Consider this analogy from Stephen Covey’s “The 7 Habits of Highly Effective People.” Envision a group of people cutting their way through the jungle with machetes. They’re the producers, the problem solvers. They’re cutting through the undergrowth, clearing it out. The managers are behind them, sharpening their machetes, writing policy, and bringing in improved technology. The leader is the one who climbs the tallest tree, surveys the entire situation, and yells, “Wrong jungle!” But how do the busy, efficient producers and managers often respond? “Shut up! We’re making progress!”

In the dairy business, you are both the producer and the manager every day. You do the work and make the tactical decisions. But you are an owner, too, and that means you must be a leader. How did the leader know it was the wrong jungle? He had a plan.

Yes, a Plan
Dairy farmers are a very hard working group. And part of why many of you enjoy your job is that you are outside every day, in contact with the cows and the land, and making the day-to-day decisions necessary to keep your operation running. Long-term planning often means taking on some tasks that many of you find unpleasant. Working inside with records, communicating with family, and asking tough questions like “Who am I?, What do I do well?, and Where do I want to go?” Stepping back to look at the big picture can be scary.

Many may argue that there isn’t time to do these types of management activities. Even those who know planning is important often find it continually relegated to the back burner. But continually placing planning last on the to-do list means you can easily end up in the “wrong jungle.”

So Why is Low Milk Price an Opportunity?
The nature of the commodity business is that producers are price takers. There are a few ways to change your milk pay price – increase components, achieve quality premiums, and maybe change your milk processor – but you essentially are at the mercy of the market. In addition, increased consolidation in the retail market and other pressures are likely to increase...
milk price volatility. Higher, steeper ups and lower, faster downs are here to stay, at least for the immediate future. But without these external pressures, you might not be motivated to look down the road at the future of your business. The best way to move towards optimal profitability and quality of life is through planning.

What will your operation look like in 5 years? In 10 years? When are you going to retire? How are you going to retire? What is your break-even milk price? Do you need to expand to survive? None of these questions can be answered without long-term planning. Often it takes a very strong external pressure, like facing a low milk price, to push you to do the sometimes uncomfortable task of long-term, or strategic, planning.

What is Strategic Planning?

There are two main types of planning: strategic and tactical (1). Strategic planning is the big picture look. It describes the business’s overall objectives and includes a mission statement, long-term and short-term goals, and a tactical plan.

The tactical plan, in contrast, is much more specific. It describes how your business will implement day-to-day operations to achieve its long-term goals and objectives. Tactical planning is something producers do every day, though they may not realize it. When you decide on the day’s priority tasks during morning milking or the coffee break, you have created a tactical plan. A tactical plan is important, but focusing solely on this portion of planning can make it very easy to end up in the “wrong jungle.”

Why do Strategic Planning?

A common producer response to adversity is to pull that hat down a little tighter, get out there and work a little harder and a little longer. However, many producers are working as hard and as long as they can. They have already been cinching up the belt, trimming here and there to achieve that elusive “efficiency.” Planning is a way to step back and take a broader look. A good strategic plan should allow you to work smarter instead of just harder.

Planning forces you to anticipate problems and take steps to resolve them (2). Wouldn’t it be nice to know what equipment will be replaced in 1999 at the beginning of the year? Answering this question means you have done some serious data collection and analysis. You must have an inventory of your equipment, its age and use. You must have projected farm income and expense for the year. Above all, it means you know where you want your farm business to be at the end of 1999 and also at the end of 2004. Equipment purchases are somewhat long-term decisions. But contrast knowing your projected annual equipment purchases to the common way in which these decisions are made. The 8-year-old, pull behind forage chopper breaks on June 15. Do you use the extra money in the checkbook to repair it (again) or is it used for a down payment on a bigger, better chopper? Or do you hire a custom harvester?

A Mission Statement

Planning establishes a clear direction for both management and employees to follow (1). Many producers groan when they hear the words “mission statement.” One slightly cleaned-up description is “a piece of paper on the wall that gathers dust.” Indeed, plans need to be constantly reviewed and changed. General Eisenhower said, “The plan is nothing, planning is everything.” If planning occurs regularly, the mission statement can serve as a powerful filter against which decisions, both large and small, can be gauged to determine the appropriate answer for your particular farm business.

Planning defines in measurable terms what is most important for the business and helps allocate resources like land, labor, machinery, and equipment efficiently (1). Part of planning includes setting goals for things like financial efficiency, vacation time, production parameters, or home-improvement. By setting these measurable goals, managers have both created measures to allow monitoring of success and determined what issues are high priority and deserve additional resources.

How to Plan Strategically

Clearly, creating a strategic plan for your farm business is a big job. It requires gathering the entire management group and asking a lot of tough questions. To make the investment of time and effort worthwhile, a neutral third party is often involved to facilitate discussion and lead a business through the process.

Michigan State University Extension periodically offers the Agricultural Management Advancement Program (AMAP) throughout the state. This program is a 2- to 3-day workshop that leads producers through the entire strategic planning process. It involves a large investment of time and a modest investment of money. However, producers completing AMAP have been very pleased with its applicability. Please contact your local Extension office for more information about AMAP. It’s a golden opportunity.

Don’t Miss This Opportunity

A large and involuntary cut in your revenue may not seem like an opportunity. But the tough questions about the dairy industry’s future and your role in this industry can not be answered without a long-term plan. Utilize this “opportunity” of low milk price to examine which “jungle” you would like your business to be in 5 years from now.

References


Throughout Michigan, many dairy and crop producers could be more profitable by working together for mutual benefit. With grain prices down and contracts for some specialty crops increasingly hard to get, some cash crop producers might do better financially to raise forage and (or) grain crops for dairy farms on a contract basis. Over the years, crop producers who direct their production to specific dairy producers could increase income, reduce risk, and improve yields as a result of crop rotations.

At the same time, dairy producers may be better off to restructure their business and reduce the number of enterprises in which they are involved, rather than working harder to squeeze more efficiency out of numerous enterprises. Below are listed several reasons why dairy producers should consider developing business relationships with crop producers for dairy feeds.

**Why Consider Contracting Feeds?**

1. **Equipment prices.** The cost of replacing equipment adds to the cost of producing milk, especially when that equipment is not used over sufficient acres to justify the cost. Equipment ownership, use, and repair are a significant load for cows to bear.

2. **Insufficient land.** Whether a current limitation or a future one, contracting for feeds reduces the acreage needed by a dairy farm. Contracting also can involve manure application on land owned by others.

3. **Time.** Time is always limiting. The time needed for the production of crops competes with time needed for management of the herd or time with the family. Contracting for feed is also an alternative to adding hired labor.

4. **Risk management.** Contracting ahead with a crop producer for a quantity of a feed at a pre-determined price or pricing mechanism, can help reduce the price and yield risks associated with cropping season weather. It also allows for better cash flow planning.

5. **Cost of production.** While dairy producers may know whether their entire business is profitable, there are individual enterprises, such as the cropping enterprises, that may not be profitable but are hidden in an overall view. Enterprise analysis is necessary to evaluate the profitability of various enterprises and should be done to determine if contracting for feeds would be more profitable.

6. **Increasing feed needs.** As herd sizes grow and feed needs increase, contracting with crop producers is a way to meet those needs without increasing the fixed costs of land and equipment per cow.

7. **Improved quality.** There is the potential that a crop producer could harvest and place in storage a crop in less time than it takes you, and therefore, quality could be improved.

**Good Communication a Must**

Good communication is the foremost ingredient for the success of any relationship. Talk about the reasonable expectations and limitations of both parties and agree on the product, price and service.

1. **Be specific about what you want.** This is feed you are buying. You may want a certain variety raised, especially if you are buying corn silage.

2. **Be specific about quality.** Although no crop producer can provide all of your feed at one level of quality, there ought to be a quality range that is acceptable. This relates to moisture content as well as fiber and protein measures.

3. **Specify timing of harvest.** You may specify harvest within a certain moisture range. If the crop you are buying is haylage, maybe agree that first cutting be based on Growing Degree Days (GDD), and show the producer how GDD for alfalfa are figured. See Michigan Dairy Review, May 1996, page 15 and May 1997, page 11.

4. **Specify length of chop.** Crop producers may not understand the importance of fiber length in the ration. Talk with them about it and specify what the length should be.

5. **Agree on a price.** Sometimes a price is agreed to before the cropping season. This might be the case for haylage. Other times, a pricing mechanism is agreed to in which the final price is based on an indicator. Some crop producers price corn silage as a multiple of the shelled corn price per bushel at a certain time and place. For example, a crop producer may determine that corn silage is priced ($/ton, as-is) at 10 times the shelled corn price ($/bushel) on August 15 at Saginaw. The more specific you are in advance, the less room there will be for disagreement. See point 7 next page.

6. **Relating price to quality.** While quality of dairy feeds is critical, and pricing based on quality is possible, it can be very cumbersome to develop a pricing method based on quality. It is in the best interest of the crop producer to deliver high quality feed in order to keep the customer.

It may be best in the long run to have a quality range that is acceptable. One could either refuse forage below a certain quality level or discount the price. If there is a discounted quality, maybe there also should be a bonus quality if you feel it is worth more at a certain quality level. Those possibilities should all be agreed to before hand.

The most important quality factor in haylage is the level of
neutral detergent fiber (NDF). This measure, rather than protein, should be the basis for acceptable quality.

7. Always price on a dry matter basis. Set a price for a certain moisture level, then adjust that price based on the tested moisture level (see the following article).

8. Consider other factors in price. There are other factors that may impact on pricing. For example, if an additive is applied to the crop (such as anhydrous ammonia to corn silage), value may be increased. Likewise, if harvest costs are higher (kernel processor on the harvester) or seed costs are higher (new specialty corn silage varieties), price should reflect these. This should all be discussed and agreed to before any seed goes in the ground.

9. Agree on the service. All loads should be weighed. This will go a long way toward avoiding disagreements. In addition, a moisture test should be done either on a sample from every load (if it is delivered throughout the year) or on some multiple load number (such as every third or fourth load) if it is all received at harvest time.

What Should You Do Now?

1. Calculate your cost of production for feeds. Evaluate your labor situation and cropping equipment. Evaluate all alternatives including contracting with a crop producer to raise a certain feed for you.

2. Budget your feed needs. Figure out how much of each feed you will need. Figure in the losses during storage and feeding. Be liberal in the amounts you figure as you may change feeding rates during the year.

3. Talk with producers. Approach crop producers with whom you might be interested in contracting. Discuss the factors listed in this article and maybe other factors such as manure application and its value.

4. Make a decision. If this alternative makes sense for your operation, then work out an agreement now. Don’t wait until harvest time. Written agreements are best.

5. Consider changes you need to make. Work to eliminate bottlenecks for putting feed into storage. In most cases, crop producers would rather harvest the crop and bring a certain quantity to the buyer’s farm for storage. As a buyer, you should be prepared to handle it at the rate in which it is delivered. The buyer is usually responsible for packing it in a horizontal storage so that he or she bears the responsibility for the quality of the packing.

Conclusion

There are advantages to both the crop producer and the crop feeder of a joint business relationship. Remember, a business relationship has to be advantageous to both parties or it won’t last. Risk has to be shared by both parties. And, the agreement should have a long-term outlook. That is, in some years, it may benefit one party more than the other, but over the long term, both should benefit.

How to Evaluate Prices for Alternative Feed Sources

Phil Durst
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Producers are sometimes faced with opportunities to buy alternative feeds at different moisture levels and prices. You may find it difficult to compare the two feeds on an equal cost basis. Let me show you how I evaluate those prices; maybe it will be helpful to you.

Basically, I set up two equivalent relationships of price to dry matter. For example, if I can buy hay (15% moisture) for $90 per ton, what is the equivalent price for haylage at 45% moisture? The equation for that equivalent relationship is:

\[
\frac{\text{Shay price}}{\text{hay dry matter, \%}} = \frac{\text{Shaylage price?}}{\text{haylage dry matter, \%}}
\]

Use the dry matter percentages rather than the moisture levels. Dry matter percentage is 100 minus the moisture percentage (i.e., 100 – 15% moisture = 85% dry matter). It doesn’t matter whether you use the decimal (0.85 and 0.55) or the whole number (85 and 55), as long as you are consistent.

In this example, we know the price of hay and the moisture levels, and thus the dry matter percentages of both feeds. So we put those values in the equation. The unknown is the equivalent price of the haylage, so we use “X” in the equation for that value and then solve for it.

\[
\frac{\text{hay price}}{85\text{% dry matter}} = \frac{\text{X}}{55\text{% dry matter}}
\]

To find out the value of X we multiply both sides of the equation by the denominator under X; 55 in this case.

\[
\frac{(55)(90)}{85} = X
\]

and X, the equivalent value of the haylage, equals $58 per ton at 55% dry matter.

This is a simple way of equating prices. It assumes all other things (e.g., quality, and protein and NDF contents) are equal – which they rarely are. But, it does provide a basis for comparison.

Another caution is that the moisture level needs to be checked rather than assumed. We assumed the hay was 15% moisture, but hay out of the field may be 20 to 25% moisture versus 15% out of storage. Use multiple samples to check the moisture of any feed.

Changing Value with Moisture

You also can use this method to adjust the price of a commodity for its moisture level. If you agree on a com-
Building Safe and Effective Electric Fences

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An electric fence controls livestock by delivering an uncomfortable current flow through the body of an animal for a sufficiently short duration so as to not cause injury to the animal. In order for this to occur, the animal must touch the fence wire and complete the circuit from the “hot” terminal of the fence energizer to the fence wire, through the animal, through the earth and back to the ground terminal of the energizer. It is important to keep in mind that a circuit must be completed. The earth is a part of the circuit, and the electric fence must work even when the earth is dry. To deliver enough current to get the attention of an animal even in dry conditions requires high voltage on the wire. Most electric fence energizers intermittently charge the wire at more than 5,000 volts.

**Fence System Components**

There are three main parts to an electric fence: (1) energizer; (2) fence wire and posts; and (3) grounding electrodes (several ground rods). The energizer produces a high voltage charge that only lasts a small fraction of a second.

The fence is an extension of the high voltage terminal on the energizer. There are many types of fence material that can be used depending upon the type of animal to be controlled and whether the fence is to be permanent or temporary. Fence wire can be smooth aluminum or soft steel. High tensile smooth steel wire is a popular material for permanent fences. A combination of copper or stainless steel filaments and flexible nonmetallic material often called polywire or ribbon wire is used for semi-permanent and temporary fencing. Electric netting is a material usually constructed of nonmetallic filaments and wire.

The ground rods return the current to the energizer. In order for an animal to receive a shock, a circuit must be completed. The ground rods complete the circuit from the earth back to the energizer. A good grounding electrode is necessary for the electric fence to work effectively.

**Materials Needed for Installation**

The parts needed are an energizer, smooth fence wire, insulators, posts, a minimum of three ground rods, copper wire to connect energizer to the ground rods, ground rod clamps, high voltage insulated wire to connect fence charger to the fence wire, and connectors to make wire splices.

**Tri-State Dairy Management Conference**

Mark November 10-11, 1999 on your calendars for the Inaugural Tri-State Dairy Management Conference in Ft. Wayne, IN. Registration material and program for the dairy producer conference sponsored by dairy extension in Indiana, Michigan and Ohio will be available in July.
Selecting the Proper Energizer

One of the most important aspects of making sure an electric fence system works effectively is proper grounding of the energizer. If an energizer does not seem to control livestock, the solution is not necessarily a more powerful energizer. Improving the grounding may be the lowest cost, most effective means of improving the operation of the electric fence system.

Energizers today are generally of the low impedance type that deliver a very high current to the fence for a very short time. Even when some grass or other vegetation is touching the fence wire, the system can still deliver enough current to control livestock. Choosing an energizer that is labeled by a testing laboratory such as UL (Underwriters Laboratories), ETL (Electrical Testing Laboratories), or CSA (Canadian Standards Association) is recommended. Energizers currently are available with large outputs in the 10’s of Joules, but most of these energizers do not meet labeling requirements. The larger the output from a fence energizer, the greater the potential for hazard. Caution should be taken to prevent small children from contacting electric fences and all individuals should take extra care to avoid contact with their head or neck. There have been incidents reported where deaths have occurred from this type of contact.

The operating characteristics of electric fence chargers are so different that it is difficult to compare one energizer with another. The maximum energy output in Joules is one method used by manufacturers to rate energizers. However, two energizers with the same energy rating are not necessarily equal in effectiveness.

Grounding Is Essential

An electric fence system will not work effectively unless the current has a low resistance path from the earth back into the energizer. The ground rods make contact with the earth to complete the path. The grounding required by a fence energizer will vary depending on the soil type and moisture (dry or sandy soils need additional grounding). For an average soil, it is recommended that a 5 Joule low impedance charger be grounded with three, 8-foot ground rods spaced at least 10 feet apart. Doubling the Joule output of the energizer would double the grounding needed.

One method to check the adequacy of the earth return system is to measure the voltage between the energizer ground rods and a connection to the earth a few feet away (e.g., to a screwdriver stuck in the ground). If there is a perceivable voltage between these points, the energizer grounding should be improved. This voltage can be measured with a tester designed to measure high voltage fences.

Where to Install the Energizer

An energizer should be placed at a location where it is possible to maximize separation of the energizer grounding and electrical wiring system grounding. For some farms, the best place for the energizer may be outdoors away from animal buildings and grounded equipment. If an energizer is installed indoors, the high voltage wire must be taken to the outside using high voltage cable. Cable for this purpose is commonly available and generally is rated at 20,000 volts. Electrical wire of the type used for the building wiring only has insulation rated at 600 volts. This type should not be used as a high voltage lead wire.

Types of Fence Circuits

A standard fence circuit can use single or multiple wires with the animal contact made between the fence and the earth. In areas where the soil is sandy or dry, a path through the earth is not easy to obtain and a continuous ground fence circuit is recommended. The energized wire(s) are alternated with grounded wire(s) connected to a ground rod near the fence energizer. When an animal touches both an energized wire and a grounded wire, the intensity of the shock will be greater than when touching the energized wire and the earth. The grounded wire(s) should not be connected directly to the energizer ground terminal (lightning hazard), and the electrodes for the fence charger and grounded wires should be located at least 50 feet apart.

Preventing Unintended Shocks

An improperly installed electric fence system can result in unintentional shocks to livestock at grounded equipment such as at waterers, feeders or even in a milking parlor or barn. The most frequent cause is improper grounding of the energizer. The energizer must have its own grounding electrode located at least 50 feet from any other metal object in the earth. An energizer must never be grounded to the farm electrical system grounds, to the utility system grounds, to metal water pipes, or to metal objects in a building such as stalls, fences, or dividers. Such improper grounding puts the metal objects that can be contacted by livestock in the electric fence-to-earth return path. If the electric fence circuit is completed though vegetation touching the fence or other shorting out of the fence, an improper ground can deliver uncomfortable shocks to livestock resulting in altered animal behavior.

Are Your DHI Reproductive Data Summarized Accurately?

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Data accuracy is an important issue if you rely on reproductive data for individual cow decisions and for evaluating reproductive problems and herd performance. We have all heard the term “Garbage in, garbage out.” This typically applies to data entered into a computer database and the resulting summary of data coming out. Your DHI records are kept in such a database, and you are likely aware that sometimes information is not entered correctly by either you, an employee, or your DHI technician. In addition, you and your DHI technician need to set some options in PCDART so your data are handled and summarized correctly.

This article addresses accuracy of your reproductive data. In reviewing a number of DHI-202 reports to find herds to use as examples for teaching, I found many herds didn’t appear to have the reproductive options set correctly. In many cases, the default values were being used.

Six Important Questions

You should ask and answer six questions to ensure that the reproductive data being summarized in PCDART and on the DHI-202 Herd Summary are reliable.

Q. Is the voluntary waiting period (VWP) set correctly?
A. The VWP is your desired minimum waiting period from freshening to first insemination. This needs to be specified in the DHIA Technician’s PCDART program as the Days Open Goal (item 17 in options list). Your current VWP value appears on the lower left side in the Reproductive Summary of Current Breeding Herd section (Figure 1) on the DHI-202 Herd Summary Report. The default set in PCDART appears to be 50 days. An accurate value is needed to determine the Projected Minimum Calving Interval and Projected Minimum Days Open in the Reproductive Summary of Total Herd and to calculate percent of Heats Observed in the Yearly Reproductive Summary on the DHI-202. Have you established a VWP, and do you and your employees follow it? You may want to delay breeding high producing cows, but the majority should be bred based on your minimum VWP.

Q. Do you report all heats, breedings, and service sires to your DHIA Technician?
A. Obviously you and (or) your employees need to record all reproductive events for each cow. If you want to make use of this information, it is important that you make these data easily available to your DHIA technician on each test day and request that they input this information into PCDART. If you are using PCDART on your farm and you or your employees are recording data into PCDART, then your technician needs to import the data from your computer into their computer. This is necessary so that the data are transferred to Dairy Record Management Systems (DRMS). DRMS then develops the herd summary reports, including the reproductive summary, for both PCDART download files and the DHI-202 Herd Summary Report mailed to you after each test day. If you are using PCDART at your farm, you need to verify that your employees are inputting all data correctly.

Q. Is the Routine Pregnancy Check option turned on in PCDART?
A. Herds with the Routine Preg Check option turned on in the DHIA Technician’s PCDART program will have “Cows Bred But Not Diag. Preg.” printed as the heading in the upper right box with the distribution of Days Open at Last Service in the Reproductive Summary of Current Breeding Herd section (Figure 1) of the DHI-202 Herd Summary. In herds with this option turned off, the label in the box will read “Cows Bred Since MM-DD-YY” with the date 65 days before the current test date. Cows in the latter herds are summarized as pregnant after they have been bred 65 days or more. Therefore, cows in these herds that are reported pregnant less than 65 days after breeding are still included in the Reproductive Summary of Current Breeding Herd until they are bred 65 days or more. This results in errors in the data for Current Breeding Herd...
because it will include a number of pregnant cows, which should only be summarized in the Total Herd section of the DHI-202 Herd Summary report. In addition, cows bred more than 65 days but known to be not pregnant (open) will be erroneously included in the services per pregnancy statistics in the Total Herd summary section because they are assumed to be pregnant. To correct this problem, ask your technician to enter in PCDART the number of days you wait to pregnancy check your cows or mark the Routine Preg Check option on your DHI-213 report and give this report to your technician. The DHI-213 report, with your current options, is mailed to you after each test day. I suggest you verify that this option is turned on with the correct number of days you wait to pregnancy check.

Q. Do you report confirmed pregnant or open status cows to your DHIA Technician?
A. Coding cows as confirmed pregnant or open in PCDART affects veterinarian reports from PCDART and affects the accuracy of the reproductive summaries on the DHI-202 report and PCDART herd summary reports 147 and 148. Pregnant cows refers to those cows diagnosed pregnant for herds reporting routine pregnancy checks and having the Routine Preg Check option turned on. For herds NOT having the Routine Preg Check option turned on the word “pregnant” refers to cows bred 65 days or more before the current test date or before they left the herd (non-return rate) even though you may be reporting cows confirmed pregnant.

Q. Does your DHIA Technician or herds person have access to reproductive data and are they recording all data in PCDART?
A. Data collection requires access to the data by the DHIA technician and communications with them so they are aware of what data to enter, where to find the data, how to indicate that the data were entered into PCDART and that appropriate data options are set in PCDART. Without effort on your part, don’t expect your data to just show up correctly on the reports. Some technicians check-off data after it is recorded in PCDART by using a colored marker to highlight the data on the wall chart or in the producer’s notebook. Also, DHIA technicians can provide input forms you may use to record data going into PCDART and to simplify data recording.

Q. How accurate are your data?
A. To ensure that you, your herds person, and your DHIA Technician are entering the data the way you desire, occasionally do a data audit. This can be done easily by spot checking some recently entered data for a few cows. To do this, ask your technician to create a PCDART report that lists the three most recent of each: fresh cows, fresh heifers, cows bred, and cows sold. Then compare what’s on the PCDART report with your charts, notebooks, or any handwritten information you record for fresh cows, bred cows, and cows sold.

Here’s what to include in your data audit. For fresh cows and fresh heifers, print and check the calving date, calf sex, calf identification, sire registration number or sire stud code, and calving ease code. Check the birth date and lactation number of heifers. For bred and confirmed pregnant cows check breeding date, service sire stud code or service sire registration number, times bred, and reproductive status, i.e., pregnant or open. For sold cows, check the reason and date they left the herd. Note: some reproductive culls may be recorded as low producers when culled in late lactation because daily production was low or because the DHIA Technician wasn’t provided a reason for leaving the herd. If you want to know how many cows were culled because they were not pregnant or became pregnant too late, then provide the DHIA Technician with the true reason these cows are being culled, i.e., reproductive failure. An audit will help you and your DHIA Technician determine if there are gaps in data recording.

One Final Note. If the DHIA Technician is using your computer with PCDART to send data to DRMS, make sure that the correct options are set in your PCDART program. This influences the settings used by the DRMS computer to compute the reproductive summary data.

Summary
You can use PCDART reports 147 and 148 and(or) the DHI-202 report to identify and evaluate reproductive problems in your herd. It is up to you and your DHIA Technician to ensure that your data are accurate. Take a few minutes next test day and work with your technician to evaluate how you are doing at getting information into PCDART correctly and accurately. It will pay big dividends when you use the reproductive data.

Answer
In the example on page 5, the price of high moisture corn = $68.70/ton @ 73% dry matter.

Is Your Farm Computer Ready for Y2K?
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Sanilac and St. Clair Counties

We are just a few short months away from the year 2000. There has been much ballyhoo in the media over the past months concerning the so-called “Millennium Bug” or “Y2K Problem”. As time marches on and we get closer to January 1, 2000 you will be hearing even more concerning this issue.

In a nutshell, the “Y2K Problem” concerns the inability of some computer hardware and software to function properly when the calendar date rolls over from 19XX dates to 20XX dates or when some computer software attempts to make calculations using dates in the year
2000 or beyond. In years past to save precious memory space, computer hardware engineers and software programmers formulated and used the two-digit system to store year information; for example, 1997 is stored as “97” not “1997”. This system works fine until a change in the century or millennium (a year ending in “00” such as the year 2000) occurs. Then, computers or other electronic devices programmed or designed in this way could misinterpret the digits “00” to mean the year is 1900 rather than 2000. Some systems and software also may not be able to recognize the year 2000 as a leap year (unlike the majority of leap years, years ending in “00” are only leap years if divisible by 400), thus, some hardware and software may not be able to transition properly from February 28 to February 29 to March 1, 2000. Most computers and electronic devices with the “Y2K Problem” will continue to operate, but may give erroneous dates after December 31, 1999. Experts anticipate that in a very, very few exceptional cases, some computer hardware and software or electronic devices may fail to function at all after December 31, 1999. Some problems may even appear before January 1, 2000 when computers and (or) software use dates beyond the year 2000 in calculations. For more information on the “Y2K Problem” contact the following web sites:

Yahoo Year 2000 Resource Site
http://www.yahoo.com/Computers_and_Internet/Year_2000

Committee on Science, Subcommittee on Technology
http://www.house.gov/science/y2k.htm

U. S. Federal Government Year 2000 Product Compliance Database
http://y2k.policyworks.gov

Year 2000 Home Page, Peter DeJager
http://www.year2000.com/cgi-bin/y2k/year2000.cgi

Three Important Issues
At the heart of the “Y2K Problem” are three issues that you should make sure your farm can deal with successfully to achieve “Y2K Compliance”.

ISSUE 1: Is my computer hardware “Y2K Compliant”?  Most personal computers based on Intel Corporation’s X86 (286, 386, 486) and Pentium (Pentium, Pentium II, Pentium III) microprocessors are built with the century information. For example, the “19” in “1998” is built into the computer’s hardware in such a way that it cannot be changed. Therefore, the computer hardware always thinks it is dealing with dates from 1900 to 1999. To remedy this problem, several years ago computer manufacturers began upgrading the ROM-BIOS portion of the PC’s memory to allow recognition of dates in the 21st century (year 2000 and beyond).

Chances are that if your computer was manufactured after 1993 to 95 it has been equipped with a ROM-BIOS making it “Y2K Compliant”. To insure that your computer is “Y2K Compliant” companies such as Intel Corporation, Gateway 2000, and others recommend testing your computer using a utility called “YMARK2000”. The “YMARK2000” utility was developed by the National Software Testing Labs (NSTL). The NSTL provides the global standards for information technology as the world’s leading independent information technology testing lab. The “YMARK2000” utility is free of charge and can be downloaded free from NSTL’s web site at:

National Software Testing Labs

Another good web site for “Y2K” background information and links to many computer hardware and software manufacturer’s “Y2K” resources is the Intel Corporation’s site at:

Intel Corporation
http://support.intel.com/support/year2000

ISSUE 2: Is my computer software “Y2K Compliant”? Even though your computer hardware may be “Y2K Compliant” it does not necessarily follow that your computer software is “Y2K Compliant”. Most of the latest versions of popular commercially available software are “Y2K Compliant” or can be made so with minor updates available from the manufacturer. Regardless, it is important to take a complete inventory of the software on your computer, especially programs critical to your business (e.g., accounting or herd management software). Write down the version number of each software product and check with the manufacturer concerning its “Y2K Status” and what you need to do, if anything, to make it “Y2K Compliant”.

Links to many software manufacturers are provided on Intel Corporation’s web site (address listed above). The web addresses for “Y2K” information for Microsoft and Intuit (Quicken, Quickbooks) products are listed below:

Microsoft
http://www.microsoft.com/technet/year2k

Intuit
http://www.intuit.com/support/y2k_standard.html

ISSUE 3: Does any of my “critical” equipment contain “embedded chips” that are not “Y2K Compliant”? Small computers, called micro-controllers (or PLCs, programmable logic controllers), are in almost every device that
has electrical components. Devices as diverse as anti-lock braking systems, automobile ignition and fuel systems, cellular telephones, fax machines, and programmable VCR’s are equipped with these microchips. These chips are programmed with a set of software instructions that tell the devices how to operate. Most devices equipped with “embedded chips” will not be affected by the “Y2K Problem”. Those most likely to be affected will usually have a display showing calendar dates (e.g., the LCD readout on your programmable VCR or your fax machine). If you suspect that a piece of equipment contains “embedded chips” and the equipment is critical to your business and employee safety you should check with the manufacturer to insure that the device is “Y2K Compliant”. For more information on “embedded chips” and the “Y2K Problem” contact the following web site:

“The Millennium Problem in Embedded Systems”, UK Institute of Electrical Engineers

http://www.iee.org.uk/2000risk

January 1, 2000 will be here before you know it. Do not put off insuring that the “Y2K Problem” has minimal impact on your farm business. This is a task I would accomplish as soon as possible. The closer January 1, 2000 approaches the more difficult it may be to get the products and services needed to bring your operation into “Y2K Compliance”.

Announcement

The MICHIGAN STATE UNIVERSITY SPARTAN DAIRY RATION EVALUATOR 2.0 is “Y2K Compliant.” The software itself can handle and compute successfully in 2000 and beyond.

Employee Management

What Michigan Dairy Farmers Pay Their Employees

Kurt Anderson
Extension Dairy Agent
Huron and Tuscola Counties

During my 4 years as a member of the Michigan State University Extension Dairy Team I have been asked many times, “What are dairy farmers paying their employees?” Other than referring to the Michigan Department of Agriculture’s (MDA) statistical handbook for an average of all farm workers, no dairy-specific information was available. In the 1997 Agricultural Statistics Handbook, average wages for field workers were $6.78/hour and $6.62/hour for livestock workers. To gather a clearer picture of this important topic the MSU Extension Dairy Team provided funding for a survey of compensation in Michigan’s dairy industry.

The survey was mailed to owners of 400 herds randomly selected from the MDA’s list of dairy producers. This sample represented slightly more than 10% of the state’s dairy producers. Of the 400 surveys mailed, 219 were returned. Of these, 74 respondents hired additional non-family labor. The summaries in this article are based on these 74 respondents. Table 1 shows the distribution by region of the state of these 74 surveys.

The average size of the 74 herds employing labor was 111 cows. Table 2 summarizes herd sizes of farms responding to the survey.

Employee Compensation

Wage rates did not increase as herd size increased. However, larger farms were more likely to offer employee

<table>
<thead>
<tr>
<th>Herd Size</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>More than 200 cows</td>
<td>9.6</td>
</tr>
<tr>
<td>151 to 200 cows</td>
<td>17.8</td>
</tr>
<tr>
<td>101 to 150 cows</td>
<td>24.6</td>
</tr>
<tr>
<td>50 to 100 cows</td>
<td>32.9</td>
</tr>
<tr>
<td>Under 50 cows</td>
<td>15.1</td>
</tr>
</tbody>
</table>

Table 1. Surveys returned by region of the state; 74 herds reported hiring non-family farm labor.

<table>
<thead>
<tr>
<th>Region</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>East central</td>
<td>27</td>
<td>36.5</td>
</tr>
<tr>
<td>West central</td>
<td>30</td>
<td>40.5</td>
</tr>
<tr>
<td>Southeast</td>
<td>6</td>
<td>8.0</td>
</tr>
<tr>
<td>Southwest</td>
<td>5</td>
<td>6.8</td>
</tr>
<tr>
<td>Northern lower</td>
<td>3</td>
<td>4.1</td>
</tr>
<tr>
<td>Upper peninsula</td>
<td>3</td>
<td>4.1</td>
</tr>
</tbody>
</table>
Of the farms offering these benefits, 38% had a waiting period before employees began receiving them.

Incentive Pay Plans
Of 74 survey respondents hiring non-family labor, 27% of farm managers offered incentive pay to their employees. The vast majority of these farms shared a portion of milk quality premiums with employees. This represents an easy program to administer, with an independent party, the dairy plant, keeping the records for both parties. The only other incentive pay plan reported by respondents was for cows confirmed pregnant.

Pay Period Intervals
Of 74 reporting herds, most employees (58%) were paid twice a month. Wages were paid following milk checks received on the 1st and 15th of each month. Weekly pay was given to 27% of dairy farm employees. Most employees were compensated on an hourly basis (55%); salary compensation was utilized for 16% of dairy farm workers. Both methods were used by 29% of respondents on farms having both full- and part-time employees. Farm managers responding believed their wages were competitive with that of other dairy farm employers according to 49% of the responses. However, a significant percentage (43%) did not know if they were competitive with other dairy farms. When asked if they were competitive with non-dairy farm employers, only 25% believed that they were, whereas 30% believed they were not competitive with other employers. A significant percentage of survey respondents (45%) were unsure if they offered competitive wages compared with non-dairy farm employers. Not being sure what constitutes a competitive wage can make recruiting future employees difficult.

Staff Recruitment, Selection
When seeking employees, virtually all farms respondents (88%) reported they used word of mouth to recruit workers. The next most popular method used to locate employees was an advertisement in a local newspaper, used by 22% of survey respondents. Larger herds were more likely to make use of newspaper advertisements. Other recruiting tools reported were use of regional agricultural publications (6%), statewide agricultural publications (4.5%), national publications (1.4%), and local employment agencies (2.7%).

Only 8% of survey respondents used written job descriptions to assist in selecting qualified employees. The use of a job-related test to identify worker skill levels was utilized by 27% of these dairy farms. The majority of survey farms (57%) reported that they checked potential employees’ stated work histories. The majority (60%) also checked job references given by job applicants.

A significant labor force in Michigan’s dairy industry identified by the survey was student labor. High school student labor was utilized by 59% of the surveyed farms.

### Table 3. Comparing wage rates of dairy farm workers with workers in other Michigan industries.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Annual Wage Rates, $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inexperienced dairy¹</td>
<td>14,575</td>
</tr>
<tr>
<td>Salaried dairy²</td>
<td>17,760</td>
</tr>
<tr>
<td>Experienced dairy²</td>
<td>18,850</td>
</tr>
<tr>
<td>Michigan retail²</td>
<td>14,560</td>
</tr>
<tr>
<td>United States average³</td>
<td>28,945</td>
</tr>
<tr>
<td>Michigan average³</td>
<td>31,522</td>
</tr>
</tbody>
</table>

¹Responses from Michigan dairy farms based on 2,500 hours per year.

²Bureau of Labor Statistics based on 2,080 hours per year.

Employee Benefits
Of 74 herds reporting hiring non-family labor, 50 farms reported offering some type(s) of employee benefits. The most common benefit offered was health insurance (32%), followed by paid vacation (29%). Other benefits reported were:

- Meat and milk (22%)
- Employee housing (21%)
- Paying the employee’s half of social security (19%)
- Sick leave (16%)
- Life/disability insurance (11%)
- Retirement (9%)
Survey participants reported a much smaller use (18%) of college student labor.

**Hours Worked by Employees**

Employees were most often asked to work 51 to 60 hours per week (32%). Table 4 summarizes survey responses gathered from 74 herds.

Some farms also paid higher wages to employees who worked holidays or extra hours. These extra wages were offered by 19% of farms responding to the survey.

<table>
<thead>
<tr>
<th>Hours Worked</th>
<th>Percentage of Farms</th>
</tr>
</thead>
<tbody>
<tr>
<td>61 or more</td>
<td>15</td>
</tr>
<tr>
<td>51 to 60</td>
<td>32</td>
</tr>
<tr>
<td>41 to 50</td>
<td>25</td>
</tr>
<tr>
<td>Less than 40</td>
<td>28</td>
</tr>
</tbody>
</table>

**Employee Training**

While only 45% of herds surveyed favored Michigan State University Extension offering employee training, there existed a large difference of opinion based on herd size. Eighty-three percent of herds with over 200 cows desired workshops, whereas only 53% of herds with 100 to 150 cows encouraged training. This difference probably reflects the ability of larger herds to have other employees fill-in for those attending training workshops. Table 5 reflects how respondents favoring training ranked various topics.

A similar relationship existed between herd size and interest in attending personnel management workshops. Of all respondents, 86% of large herds indicated they would attend training sessions. Only 13% of herds with 100 to 150 cows favored personnel management training.

**Summary**

- Expected higher wages for employees working in larger herds was not found. No difference was observed in employee wages regardless of herd size or region of the state. However, larger herds offered more fringe benefits.
- With Michigan’s unemployment rate below 4%, dairy managers will need to utilize improved and innovative personnel management techniques to attract and retain qualified employees. Top dairy managers will need to compete with other industries for available workers who can choose among several employment opportunities.
- Managers of larger herds are more interested in employee training and personnel management workshops. These can be important tools to reduce employee turnover and retain a more highly qualified work force.

### Addressing Employee Performance Problems

**Dann Bolinger**

*Extension Dairy Agent*

*Clinton and Gratiot Counties*

Addressing employee performance problems is a common concern of dairy farm managers and employee supervisors. Performance problems can be very frustrating. Sometimes it can be all too easy to become frustrated, throw your arms up in disgust and give up. However, do not be discouraged, there is hope. Although there are some situations that cannot be resolved, there are successful means of addressing job performance situations without losing the employees or your mind.

If the employee in question is not performing to your satisfaction, first ask yourself what your expectations are. What standard of performance would make you content? Once you have identified your expectations, be sure that they are reasonable to expect of someone besides yourself. If you are not sure if they are reasonable, ask an outside party such as an appropriate consultant (i.e., veterinarian, nutritionist, or extension agent).

**Is the employee aware of your performance expectations?** If he or she does not know what is expected, he or she most certainly will not achieve it.
Even an expert marksman is not likely to hit the target, if no one tells him what the intended target is.

An explanation of duties and responsibilities is essential to make farm workers aware of not only what they are supposed to do but why they are supposed to do it. For instance, if an employee doesn’t understand the role of colostrum in the health and performance of a calf, why would prompt feeding of colostrum be a high priority to the employee? Your parents may have been able to get away with telling you to do something simply “because they said so”, but few employees will respond positively to that approach. People need to know “the why” as well as “the what” associated with their jobs. The use of written detailed job descriptions and standard operating procedures for routine tasks partially can fulfill the need to make employees aware of expectations. In order to achieve complete awareness of performance expectations, effective communication between supervisor and employee is an absolute necessity.

Follow the Eight P’s

Effective communication with employees on delicate issues such as job performance means following the eight P’s:

1. Prompt: Address problems promptly. Do not ignore the situation or procrastinate in providing a response. The sooner you take action, the more effective it will be.

2. Private: Talk in private. Select an appropriate time and place to discuss job performance issues with the employee. Always discuss such things in private, never in front of other employees or visitors.

3. Positive: Always approach the situation with a positive attitude and in a helpful manner. Be certain to attack the problem and not the person. Do not dwell on past performance; rather, focus on helping the employee improve his or her performance in the future.

4. Planned: Use a planned approach. Address the situation one step at a time. Don’t overload the employee with several issues at once.

5. Precise: Be very precise with your concerns. Use specific examples. Generalities and vague references will not address the problem.

6. Pertinent: Be sure that you are only dealing with pertinent facts. Avoid using hearsay, making assumptions, or making personal judgments.

7. Polite: Always be polite. Remain calm and do not be defensive. Thank him or her for feedback and input both good and bad. Say, for instance, “Thank you for telling me. I’d rather hear it from you than have you think it and not say it.”

8. Promote: Promote improvement through positive feedback. When providing feedback, be specific. Saying, “Good Job!” isn’t enough, unless the employee is aware of specifically what was improved.

If you conclude that the employee knows the specific expectation and is still not achieving it, you then must consider whether or not he or she is capable of performing the responsibility. Are all of the necessary physical resources at the employee’s disposal to succeed in reaching expectations? For example, are the milkers unable to milk the expected number of cows per hour because of a malfunctioning, nonfunctioning, or non-existent crowd gate? Or are the actions of another employee or you inhibiting the employee? Could you be the reason that the cows are not getting fed on time? Maybe you stop and talk to the employee for an hour every morning while he or she is trying to mix feed?

Evaluate Employees’ Skills

After determining that physical resources and interference are not a limiting factor in an employee’s performance, you need to evaluate the individual’s skills. Frequently, the problem is simply a lack of training. If inadequate training is the culprit, insure that the person receives the needed instruction. Practice likely will be necessary. Most people need to see, hear, or do things at least seven times before they fully grasp the concept being taught. As always, encouragement and support are essential during the learning process and beyond.

It is possible that the employee simply does not have the aptitude to perform the duties required to achieve expectations. If inadequate aptitude is found, consider reassigning the person to another job or in some cases the person may need to be terminated.

Employees that know and understand the expectations and possess the resources and skills needed, but still do not perform may have other issues that need to be addressed. The person could simply lack initiative or motivation.

1. Is there reward for not performing? For instance, does he or she get to go home earlier by spending only 10 rather than 30 minutes watching cows for estrus?

2. Is there a lack of positive incentive? What is in it for the employee? Do you give recognition or attention for a job well done? Do you base promotions and raises on performance or only on longevity?

3. Is there punishment for doing a good job? An example is when the employee or crew who does the best job of scrubbing the parlor equipment and walls is rewarded with having to always be the one who must scrub the parlor equipment and walls.

Occasionally, and despite all of your efforts, an employee who is quite capable of performing refuses to meet expectations. You need to make a point of discussing the problem with this individual. Make every attempt to identify the true problem. Is it a bad attitude? Is the person afraid to admit that he or she does not know how to do the task(s)? Is it something else?

If the decision is made to terminate someone, it is in your best interest to first exhaust every option to remedy the situation. In order to protect yourself from litigation, be certain to document in writing all of your corrective actions.

Summary

Improved performance from your employees can be achieved by simply...
Does Ration Moisture Content Affect Feed Intake?

Herb Bucholtz
Dept. of Animal Science

"The ration is too wet, that's why feed intake and milk production are down" is an often-heard statement. What effect does ration moisture percent have on feed intake?

Declines in dry matter intake can be associated with rations above 55% moisture. Numerous experiments have shown decreases in dry matter intake when silages or high moisture fermented by-products are added to rations. However, the research does not indicate that ration water content per se is the reason for decreased feed intake. Several experiments have shown that addition of tap water to increase ration moisture does not depress dry matter intake (2,4).

Lowering Dry Matter Intake

Several experiments in which alfalfa silage was substituted for dry alfalfa hay lowered dry matter intake. The alfalfa forage used in those experiments was the same variety, harvested from the same field, and substituted in the rations on a dry matter basis, so the only differences in the rations were the moisture content and dry versus fermented form of the alfalfa forages. As the proportion of alfalfa silage in the ration increased, there was a corresponding decline in total dry matter intake. To a lesser extent, declines in dry matter intake also have been reported when corn silage, grass silage, and fermented wet grain by-products are added to rations, substituting for drier ingredients (1, 2).

The question is: Why do high moisture feeds, silages and wet fermented grain by-products depress dry matter intake? Proposed causative factors include: pH, organic acids, and other chemical compounds produced during the silage fermentation process.

Forages harvested and stored at higher moisture content (greater than 65% moisture) often result in silages with lower pH and higher organic acid concentrations.

Diagnosing Problem Silages

The following Michigan Dairy Review article, “Fermentation Acid Analysis for Silages,” by Dr. Tom Herdt, discusses using silage fermentation acid concentrations to assist in diagnosing problem silages.

Lower dry matter intake when alfalfa silage is substituted for dry alfalfa hay has been attributed to nitrogen compounds namely, amines produced during the silage fermentation process. Alfalfa silage harvested at greater than 65% moisture undergoes greater plant protein breakdown (proteolysis) that increases the concentration of non-protein nitrogen, including amines. Recent experiments have shown that the amines found in alfalfa silage depress dry matter intake. Corn silage contains lower concentrations of amines as compared with alfalfa silage, but the concentrations are higher than found in dry alfalfa hay (3).

The Bottom Line

Silages, due to chemical compounds produced during silage fermentation (organic acids, lower pH, and amines), reduce dry matter intake. In Michigan, to harvest, store, and feed dairy cattle dry forages as a way to prevent the undesirable compounds produced during silage fermentation is almost impossible because of weather related factors. Harvesting alfalfa and corn for silage at moisture levels lower than 65% is achievable and will help to minimize excessive and undesirable silage fermentation end products. Reduced possible risk of depressed dry matter intake associated with fermented feeds can be accomplished by monitoring crop moisture content during harvest.

The recommended upper moisture content for alfalfa silage is 65% and 70% for corn silage.

Monitor Your Moisture

Moisture should be monitored continuously during alfalfa and corn silage harvest. Moisture content, especially for alfalfa, can vary greatly during any harvest day. Testing for moisture only a few times per day probably will not assure that all the silage harvested on a given day will be within an acceptable moisture percentage range.

A systematic plan for continuously monitoring moisture during harvest has been developed by a few Michigan dairy farmers. Monitoring moisture will require an organized plan.

1. Determine how frequently to test.
2. Assign someone to be responsible for testing.
3. Establish acceptable moisture ranges.
4. Plan what to do when the forage being harvested falls outside the acceptable moisture range.
5. Have one or more moisture testers available during harvesting.
The most common moisture testers used in farms are a microwave or a “Koster” forced-air moisture tester. Electronic testers may not be sufficiently accurate. More information on moisture testers is available from MSU Extension Dairy Agents.

**References**


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**Trouble-shooting: Fermentation Acid Analysis for Silages**

Thomas H. Herdt  
Animal Health Diagnostic Lab.

As pointed out in the previous article (by Dr. Herb Bucholtz in this issue of Michigan Dairy Review), certain silage characteristics can affect adversely feed intake of dairy cows. Silage characteristics associated with feed intake include such things as moisture concentration, pH, organic acid concentrations, and concentrations of plant protein breakdown products. Several of these characteristics are related to fermentation that took place during the ensiling process. Useful information about these fermentation patterns can be obtained by measuring fermentation acid concentrations in silage. This information can be used when trouble-shooting feed intake and animal performance problems in dairy farms. This article will briefly review the process of silage fermentation and then discuss interpretation of fermentation acid profiles of silages.

When forage is cut for silage, it contains a population of naturally occurring bacteria. On the living plant, growth of these bacteria is held in check by natural plant defense mechanisms. After the plant is chopped and in the silo, the bacteria multiply rapidly. Various species of bacteria compete for dominance within the silo. For favorable silage fermentation naturally occurring, homofermentative lactic-acid bacteria (LAB) should emerge from this competition as the dominant species. The important characteristics of LAB are that they produce lactic acid from plant sugars, and they don’t degrade plant proteins. This is desirable because lactic acid is the major preservative in silage. Furthermore, lack of plant protein degradation is important not only because it preserves nutritional quality of the proteins, but also because nitrogen products formed during protein degradation are important causes of reduced feed intake.

Conditions favoring dominance of LAB are low moisture (60 to 65%), ambient temperature greater than 60°F, high sugar concentration, low buffering capacity, tight packing, and efficient exclusion of air in the silo. Corn is a particularly desirable crop from which to make silage because typically sugar content is high, relative to other silage crops, and buffering capacity is low. Alfalfa, on the other hand, is a more challenging crop from which to make silage because sugar concentration is low and buffering capacity is high.

**Competing Bacterial Species**

Some of the other bacterial species that compete with LAB for dominance in the silo include clostridia and coliform bacteria. Clostridia bacteria are particularly undesirable because they degrade plant proteins extensively, creating protein degradation products known as amines. Some of the most important amines have such nasty sounding names as “putrescine,” “histamine,” and “cadaverine.” These protein degradation products can affect adversely feed intake. Coliform bacteria also may degrade plant proteins, although probably not as extensively as clostridia. Conditions favoring dominance of clostridia and coliform bacteria are high moisture concentrations (>70%) and high buffering capacity.

From the previous discussion it might seem that culturing the silage to determine which species of bacteria predominates would be a useful means of evaluating silage fermentation quality. However, this is not the case because microbial populations in the silo can shift over time, and the dominant population at the moment may not reflect the overall fermentation pattern over time. In contrast, concentrations of fermentation acids form a “foot print” of the bacterial population that produced them. Thus, measuring fermentation acid concentrations can provide valuable information relative to the predominant type of bacteria influencing silage fermentation.

**Major Fermentation Acids**

The major fermentation acids in silage are lactic acid, acetic acid, propionic acid, and butyric acid. Lactic acid bacteria, as the name implies, produce lactic acid. Therefore, it is desirable that lactic acid be the predominant fermentation acid in silage. Clostridia bacteria produce butyric acid; thus, presence of butyric acid is a clear indication of clostridial fermentation, with accompanying degradation of plant proteins. In addition, high butyric acid concentrations in silage can lead directly to ketone body production in the cow. Ketone bodies formed from silage butyric acid are probably not a direct cause of ketosis, but do appear to increase ketosis incidence in ketosis-prone herds. In high quality silages there should be essentially no butyric acid. Higher moisture silages, especially haylages, are prone to clostridial fermentation with butyric acid production. The relationship of silage moisture concentration of haylage to the risk of butyric acid formation is illustrated in Figure 1.

Acetic and propionic acids are the other major fermentation acids in silage. They may come from “heterofermentative” LAB, in which case the presence of small concentrations of...
these acids is desirable. Alternatively, acetic and propionic acids may come from coliform bacteria fermentation, which is detrimental because these bacteria may cause some protein breakdown. High concentrations of acetic acid, especially when equal to or higher than the lactic acid concentration, are undesirable. Guidelines for desirable fermentation acid profiles in corn silage and haylage are given in Table 1.

Whenever poor feed intake is a problem with silages, fermentation acid concentrations, as well as moisture and pH values, should be measured. Essentially nothing can be done to correct a fermentation problem once it has occurred. However, once the problems are known, the offending silage can be diluted with better silage, and (or) fed to animals with relatively low nutritional needs.

Making Silage

To avoid undesirable fermentation patterns in silage, proper silage making techniques are essential. These include harvesting at recommended plant maturity and moisture concentration (60 to 68%), rapid silo filling (especially in bunkers), appropriate particle size, and extensive packing. Covering bunker silos with plastic or other material impervious to air is also important.

To measure fermentation acids in silage, take fresh samples from several places across the face of the silo. Fermentation patterns can vary from place to place within the silo, so sampling from various points is important. At least 6 to 8 inches of silage should be removed before taking the samples. It is best to take the samples at feeding time to assure that an adequate amount of silage is removed from the silo face. In some situations in which the stability of silage after exposure to air is in question, it may be useful to sample directly from the silo face, and from the feed bunk. However, for initial testing, samples should be taken 6 to 8 inches into silage. Samples should be placed in airtight plastic bags and placed on ice for delivery to the laboratory. This prevents further fermentation of the silage during transit. Silage fermentation acids can be determined by the Nutrition Section of the Animal Health Diagnostic Laboratory at Michigan State University. For further information, contact the laboratory at (517) 353-9312.

1 The term “homofermentative” means there is only one product of their fermentation, in this case lactic acid.

2 The term “heterofermentative” means there are multiple fermentation products, including acetic acid, propionic acid, as well as lactic acid.

<table>
<thead>
<tr>
<th>Table 1. Desirable pH and fermentation acid concentrations in corn silage and haylage.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Criterion</strong></td>
</tr>
<tr>
<td>pH</td>
</tr>
<tr>
<td>Acetic acid (% of dry matter)</td>
</tr>
<tr>
<td>Propionic acid (% of dry matter)</td>
</tr>
<tr>
<td>Butyric acid (% of dry matter)</td>
</tr>
<tr>
<td>Lactic acid (% of dry matter)</td>
</tr>
<tr>
<td>Lactic acid as a percentage of total fermentation acids</td>
</tr>
</tbody>
</table>
Important Tips For Managing Ketosis

Michael McFadden
Extension Dairy Agent
Bay, Isabella, Mecosta, Midland Counties

Ketosis is a metabolic disorder that plagues many dairy cows. Cows typically show clinical signs of ketosis during the first 30 days of lactation. Dairy producers often focus preventative efforts on the rations for lactating cows when trying to correct ketosis problems in their herds. This can lead to frustration in those cases in which the origin of the ketosis problem lies in the management of the dry cows in the farm. Testing dry cows for ketone bodies in the urine can be an invaluable aid in identifying the origin of ketosis problems. The dipsticks used in testing urine for ketone bodies must be protected from moisture. False negative results can be obtained when the test dipsticks become damp. If ketone bodies are present in the urine of dry cows, changes in management of dry cows may be warranted. Conversely, if ketone bodies are not detected in the urine of dry cows then it may be appropriate to address the feeding management of cows in early lactation.

Dry Matter Intake Decreases
Dry matter intake of cows decreases about 30% during the last 1 to 2 days prior to calving and does not recover for several days after calving. In many cows, intake may decline progressively over the last 10 to 14 days before calving. This decrease in dry matter intake reduces the amount of energy available for metabolism by the cow. In response to this energy shortage, cows begin to use body fat as an alternative energy source. The fat circulates via the bloodstream to various target organs in the form of non-esterified fatty acids (NEFA). NEFAs also can accumulate in the liver of the cow and cause fatty liver.

Liver triglycerides (fat) can increase by a factor of three at calving time and by four times during the fourth week of lactation (1). High concentrations of circulating NEFAs and fatty infiltration of the liver have been associated with post-calving health problems (2). Cows that were force-fed and did not experience this usual decrease in dry matter intake had reduced deposition of fat in the liver (3). This would emphasize the absolute importance of dry matter intake to the dry cow immediately before calving. Having fresh feed and water available to this group 24 hours a day, and using practices that encourage feed consumption should be primary goals of a successful transition from the dry period to lactation.

Another important consideration for feeding close-up (within 2 to 3 weeks of calving) dry cows is the ration itself. Close-up, dry cow rations should consist of a totally mixed ration with an energy density of 0.73 Mcal NE/lb and a crude protein level of 16%. Five to 8 lb of the ration dry matter should be a fermentable starch source such as corn. Fermentable starch sources promote elongation and proliferation of rumen papillae, which assist in absorption of fermentation acids and avoidance of rumen acidosis later on. Fermentable starch also allows the population of rumen microbes to become acclimated to the higher grain diets fed during lactation. Another 5 to 8 lb of ration dry matter should come from long forage such as grass hay or silage. The purpose of the long forage is to maintain the rumen matte and subsequent health of the rumen and the cow. It also can be beneficial for some of the forages to be similar to those used in early lactation rations.

Important Factors for Diet
Availability of fresh feed and water, adequate amount and length of forages, and a supply of fermentable starch from grains are the cornerstones of a successful close-up, dry cow program. The investment of time and resources to properly manage close-up dry cows is one of the most important and profitable investments that can be made in a dairy farm.

References
(sperm) throughout his life, the cow never produces any new follicles or eggs after birth. Rather, the cow starts rapidly losing her germ cells or eggs beginning when she is an embryo. Indeed, by the time a heifer reaches 8 months of age only about 21,000 of the original 2,000,000 healthy follicles with eggs remain, and by 4 to 6 years of age, only about 5,000 healthy follicles remain. Thus, a 5-year old cow does not run out of eggs! Nevertheless, there is a loss of 99.75% of the cow’s original 2,000,000 eggs by the time a cow is 4 to 6 years of age!

The Mystery of Sleeping Follicles

What does all this have to do with follicular waves? Well, since a pair of ovaries usually contains 100,000 primordial follicles at birth, they don’t all grow and ovulate at once or the reproductive life span of the cow would be really short! Moreover, the ovary isn’t big enough to accommodate such massive follicular growth, nor could the uterus nurture such an outrageous number of eggs even if they all could be fertilized. Mother Nature has solved this particularly thorny problem by putting all of the immature, primordial follicles to “sleep” or in a dormant state as soon as they are formed during embryonic development, and by creating the wave phenomenon for growth when follicles “wake up”. No one understands why follicles go to sleep, why they remain asleep, or what triggers a select group of follicles, rather than all of them, to wake up and begin to grow.

Primordial Follicular Growth

Reproductive scientists are reasonably certain that a group of primordial follicles distributed across both ovaries awakens and begins to grow each day. No one is sure exactly how many follicles grow each day. But, if one uses Dr. Erickson’s numbers it appears that about 330 primordial follicles grow each day during the first 8 months of a calf’s life. Then, growth of primordial follicles slows dramatically to only about 7 a day by the time a cow reaches 6 years of age! This daily growth process probably begins in the embryo and continues throughout the cow’s life until reproduction ceases, which typically occurs between 15 to 25 years of age. So, by the time a cow is 5 to 6 years old, she has not only lost 99% of her original number of primordial follicles and eggs, but the daily growth of follicles has slowed from hundreds to about a half dozen. Does the number of primordial follicles a calf is born with affect subsequent fertility? Does the massive loss of follicles and eggs, and slowed daily growth of follicles as the cow ages explain why cows may be more difficult to get pregnant than heifers? No one knows the answers to these questions. Nevertheless, in Dr. Erickson’s studies, he reports that cows with infertility problems also had a very low number of primordial follicles compared with fertile cows.

Despite the potential for growth of a different group of follicles each day, only a few groups continue to grow until one of the follicles reaches the size necessary for ovulation. In theory, during a 21-day estrous cycle, 21 different groups of primordial follicles would begin to grow. However, only two or three groups beginning growth during one estrous cycle continue to grow, and generally only one follicle from each group grows to ovulatory size. Because a primordial follicle is less than 0.002 inches in diameter and an ovulatory-size follicle can reach nearly 0.8 of an inch in diameter, a primordial follicle must increase in size at least 400-fold before it reaches ovulatory size! A wave of follicle growth, therefore, is initiated when a small group of the 100,000 sleeping primordial follicles awakens and begins to grow. While one wave is ongoing and selecting one follicle to reach the size for ovulation, all the other follicles within the group, and all the other primordial follicles that begin growth each day, die! The process of follicle death, which is one of the hottest topics in biology today, is called apoptosis. Dead follicles disappear from the ovary via a process called atresia.

The continuous waves of follicle growth and death explain why so many of the original number of primordial follicles and eggs in the embryo rapidly disappear as cows age. It is not known if this decrease in numbers of eggs affects fertility of cows.

New Follicular Growth

Once a follicle within a wave reaches ovulatory size, it either ovulates or dies. Once ovulation or death occurs, a new wave of follicular growth begins. Thus, waves of follicular growth continue at reasonably regular intervals throughout the cow’s life. Practically speaking, we have no way of determining exactly when a wave begins. Once follicles in a wave reach 0.2 inches in diameter, ultrasound can be used to monitor their growth to ovulatory size. Using ultrasound, Dr. Richard Pursley in our Department of Animal Science determined that most heifers have three waves of follicular development during one estrous cycle (Figure 1, next page). But, most lactating cows have two waves. For heifers with three waves, two waves occur during different times of the luteal phase of the estrous cycle while the corpus luteum is growing (depicted in top portion of figure). Each of these waves ends in development of a mature follicle that does not ovulate because the heifer is not in estrus or heat (Waves 1 and 2; depicted in lower portion of figure). These non-ovulatory waves are followed by another wave occurring during days 17 to 21, which leads to development of the follicle that ovulates after estrus.

The single follicle that develops to the size adequate for ovulation during each follicular wave is now commonly called the dominant follicle. Ultrasound has been used recently to identify waves of follicular development that occur at approximately weekly intervals before puberty, during pregnancy and after calving. So, waves of follicular growth occur most of the time in female cattle. To summarize, although a calf is born with 100,000 primordial follicles, and waves of follicular growth occur at regular intervals...
throughout life, only a tiny number of follicles reach ovulatory size and become dominant, and an even smaller number of the dominant follicles ever ovulate.

**Examining the Luteal Phase**

Okay, follicles grow in waves and a dominant follicle in each wave escapes all this apoptosis, atresia and death and reaches ovulatory size. What about those large ovulatory size dominant follicles that develop and die during the luteal phase? What’s that all about? Let’s start with the last question. In Figure 1, you will notice that Wave 1 occurs about the time an embryo would enter the uterus after fertilization and during the early stages of embryonic development. Although it is unknown if the dominant follicle in Wave 1 has any effect on early embryo development, it would be interesting to know, especially since the cause(s) of the high embryo mortality in cows remains unknown. Surprisingly, Wave 1 and Wave 2 may be involved in timing when a corpus luteum will regress. Dr. Roy Fogwell of the Michigan State University Department of Animal Science did studies showing that if growth of the Wave-1 and -2 dominant follicle was blocked, regression of the corpus luteum and occurrence of estrus also were delayed. Finally, the dominant follicle in the ovulatory wave has important roles for successful reproduction. It is the only follicle on the ovary that produces major amounts of estrogen. When the cow is in estrus (heat), this follicle produces enough estrogen to simultaneously cause estrus, trigger release of the hormone that causes ovulation, and prepare the uterus for pregnancy. Bring on the bull, or should I say AI technician! That’s not all. After ovulation, the dominant ovulatory follicle transforms into a corpus luteum which produces progesterone required for a successful pregnancy. While the other dominant follicles that develop during the luteal phase of the estrous cycle, or during pubertal development, pregnancy, or after parturition, also produce estrogen, the amounts are not sufficient to cause estrus or ovulation.

**What Can the Producer Do?**

Okay, so waves are important to the dairy cow! What about me, the producer? There are no reproductive dairy management methods widely used that precisely control waves! So what? Well, this means that you the producer can not precisely control growth of the ovulatory follicle. For example, prostaglandin causes regression of the corpus luteum, but it does not control when a wave will occur, nor when or how fast follicles will grow in a wave. Remember, although most heifers have three waves, some also have 1, 2 or 4 per estrous cycle. In addition, even among cows that have the same number of waves during an estrous cycle, there is also variability when a wave starts and ends. Because stage of development of the ovulatory follicle in each cow’s wave is different at the time prostaglandin is injected, precisely when growth of the ovulatory follicle will start, and how fast the ovulatory follicle will grow, will be different for each cow. Because prostaglandin does not control when a wave will occur or the rate of growth of follicles in a wave, ovulation will occur at various times after prostaglandin treatment. Thus, the *asynchronous* growth of the ovulatory follicle after prostaglandin treatment leads to variability when ovulation occurs, usually spanning a period of 3 to 7 days after prostaglandin treatment. The variable ovulation times after prostaglandin treatment explains why fixed-time AI after prostaglandin treatment usually results in poor conception rates. For fixed-time AI to result in consistently high conception rates in heifers (greater than 60%), reproductive scientists must first learn how to precisely control occurrence of a wave, and growth and maturation of follicles in a wave in heifers. For example, Ovsynch®, which uses a combination of prostaglandin and GnRH, is being used by Dr. Pursley to synchronize follicle waves and ovulation in lactating dairy cows so fixed-time AI can be practiced successfully.

Learning how to synchronize follicular growth also will improve success of superovulation and *in vitro* fertilization. Finally, improving our basic understanding of hormone production by the dominant follicle in a wave should stimulate development of new methods to control puberty, and to control occurrence of estrus and ovulation postpartum.

**Summary**

The regular occurrence of follicular waves is necessary for successful reproduction in the cow. However, number of waves per estrous cycle, and the timing of when each wave begins and ends, differs among cows. Consequently, development of methods to artificially control a wave and ovulation, such as use of Ovsynch®, would improve the reproductive tools available to control ovulation and thus be of economic importance to dairy producers.
Meet Your Dairy Agents...

Pam Jahnke  
Dept. of Animal Science

Dr. Barbara Dartt. Serving a diverse dairy industry is one of the main challenges that Dr. Barbara Dartt has had to face since being named the Michigan State University Extension Dairy Agent for Ionia, Kent and Montcalm Counties, an area home to about 300 dairy farms.

Her clientele ranges from hand-milking Amish farmers with herds of under ten cows to producers with 1,800 cows and modern automated milking systems. Her goal? “Understanding what is topical and relevant to my three-county area and trying to provide expertise to all of those producers,” said Dr. Dartt, who started her job last fall.

Her office is located at 100 Library St. in Ionia. Dr. Dartt can be contacted by phone at 616-527-5357 or e-mail at darttb@msue.msu.edu.

To find out what’s relevant, she has been hosting discussion groups and letting the attendees choose the agenda. Hot topics have included the merger of Independent Milk Producers Cooperative Association with Dairy Farmers of America, manure management, and cow reproduction.

“It’s like meeting at the feed mill or leaning over the fence. It’s a chance to share common practices and avoid reinventing the wheel,” Dr. Dartt notes.

Recently, she taught a series of basic computer skills classes for farmers and agribusiness people and has been conducting annual financial analyses for individual farms. A future goal is getting producers interested in strategic management training.

Growing up on an upper Michigan farm that grazed 650 head of sheep and cattle, Dr. Dartt is no stranger to production agriculture. Her father, Dr. Ben Bartlett, is the MSU Extension Dairy and Livestock Agent for the Upper Peninsula and her grandfather, Warren Cook, served as a County Extension Director in Eaton County. As a result of her farm background and extension heritage, her career goal is to be a resource for agricultural producers. Extension work is a logical way to pursue that goal, she said.

Dr. Dartt received her M.S. in Agricultural Economics in 1998, her doctorate of Veterinary Medicine in 1996 and her B.S. in Animal Science in 1993 - all from MSU.

She received the Veterinary Student Research Award for “outstanding contribution to research” and the Bovine Production Medicine Award from MSU’s College of Veterinary Medicine in 1996 for her “outstanding abilities” demonstrated in herd medicine.

Prior to her current post, she served as a graduate research assistant for the MSU Department of Agricultural Economics, where she conducted her master’s research evaluating profitability, labor efficiency, and quality of life in Michigan dairy farms using rotational grazing. She also practiced veterinary medicine in dairy farms in the Fowlerville area.

Phil Durst. Communication of practical information to meet needs of dairy producers is the backbone of a dairy agent’s job, notes Phil Durst, Michigan State University Extension Dairy Agent for Northeast Michigan.

Since Durst, who has been at the job for a little over a year, deals with farmers from a 14-county area, his methods of communicating are as varied as his farmers’ needs. Through meetings, one-on-one visits with farmers, and as the author of a newsletter, “Cowsense,” he works to meet those needs.

To stay in touch with his constituency, he hosts monthly community dairy meetings dealing with topics such as nutrition, breeding, lameness, and DHIA records in West Branch, Clare, Alpena, and Mio. In addition, he has been coordinating the dairy portion of the Northern Michigan Grazing Conference held in January that also brings together beef and sheep producers.

He also hosted a monthly milk price risk workshop to assist farmers in understanding the milk market and price risk-management tools available through the commodity exchanges. This workshop, in West Branch, was initially begun when he and Fred Hinkley, County Extension Director for Ogemaw County, worked with Independent Cooperative Milk Producers Association to start price risk-management workshops around Michigan.

“Managing a dairy today takes business skills as well as production skills. Knowing the cost of production and comparing yours with others in the industry will help to highlight strengths and opportunities in the operation,” he said.

Durst has been promoting Northeast Michigan as an ideal place to relocate a dairy, adding that lately he has been working with individual farms interested in expansion. “This is an area where dairies can and will grow,” he said.

Prior to his job here, he served as the County Extension Director and a Dairy Agent in a five-county area in Pennsylvania. While in his former job, he won national awards from the National Association of County Agricultural Agents in the area of communications.

Durst earned his M.S. in agronomy from Pennsylvania State University in 1985 and his B.S. in chemistry from the Philadelphia College of Pharmacy and Science.

The counties that he covers include: Alcona, Alpena, Arenac, Cheboygan, Clare, Crawford, Gladwin, Iosco, Montmorency, Ogemaw, Oscoda, Otsego, Presque Isle, and Roscommon. His office is located at 205 S. Eighth St. in West Branch. He can be reached at 517-345-0692 or by e-mail at.
with the Michigan Holstein Spring Spectacular, was held in conjunction said. event is a great recruiting tool, Domecq Dairy Judging Teams assisted. Such an event was the Future Farmers of America (FFA) Dairy Judging Field Day, a show calf sale, and the annual recognition banquet.

All three events - held within one week for the first time - took place March 25 through March 27, said Joe Domecq, a faculty advisor for the MSU Dairy Club and coach of the MSU Dairy Judging Team.

The FFA Judging Field Day held at the Pavilion attracted 80 high school students from across the state. Students from the MSU Dairy Club and MSU Dairy Judging Teams assisted. Such an event is a great recruiting tool, Domecq said.

A second event, The Spartan Spectacular, was held in conjunction with the Michigan Holstein Spring Show, the Michigan Jersey Show and State Sale at the Pavilion for Agriculture and Livestock Education at MSU. Student chairman of the event was Chad Kreeger, who was responsible for cattle selection and preparation, advertising, and dealing with buyers and sellers. Club and team members assisted with bookkeeping and clerking duties as well as taking care of the heifers for 4 days at the Pavilion.

Nineteen heifers and one package of five embryos were sold with the high animal going for $5,000. The average selling price for all 20 consignments was $1,750. Nine of the heifers were from Canada with the rest - including the embryos - from Michigan. “Stookey EP Blackrose - ET” was the top selling calf. She was sold by Harold and Todd Wright and Richard Wattie of Ontario and Quebec, Canada. She was purchased by Michigana Farms of Scotts, MI. Michigana Farms also purchased two other heifers in the sale.

Domecq, a specialist in the MSU Dairy Management Program, said the intent of the sale was to have a small select sale of animals that would do well in a show ring and 4-H members would want to buy. “It (the sale) exceeded expectations - the students did a tremendous job, and we already have interest for next year’s sale,” Domecq said.

The third event was the Annual MSU Dairy Club Banquet, which attracted about 120 people including parents, students, alumni, faculty, and industry people held March 26 at the Sheraton Lansing Hotel. Those students honored at the banquet were Corey Risch for Outstanding Senior; Chris Pawlanta for Outstanding Ag-Tech Member, and Chuck VanErp for Outstanding First-year Member. Jack Barnes, retired general manager of the Michigan Milk Producers Association, was the guest speaker. Barnes also was

Members of the Michigan State University Dairy Club and Dairy Judging Teams wrapped up their 1998-99 academic year by hosting three popular events in one 3-day period. These were the Future Farmers of America (FFA) Dairy Judging Field Day, a show calf sale, and the annual recognition banquet.

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A second event, The Spartan Spectacular, was held in conjunction with the Michigan Holstein Spring Spectacular, was held in conjunction
 awarded the club’s Honorary Alumnus Award.

Concluding the banquet was an auction and raffle, both conducted as fund-raisers, with the proceeds going to the club account. A donation will be given to the Michigan Dairy Memorial Scholarship foundation in Jack Schut’s name, a former club member who died in February.

Michigan Dairy Expo
Set for July 5 - July 9

Tomorrow’s dairy industry leaders are expected to attend this year’s Third Annual Michigan Dairy Expo set for Monday, July 5 through Friday, July 9 at the Pavilion for Agriculture and Livestock Education at Michigan State University.

“Our objective for this event is to provide an environment of dairy activities that will foster positive youth development and excite our young people about opportunities in the dairy industry,” said Richard Pursley, faculty coordinator of the event. Encouraging and promoting youth involvement in dairy activities, showcasing the Michigan dairy industry and providing continuing education to the industry are all part of the program’s goals.

The Dairy Expo will include state breed shows, youth and adult workshops and seminars and the 4-H Dairy Days Program. A new facet of the program this year includes consumer education day which will include exhibits on young calves, milking cows, nutrition, cooking demonstrations, and safety and storage of dairy products.

During the Expo, $10,000 in premiums and $3,000 in calf giveaways will be awarded, said Pursley. He said six heifer calves will be given away to the top six placing youths in the youth events.

Here is the schedule of events, which are free.

• **Monday, July 5**
  7:00 - 9:00 p.m. - Youth workshop - Fitting and Showing Dairy Cattle.

• **Tuesday, July 6**
  8:00 a.m. - The 1998 All-Michigan Dairy Youth Show (beginning with Showmanship)
  7:00 - 9:00 p.m. - Youth Workshop, Dairy Cattle Judging.

• **Wednesday, July 7**
  Consumer Education Day, 3 to 8 p.m., adult exhibits.
  8:00 a.m. - Youth Dairy Cattle Judging Contest.

• **Thursday, July 8**
  Lansing Area Kids Day, consumer education continues with youth displays from 9 a.m. to 3 p.m.
  9:00 a.m. - 4-H Dairy Bowl - Junior Skillathon, and Colored Breed Show.
  1:00 p.m. - 4-H Dairy Quiz Bowl - Quiz off.
  6:00 p.m. - Youth Awards Banquet - Hannah Ballroom

**Friday, July 9**
  8:00 a.m. - Open all breed show - two rings in arena, Colored Breeds and Holsteins.
  3:30 p.m., Supreme Champion.


Sponsorship of youth events remain available. If interested, please contact Carla McLachlan at 517-432-5402.

Business and Finance

Michigan Milk Market Update

Christopher Wolf
Dept. of Agricultural Economics

One prominent agricultural economist defines milk price volatility as a dropping milk price. When the price is rising, that is not volatility, right? The volatility of the milk price is evidenced by the large month-to-month changes in the basic formula price (BFP), which is a function of cheese and butter prices. The forecast was for the BFP to drop from December to January to February. What else could it do from an historic high of $17.34 per hundredweight (cwt) in December. The magnitude of the drop from $16.27/cwt in January to $10.27/cwt for February’s BFP (announced March 5), also was historic being the largest single monthly decrease ever (see Figure 1). By the time you read this, the drop will be old news. The BFP price drop was a bit of an over-reaction and the BFP bounced up to $11.62/cwt in March.

Let’s take a look at what is happening behind the milk price volatility. There are several factors perhaps the most important of which is the movement away from Price Support Program intervention in the dairy markets. The Price Support Program has existed since 1949. From 1950-1981 the support price was 75 to 90% of ‘parity.’ Parity was defined as an index of agricultural commodity prices from 1910-1914, not coincidentally a prosperous time in agriculture. The Price Support Program tempered both low milk prices, by purchasing any product offered at the support price, and high milk prices, by selling product back into the market at trigger prices.

Large government purchases in the early 1980’s caused the support price to be changed to a function of projected government purchases. The Price Support Program still maintained a functioning price floor for several years. The 1996 Farm Bill, also called Freedom to Farm, phased out the Price
Support Program with December 1999 being the final month. The support price has been below market price for all products except non-fat dry milk for several years. In 1999 the support price is $9.90/cwt for milk containing 3.67% fat. Even though government purchases have been small for several years, the Price Support Program has tempered price volatility through purchases and the psychological effect of its existence.

**General Supply and Demand**

Also affecting the milk price level is the general supply and demand situation in the U.S. Figure 2 displays milk production level for 21 major dairy states (which account for the vast majority of milk production in the U.S.) as well as the BFP for 1997 and 1998. Milk price and milk production generally move opposite each other.

**Michigan Milk Market Prices**

Michigan milk market prices for 1998-99 are displayed in Figure 3. These prices do not yet reflect the drop in manufactured milk price. The fluid milk premium has climbed back up to one dollar in early 1999 after falling to near 70 cents with the high fluid prices in September.

**Average Mailbox Milk Price**

The average mailbox milk price divided by the feed costs (milk price-to-feed cost ratio) in Michigan for 1997 and 1998 is displayed in Figure 4. The feed cost index is a function of the average Michigan prices of corn, hay, and soybeans. The milk price-to-feed cost ratio is a simple proxy for profitability. A higher ratio indicates a larger margin between milk and feed prices and should indicate that the average Michigan dairy farmer is better off than with a lower ratio. This ratio is a general barometer of the margin between milk price and feed costs. The ratio ranges from a low of 2.03 in May 1997 to a high of 4.09 in December 1998. As Figure 4 shows, the milk price-to-feed cost ratio has climbed steadily through 1997 and 1998.