bell that trains the animals to move forward as cows leave after milking. These systems can range widely in price. Retrofitting a remodeled or existing parlor with automatic walk-through stall is very difficult (David Kammel, personal communication, 2004).



This fully-automated double-16 herringbone parlor can milk about 100 cows an hour.

In designing your parlor, be sure to consider regulatory requirements for sanitation — whether you are going to clean your equipment in place or are going to carry milking machines to the milk house for washing.

Also be sure to consider adequate lighting and cow flow during the planning stages of any remodeling or new construction. Cows used to being milked in another setting will take some time to adjust to the new parlor. Often, producers choose to allow the cow to explore the space on her own, in order to become accustomed to it. Some spread some manure to reduce the strangeness of the odors associated with new construction. Above all, the cow should be encouraged, rather than forced, into the new parlor. Whenever there is a dramatic change in the milking center, a training period is required for both the cows and the milkers.

CHAPTER 8: MILKING CENTER OPTIONS

Conclusion

As you consider remodeling or constructing a new parlor for your operation, you should visit farms that have the parlor types you are considering and talk to the producers and milkers who use them. Standing in the pit or next to the cow in a step-up parlor will give you the best impression of how a new milking center design would work for you and your operation.

TABLE 13: Capital start-up investment estimates for milking centers

REMODELED SWING PARLOR	\$1,600 – 6,500 per milking stall
NEW SWING PARLOR	\$15,000 – 20,000 per milking stall (including building, concrete, plumbing, electrical)
CROWD GATES	\$3,000 – 20,000 each
MILK METERS	\$1,000 or more per stall
AUTOMATIC TAKEOFFS	\$800 – 1,000 per stall

Sources: Chastain, 2000; Kammel, 1999; Kammel, 2001

If you are considering adding or changing a facility, see the *Resources* section at the end of this book.

Resource people

The following people contributed information for this chapter. You will find complete contact information in the *Resources* section the end of this book.

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Vance Haugen, grazer and county agent, University of Wisconsin Extension

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CHAPTER 9: ENTRY AND EXIT STRATEGIES

A person can't milk cows forever. And new dairy farmers have to come from somewhere. Farm transition is a complex process because it has both financial and emotional impacts. Senior farmers are not just transferring property — the dairy farm is also their home, their life's work, their income, their retirement fund, and a potential tax liability (Chuck Schwartau, personal communication, 2004). While neither the beginner nor senior farmer may have prior experience in a farm transition, both need to be aware of the deep-seated needs and emotions that come with the deal. When the transfer is not merely a quick-and-dirty sale, there is usually a trial period or extended time when the senior farmer observes the skills and commitment of the new farmer. This period also tests the willingness of the retiring generation to let go.

Beginners have more options than just inheriting a farm. In fact, a survey of Wisconsin dairy farmers showed that 88 percent of the respondents came from farm backgrounds, but only 20 percent took over their parents' farms (Barham et al., 2001). Several states have linking programs to connect these prospective and current farmers for purchase, lease, or jobs. Once a link is established, strategies for farm entry or exit can include the following:

- purchase/sale
- lease
- work-in arrangements
- sharemilking
- ag school

A farmer who is ready to retire must consider how to create a revenue stream that will serve as a pension or retirement income once he or she leaves farming. Sometimes, land rental or partial herd ownership can provide income. In other situations, farm assets may be sold. Such sales can take place directly or in installments. Accountants can help farmers understand tax implications for sales and gifts. Sometimes, farmers opt for piecemeal sales, in which they sell a percentage of the farm, or a certain number of cows or heifers, to the next generation a few at a time.

Outright sale/purchase of a farm is the quickest for the landowner and the hardest for the beginner. The landowner gets his money and gets to walk away from the farm completely. He also has to shoulder the risk of payment default and may have substantial capital-gains or income taxes to contend with.

The beginner has to come up with the cash to purchase the property. Few beginners can access the credit necessary both to buy property/livestock/equipment and to finance operating expenses (some financial advisors tell beginners to pick just one: own land or be a working farmer). High debt increases the risk of a bad year causing the collapse of the entire farm, and lenders are apt to constrain a leveraged beginner's management choices in order to protect the loan. Some programs are available to help with purchases, however, such as USDA's Farm Service Agency (FSA) Beginning Farmer farm ownership or farm operating loans. Several states have "aggie bond" programs that provide tax cuts for landowners selling to beginners.

Leasing/renting provides an alternative to buying to get control of land or livestock. The landowner retains ownership and has less risk for overall default, while finding fewer tax headaches. The beginner has a relatively smaller investment in starting up, and can sometimes rent the farm, livestock, and facilities in entirety. The lease describes the property to be used and the management responsibilities of each party, which can effectively remove the landowner from all management decisions, but only for a limited time. Financing from FSA may be available, as leases are farm operating expenses. Some states (like Nebraska) have tax credit programs to encourage renting to beginners.

Martin Kleinschmit and Wyatt Fraas of the Center for Rural Affairs contributed substantial portions of this chapter.

CHAPTER 9: ENTRY AND EXIT STRATEGIES

Work-in arrangements allow a controlled process for a beginner to buy into an existing farm while learning from the senior farmer. Beginners often start by working for the landowner and trade an increasing amount of their labor for ownership of farm assets. The landowner accesses the beginner's labor, and both learn about each other over an extended time.

Building equity in livestock is a key first step, perhaps through buying heifers, milking cows, or a portion of the calf crop. Concentrating ownership in income-generating assets allows the beginner's equity to grow as quickly as possible while limiting cash expenses, taxes, depreciation, or replacement costs.

In this process, the new farmer may eventually pay rent on land and facilities to the landowner and own a separate herd. In some cases, the two share labor, machinery, and buildings. Working together requires a very positive relationship between the beginning farmer and the existing farmer/owner. Many people in these relationships find that listing expectations in written form is beneficial (some examples are at www.cfra.org/issues/linking_strategies.htm and at www.farmprofitability.org/pracstrat.htm). Developing trust between the experienced farmer and the learning farmer is critical.

Sharemilking, which has long been used in New Zealand, is a type of work-in plan. This allows farmers who are exiting the dairy industry a way to recapture income from the facilities and the herd when there are no heirs who want to farm. In this arrangement, the farm owner shares a percentage of the milk check in exchange for the commitment of labor from a beginning dairy farmer. The beginners also usually take a portion of their pay as heifer calves, thus gradually increasing their equity in the farm (Stevenson et al., 1999).

This kind of cooperative work agreement allows for the increase of skills and knowledge along with a growing herd. Sharemilkers gain management skills, economic incentives, and can build equity over time without having to finance the purchase of land, livestock, machinery, and other assets simultaneously. Owners can benefit from secure strategies that reduce their workload, enable them to begin retirement gradually, or help them exit dairy farming (Tranel, 1996).

Well-designed, equitable agreements benefit both parties. According to dairy specialist Larry Tranel, "an ideal share lease agreement has two main objectives: 1) attaining the maximum economic efficiency in resource use, and 2) allocating the returns between owner and sharemilker based on their respective contributions (Tranel, 1996).

Most often, the sharemilker receives 20 to 30 percent of the farm's income for labor invested in the farm. If the time comes that the sharemilker owns most, or all, of the herd, the income from milking is usually shared equally.

At this point, the two farmers can decide if a formal partnership or corporation would benefit them. This can continue to transfer assets to the beginner and can be an estate-planning tool for the retiring farmer. Farmers often seek help in these arrangements from attorneys or accountants who specialize in estate planning. In addition, corporations sometimes prove easy to start and difficult to dissolve, so new and exiting farmers should seek legal guidance and proceed with caution.

Agricultural schools are another way to develop farming skills. For example, the Wisconsin School for Beginning Dairy Farmers at the University of Wisconsin teaches farm management skills and helps new farmers develop a support network. In Minnesota and other states, the Farm Beginnings business-planning course offers intensive instruction in goal setting, finances, and marketing alternatives. Many community and technical colleges also offer practical animal science, farm management, and dairy courses. Many schools have internship plans with nearby farms. In addition, lenders and prospective senior-farmer-partners often look favorably on technical farm training when interviewing a beginner.

CHAPTER 9: ENTRY AND EXIT STRATEGIES

USDA census data show that while dairy farm numbers are falling rapidly, the average age of dairy farmers is younger than that of farmers in general. It appears that many dairy farmers may be choosing to quit milking but continue farming. Beginners can address the reasons for “milking burnout” in designing their own dairy operation. For example, while individual farmers don’t control the milk price, cooperatives do negotiate more successfully for better prices or hauling fees. And adding value to milk through strategies like making farm-processed butter or cheese, or producing organic milk, can result in higher prices. Renovating older facilities rather than building new construction can save a lot of cash, along with saving a lot of physical wear and tear on the operator (see Chapter 8, *Milking Center Options*) (Vance Haugen, personal communication, 2004).

Success often depends on the level of passion and commitment on the part of any new farmer. Those who are determined to become dairy producers generally find the means to do so.

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Farm Link Programs:

FarmLink
Michigan Farm Bureau
(800) 292-2680
www.michiganfarmbureau.com

Farm Link
Wisconsin Farm Center
(800) 942-2474
www.datcp.state.wi.us

National Farm Transition Network
www.farmtransition.org

CHAPTER 9: ENTRY AND EXIT STRATEGIES

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The following people contributed information for this chapter. You will find complete contact information in the *Resources* section the end of this book.

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