Volume 2 Issue 1 Spring 1993

University of Minnesota DAIRY Initiatives NEWSLETTER

Contents

Industry Leaders Boost Minnesota Dairying

In an historic move, members of the year-old Dairy Leaders Roundtable recently agreed to work together in a public-private partnership to lead the revitalization of Minnesota's dairy industry.

The action represents commitment to an unprecedented level of cooperation among top leaders of producers' organizations, agribusiness, the University, and state government. It will enable the group to fund workshops and demonstration farms, encourage streamlining of government regulations, and develop other efforts aimed at strengthening the Minnesota dairy industry's competitiveness, profitability, and social vitality. Educational projects include continued publication of this newsletter.

Richard G. Anderson

Gov. Arne Carlson proclaims "Dairy Partnership Day."

The new level of cooperation was announced at a meeting of the roundtable in St. Paul Dec. 10. The event was attended by Gov. Arne Carlson, who proclaimed the day "Dairy Partnership Day" and pledged his support to reversing the decline in the state's dairy industry.

"The dairy industry has the potential for a bright and growing future based on its rich heritage, strong infrastructure, well-developed markets, ideal environment, and exceptional producers," Carlson noted in making the proclamation.

Roundtable coordinator Ed Frederick called the agreement to work together in a public-private partnership "a landmark event for the dairy industry in Minnesota."

"Groups that have been competitive, if not adversarial, in the past, have formally united in the common desire to renew the health of the state's dairy sector," he said. "Recognizing that now is not a time to compete but to pull together, diverse dairy interests have created a formidable force pledged to work together for the common good ."

Having a Tough Time Coping With Government Regulations?

Then here's good news for you!

Thanks in part to the Dairy Leaders Roundtable, it's now easier for Minnesota dairy farmers to find their way through the regulatory maze. At roundtable members' urging, the Minnesota Department of Agriculture recently hired an ombudsman to help members of the dairy sector and other farmers deal with industry regulators and to provide a forum for producers' suggestions on ways to make regulations more workable. If you're having trouble feeling your way through the regulatory maze, need help communicating with government agencies, or have a constructive and workable suggestion for streamlining the government requirements you find yourself up against, you can contact the ombudsman by calling the MDA at 612/297/2200.●

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Revitalizing the Dairy Industry

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Minnesota dairy industry has the potential for a bright and growing future based on its rich heritage, strong infrastructure, well-developed markets, ideal environment, and exceptional producers."

— Gov. Arne Carlson

The roundtable has set as its goal to boost Minnesota's share of the national market for dairy products to the 1990 level of 6.8 percent—a goal that will require increasing production to 11 billion pounds. Minnesota milk production dropped from 10.9 billion pounds in 1983 to 9.8 billion pounds in 1991, and the state's share of the national market declined during the same time from 7.8 to 6.6 percent.

Following is a listing of the organizations and persons that make up the Minnesota Dairy Leaders Roundtable:

AMPI, North Central Region (Mark Furth*, Mel Kunstleben)
AgriBank, FCB (Paul DeBriyn)
Bongards Creameries (Matt Quade)
Dairy Equipment Company (Paul Thompson)
Farmers Home Administration (Russ Bjorhus*)
First District Association (Ronald Leaf, M.H. Lenzmeier)
Glencoe Butter and Produce Association (Leonard Pavlish, Harold Templin)
Kraft General Foods (Allan Zolin)
Land O'Lakes, Inc. (Jack Gherty*, Murl Nord)
Mid-American Dairymen, Inc. Northern Division (Jim Lefebvre*, Eugene Quast)
Minnesota Agri-Growth Council (Tom Cochrane)
Minnesota Agri-Women (Norma Hanson)
Minnesota Association of Cooperatives (Allen Gerber)
Minnesota Bankers Enterprise Network (Robert W. Hanson)
Minnesota Dairy Promotion Council (Mike Kruger, Lyle Tjosaas)
Minnesota Department of Agriculture (Elton Redalen*)
Minnesota Department of Trade and Economic Development (E. Peter Gillette)
Minnesota DHIA (Tom Sammon, John Halvorson)
Minnesota Farm Bureau (Al Christopherson)
Minnesota Farmers Union (Dave Frederickson)
Minnesota Holstein Breeders Association (Douglas Dickmann, Jim Kraus)
Minnesota Milk Producers (Bill Dropik*)
Minnesota Purebred Dairy Cattle Association (Tim Nix)
Minnesota Rural Futures (Julie Larson)
Minnesota Veterinary Medical Association (Gary Neubauer*)
National Farmers Organization (Lee Groehler)
Northwest Feed Manufacturers (George M. Speers)
Plainview Milk Products Cooperative (Dennis Brewer, Paul McNallan)
Twenty-First Century Genetics (Tom Lyons)
University of Minnesota College of Agriculture (Dick Goodrich*)
University of Minnesota College of Veterinary Medicine (John Fetrow)
University of Minnesota, Minnesota Extension Service (Jerry Miller)
Wisconsin Dairies Cooperative (Delbert Mandelko, Donald Storhoff)
Women Involved In Farm Economics (Deborah Mills*)

Facilitator: Ed Frederick (University of Minnesota)

**steering committee members*

The Dairy Leaders Roundtable was created in 1991 at the urging of the University's Dairy Initiatives program. Members have spent the past year developing strategies for helping to turn around the steady decline in production and market share Minnesota dairying has suffered during the past decade.

Feeding 1992 Corn

Making the Most Out of a Problem Crop

For many Minnesota corn growers, 1992 was not a good year. Late spring and early fall frosts and the cool summer produced an immature, poorly drying crop with potential for low feed value and high storage losses.

If you're among those whose corn is less than best, you can reduce the effects on your milk production by adjusting for the lower feed quality of immature corn. Following are some suggestions by extension dairy specialist Jim Linn:

CORN SILAGE

In corn silage made from an immature crop, dry matter (DM) and digestibility tend to be lower than usual, crude protein (CP) and fiber content are generally higher, feeding value is probably the same or slightly decreased, and protein content and degradability are about average.

What to do:

1) Because energy value is calculated from fiber and fiber digestibility is lower in immature corn, your actual energy value will probably be about 5 percent less than the figure you get from a forage test report. Adjust for this difference by multiplying the total digestible nutrients (TDN) number on your forage test results by 95 percent (0.95) to get the TDN number you should use in balancing your rations.

2) Feed a good source of degradable protein such as soybean meal or urea plus a buffer (0.5 to 1 percent of the DM) in diets in which more than half of the forage DM comes from corn silage.

CORN GRAIN

In immature corn harvested as grain, test weight and energy value tend to be lower and fiber and soluble protein (largely in the form of nonprotein nitrogen, or NPN) tend to be higher than in mature corn. CP usually is higher in these circumstances, too, but for some reason this doesn't seem to be the case this year in Minnesota. The pH will probably be lower than normal in ensiled corn, but the corn should preserve well as long as you exclude air.

What to do:

1) Estimate energy value of immature corn for ration-balancing purposes by subtracting 1 TDN unit from the normal 88 TDN (dry matter basis) for every 1 pound your corn test weight is below 54 pounds per bushel. For example, if your corn tests 47 pounds bushel weight, your estimated TDN value would be 88 - 7 = 81. *(Note: This method only works down to about 40 pounds per bushel. If your corn tests below 40 pounds bushel weight, use the normal estimated energy value rather than this conversion.)*

2) You can feed more corn to make up for the decreased energy content in low test-weight corn. However, there are limits. If you do increase the amount of corn you feed, be sure your lactating cows get enough fiber and that nonfiber carbohydrates (NFC or NSC) do not exceed 42 percent of DM.

3) High-moisture corn produces rapid rumen fermentation and protein degradability. To compensate for this, limit urea, soybean meal, and other highly degradable protein supplements.

4) High-moisture corn may become very fine and floury in texture, affecting rumen fermentation. Feeding this kind of corn in your cow's diet may result in a decrease in milk fat test. To counteract this, substitute some dry corn to the diet, and make sure your cows are getting adequate fiber.

What About Mold?

Many producers have found that this year's poor drying conditions have produced moldy corn. Fortunately, most of the mold that is showing up is gray or black, rather than the reds, white-pinks, or blue-greens that indicate the presence of more serious mycotoxin molds.

That doesn't mean you're off the hook, however. While the gray-black molds may not cause health problems, they do reduce feed quality. Moldy feeds are lower in nutrient content and generally result in decreased DM intakes, causing milk production to decrease. In severe cases, they may also cause diarrhea.

Unfortunately, there is no additive or cure for moldy feeds. Prevention is the best answer. Mold is an indication that ensiled feed is being exposed to air. Silos that are tight should only have slight mold problems around doors and on the feeding surface. If you have moldy feed in your silo, clean off and throw away the bad stuff and then try to increase the feeding amounts to stay ahead of the mold.

Watch Out for Mycotoxins!

Early fall tests throughout Minnesota suggest that mycotoxin molds haven't been a major problem. But if conditions are right, these harmful molds could cause problems come spring.

You can minimize the damage from mycotoxins by keeping an eye out for the first indication of trouble. The most obvious sign is the appearance of red, white, pink, or blue-green molds on your corn. Not all mycotoxin shows up in this way, however, so if you see other indications that your cows might be suffering from mycotoxin poisoning—off feed, low milk production, reproduction problems, or general poor health—you'll want to screen your corn. Your specialized dairy agent or county extension agent can advise you on how to determine whether you have mycotoxin contamination and on what to do if you do.

For more information on molds, ask your county extension agent for a copy of Minnesota Extension Service publication AG-FO-3538, Molds and Mycotoxins in Feeds. ●

Whether your corn crop is in great or lousy shape, the key to getting the most feed value from it is to test it and balance your rations. Unless you know what you have, you can't tell whether your cows are getting what they need. And unless they get what they need, they're not going to give you what you need—enough milk to make your efforts worthwhile.

Maintaining the Edge

Can Minnesota Dairying Compete in Today's Market?

Our ancestors settled Minnesota farm lands with dairy cows for good reasons: productive land for growing forage and grain; a suitable climate; plentiful water; and people committed to working hard. The formula worked for them, and through the years, the state became widely known for its quality dairy products—cheese, dry milk, ice cream, and butter.

However, the past half century has seen great changes in the dairy landscape. The number of dairy farms plummeted from 151,000 in 1945 to fewer than 15,000 today. The number of dairy cows in the state dropped during the same period from more than 1.6 million to 673,000. Meanwhile, highly competitive dairy farms have sprung up along the Pacific Coast and in the Southern Plains region of the United States. The result: Minnesota's share of U.S. milk production dropped 20 percent between 1980 and 1991.

With changes so dramatic, some have questioned whether Minnesota will be a good place to produce milk in the future. Will other states continue to gain market share at our expense?

The answer to that one *depends on you.*

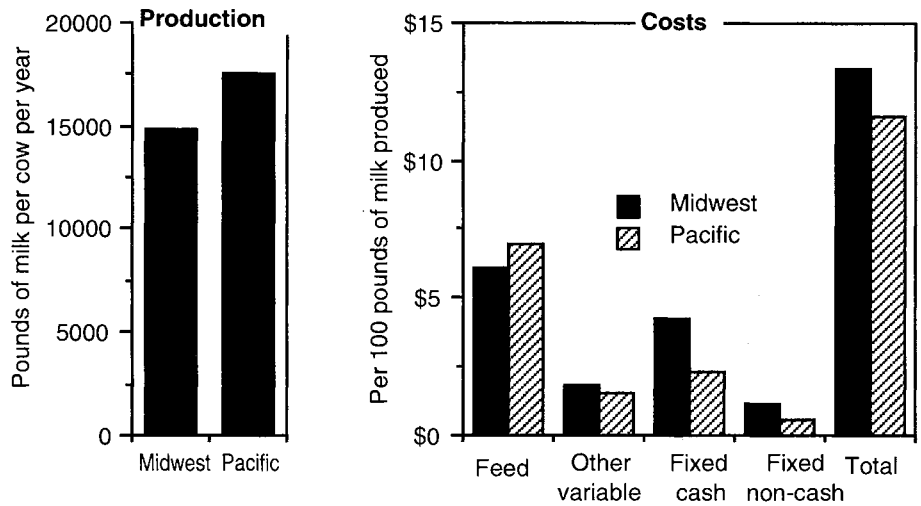
Minnesota *can* remain competitive—but only if individual producers dedicate themselves to making their own operations competitive. The long-run winners will be those dairies that can keep a satisfying level of profit in the long run. And that means keeping the cost of milk production down.

Keeping production costs down is a two-part deal. First, it means capitalizing on the inherent competitive advantages our forefathers and foremothers saw when they first brought dairying to Minnesota. Second, it means minimizing the impact of areas in which we are at a competitive disadvantage relative to producers elsewhere.

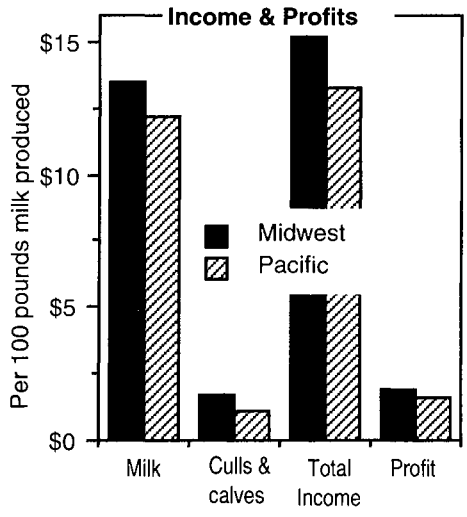
The Midwest's stiffest competition is from the Pacific region (California, Washington, and Oregon). USDA statistics, as summarized in the graphs below, show how the two regions compare in the structure of their costs and returns.

The bad news is that these estimates show that average Midwest milk production costs are $1.27 per hundredweight higher than those in the Pacific region. The good news is that the regional differences in the various categories reveal a wealth of opportunity for reducing this disadvantage—for sharpening our competitive edge.

Midwestern dairy producers have the advan-



source: USDA Economic Indicators of the Farm Sector, 1991



tage in milk price and feed cost. Major competitive disadvantages are in the areas of productivity and investment costs. The estimates presented in the graphs represent averages, and actual costs, of course, vary greatly from farm to farm. However, the figures do provide a guide for uncovering the opportunities to improve the competitiveness of your operation. Overall, they define four basic things Minnesota producers can do to increase our ability to compete:

1. Increase per-cow production. Production per cow is close to 3,000 pounds higher in the Pacific region. Because the cost of producing milk decreases by $0.30 to $0.40 per hundredweight for each 1,000 pound increase in average annual production per cow, we can improve our competitive advantage by upping this number.

2. Exploit feed-cost advantage. Feed typically accounts for 50 percent of the cost of producing milk in the Midwest, and an even greater percentage in the Pacific. We can capitalize on this advantage in two main ways. The first is by improving forage quality so we get more milk out of what we feed. The second is to look critically at whether there are even cheaper, better ways to feed our cows. More and more Midwestern producers are finding that they can purchase better quality feed for less money than it takes to raise it when all costs—including land, machinery, and time—are taken into account.

3. Control capital investment and manage debt. More expensive stall barns, smaller herd sizes, and greater diversification with more money invested in land and field machinery are among the main reasons that investment-related costs are greater in the Midwest—typically $6,000 to $8,000 per cow compared to $3,000 to $5,000 in the Pacific region. Ways to reduce this disadvantage include increasing productivity, optimizing herd size, finding lower cost options for facilities, and purchasing rather than raising some of the feed.

4. Increase return to labor and management. The return to labor and management is the monetary reward you and any other workers (including hired labor) receive for what you do, including the money you use to cover payments on the principal balance of loans. The Midwest has a small advantage here. However, this is wiped out by more milk per cow and more cows per worker in the Pacific region—numbers that translate to more milk per hour of labor, more money per cow, and more money per family. Your goal should be to produce at least 300 to 400 pounds of milk per hour of labor. Larger herds, higher production, group housing, and parlor milking all contribute to the labor efficiencies the Pacific region enjoys, and may provide a clue as to how we in Minnesota can improve our competitiveness in this area.

The chart below can help you find your current position on the competitiveness scale and plan for increasing your own farm's competitive edge.

category	*"competitive edge" goal:*	*your goal:*
per-cow production	**19,000 lb/yr**	
milk sold per family	**900,000 lb/yr**	
feed cost/cwt*	**< $5.50**	
dairy investment/cow	**< $5,000**	
loan interest	**< 10% of expenses**	
milk produced per labor hour	**> 350 lb**	

**including young stock*

Profitability

Dairying Can Pay ... If You Control Your Costs

Can a Minnesota dairy producer make a profit in today's economy?

The decline in number of Minnesota dairy farms in recent years suggests that some have decided that the answer for them is "No." Yet at the same time there are plenty of producers who are alive and well and making a satisfying profit.

What's the make-it-or-break-it difference? According to extension agricultural economist Earl Fuller, it's a matter of controlling how money is spent.

Fuller uses the table below to demonstrate the difference that cost control can make. The table, adapted from the 1991 Southeast Minnesota Farm Business Management Association's annual report, shows some of the differences between dairy farms with the most (high) and least (low) profitable records measured as return to overhead to the dairy enterprise.

ITEM	LOW PROFIT FARMS		HIGH PROFIT FARMS	
	quantity	*value*	*quantity*	*value*
milk sold (lb)	14,650.59		18,261.62	
total return		$1,478.05		$2,120.50
corn fed (bu)	124.33		108.66	
protein, vits, minerals (lb)	1,272.81	$ 201.64	2,202.30	$ 288.72
breeding		31.68		29.18
veterinarian & medicine		76.79		58.85
supplies		132.66		103.58
marketing		66.97		53.31
other direct costs		822.42		650.40
TOTAL DIRECT COSTS		1,332.16		1,184.04
RETURN TO OVERHEAD		145.89		936.46
average number of cows	52		102	
percent of barn capacity used	90		113	
lb milk per lb concentrate	1.8		2.1	
average milk price ($/cwt)	11.43		12.30	

Notice that operators of the seven low farms spent more money in most of the categories and fed more bushels of corn, yet they produced less milk—and the milk they produced sold for less.

The conclusion? It's not how much you spend, but how, where, and on what you spend it.

Can you control costs so they look like the ones in the top producer category? Yes—by controlling what and how economically you feed and by strategically trimming expenses to control

your inputs without economically damaging milk production.

It's true that sitting and thinking things through may seem like time wasted when there are gutters to be cleaned. But, says Fuller, trying to cut costs without knowing how they relate to making milk is about as smart as driving to town with your eyes shut. You may have some general idea of where the road lies, but unless you take time to look at what you're doing, chances are you'll end up in one ditch or another.

Fuller recommends that you use the following three-step process to control your costs:

Step 1. SET UP A COST STRUCTURE THAT SEPARATES COSTS THAT VARY WITH OUTPUT FROM THOSE THAT DON'T. Unlike many accountants and even some economists, Fuller recommends you forget about trying to break everything from feed to stanchions down into costs per pound of milk produced. Rather, he suggests, the best way to get a handle on where it pays to cut back and where it pays to spend more is to organize your accounts so costs are divided into four main categories:

- **General Business Overhead.** These are costs that exist just because you are in business—what many refer to as "fixed" costs of being in farming. They may vary with time but are not affected by how much milk you produce. Some examples of items in this category are real estate taxes, interest on most loans, magazines, and certain building and machinery repairs.

- **Dairy Overhead.** These are costs that exist only because you are in the dairy business. Like the first category, these are "fixed," but only so long as you dairy. Examples are the costs of buying and repairing dairy equipment.

- **Costs Directly Tied to Enterprise Size.** These are costs that increase proportionately with the number of cows or acres you have. Some examples are feed, seed, fertilizer, vet, DHIA, dairy expense, corn expense, and calf feed.

• Costs Varying with Output But Not Proportionately. These are costs for which you get a volume discount. Some examples are fertilizer, seed, and milk hauling.

Step 2. FILL IN THE BLANKS.
Once you have categorized your expenses to fit the structure shown above, set up your accounts and summarize expense data accordingly.

Step 3. ANALYZE AND COMPARE YOUR PERFORMANCE.
Now it's time to go back to the table at the beginning of this article. Where do your costs look more like the losers than the winners? That's a clue to where your money leaks are.

Look at the big-ticket items first to see if you can pare costs there. For costs in the first two categories of the cost structure you set up in Step 1, straight penny pinching will do. For those that vary directly or indirectly with output, however, don't cut back until you figure out how the change will affect production.

If a proposed change would decrease output more than it would save money—well, to put it bluntly, you'd get the same effect with less work if you just threw your money straight into the wastebasket. But if the money you would save by cutting a particular expense is greater than or equal to the value of the lost production, go for it.

In the same way, if you can find areas where you can spend additional money and more than make up for the added costs in increased production, that's worthwhile. However, if a change would take more money out of the till than it would return in added output, forget it. It's that simple.

Best Bets for Cutting Costs

If you want to increase your profitability, you'll need to pay close attention to how you control what you spend. Extension economist Earl Fuller offers the following tips for becoming cost conscious:

• WORK SMART, NOT JUST HARD. Look at how you're doing things with a critical eye. Are there ways you could streamline what you're doing to free up more time for other, more productive things? Are there purchases you can make that will more than pay for themselves in increased milk production? "It's how we've always done it" is not a legitimate reason for doing anything on a cost-conscious farm.

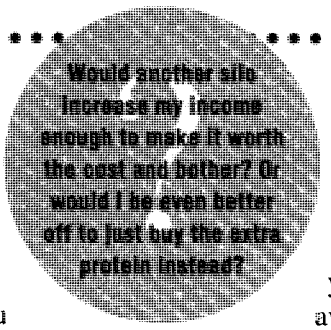
• BUY RIGHT. "Many farmers let people sell them things, rather than buying them," Fuller says. The difference? When you're "sold," you rely too heavily on the advice of someone whose primary goal is to get your money into his pocket. When you buy, you talk with others, look at how the item will fit into your operation, brainstorm and compare other, less expensive ways you might achieve the same end.

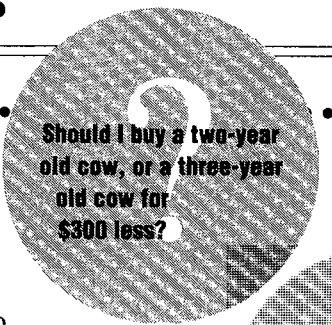
• KEEP TRACK OF WHAT YOU'RE DOING. If you don't know what you're spending now in a particular expense category, you won't know a good—or bad—deal when it comes along. But if you know, for instance, that your veterinary bill is a real drain on your wallet, you can concentrate on that area as a place to search for economically cuttable corners—in this example, perhaps by adding a preventive health care program.

• FEED RIGHT. One of the main ways in which money is poorly spent in Minnesota dairying is in inappropriate feed decisions. Time spent thinking ahead about what to grow, what to buy, how to store, and how to balance rations is not time wasted! It's time invested in making sure that you'll get more out of your cows than what you put in. And that's your goal, right?

• REMEMBER THAT THE CHEAP WAY IS NOT ALWAYS THE BEST WAY. Fuller points out that the least expensive way to feed cows is not to feed them at all—but that's obviously not the best approach, given your overall goal of making a living producing milk. The trick is to look at the added cost of a spending option and decide whether it will more than pay for itself—and also whether there might be an even better option. ●

Juggling the Options





Some farm management questions like these contain so many variables that they can be pretty close to impossible to answer accurately without organized on-paper analysis. Fortunately, if you live in Minnesota you have ready access to computerized assistance as you weigh the consequences of various farm management options on your profitability.

Work sheets, publications, and many computer programs covering everything from deciding which cow to buy to finding the most cost-effective way to pass along your farm to your heirs are available to help you make the best possible decisions in your circumstances and with your goals. The publications and many programs are available through your county extension office. For more information, contact your county agricultural extension agent or your specialized dairy agent. ●

A Breath of Fresh Air

For a healthier, more productive herd, make barn ventilation a year-round priority

How's the weather been lately inside your barn?

If the temperature, moisture, and odor levels have been less than ideal, it's time to start thinking about ways to improve your ventilation.

"When many people think of barn ventilation, they have the heat of summer in mind. But it's important to keep air moving during the other three seasons, too," says extension agricultural engineer John Chastain. "Proper winter ventilation is needed to remove moisture, manure gases, and excess animal heat year-round. The result will be a healthier and more productive environment for the cows."

If your barn conditions are less than ideal, now is the time to make plans to improve things. That way, you can make the changes when the weather permits and be all set for next year.

In this article, we will describe inexpensive ventilation methods using a 40-cow tie-stall barn as an example. If you have a tie-stall barn, you can easily adapt the ideas presented here to your own circumstances.

It Takes Three

A proper ventilation system for Minnesota dairy barns has three key components: **fans, inlets,** and **controls.** Even though fans are probably the first thing you think of when you think ventilation, they are only one part of the deal. In order to work properly, fans must be combined with properly sized and located fresh air inlets. They also should be thermostatically controlled so that they move the proper amount of air for the given conditions.

FANS AND THERMOSTATS

To ventilate your barn properly, your first step is to install the right size fans in the right places with the right controls.

Sizing Your Fans. Select fans based on the number of cows in the barn. Your goal is to deliver 50 cubic feet of air per minute per cow (cfm/cow) in the dead of winter, 170 cfm/cow in milder weather.

Table 1 shows how we determined fan capacity for a 40-cow barn. You can perform similar calculations to figure what size fans you need for your barn. Try to break the total capacity down into several fans so you can adjust the ventilation with the weather. The total capacity should add up to your calculated needs. If you have to be off a bit, it's better to slightly over-ventilate than to under-ventilate.

Weather Condition	*Ventilation Rate per Cow*	*Ventilation Rate for 40 Cows*	*Required Fan Capacities for 40 Cows*
Winter	**50 cfm/cow**	**2,000 cfm (40 x 50)**	**1 fan, 2,000 cfm**
Mild	**170 cfm/cow**	**6,800 cfm (40 x 170)**	**Add 2 fans rated at 2,400 cfm or 1 fan rated at 4,800**

TABLE 1: Winter and Mild Weather Ventilation Fans for a 40-Cow Barn

EXAMPLE:
You have a 40-cow tie stall barn with two direct-drive fans mounted in the east wall. One fan has a blade diameter of 18 inches, a 1/3 hp motor, and a speed of 1,725 rpm. The other measures 14 inches, has a 1/8 hp motor, and also operates at

Working With What You Have

Before you start adding fans, consider what you already have. If your fans have been around awhile, your best bet is to replace them. If they're in good shape, however, you can keep them if you can figure out their output.

To do so, first ignore any rating given on the fan itself. Chances are there isn't one, but even if there is, it's probably a "free air" rating, which is not the number you need to properly size fans for your barn.

Instead, ask the fan dealer or manufacturer to give you an airflow rating "at 1/8 inch of static pressure." Be sure you have the following information handy:

blade diameter (inches):
motor size* (HP):
motor speed* (RPM):
size of sheaves (if belt driven):
description of shutters/louvers:

*usually listed on the nameplate. If not, replace the fan with a new one.

Once you find out your current fan output, compare it with what you need (see article) and add fans as necessary. ●

Buy It Right

When you shop for fans, a bit of know-how can save you years of headaches. Chastain offers the following hints:

GO FOR DIRECT DRIVE. Fans come in two types, direct drive (fan blades are mounted to the motor shaft) and belt driven. Belt-driven fans are not recommended for livestock barns because they need more maintenance and the corrosive environment can reduce belt life.

LEAVE THE LOUVERS. Louvers or shutters are not recommended for the continuously running winter fan. If you use them on your other fans, be sure to select fans based on airflow ratings with the shutter or louver installed.

SIZE IT UP. Select fans to give the need airflow at 1/8 inch of static pressure. Do not base your choice on motor size or blade diameter. Always look for the AMCA (Air Moving and Conditioning Association) certification or other reliable testing to assure valid fan ratings.

SIMPLE PAYS. Don't mess with multispeed models. Single-speed fans may seem less fancy, but they tend to be more reliable in providing the ventilation you need.

For more advice on selecting a fan, ask your county extension agent for a copy of Choosing Fans for a Livestock Ventilation System (AG-FS-0956). ●

1,725 rpm. Both fans have shutters. Based on information provided by the manufactuers, the larger fan is rated at 3,400 cfm and the smaller is 1,800 cfm.

Neither of these fans is suitable for the winter ventilation rate of 2,000 cfm (from Table 1). Therefore, the best option is to buy a new fan that will provide the proper rate. Mount the new fan in the east or south wall. Use the two existing fans to provide the mild weather rate. All three fans running together will provide 7,200 cfm, which is slightly more than the required mild weather rate, but it's better to over-ventilate than under-ventilate. Also, by using three fans, you can increase the ventilation rate more gradually.

In this example, the fans would be thermostatically controlled as follows:
2,000 cfm fan—runs continuously
1,800 cfm fan—Turns on at 40°
3,400 cfm fan—Turns on at 45°

Fan Placement. Ideally, all fans should be placed on the east sidewall of the barn, equally spaced, and 10 feet from doors or windows. If you're working with an existing barn you may need to bend the rules a bit, but at the very least make sure the continuously running winter fan is on the east or south wall. Otherwise strong winter winds, which usually blow from the northwest, can overpower the fan.

Thermostats. To keep ventilation where it should be in all weather, control all fans except the continuously running winter fan with thermostats set at 40° to 45°. (For older barns, use the 40° setting to help control condensation.) If you have an older, poorly insulated barn, you may want to install a separate safety thermostat for the winter fan so it will turn off if the barn temperature falls below 34°.

INLETS

All the fans in the world will do you little good if you don't have inlets for fresh air to enter the barn. This doesn't mean the drafty spots around the windows, either. Fresh-air inlets must be evenly distributed and sized according to the amount of airflow you need.

If inlets were part of the plan when your barn was built, you're in luck. If not, you can add them. But before you start sawing, start by figuring out where and how big to make your holes.

Caution: Barns that have large cracks or leaks will not benefit as much from the addition of air inlets as a relatively tight barn. Correct leaks in the barn first to make sure you get the air mixing and distribution you need.

Sizing Inlets. You will need one square foot of inlet for every 800 cfm fan capacity at the mild weather ventilation rate. In the 40-cow barn example, the total inlet area needed is 6,800/800 or 8.5 square feet.

Your calculated total inlet size should give you a winter ventilation rate velocity of 200 feet per minute (fpm) or more. Check this by dividing your winter ventilation rate by the inlet area. For the 40-cow barn example, the calculation is 2,000/8.5 or 235 fpm.

Continued on page 10

Adding Inlets

The best method for adding inlets to an existing two-story barn depends on your setup. If you have a ceiling beneath the hay mow floor, you'll need to use a box inlet system. If not, you can use a bored hole system.

BORED HOLE INLET SYSTEM. In the bored hole system (Figure 1), form inlets by drilling a row of evenly distributed holes along each sidewall with a hole saw and drill. Install a header board in the loft to keep loose hay from plugging the holes.

To calculate the number of holes you need, divide the total inlet area needed by the area per hole (0.02 square feet for a two-inch hole, 0.05 square feet for a three-inch hole). In our 40-cow barn example, the number of three-inch holes needed is 8.5/0.05, or 170.

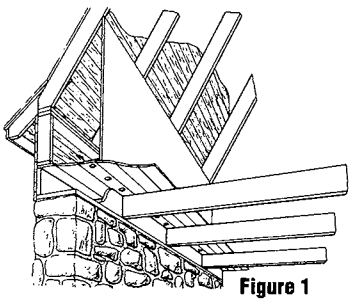


Figure 1

BOX INLET SYSTEM. You can buy a commercial box inlet system. However, if you have more time than money, it's cheaper and not too hard to build your own.

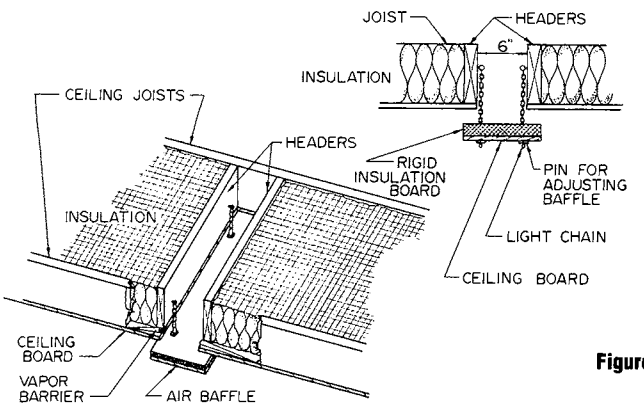


Figure 2

Construction of a box inlet system is shown above (Figure 2). Cut the inlet hole 22.5 inches by 6 inches (assuming joists are spaced 24 inches on-center). Add header boards to prevent hay from plugging the inlet.

Cut the baffle board 14 inches by 32 inches and insulate the "cold side" with 1/2-inch foam board. Hang it from the box inlet with an eye hook eye screws, and a chain so that there is a 1-1/2 inch gap between the baffle and the ceiling.

A box inlet of these dimensions will provide an opening of 0.6 square feet. To calculate the number of box inlets you need, divide the total inlet area by 0.6. For the 40-cow barn example, for instance, we would need 8.5/0.6, or 14 box inlets.

Space box inlets evenly along each sidewall over the feed alley. The long side of the inlet should run the same direction as the sidewall. ●

Ventilation

Continued from page 9

Locating Inlets. Locate the inlets in your barn so that air is drawn from the attic space or hay mow. Two rows of inlets, one along each sidewall, are sufficient if your barn is less than 38 feet wide. If it is wider than that you'll need a row of inlets down the center, too. For more information on ventilating wide barns, ask your county extension agent for a copy of the Midwest Plan Service publication *Mechanical Ventilating Systems for Livestock Housing (MWPS-32).*

Starting from Scratch?

If you're building a new barn, your best option is to install a "multi-setting inlet system," which consists of thermostat- or gravity-controlled inlets that adjust the total inlet area each time the airflow changes. You can learn more about this type of system in the following Midwest Plan Service (MWPS) publications, available from your county extension office or the University of Minnesota Department of Agricultural Engineering, 1390 Eckles Avenue, St. Paul, MN 55108, Attn: Wendy (612/625-9733):

Mechanical Ventilated Systems for Livestock Housing (MWPS-32) Cost: $6.39 (includes tax)

Dairy Housing and Equipment Handbook (MWPS-7) Cost: $8.46 (includes tax)●

Condensation Problems?

Proper ventilation will help prevent condensation in your barn. However, good insulation is also part of the picture.

For a stall barn, insulate the ceiling to R-25, the equivalent of about 8 inches of fiberglass insulation. Insulate the wall to R-14 by combining 3.5 inches of fiberglass with internal sheathing. Install a 6-mil polyethylene vapor retarder below the inside surface (warm side) of the wall.

If you have a barn with an uninsulated mow floor, be sure to keep at least two feet of hay in the mow throughout the winter. Condensation will often form on solid block on masonry walls during extremely cold weather. The only way to prevent this is to add insulation to the block walls. Some dairy producers in northern Minnesota have added a layer of rigid insulation to the outside of their stall barn walls with some success. ●

Feed Additives

What and When?

When it comes to improving your cow's rations with feed additives, you have plenty of choices. Many of the compounds sold for supplementing feed can help boost your production. But it's important to remember that additives cost money, too—usually in the range of 2¢ to 40¢ per cow per day. So before you decide to add them to your cow's ration, it makes sense to figure out whether under your circumstances the benefits will outweigh the cost.

The first step is to know what benefits the various additives can be expected to provide. The following table, prepared by Jerry Olson, Extension Veterinary Nutritionist, lists common additives, what they do, and when it makes most sense to use them:

Additive	*Use/Benefits*	*Conditions**
anionic salts	**prevent milk fever; increase milk; improve reproduction**	**5**
fungal fermentation extracts	**increase milk; reduce digestive upsets**	**1,2,7,8**
buffers (sodium bicarbonate, sodium sequicarbonate, magnesium oxide)	**increase milk; increase milk fat; increase DMI**	**1,2,3,7,8**
fats	**increase milk; increase milk fat; improve reproduction**	**1**
niacin	**increase milk; reduce ketosis; increase milk protein**	**1,6**
probiotics	**reduce digestive upsets; increase milk**	**1,2,7**
yeast culture	**increase milk; reduce digestive upsets**	**1,2,7,8**
zinc methionine	**increase milk; reduce somatic cells**	**4**

**Conditions under which the additive is most likely to help:*

1 = early lactation, high production
2 = high concentrate, low fiber diets
3 = high corn silage, wet diets
4 = high somatic cell count herds
5 = dry cows, two weeks prepartum, on high calcium diets
6 = cows with good to excess body condition
7 = cows with digestive upsets and "off-feeds"
8 = heat stress

Just because a cow fits a given category doesn't mean she automatically ought to receive the supplement. You need to decide whether the payoff—in increased milk production, increased fat or protein content of milk, increased dry matter intake, or improved reproductive performance—is worth the cost of the additive.

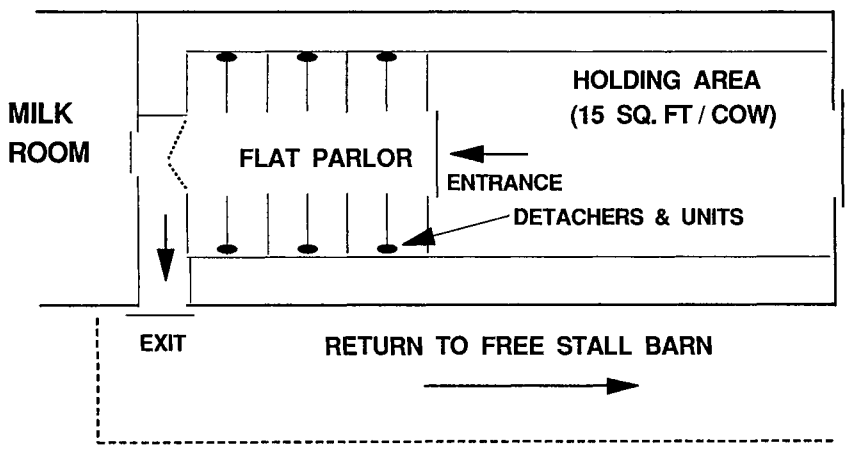
To do this, first of all include your nutritionist or veterinarian in the decision as to whether it makes sense to even try the additive. Then monitor the benefits to make sure they exceed the added cost. Economists recommend that feed supplements pay back double what they cost you in order to be considered worthwhile.

Flat Parlors

A Transition Strategy

It's the dairy producer's Catch-22: You've done the calculations, and the numbers say a bigger herd is your key to keeping your head above water in today's increasingly competitive market. The problem is, you can't fit more cows in your tie-stall barn—let alone get them milked twice a day. Yet until you see some of the extra income that more cows would bring, there's no way you can afford the money it would cost to put in the milking parlor and freestall system that would make more cows manageable.

FIGURE 1: Double-6 flat parlor and holding area.



Fortunately, this Catch-22 has a way around it. It's called a flat-parlor milking system, and it's an affordable stepping-stone for those who would like to make the transition to a parlor system, but don't have the capital to finance the switch all at once.

The plan goes like this: you put in freestall housing now, but instead of sinking big bucks into a parlor at the same time, you remodel your tie-stall barn into a holding area and a ground-level parlor milking facility. The resulting system, though not as efficient as a true parlor, allows you to handle more cows than you could in your tie-stall barn and can tide you over until the added income they provide allows you to make the full transition.

Extension agricultural engineer John Chastain recommends the following procedure for making the switch:

1. Add a freestall barn. The barn you put in should be the one you plan to use once your permanent parlor is in place, so think carefully about the design, size and site to make sure it will meet your long-term needs. Ask your county extension educator for a copy of *Freestall Design and Management (AEU-1)* for help in making the transition to a freestall barn.

2. Create your holding area. One of the many layouts Chastain recommends for converting your tie-stall barn into a holding area and flat parlor is shown in Figure 1. Allow 15 square feet in the holding area per cow; if you plan to milk 100 cows, a holding area of 750 square feet will allow you to bring half the herd over from the freestall barn at a time. The crowd gate will help you keep the cows moving through at milking time, but you can leave it out if you don't want to spend the $2,000 or so it will cost you.

3. Convert part of the barn to a flat parlor. Chastain recommends you use the system shown in Figure 1, modifying the number of milking units depending on how many workers you have. The "double-6" configuration shown has three milking units on each side and uses automatic detachers to reduce the amount of bending and time spent in switching from one cow to the next. Dual lever stanchions let you lock and release

three cows on each side at a time, increasing the rate at which you can move cows through.

To use a double-6 flat parlor, you bring in cows six at a time (three on each side of the barn) and hook them up. The next six can be brought in and washed while the first set are being milked—that way they'll be ready to go when the first set is done. With this system, you can milk 35 to 40 cows per hour if you are milking alone.

The maximum number of units that one person can easily handle is eight. A double-4 flat parlor could provide a milking rate of about 50 cows per hour.

4. Add heating and modify ventilation as needed. Because cows will not be housed in the facility, your flat parlor/holding area combination will need some climate-control changes for animal and operator comfort.

First, you'll need a heat source for the flat parlor. The size of the heater you install depends on the size of the room and how well it is insulated. According to Chastain, in most cases you will be in good shape if you provide 7 Btu/hour of heating capacity (2.05 watts, if you're using electric heat) for each cubic foot of room volume.

Ventilation needs are also different than they were for your tie-stall system. Table 1 shows the mechanical ventilation recommended for a flat parlor and holding area as shown in Figure 1.

Season	*Ventilation Rate (CFM/cow*)*	*Fresh Air Inlet (Sq. feet/cow*)*	*Best Ventilation System Type***
Winter	**75**	**0.09**	**negative pressure**
Summer	**250**	**0.31**	**positive pressure**

*Multiply the per-cow figures by the capacity of your holding area to get the total needed.

**A negative pressure system is an exhaust ventilation system. A positive ventilation system forces the air into the building.

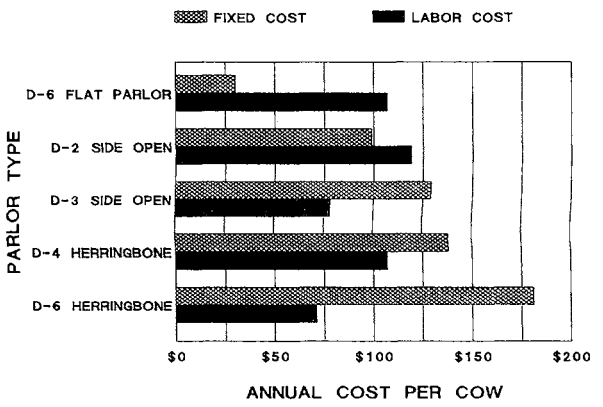
Dollars and Sense

Does it make good economic sense to put money into a flat barn system for the short run when what you really want eventually is a conventional parlor?

Yes, says agricultural engineer John Chastain. By buying into an intermediate step, he argues, you can pace your investments and so have more money available for investments such as a TMR wagon that increase profitability. Capital may also be needed for an improved waste management system. Besides, Chastain points out, with careful planning much of the equipment you buy to convert to a flat parlor can be transferred to the parlor system when you go for the final conversion.

Let's say you want to build your milking herd to 100 cows (85 milking at any one time). The conversion of your existing barn to a double-6 flat parlor and holding area would cost $15,000 or so (excluding bulk tank), perhaps as little as $10,000 if you're able to use some of the milking equipment you have now. For most people that's a reasonable investment to make to build up the milking herd, especially when you compare it with the $80,000 to $120,000 required for a new parlor. When you break the numbers out into annual cost per cow, the difference is clear: fig. 2.

FIGURE 2: Comparison of annual parlor costs for 100 cows



So why not just settle for the flat parlor, rather than converting to a conventional parlor system? The labor costs shown in figure 2 provide the answer to that one. Not only does a conventional parlor make milking less health-risking by reducing your deep-knee bends, it also reduces milking time—time that you can spend milking more cows or paying increased attention to other profit-making aspects of your operation. ●

How Big?

If you decide to convert your barn into a flat parlor, you'll need to decide how many milking stalls to put in. Common sizes are a double-6, double-8, and double-12.

One factor in your decision is the size of your barn. Be sure to allow 15 square feet of space in the holding area for each cow. After that, the number of stalls depends on how much you want to spend for milking equipment and on how much labor will be available for milking. A single milker can handle a double-6 or a double-8 with automatic detachers. A double-12 flat parlor can provide throughput rates of about 80 cows per hour if two people are milking cows. ●

Beyond the Bottom Line:

Business Principles Can Improve Your Family Farm

by Sharon Danes

Farming today means more than running a family farm. It also means running a business. As in any business, success is measured not only by the bottom line, but also in the satisfaction felt by the people people who work for it.

An article in the *Financial Post* describing a Canadian study of the 100 best companies to work for provides some valuable insights into what makes a company successful. Following are the main points from the article and how you can apply them to your family farm business.

1. There is no single "right" organizational structure. More important are the attitudes toward the structure.

On the Farm: Your farm might be a sole proprietorship, a partnership, or a corporation. Any of these can work well for running a farm business. But does everyone involved understand and accept the structure? Does it make sense under your circumstances?

2. In successful companies, there is a "team spirit"—a sense among employees at all levels that they are working together to achieve common goals.

On the Farm: Do the members of your farm team share common goals? Do you have clear targets and dreams for the farm? Are they similar for all members?

3. Workers in successful companies feel like the company has sincere regard for them as individuals.

On the Farm: Do all members of your farm business feel they have a role in the business?

4. Successful companies have excellent communications—open and free dialogue. Especially important are regular meetings to keep everyone up to date on company policy and decision-making.

On the Farm: How good do you communicate on your farm? Does everyone feel they have a part in making decisions?

"All in Favor . . ."

This last point brings up a very important suggestion for family farms—the farm business meeting. Regular farm business meetings are a valuable tool for keeping your farm team on task. They foster communication. They also help keep family members updated on the farm's goals and give everyone a chance to participate in making decisions.

When you hold farm business meetings, you remind everyone—yourself included—that the farm really is a business. You also increase the odds that decisions you make will be sound from a business perspective, not just based on emotion.

Four Good Reasons to Hold Farm Business Meetings:

#1. Business meetings help members separate family relationships and personalities from the business decisions that must be made. Family members' emotions can complicate farm business decisions. That doesn't mean that emotions shouldn't play a role. But by making decisions in a business-like environment, you increase the odds that decisions will be sound from a business angle.

#2. Business meetings help everyone to feel like they are part of a team. Families find they get more help with "leg-work" if all members, including spouses and children, are involved in making decisions.

#3. Business meetings provide a built-in forum for planning. By deciding to meet on a regular basis, you have established a setting not only for solving the problems of the day, but also for planning for the future and anticipating changes, too.

#4. Business meetings provide focus. By setting regular meeting times and places, you minimize distractions and increase the chances that members will come mentally prepared to look at the enterprise and where it is going. ●

How Often?

You've decided the family farm meeting makes sense to you. Next question: How often do we hold these things, anyway?

As it turns out, the frequency doesn't matter nearly as much as the regularity. Depending on how many people are involved and how complex your operation is, you may want to meet weekly, monthly, seasonally, or yearly. More important is that you meet on a regular, predictable basis. That way everyone can plan ahead and be there. ●

Do We HAFTA?

When you toss out the idea of business meetings, you may not get a whole lot of support at the outset. People associate meetings with businesses or clubs, not with families. Family members may not want to get too formal. You might hear, "We're just a family running a farm. Why do we need business meetings?"

If family members hesitate about the idea, point out that in some respects you already have similar meetings. They may be more informal, but every farm family does some kind of planning. Talk about the advantages of having a regularly scheduled business meeting (see box). Scale down the meetings if necessary to a level of formality that fits with your family. Once you get in the swing, your family members will be amazed at how well the idea works.

Beware the Pitfalls.

Family business meetings can do great things for your farm business. However, there are a few pitfalls you'll want to avoid:

The "Universal Fix" Pitfall. It slices, dices, chops, and stirs . . . even washes dishes and puts them away at the end! Face it, no gadget can do it all—and no single meeting can, either. If you expect to solve several years' worth of problems in a single sitting, you will be sorely disappointed. Set realistic expectations for each meeting and be sure to look back at the progress that you have made, rather than being blinded by the mountains yet to be conquered.

The "Endless Agenda" Pitfall. As long as we're going to get everybody together, we may as well talk about everything and get it all done at once, right? Wrong! If your agenda is outrageously long, participants will dread the meeting before it starts and be too stiff to move by the time it's done. Schedule several short meetings to deal with different topics rather than one massive, unfocused "catch-all" meeting.

The "Fuzzy Finish" Pitfall. You covered all of your topics and you feel like the meeting went well. But a week later, nobody remembers what they've agreed to. The solution? End your meeting with a specific review of what will be done and who will do it. Your goals are more likely to be met if members leave knowing what is to be accomplished.

Farm business meetings encourage the idea that management of the farm is shared. This is especially important if there is hope that the farm will be kept in the family. Regular business meetings build family strength, which, in turn, brings strength to the farm business. Trying something new may feel awkward and inappropriate at times. But with practice, the family business meeting can become a valuable management tool for your farm enterprise.

Guidelines for Effective Farm Business Meetings

When organizing your farm family business meeting, start by considering the "five W's" of good meetings:

WHY? Why do farm families need business meetings? Clearly state the purpose of the meeting. Is it a production meeting or a farm business meeting? Do you want to keep the two separate?

WHO? Who should be involved in the meeting? Are children old enough to be involved? In a multifamily farm, should spouses be included? What about immediate family living off the farm?

WHERE? Where should meetings be held? Choose a quite, comfortable atmosphere, free of interruptions. Make sure you have pens and paper and a table that can seat everyone. If many families are involved, rotate the meeting place. Consider using neutral territory—a meeting space in town, for instance.

WHEN? How often should meetings be held? Some families find that a weekly production meeting and a monthly general farm business meeting work well. What you choose depends on how many people are involved and how complex your operation is. Just be sure to keep to a regular schedule. If you need to, have several short meetings rather than one meeting that is too long and overwhelming.

WHAT? What should you discuss? A good meeting follows a set agenda. Carefully decide what topics you want to discuss and put together an agenda. Have someone keep minutes and summarize the meeting at the end. This helps you see clearly how your goals are to be met. Before you adjourn, set a time, date, and place for the next meeting. ●

—*adapted from* Profit from People Power, *Alberta Agriculture*

Extension Specialized Dairy Agents

Sheldon Erickson Roseau County	**218/463-1052**
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Production Staff:
Editors: Gilbert Ward, Mary Hoff
Designer: Tara Christopherson
Illustrator: John Bush

Executive Board:
Richard Goodrich 612/624-1205
Director

Blake Peterson 612/625-9757
Coordinator, Minnesota Extension Service

Edward Frederick 507/835-3422
Coordinator, Dairy Leaders Roundtable

Extension Specialists:
John Chastain, Agricultural Engineering 612/625-3701
Joe Conlin, Dairy 612/624-4995
Ralph Farnsworth, Mastitis/Veterinary 612/625-3130
Mervin Freeman, Farm Management 507/285-8153
Earl Fuller, Farm Management 612/625-1226
James Linn, Dairy 612/624-4995
Neal Martin, Agronomy/Forages 612/625-3747
Jerry Olson, Veterinary/Dairy 612/625-0280
Mike Pullen, Residues 612/624-1749
Jeffrey Reneau, Dairy 612/625-4995
Gerald Steuernagel, Dairy 612/625-4995

MINNESOTA EXTENSION SERVICE
UNIVERSITY OF MINNESOTA
Dairy Initiatives Program
146 Classroom Office Building
University of Minnesota
St. Paul, MN 55108