Have you ever heard of the Darwin Awards? For those who have not, these awards are given to individuals who, out of their own stupidity, are improving the human species by removing their genes from the gene pool. Some of the nominees for 1999 include the following.

Nominee No. 1, from the San Jose Mercury News: An unidentified man, using a shotgun like a club to break a former girlfriend’s windshield, accidentally shot himself to death when the gun discharged, blowing a hole in his chest.

Nominee No. 2, from the Kalamazoo Gazette: James Burns, 34, a mechanic from Alamo, Michigan, was killed as he was trying to repair what police described as a “farm-type truck”. Burns got a friend to drive the truck down the highway while Burns hung underneath so that he could ascertain the source of a troubling noise. Burns’ clothing caught on something, however, and the other man found Burns “wrapped around the drive shaft.”

Nominee No. 3, from the Hickory Daily Record: Ken Charles Barger, 47, accidentally shot himself to death in Newton, NC. Awakening to the sound of a ringing telephone beside his bed, he reached for the phone, but grabbed instead a Smith & Wesson 0.38 Special, which discharged when he drew it to his ear.

Nominee No. 4, from the Indianapolis Star: Sheriff investigators said that Gregory David Pryor died in his parent’s rural Dunkirk home while cleaning a 0.54-caliber muzzle loader that had not been firing properly. Gunpowder ignited and the weapon discharged in his face when he used a cigarette lighter to look into the barrel.

Nominee No. 5, from the Arkansas Democrat Gazette: Two local men were injured seriously when their pick-up truck left the road and struck a tree near Cotton Patch

The Darwin Awards go annually to people who have shown incredible, stupid behavior and an apparent complete disregard for basic common sense. The human species is better served by having their genes removed from the gene pool. At times, the dairy industry in the Tri-State area shows behavior worthy of a Darwin Award. The area is blessed with an unmatched array of natural resources and is located strategically next to large, growing dairy markets. Despite these natural blessings, the area has progressively lost market share of the growing national milk supply. To remain a long-term, viable and competitive dairy region, our industry must address issues of structure, economic impact, animal waste, research, and leadership.

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Summary
The Darwin Awards go annually to people who have shown incredible, stupid behavior and an apparent complete disregard for basic common sense. The human species is better served by having their genes removed from the gene pool. At times, the dairy industry in the Tri-State area shows behavior worthy of a Darwin Award. The area is blessed with an unmatched array of natural resources and is located strategically next to large, growing dairy markets. Despite these natural blessings, the area has progressively lost market share of the growing national milk supply. To remain a long-term, viable and competitive dairy region, our industry must address issues of structure, economic impact, animal waste, research, and leadership.

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on State Highway 38. Thurston Poole and Billy Ray Wallis were returning home after a frog-gigging trip. Poole’s pick-up truck headlights malfunctioned due to a burned out headlight fuse. A replacement fuse was not available, but Wallis noticed that a 0.22-caliber bullet from his pistol fit perfectly into the fuse box located next to the steering wheel column. Upon inserting the bullet, the headlights began to operate and the two men proceeded eastbound toward White River Bridge. After traveling approximately 20 miles and just before crossing the river, the bullet apparently overheated, discharged and struck Poole in the right testicle. The vehicle swerved sharply to the right and struck a tree. Poole suffered only minor cuts and abrasions from the accident, but will require surgery to repair the wound. Wallis sustained a broken clavicle. Upon being notified of the wreck, Poole’s wife Lavinia asked how many frogs the boys had caught, and whether anyone had gotten them from the truck.

What is the connection between the Darwin Awards and the Tri-State Dairy Industry? As you read the list of nominees for 1999, you must have realized that in all instances the nominees ended up on the list because they failed to realize in time the potential negative impact of their actions. As you read these accounts, surely you must have thought “how can someone be so stupid?” Well, as I look at the behavior of our dairy industry in Indiana, Michigan and Ohio, I am sometimes very worried that we are positioning ourselves to receive a Darwin Award in 5 or 10 years from now.

From a natural resources standpoint, the Tri-State Area possesses the critical elements to foster a dynamic dairy industry. The climate is near ideal for dairy production. Crop production is extensive, and availability of good quality feedstuffs rarely is questioned. In all three states, the dairy infrastructure ranges from adequate to extensive. Land Grant Universities and other colleges offer a wide range of programs to address the needs of the industry. The combined milk production in all three states, estimated at 12 billion pounds in 1998, meets only 80% of the 15 billion pounds of the total milk demand of its growing population. The dairy processing sector is extensive and easily could handle substantially more milk. South and east of us is a region experiencing a constant milk production decline combined with a steady increase in the human population. Currently, the Southeast must import over 3 billion pounds of milk per year just to supply its demand for fluid milk. This deficit in fluid milk is projected to keep increasing for years to come. Our states are strategically located to capture this growing market. However, we have failed to grow our industry to even follow the national pace of growth in demand for dairy products. In 1970, Indiana, Michigan and Ohio produced 11.4 billion pounds of milk altogether, or 9.7% of the total national milk supply. In 1996, the same three states produced 11.9 billion pounds of milk, or 7.8% of the national production. I don’t know of any business that can continuously lose market share and expect to remain viable in the long-term. Our industry is sometimes hopelessly divided on issues that shouldn’t be issues in the first place. Many, if not most, are content with myopic solutions equivalent to using 0.22-caliber bullets as fuse replacements because “they work”, that is, they keep the headlights on. Until....... To avoid receiving a Darwin Award, the Tri-State Dairy Industry must address problems in five areas.

1. Structural issues. The terms “mega” farms and “factory” farms are often used to describe larger dairy operations. Total farm assets of a 1000-cow “mega” farm are generally in the $5 to 6 million range, or about the size of a medium-sized grocery store. Its annual gross sales amount to $3 to 4 million, or about the same as a modern gasoline station. Whereas new grocery stores often receive tax abatements for their construction, and whereas modern gasoline stations are welcome along our highways, construction of a 1000-cow dairy is often perceived as a danger to the community and an unwelcome addition to our industry. Opposition claims that they are a threat to family farms, ignoring the fact that the vast majority of larger dairy farms are family operations. Mega dairy farms would be considered small businesses in every other industry that I know of. Our industry needs considerably more large herds if it is to maintain its current market share of the national milk supply. The only hope that we have to save some smaller dairy farms is to insure that the infrastructure (veterinarians, feed dealers, equipment dealers, nutritionists, milk handlers, etc.) remains competitive and available by ensuring that a critical mass of milk is produced locally.

2. Economic impact issues. In all three states, the dairy industry has a significant impact on the rural economy. All too often, however, the magnitude of the impact is severely underestimated even by our own industry. For simplicity reasons, the economic impact of the dairy industry generally is reported using farm gate receipts, as if the milk check remained entirely on the farm without being spent, and as if the milk was leaving the state without further processing. Farm gate receipts do not account for the indirect and induced effects of an agricultural industry. Such effects are very large in the dairy industry. Dollars generated from the production of milk and its processing flow through the economy, and multiply many times during the span of a year. Dr. Cameron Thraen and I at Ohio State used a standard input-output method to estimate the economic impact of a new 2,500-cow dairy in northwestern Ohio. To the surprise of many, we estimated that a farm of this type has a long-term, sustainable economic impact amounting to $13.4 million per year and generates a total of 129 additional jobs earning an average of $21,700 per year. A dollar flowing through a dairy of any size fuels 7 to 10 additional dollars of economic activity per year.
Our rural sector and its tax base are heavily dependent on the economic activity generated by our dairy industry. Our failure to communicate this message appropriately explains in part the erosion of our political support.

3. Animal waste issues. Many of our inner cities are gross examples of the dismal failure of some of our public development policies. Many people working in towns or cities live outside the town boundaries. Extensive road networks allow many would-be urbanites to live their dreams of country living and weekend farming. Unfortunately, their perception of rural living differs substantially from historical reality. Imagine, Elsie the cow comes with an unmistakable odor! Amazingly, most people would be very insensitive to someone complaining of neighborhood noise if he knowingly built his house in an industrial park. But the same is not true for people complaining of agricultural odors although they built their house in an “agricultural park”. This battle, however, was lost a long time ago. New approaches must be designed and used if we don’t want to eventually lose the war. Targeted research in this area could play a dramatic role.

4. Research issues. Some time very soon, the dairy industry will have to face the fact that applied research, especially in the area of dairy farm management will have to be industry-funded. In years past, research in both applied and basic areas of dairy production was heavily funded by governments, primarily the federal government. In real terms, public investments in applied dairy research have been steadily declining over the last few decades. Currently, the critical mass of public research dollars in applied dairy research simply is not there. The research agenda has slowly shifted through time. At the risk of being overly simplistic, current public research efforts can be grouped into two clusters: fundamental (basic) research and “feel-good” research. It is sad, but (almost) true, that it is easier to secure grant money to fund a program teaching unwed, teenage mothers how to cook spaghetti than it is to fund a research program in applied dairy management. Thus, most of the questions asked by our progressive industry must be answered from opinions as opposed to research-based facts. Currently, issues of optimal cow grouping, bunk space, feeding frequencies, essential milking routine elements, body condition score, facilities layouts, etc., are answered almost solely from anecdotal evidence. If we are to rely on scientific evidence as the basis for decision-making, then our industry must get involved directly in the funding of research activities.

On a national basis, dairy producers are assessed $0.15 per hundred weight of milk sold to fund the dairy check-off program. This program currently is raising over $240 million per year for advertising and marketing programs and for some research in the development of dairy products. However, by federal mandate, not a single dollar goes to production research. I know of no other industry or company that ignores so completely the funding of research to improve the efficiency of production of its raw product. The paper and timber industries, for example, spend large amounts of money to find ways to improve the productivity of land dedicated to wood production. The rates at which firms invest in research and development vary across industries depending on profitability, growth, and the rate of return on those investments. Commodity industries with small potential for growth (e.g., coal) invest 0.2 to 1.0% of gross revenues in research and development activities. For the dairy industry, these figures translate into rates between 2.5 and 10.0¢ per hundredweight. These numbers must be tripled if one uses a less pessimistic view of the dairy industry and assumes moderate growth, a scenario more in line with the 35% growth of national milk production during the last three decades. Unfortunately, research and development investments by the dairy industry in our three-state area are nowhere close to these benchmarks. Currently, Ohio has a voluntary dairy research check-off program. This program is not very effective due to the low level of participation by Ohio producers. Indiana has no equivalent program. Currently in Michigan, there is an initiative underway to implement a production research and education check-off program of 1.5¢ per hundredweight of milk sold, with all Michigan dairy producers investing. We, in Ohio, are hoping very much that this initiative fails! Otherwise, we may lose much more in the future than annual football games.

5. Leadership issues. Old-fashioned dairy leadership is still very much present in each of our states. This leadership shows a characteristic pattern of “protect and defend”. But there also is an emergence of new leadership best characterized as “grow and expand”. The clash between these two types of leadership is obvious even to remote observers and does a disservice to the industry. On the marketing side, a flurry of mergers and consolidations has resulted in huge dairy cooperatives with national scope. This may be good for the marketing of our milk, but state and regional dairy leadership have been left with a large void. In all three states, however, we are witnessing the emergence of new professional dairy producer organizations. It is vital that our industry does not stand on the sidelines while these younger organizations mature. Their failure would be an unmistakable omen for an outstanding Darwin Award for our Tri-State Dairy Industry.

This article is from the talk given by Dr. Normand St-Pierre, Associate Professor of dairy management, The Ohio State University, at the inaugural Tri-State Dairy Management Conference held November 10-11, 1999 in Ft. Wayne, IN.
From Firefighter to Dairy Manager: How to Change Your Career

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Everybody has “one of those days” now and then. Take the following example. Your day starts when a fresh heifer, coming through the parlor for just the second time, attempts to visit you in the pit during morning milking. You finally finish chores after interruptions from two salesmen and one Extension Agent. Next on the agenda – hooking up the manure spreader – but the hitch is broken. You jump into the pick-up and head to town for parts, only to run out of gas. And it’s only 10 o’clock! This string of mini-crisis could make you wish you had never gotten out of bed.

But what about the rest of your days – the “normal” ones? Do you perform most of your daily tasks because you have to, like a firefighter responding to each new emergency? For instance, are you “forced” to fix the chopper during corn silage harvest because you did not have time for regular maintenance? Or do you perform many tasks because they are the most important or profitable or timely things you can do at that moment? Consider that there might be two modes of operation – proactive and reactive (1).

The Mirage of “Busy-ness”

Filling every day by reacting to urgent tasks certainly can be very attractive. Responding to and solving each new crisis gives many people a feeling of accomplishment. In fact, this reactive trait is often found in good workers. However, evaluating the success of a reactive day is difficult. Is success a list of crossed out “to-dos” or a crisis averted? Or is success something more long term – like a profitable dairy business that can be passed to the next generation?

In “Low Milk Price: A Golden Opportunity” in the May, 1999 issue of the Michigan Dairy Review, it was indicated that, on a daily basis, dairy producers are both the labor and management components of their operations. As a laborer, you are faced with a seemingly endless “to-do” list and you must concentrate on the present. But as a proactive manager, it is your responsibility to look around and determine if you are laboring effectively. Are you using the best, most affordable technology? Are the most important tasks getting done? For example, are the maternity pens cleaned regularly, or has this job taken a back seat because you are too busy treating toxic mastitis cases? The second job is obviously more urgent than bedding or cleaning pens. This simple example illustrates just how easy it can be to keep very busy while at the same time actually accomplishing very little.

As a manager, unless you understand your own definition of success, it will be difficult to determine if you are laboring effectively. Everyone’s definition will probably be somewhat different. But, without a definition, it is impossible to align labor’s daily tasks to help you accomplish this success. Simply being reactive and busy probably will not get you there.

Defining Success

Ideally, most daily tasks would be aligned under a tactical plan. A tactical plan is very specific. It describes how your business will implement day-to-day operations to achieve its goals and objectives – your definition of success. Clearly, without a handle on your definition of success, it becomes difficult to arrange daily tasks to accomplish anything more than the status quo. See Figure 1.

Having a strategic plan, however, can allow you to align your tactical plan with your goals. A strategic plan describes the business’s overall objectives and includes goals and your tactical plan. Creating a strategic plan is a proactive step that takes time. Your current mode of operations could more closely resemble firefighting than planning. If this is the...
case, it may be hard to imagine that you could find a spare moment to think about defining success and goal setting, much less ponder how your daily tasks will help you accomplish these goals.

**How to Change Your Career**

Making a commitment to evaluate your mode of operations means stopping and thinking about what success means to you and aligning your daily tasks with these goals. As you might guess, this can be very easily said, but much more difficult to do. Here are some ways to begin.

1. Start small. Set aside one regularly scheduled hour with no disturbances to plan the upcoming week. If possible, plan the week in conjunction with relevant managers or family members. It is key that this hour is a high priority both to you and others involved. If you miss a few planning sessions or ignore the outcomes, your family and employees will follow your example.

   a. List what is going to come up in the next week. Be sure to include all facets of your life: farm, family, social, community, and others. Anticipate bottlenecks and crises. For example, could you run short of feed, labor, or supplies?

   b. Prioritize the tasks. This will help you stay focused on the important, not the urgent.

   c. Delegate!! If you have other people that help you on the dairy, you will never move beyond reactive unless you are able to trust them with some of the tasks that you regularly do.

2. Set goals. After a month or two of these weekly meetings, it may be easier for you to formulate goals. Some may be short-term and can be accomplished over the next few months. Others may be longer-term. If you have been able to involve key family members and employees, you may be surprised to learn about their definitions of success.

3. Get help! There are a lot of resources out there that have useful information for you and your dairy farm. Use the ones that you trust to help you decide which tasks are important. Resources include your veterinarian, nutritionist, cooperative representative, Extension Agent, and others.

**Taking the First Step**

Many people in today’s dairy industry understand how fast it is changing. Trying to make yesterday’s methods work in tomorrow’s climate simply will not allow your dairy farm to survive. Consider following the above steps and shape your own future by being a proactive dairy manager, rather than simply being a reactive fire-fighting laborer.

**Reference**


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**Management Teams, a Key Strategy**

Dean Ross  
Extension Dairy Agent  
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The rise or fall in the fortunes of any business is related directly to the success (or lack of success) of individual decisions made on a daily basis. In order to guide businesses through the minefield of daily decision making, the owner/operator needs to have choices. A management team of resource people, both off-farm consultants and on-farm personnel, can help coordinate information and add details during the decision making process.

**Making Decisions**

Taking the raw data developed by everyday activities and previous experience, and weighing them against known information to develop an answer that meets the needs of the situation, is one way to describe decision making. But, most decisions are made in a split second using experience as a general guide. Collection and processing of information from a variety of sources is a critical step in making successful decisions.

As more and more of the issues surrounding dairying require specialization, and new types of professionals come onto the scene, no longer can the dairy producer use only experience and the information at hand to make decisions. The number of professionals visiting dairies as advisors, specialists and management partners seems to grow each year. These “expert” resources might include the following: veterinarians, feed and seed sales representatives, Extension Agents, lenders, nutritionists, DHIA technicians, crop consultants, conservation service representatives, semen sales representatives, accountants, lawyers, dairy supply sales representatives, MDA inspectors, specialty dairy equipment dealers, field personnel from milk cooperatives, and herd management consultants.

Each of these individuals commonly work within their own area of expertise and all of them may provide the dairy producer with valuable advice or some form of service that directly affects the operation and success of the dairy. Yet, very often these people guide the producer to decisions without any idea how these decisions might affect some other part of the farm operation. The veterinarian may or may not be aware of recent changes in rations the nutritionist has formulated, and how these changes might affect some herd health aspect. The milk cooperative field personnel might make suggestions for structural or management changes or improvements that the milking equipment dealer does not know about when doing routine maintenance or planning.
There is a huge variety of intersecting interests on dairy operations, and if the advisors associated with these interests are not coordinated, then a great deal of added managerial friction is created, friction that can cost the producer money. The question then becomes, how to use these professionals in a way that will enhance their usefulness to the dairy business?

Management Teams

An emerging method for integrating these resources is the formation of a management team for the farm. The team, consisting of a group of commonly consulted off-farm professionals would meet at regular intervals, work together to resolve technical questions, and provide managerial support for the producer. They are available to provide help in weighing decisions to be made and provide feedback on those decisions already in motion. This is not to suggest that this group would supplant the farm operator as the decision maker on the farm. They would merely be sources of information, ideas, and technical expertise working together to enable the decision maker on the farm to function more effectively and successfully.

There are a variety of advantages to adopting a management team strategy. In non-agricultural business settings, team-style advisory and management groups have been promoted as empowering management styles. Self-made businessmen like Ross Perot and Bill Gates, while they are obviously successful people, did not build their empires solely on their own technical abilities. The smart thing Perot and Gates did was to surround themselves with people who were very bright, each with individual technical skills the business needed, and they exploited that expertise for the gain of the firm. It is time for dairy producers to consider this strategy as well.

Advantages

Let’s consider how a management team might be a beneficial strategy for dairy producers.

1. Off-farm experts already used on the farm will work together more effectively. Each will be able to gather information, ideas, and keep the entire group informed of how the farm is operating in their area of specialization. As a result, all others will be provided with a better understanding of the entire farm operation.

2. Working as a team will help stimulate individuals’ interests and efforts. Actively working with these advisors as a management team toward definite goals exhibits an attitude on the producers’ part that he or she is not just going through the motions without direction.

3. Working together as a team will provide opportunities to develop whole-farm strategies with all the players on-board and participating. The team approach also will lay the groundwork for goal setting, both personal and for the farm operation. This will clarify for team participants their contribution to the farm as part of the whole.

4. This system will open lines of communication and interaction, which will give management strategies a great deal of flexibility when needed. As situations develop or threaten the farm operation, new strategies can be more easily developed if all the participants understand the ramifications of change. Also, the presence of a representative from the farm’s lender(s), will allow those lenders to understand the mode of operation on the farm much better. In most cases, the lender should be interested in working with the producer. It is in their best interests to do so.

5. Management teams help promote a more competitive farm operation. The team and in turn, the producer, will have a much better understanding of production costs and opportunities to improve.

6. Lastly, the management team approach can be cost-effective. Research indicates that producers using a team approach returned up to $2 for each $1 spent on management changes.

Putting the Team Together

The first thing to consider is how the team will be expected to operate. Will they meet twice a year, three times, four times, or even monthly? Experience has indicated a minimum of three times per year is best, with quarterly meetings most often used. But, some teams meet monthly and are successful.

In many cases the producer opts, at least in the initial stages, to have the meetings facilitated by another party. This has benefits if the producer does not feel comfortable in this role, and it also provides the producer the opportunity to step back somewhat and analyze the direction and content of the discussion.

There are a variety of people willing and able to step into the role of facilitator. One of the group may be willing to share this responsibility, or perhaps this is an opportunity to make use of someone from the local MSU Extension Office, Conservation Service, or Cooperative. This individual’s knowledge of the farm operation is important, but open communication with the farm owner is most important.

Prior to each meeting, the facilitator and the producer need to meet and plan an agenda for the meeting. All the issues, questions, and concerns that the producer would like to explore need to be identified. Alternately, each of the rest of the team needs to identify issues they would like to discuss and be sure these are on the agenda as well.

The producer also will need to identify whom to include in the management team. All the persons identified earlier are candidates and there likely will be others unique to each farm situation. Keep in mind not every member will be needed at all meetings. Some may only come when an issue arises for which they are responsible. Others may include key employees, or even another local dairy producer to provide a similarly experienced point of view for the farm owner.

Once identified by the facilitator and farm owner, the team should be informed of what is planned and be formally invited...
to participate. Some may not feel that participation on their part is warranted. But, if a producer is set on the course of utilizing a management team, non-participation by a key member should prompt the producer to consider exactly who is employed by whom. It should be stressed to all the invited individuals that “egos will be left at the door”; of this type of activity is too important to the success of the operation to be tainted by personal issues. The goal of this management strategy is to benefit the entire operation. Each team participant needs to feel free to express thoughts and ideas for the group to consider without judgment. This may be the most difficult aspect of working within a team situation. The addition of an experienced facilitator can help overcome these concerns. Utilizing a team is not easy, but it can prove to be successful on your farm.

A dairy management team is one route that can be used to add value to the management program and increase its effectiveness. If there is an interest in increasing the competitive edge or developing honest feedback on past decisions, a management team is a proven way to build success.

References available upon request from D. Ross.

Light-up in the New Millennium

H. Allen Tucker
Dept. of Animal Science

In the dark ages of the 1970’s and 1980’s we discovered that long-day photoperiods of 16 hours of light:8 hours of dark increased milk yield 5 to 16% (4,5). These observations were confirmed and extended by numerous other researchers in the last 20 years. Across 10 different studies using long-day photoperiods, milk production increased an average of 4.4 lb per cow per day (1). In view of the current expansion of herd sizes and facilities, it seems timely to summarize our knowledge of effective lighting systems that may be incorporated into your facilities. An earlier summary of this topic was published in the Michigan Dairy Review, Vol. 2: 7, February, 1997.

Duration

Daily exposure to 16 to 18 hours of total light per day effectively increases milk yield. Continuous light is not recommended because the cows interpret this as a short day. In other words, a cow needs 6 to 8 hours of darkness within each 24-hour period to achieve the optimal increase in milk production to a lighting system. To accomplish 16 to 18 hour photoperiods, the lights should be controlled with an automatic timer. Don’t rely on your memory or that of others to turn lights on and off manually. Provided sunlight can readily penetrate the facility, it is possible to supplement with artificial light for relatively short intervals before sunrise and after sunset. Such a supplemental scheme will save on operational costs. The principle is to provide a total of 16 to 18 hours of light each day.

Intensity

Long-day-induced increases in milk yield occur when intensity of light is at 20 to 30 foot-candles at eye level of the cow. Intensity of light can be measured with a hand-held light meter. Lamps should be placed over the cows’ heads where they spend the most time. Therefore, the free-stalls, not the feed alley, should be the primary area lighted. “Head-to-head” rows of free-stalls can be lighted with a single row of lamps. The feed alley may be lighted, but this involves increased costs of installation and operation of additional lamps. It is not necessary to have 20 to 30 foot-candles of light in every nook and cranny of the facility. Remember, as height of the lamps above the cows’ heads increases, a greater area is lit, but intensity of light decreases. Periodically cleaning lamps is essential to maintaining intensity of light.

Lamps

Installation of fluorescent lamps are recommended for facilities with low ceilings such as found in many stanchion or tie-stall barns. In cold barns the fluorescent fixture should be equipped with a high output, rapid start, dust and moisture resistant, -20 degree Fahrenheit ballast. Metal halide lamps are recommended for facilities with high ceilings such as usually found in free-stall barns. Though more expensive, lamps equipped with a reflector and refractor are more energy efficient.

Lights and bST

Long-day photoperiods combined with bST additively increased milk production (2). Increased milk production occurs within a few days after bST treatments are initiated, whereas long-day induced increases in milk yield require several weeks of exposure. In confirmation of our earlier work, long-day photoperiods increased dry matter intake in these more recent studies. Indeed, long-day photoperiods may stimulate feed intake earlier in cows treated with bST as compared with bST alone.

Lights and 3X milking

There have been no reports comparing light-induced and 3X milking-induced increases in milk yield, although there is no apparent reason to believe that milk yield would not increase, at least additively, to a combination of both management practices. A troublesome problem with a combination of long days and 3X milking is supplying a sufficient number of hours of darkness. One approach may be to offset the lighting schemes in separate pens so that different pens receive darkness at different times of the day. The principle should be to coordinate exposure to lights with routine feeding, management, and milking practices. Placement of 4 watt red incandescent lamps 20 to 30 feet apart along walkways can be used to assist...
with movement of cattle in the dark.

**Lights and the Dry Period**

Surprisingly, new research shows that exposure to long-day photoperiods during the dry period reduces milk yield in the subsequent lactation more than 6 lb per day in comparison with cows given short-day photoperiods (8 hours of light:16 hours of dark) (3). Perhaps cows eventually become refractory to continuous exposure to long days in the previous lactation, and exposure to short days during the dry period resets a cow’s responsiveness to the stimulatory effects of long days during the subsequent lactation. Depending upon facilities, the dry period would be an ideal time to expose dairy cows to short-day photoperiods in order to stimulate subsequent milk production.

**Summary**

There is overwhelming evidence that exposure of cows to 16 to 18 hours of supplemental light at an intensity of 20 to 30 foot-candles each day during lactation stimulates milk yield, with or without bST. New research suggests that exposure of cows to short days (8 hours light:16 hours dark) during the dry period may stimulate milk production in the subsequent lactation of cows re-exposed to long days.

**References**


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**Genetics**

**Take Time to Review Your Sire Selection Goals**

Kathy Lee
Extension Dairy Agent
Northwest Lower Peninsula

While planning for the new year, why not take some time to update the sire selection goals for your herd? What was the average genetic merit of service sires used during 1999? This average should be weighted according to the number of units of semen used per sire. If you use DHIA records, a genetic summary including the service sire averages is printed on the DHI-202 Herd Summary report. Give yourself a pat on the back if you met or exceeded the goals you set at the beginning of 1999.

After determining what you accomplished in 1999, you can set your service sire selection goals for 2000. You can base your primary selection on Net Merit $ (NMS). NMS is an economic index that includes predicted transmitting abilities (PTAs) for milk/fat/protein dollars, productive life, and somatic cell score (SCS). The index gives a relative weighting of 10 for yield, 4 for productive life, and -1 for SCS (SCS has a negative weight because lower SCS is more desirable). The NMS index reflects the net contribution to income from these traits on a full lactation basis. Bull percentile rankings are based on NMS with the highest ranking bulls being at the 99th percentile.

Table 1 lists the November, 1999 genetic merit of actively marketed AI sires associated with various percentile rankings. For example, a Holstein sire that is at $193 NM would be at the 85th percentile. Only 15% of the Active AI Holstein sires would have a higher ranking. It is recommended that your target for service sires be at the 80th percentile or above.

**Upcoming Changes**

Several changes in the genetic evaluations will occur in August, 2000. They include:

1. Genetic base change. The genetic base is updated every 5 years. Cows born in 1995 will be the new base population and their average PTAs will equal zero. The PTAs are expected to decrease by 674 lb milk, 20 lb fat, and

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n = number of bulls in the current “Active” AI population for each breed.
Successful AI: Manage the Details- Part 1

Roy Fogwell
Dept. of Animal Science

If conception rate in your herd is as high as you desire and if all of your calves are conceived from artificial insemination (AI), stop reading and move to the next article of interest.

For most dairy herds conception rate is lower than desired because of combined effects of biology of cows and imperfect procedures by people. Resolution of the biological and metabolic causes of reduced conception rate will require more research and basic understanding of these events. If conception rate in your herd is lower than the average of 45% and your cows are healthy, this means that to improve success of AI, the major opportunity is for you to be certain that procedures for AI are near perfect. You must make sure that people are not the reason why success of AI is lower than is possible biologically.

First, dairy managers must be sure that AI is timed properly according to heat and ovulation in the females that are inseminated (see Michigan Dairy Review, May 1998, p.11). Second, for maximal success of AI dairy managers must be sure the technical procedures for AI are followed with full attention to details and with full use of current knowledge. Any single error in AI technique may seem trivial and not important. But, compared with what is possible, multiple small errors can add together to lower success of AI in your herd.

The Technical Details of AI

This article is the first in a series that will focus on the technical details of AI. The goal of this series is to guide you through a review of procedures for success with AI. It is suggested that you use these discussions as a check list. To insure that the review of your procedures is objective and critical, invite a neutral observer who is a specialist with AI to evaluate your procedures. If your technique differs from proven guidelines, you should make appropriate changes.

Do not change AI procedures according to opinions or personal experiences. The current procedures recommended for AI are based on research in many herds with thousands of animals. These recommendations should command your full confidence and dictate exactly your procedures for AI. Do not “experiment” on your own because most dairy herds in Michigan do not have enough females to be confident in the results. The risk is that a few cows can change the percent success by a large margin and lead to incorrect conclusions.

The use of straws as a system to package, store, and deliver semen to heifers and cows has many advantages. But, straws for semen have a very large surface area for the amount of volume. This means that the sperm inside the straws are highly vulnerable to mishandling. Importantly, straws are very sensitive to the environment, so errors that may seem small to you can be very important to the sperm. Note that the problem is not straws! The problem is the manner that people handle straws. Therefore, most procedures and most of your attention during AI should be directed to provide an ideal and stable environment for all straws that contain semen. Handle straws with the attitude that you are a sperm and that the environment immediately outside of the straw will affect your survival.

A. Semen Tank

1. General comments

Your tank to store frozen semen is a double walled thermos bottle. The inner wall is attached to the outer wall only at the neck. This joint of the two walls at the neck of the tank is fragile especially if the tank leans or falls sideways. A crack or fracture in the neck of the inner tank will ruin the tank and allow critical warming. Secure tanks during transport.

Tanks should be handled gently so that the outer wall is not punctured. Place your tank on wood or linoleum so there is not direct contact with concrete floors that might be corrosive or abrasive. If the outer wall of your tank develops a hole, the vacuum between the walls will be lost, and the tank will not hold temperature for the expected period of time.

Frost anywhere on the outside of the tank means there is a problem. If you see frost on the outside of your tank, you should obtain a different and reliable tank immediately.

Anywhere that humans live, liquid nitrogen will produce nitrogen gas. Thus, the plug for the opening of the tank must
be in position to reduce, not block, the escape of nitrogen gas from the tank. If because of dirt or water the plug forms a tight seal at the top of the tank, there is a risk of explosion. In addition, if the plug is frozen into the tank you will not be able to remove semen when needed. Therefore, use the hinged dust cap to protect the plug from dust and freezing of water vapor from the air.

Monitor your tank daily to check for leaks. Do not assume that a new tank is perfect! Have a plan to immediately obtain a tank that contains liquid nitrogen if your primary tank fails! Your financial investment in semen can be thousands of dollars. Protect this investment and be sure to have a plan for an emergency. But, the best strategy is to monitor the tank closely to avoid emergencies.

1. Liquid nitrogen - note date tank was last filled and the level of nitrogen.
2. Inventory of semen
   a. Age of semen. There should be little or no semen in your tank longer than 1 year. Semen older than 1 year should have a specific genetic purpose in your herd. Note that frozen semen will remain fertile for many years. Thus, the concern with age is mostly genetic. But, the longer that semen is in your tank, the greater the risk that handling will cause some irreversible damage to the sperm.
   b. Maintain a written record of all semen purchases.
   c. Establish a map of your tank on a wall chart, in a notebook, or in an electronic file. The map should be designed according the structure of your tank. Canisters are the large containers with handles that extend out of the neck of the tank. Canes are the aluminum strips that are stored within the canisters. Each cane can hold 2 goblets. The straws of semen are stored within a goblet. Your map should show all canisters and canes that are in the tank. The contents of each canister should be recorded on the map. Use a removable sticker for each cane. Use tally marks plus the name of the bull to indicate new semen added. Then cross off marks as semen is used.
   d. To avoid damage and theft with a small lock to secure the dust cover to insure safety from curious children.
3. Location of the tank should be:
   a. in an area with a cool and consistent temperature;
   b. with good ventilation to maintain high oxygen and low humidity in the air;
   c. in good light; and,
   d. to avoid damage and theft with a small lock to secure the dust cover to insure safety from curious children.
4. Record names of all people who add or remove semen from your tank.
5. Maintain convenient, dry, and clean storage for supplies.
6. Maintain convenient, dry, and clean storage for supplies.
7. Establish an illuminated non-absorbent work surface.
8. Maintain cleanliness of the tank and the general area!

Summary

There are literally thousands of details that affect the success of AI. The good news is that many of these details are biological events that work very well in most animals. Your major opportunity to control these biological events is to keep females healthy and nourished and for you to follow the rules for timing AI. Beyond these issues, there are still many technical details that affect the success of AI that you can control.

The challenge is to recognize and to apply the principle that the sum of all details is needed for success. For example, there are no details too trivial to ignore or to violate. Do not allow the routine of AI or distractions of other responsibilities make you careless with any specific aspect of handling semen. Recruit an expert to review your plan and your procedures.

Artificial insemination has been available commercially for at least 50 years. Many basic aspects of AI have remained the same over that period of time. But, there have been and will continue to be developments in this highly technical procedure. Success with AI depends on informed attention to all of the established and new technical details. You should complete a refresher course for AI at least once every 5 years. This repetitive training will provide a critique of how you actually perform the procedures for AI and will keep you informed about new developments.

For continued and possibly increased success with AI you must be informed, you must take your time, and you must concentrate on the details!

Imagine that you are a sperm in a straw. At best this is a foreign environment that has great potential to be harsh. Review everything that you and your employees do while handling straws of semen in and around your semen tank. Semen deposited into your cattle can be no better than semen removed from your tank. The semen tank, not the straw, is the dwelling for the semen. Do everything possible to make sure that this dwelling is a “safe house” for sperm. Constantly ask yourself, does management of the semen tank at your farm create an optimal environment for a sperm?

References:

Dairy Owners and Managers

Be sure to share every issue of Michigan Dairy Review with your herd persons, milkers, calf care givers, feeders, and others working in your business. More informed employees are important assets for your dairy farm business! These individuals also should be encouraged to attend the winter dairy program, Investigating Disease on the Dairy Farm, January - March, 2000. See page 23.
What happens when it is 95° Fahrenheit, humid, no breeze, and your six-row barn has no fans? Well, besides cows eating less, producing less milk, and being more susceptible to environmental pathogens, your cows will have a very difficult time becoming pregnant. Over the last 3 years our laboratory conducted several experiments to gain a better understanding of the problem of poor fertility in lactating dairy cows. A research grant funded from the Michigan Animal Agriculture Initiative supported projects designed to improve reproductive efficiency of lactating cows in commercial dairy herds. The studies were completed on seven different dairy farms across Michigan. One of these projects, completed last summer, provided us with compelling data about the effects of heat stress on ovulation and a newfound reason for poor fertility in the summertime.

Cows Failed to Ovulate

We were hoping to finish last summer’s study in June and thereby avoid any extremely hot weather. But, as luck would have it, there were two periods in June that were much hotter than normal. And as more luck would have it, we had large groups of animals ready for artificial insemination (AI) during each of those periods. In a study designed to determine the ideal time(s) for the 2nd injection of gonadotropin-releasing hormone (GnRH) in the Ovsynch® protocol [GnRH, 7d later prostaglandin F2α (PGF2α), 36 h later GnRH, and 8 to 20 h later timed-AI] (4), one of the most revealing measurements was the difference in “percent cows ovulating” following Ovsynch® on two farms on one day of the hottest period of the year.

From past data (5), 85 to 90 % of cows treated with Ovsynch® had synchronized ovulations. If follicle growth is synchronized, meaning a large dominant follicle exists on an ovary at the time of the 2nd injection of GnRH, nearly 100% of the cows ovulate that follicle. In addition, studies indicate that embryonic losses during the first month following AI are greater during heat stress (3). This helps to explain our data on Farm A. Even though some cows ovulated, there were still no pregnancies in the group of cows that did ovulate. This was most likely due to the harmful effects of heat stress on the embryo.

The Triple Whammy

A cow not ovulating isn’t the only reason for poor reproductive performance in hot weather. A second reason is that it is more difficult to detect cows in estrus. The third reason is that pregnancy losses are increased due to heat stress effects on the embryo. Studies from Florida (2) indicate that a portion of losses from heat stress come from early embryonic death in the first few days following fertilization. Other studies indicate that embryonic losses during the first month following AI are greater during heat stress (3). This helps to explain our data on Farm A. Even though some cows ovulated, there were still no pregnancies in the group of cows that did ovulate. This was most likely due to the harmful effects of heat stress on the embryo.

Take Action

First and foremost, keep cows as cool as possible in the summertime. More and more Michigan dairy producers are using fans. An article in the August 1998 Michigan Dairy Review discussed some of the advantages and costs of fans (1). Secondly, during the months preceding hot weather (April and May), make an effort to ensure that all cows in the breeding group (cows past the voluntary waiting period, not pregnant, and not on the cull list) receive at least one AI. The likelihood of a cow becoming pregnant is substantially decreased if that cow enters the summer season without an AI. To do this, you must dictate the time of AI. This can be accomplished best using Ovsynch®, because all cows synchronized are inseminated; i.e., you control this event. Also, Ovsynch® can be used all summer to maximize service rate (% of cows in the breeding group inseminated during one estrous cycle). Ultimately, maximal service rate x conception rate = maximal number of pregnancies!

Summary

- Lack of ovulation could be a significant factor involved in decreased fertility due to heat stress, especially in facilities that do not provide cooling.
- Ensuring at least one AI per cow just prior to summer will increase the chances of a pregnancy.

Ovsynch® had synchronized ovulations. If follicle growth is increased if that cow enters the summer season without an AI. To do this, you must dictate the time of AI. This can be accomplished best using Ovsynch®, because all cows synchronized are inseminated; i.e., you control this event. Also, Ovsynch® can be used all summer to maximize service rate (% of cows in the breeding group inseminated during one estrous cycle). Ultimately, maximal service rate x conception rate = maximal number of pregnancies!
• Maximizing service rate during the summer maximizes number of pregnancies.
• Providing the coolest possible environment will minimize the deleterious effects of heat stress on reproduction and milk production.

References

Christopher Wolf
Dept. of Agricultural Economics

After passing farmer approval with perhaps the least meaningful 90% plus affirmative vote in history, Federal Milk Marketing Order reform implementation was stopped at the last moment in September by a judge in Vermont. So, instead of a new pricing system and the Mideast Order, the old pricing system and marketing orders were in effect for October through December. However, Congress did reach an agreement and passed legislation mandating Option I-A to take effect on December 23, 1999. This means that the new system applies to Class I skim milk and butterfat prices and Class II skim milk and nonfat solids prices for January, 2000. On February 4, the Class II, III, and IV (formerly III-A) component prices for January, 2000 will be announced.

BFP Drops—Again
Meanwhile, after reaching $16.26/hundred lb (cwt) for September, 1999, the Basic Formula Price (BFP) dropped to $11.49 for October and $9.79/cwt, at 3.5% test, for November (see Figure 1). The September to November drop totaled $6.47/cwt and marked the second large drop in 1999—recall the $6/cwt drop from January to February. The November 1999 BFP is also $7.09/cwt lower than November 1998 and marks the first time the BFP, formerly the Minnesota-Wisconsin milk price, has been below $10/cwt since 1978. Figure 1 displays the BFP from 1996 through November 1999, which has been a period of extreme volatility.

Here Is Your Michigan Milk Market Update

Figure 1. Basic Formula Price, 1996-1999.

Figure 2. 1998-99 milk prices and premium in Michigan.
US Production and Supply

The most recent price drop can be attributed to large increases in nationwide milk production and stocks of dairy products. Total milk production for January through September, 1999 was 122.3 billion lb, up 3.2% while commercial disappearance was up only 2.4% nationwide over the same period in 1998. US milk cow numbers have been increasing since autumn 1998.

Michigan Milk Market

Order 40 Southern Michigan milk market prices for 1998-99 are displayed in Figure 2. These prices do not reflect the September through November BFP drop. The blend price for Order 40 was $15.49/cwt for October, its highest level since March. The fluid premium held at $1/cwt but, if past experience is a reliable indicator, the premium price will increase as the fluid price decreases helping to off-set the impending drop in fluid prices.

USD reported 295,000 Michigan milk cows for October 1999, down from 301,000 for January 1999. Total Michigan milk production was 452 million lb for October and 4,523 million pounds year-to-date (up 0.9% from the same period of 1998).

Milk Price-to-Feed Cost Ratio

The average mailbox milk price divided by the feed cost in Michigan for 1997-1999 are displayed in Figure 3. 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 proxy for profits. A higher ratio indicates a larger margin between milk price and feed costs and likely indicates that the average Michigan dairy farmer is better off than with a lower ratio. The mailbox milk price used for the ratio is only available through August 1999. At that time, the ratio was still near 4 as feed prices were very low and milk prices strong. With the recent down-turn in milk prices, this ratio can be expected to follow suit. However, feed prices are expected to remain relatively low.

Dairy Options Pilot Program (DOPP) in Michigan

Christopher Wolf
Dept. of Agricultural Economics

The second round of the Dairy Options Pilot Program (DOPP) will take place this winter and spring in 19 states, including Michigan. The program, authorized by the 1996 Farm Bill and administered by the United States Department of Agriculture’s Risk Management Agency (RMA), will be an opportunity for dairy producers in Allegan, Clinton, and Sanilac Counties to learn how dairy options markets work.

DOPP provides training and cost sharing on put-options. Put-options can be used to establish a floor price while still allowing a price increase to be realized. The pilot program will pay 80% of put-option contract premiums plus $30 per trade brokerage fee to place a floor price on up to 600,000 lb of milk. Participants will be responsible for the remaining 20% of premiums and will have 6 months from training to trade options contracts up to 12 months into the future.

Training Sessions Required

Any producer with a dairy operation located in Allegan, Clinton, or Sanilac Counties with a production history of at least 100,000 lb during any 6-month period in the last 12 months is eligible. However, a training session is required.

Training is scheduled for the three Michigan counties for February 29 (Sanilac County), March 1 (Clinton County), and March 2 (Allegan County). The 4-hour training session will concentrate on options mechanics and working with a broker. Producers may participate in the training session without obligation to participate in the options program. Contact the Extension Dairy Agent in your area for times and locations of training sessions.

Look for MDR on the Web

Dairy producers and their employees will soon be able to sharpen their current husbandry and management skills and learn new ones in areas ranging from feeding, breeding and reproductive management to hoof care of dairy cows, through expanded educational opportunities by Michigan State University’s Extension Dairy Team.

Ten Areas Emphasized

The Dairy Employee Education Program (DEEP) is aimed at strengthening the Michigan Dairy Industry by improving husbandry and management skills in 10 different areas through classroom theory and plenty of hands-on experience.

The skills taught will be herd size neutral and the target student is the person who touches the cows. These individuals may be the employees of larger farms, the herdspersons of smaller farms, or owners of smaller farms. However, the program is open to all people who wish to learn.

“This segment of the dairy farming population - farm employees - has not been targeted intensively for extension education in the past,” said Herb Bucholtz, an MSU Extension Dairy Team Leader. Because of MSU’s easy access to agriculture experts through its research and teaching faculty, it makes sense to utilize its resources, noted Bucholtz, who is also a professor of dairy nutrition in the MSU Department of Animal Science.

Farm Employees Targeted

Two of the courses - the Feeder Training Program and the Calf Care School - already have been available through four MSU extension offices and have received several favorable reactions. (See following related story, page 15.)

Bucholtz, who has taught the Feeder Training Programs to farm employees, said: “There are a number of employees on dairy farms with limited background in technical areas and farm managers may not have the time or expertise to train them.”

“Through DEEP, employees can learn practical and technical expertise, and then apply it to their daily routine. The end result is a more knowledgeable employee and hopefully increased profitability for the farm,” Bucholtz said.

“After taking these courses, employees on dairy farms will be more technically aware and well-versed in these various areas so they can implement their knowledge in practical everyday situations,” he added. As a result, the employee becomes more valuable and can make informed decisions.

Theory and Hands-on Learning

The courses will mix classroom theory and hands-on labs to keep the students’ interest. Lab work - such as measuring dry matter content of feed, inserting an esophageal tube feeder or tapping heifers - will often take place at area farms, and classroom instruction will be held at local facilities.

DEEP was developed after a survey - conducted by the MSU Extension Dairy Team - of Michigan dairy producers revealed a need for such an employee educational program. Meadows Chair Professor Dave Beede was instrumental in obtaining the Michigan Animal Agriculture Initiative Grant through MSU’s Animal Industry Coalition for the Dairy Team.

DEEP is a statewide expansion of the successful program known as Dairy Management Training and Review Series (Dairy MaTARS) created by Dann Bolinger, MSU Extension Dairy Agent for Clinton and Gratiot Counties and his Local Dairy Partner Team. Bolinger developed and hosted popular Feeder Training Programs and Calf Care Schools in 1998 and 1999. Employees represented farms ranging in size from 70 to 1,500 cows.

Due to a shortage of trained people in the work force, Bolinger wanted to provide training to the existing farm employees so they could assume more skilled positions. “Better trained employees feel more confident and are more likely to find job satisfaction and are more likely to stay,” he said.

For more information about upcoming schools contact your local Extension Dairy Agent or Steve Mooney, DEEP’s coordinator at 517-353-5254 or at mooneych@pilot.msu.edu.
Concerns about calf health prompted Robin Pung of County Line Dairy to sign up for the Calf Care School near her farm in Portland. The School was offered through the Dairy Employee Education Program (DEEP), a Michigan State University extension program. The program is aimed at teaching farm employees new skills and upgrading current ones.

Pung and one of her employees took the course during August of 1999. “We learned a lot about calf care,” she said. “We were really interested in colostrum management and learning more about that because we were having problems with calves,” Pung said.

“Good Colostrum”

After taking the class, Pung learned that her calves were not consuming enough “good colostrum” so she quickly implemented some changes at her 300-cow dairy farm. Although she didn’t change the amount the calves consumed, which is 1 gallon of colostrum during the first 12 hours after birth, she regulated the feeding schedule to ensure her calves consumed the required amount within that time frame, because the rate of absorption of colostrum by a calf significantly decreases after 12 hours.

Little Changes, Big Results

Additionally, she purchased a new colostrometer after learning how to properly use one in lab. The colostrometer is used to make sure the colostrum has the proper amount of protein and antibodies. “We realized how important it was to test colostrum.” Since implementing those changes, Pung said they have gone from one calf fatality per week to one every 8 weeks.

One of her employees, Karen Curry, the calf manager, learned how to properly use an esophageal feeder during the course’s “lab time.” A few weeks later, an excited Curry did it herself. “I felt more comfortable doing it. In the past, that task was left to the co-owner of the farm,” Curry said.

Education Important

Pung said she wouldn’t hesitate taking another class. “It keeps you abreast of what’s new and what’s going on - we’re all for school.”

Leading the Calf Care School was Barbara Dartt, an MSU Extension Dairy Agent for Ionia, Kent, and Montcalm Counties. Dartt said the workshop had 20 attendees representing six herds of dairy cows and one Holstein steer operation. The six herds of cows ranged from 20 to 800 cows and totaled about 2,270 cows. This workshop had the potential to impact almost 2,400 calves in the coming year, she pointed out.

Besides the two Calf Care Schools, five Feeder Training Programs also have been taught through DEEP.

Practicing What You’ve Learned

Attending the Feeder Training Program prompted at least one farm to implement some inexpensive changes that hopefully will result in big dividends. Butch Gross, who is a feeder at Breuninger Farms, a 200-cow dairy farm in Dexter, attended the course last summer. Gross said he learned about the benefits of tracking feed dry matter content. After class, Gross’ boss
Another farmer, Dr. Rod Friesen, a former veterinary practitioner, who now manages his father’s 360-cow dairy farm in Perrinton, sent six of his employees through several DEEP classes. “It motivates the employees to do continuing education. The more they know, the less I have to do,” Friesen said.

What They’ve Learned

His employees are now doing tasks they didn’t do prior to attending the classes like dehorning calves, running IVs and diagnosing sick cows. The training teaches new skills, but also reinforces old ones, Friesen said. “I would send my employees through it again. It was worth it.”

Employers like Friesen and farm employees throughout Michigan will have more classes to choose from as a result of the expansion of DEEP. The program is offering 10 different schools (see schedule, page 15) through classroom theory and hands-on experience throughout the state.

Regional Topics Planned

Such a program will allow high-quality and a varied course offerings to be available to more people, said Barbara Dartt. She said that topics could be taught and applied regionally as needed without having to develop them from scratch. Dartt said the popularity of such programs is a “recognition by producers large and small that they simply can not do everything well, and they’ve got to let someone else do it.”

Another MSU Extension Dairy Agent, Bill Robb, who also has hosted and taught the Feeder Training Program, said DEEP is a key training tool as Michigan farms continue to grow in size. “With larger dairy farms in Michigan today and in the future, employee training will be critical to their success. MSU is uniquely positioned to help dairy producers provide training through DEEP,” Robb noted.

Nutrition

Bunker Hill: The Battlefield with Spoilage

Phil Durst
Extension Dairy Agent
Northeast Lower Michigan

At Harper Farms in Savannah, NY, bunker silo management is given very high priority, which results in low rates of spoilage and good milk production from high quality forage. Their keys are:

- fill the silo in progressive wedges;
- pack hard;
- cover with plastic, held down with sand and tires; and,
- keep the face smooth.

If you store forage in bunkers, you are done filling them for this year and you already have made a decision to cover or not to cover the forage. Though the opportunity to do things differently in regards to filling, packing and covering won’t come again until next year, you can still affect the quality of this year’s crop by your daily management of the face where you remove forage.

How’s Your Face?

Frankly, I have never seen the face of forage in a silo that was smoother than at Harper Farms. This is a critical aspect of bunker management because it reduces exposure of the silage to air. Air at the silage face, and back into the pile, increases spoilage. And, spoilage is greater the larger the face of the silage and the fewer inches of silage you remove per day.

If you are removing over 6 inches per day, then you are probably removing enough to minimize spoilage caused by air leakage into the silo face. If, however, you are removing less than 4 inches from the face, silage 12 inches back into the pile will be exposed to air for 3 days before it is fed out. This increases the potential for spoilage. Because spoilage is a greater possibility in warmer weather this assumes more importance next spring.

Reducing Your Losses Daily

The extent of air leakage back into the pile from the face is affected by the amount of packing and the technique you use when removing silage. Because you remove silage daily, using the best technique to minimize air exposure affects qual-
ity tremendously.

Lifting up silage with a bucket opens up the face more and introduces more air into the pile. Therefore, the recommended technique is to scrape downward with the bucket and pick up the silage off the bunker floor.

Kurt Ruppel, formerly of Cornell University and now with Pioneer Hi-bred, has done research and recommends that you start at the bottom and scoop out about 1 foot of silage to create a shallow indentation, and then scrape down to break-off silage above the indentation in small increments (6 inches).

This is the technique used at Harper Farms. Their downward scraping produces a smooth face that isn’t marked by horizontal crevices through which air moves.

**Heifer Mastitis**

**Controlling Heifer Mastitis Before Calving**

Roger Mellenberger  
Dept. of Animal Science

A high percentage of mammary glands of heifers become infected during gestation, at calving, and during early lactation (7). The majority of these infections were coagulase negative *Staphylococcus* (*Staph-CN*). *Staph-CN* can invoke an inflammatory response before calving in heifers that impairs mammary development and subsequent production of milk. Heifers with *Staph-CN* infections had elevated somatic cell counts in milk as well as underdeveloped mammary glands or glands with increased connective tissue stroma when compared with unininfected glands (9). Milking cows would show a higher prevalence of *Staphylococcus aureus* (*Staph. aureus*) infections compared with *Staph-CN*.

In one study, culture results from 460 quarters of 115 heifers sampled 7 days before expected calving showed 90% of heifers and 61% of quarters were infected, and *Staph-CN* accounted for 243 of 279 isolations (3). Additional studies by these researchers showed that *Staph-CN* isolations accounted for 80 to 90% of infected heifer glands with *Staph. aureus* accounting for only 5 to 8% of infections. In contrast, studies from Louisiana found that *Staph. aureus* accounted for greater than 20% of infected quarters in heifer mammary glands, whereas *Staph-CN* was isolated from 50% of infected quarters (8). Environmental streptococci accounted for 10% of infections in the studies by Trinidad et al. (8). Therefore, *Staph-CN* was the most common isolate from infected quarters of heifers. Environmental streptococci and *Staph. aureus* were the other major isolates.

There is a major decrease in the percentage of heifer mammary glands infected from the week before calving until early lactation. In early lactation, first-lactation cows had only 11 to 36% of quarters infected compared with 60% or more before calving. *Staph-CN* accounted for 50 to 70% of the infections in early lactation (4). Despite a high rate of spontaneous recovery, a significant percentage of heifers remained infected into lactation.

**Treating Heifers Prior to Calving**

The effects of treating heifers prior to calving on infection incidence and subsequent milk production was evaluated in two studies (5,6). All four quarters of each heifer were treated with a lactating cow antibiotic 7 days before expected calving. Only 13 of 155 *Staph-CN* intramammary infections persisted into lactation in the treated group, whereas 64 of 88 untreated quarters remained infected. In a second study, heifers treated were at 14 days before expected calving as a way to diminish the potential antibiotic residues in early lactation (2). In untreated heifers, *Staph-CN* was isolated from 54% of quarters at 14 days prior to calving, 49% of quarters at 3 days after calving, which decreased to 32% of quarters by 30 days after calving. Again, some spontaneous cures occurred. Infected quarters that were treated decreased from 56% at 14 days prepartum to 7% by 3 days postpartum. Heifers also have received intramammary therapy during various stages of gestation with reported success in reducing prevalence of mastitis and in reducing somatic cell counts during early lactation in *Staph. aureus*-infected quarters (10). Efficacy (cures of *Staph-CN* and *Staph. aureus* infections) was highest if intramammary treatment was given 7 to 14 days prepartum. Jersey heifers treated 7 days before expected calving with either 200 mg sodium cloxacinil or 200 mg sodium cepahpin or 14 days prepar- tum with sodium cepahpin produced 1,168 lb more milk in 305 days than untreated heifers (1). These researchers used a price of $15.80 per 100 lb of milk minus a treatment cost of $7.62 per animal (teat dip, drug, paper towels, and labor) plus $2 per animal for antibiotic residue testing. Income was increased $184.54 per treated heifer with net

**Take Action!**

You have worked hard to harvest silage at the right time for the highest quality possible, and it would be a shame to allow it to spoil in storage. Tomorrow, when you go out to feed, first take an honest look at your silage face. Would you call it smooth? Does it unnecessarily expose too much silage to air? Can you do a better job of reducing spoilage loss by better removal technique? Can you train employees who do this job to meet your expectations?

After all, we are talking about a major part of the ration that can affect how much milk your cows will produce. Isn’t it worth the effort?
The Michigan Dairy Memorial and Scholarship Foundation, Inc. is now in its 44th year of operation. The purpose of the organization is: “The collection and administration of funds contributed by any person(s), firm(s), or corporation(s), wishing 1) to honor members of the dairy and allied industries, living or deceased, who have performed distinguished services for the dairy industry of Michigan, and 2) to provide scholarships and specific financial aid to worthy young persons desiring to acquire technical and (or) academic training in the fields of dairy science, and (or) processing or manufacturing of dairy products through a regular 4-year college course, short courses, and (or) such technical training as dairy plant engineering and (or) other courses as the Board of Directors deems advisable.”

The Foundation has honored 124 Michigan dairy leaders since its founding. The Foundation has awarded scholarships to over 300 students. These scholarships have totaled more than $480,000. This past year the Foundation awarded scholarships to 20 Michigan State University students. Five freshman scholarships of $1,000 each were awarded to:

**Melissa Siemen**, Harbor Beach, Michigan. Melissa is from a Holstein farm and is a dual major in Agriculture Communications and Animal Science. She has been an active member of 4-H in Huron County. Melissa has been involved in FFA, holding regional and chapter positions.

**Brandon Lupp**, Sebewaing, Michigan. Brandon is pursuing a major in Agriculture Communications. He has been a member of FFA for the past 4 years and has taken part in state and national conventions. Brandon also is very involved in community volunteer work, which has included youth soccer, youth basketball, and Red Cross Blood Drive volunteer.

**Mary Haase**, Alma, Michigan. Mary has worked on a 280-cow dairy farm, where she has had many responsibilities. Mary is pursuing a certificate in Agriculture Technology with emphasis in dairy management. She has been active in FFA, National Honor Society and has volunteered for the Hope Club, which is involved with environmental issues in her home area.

**Chad Root**, Morenci, Michigan. Chad is attending the Dairy Management program in Agriculture Technology at Michigan State University. Upon graduation he plans on returning to the family farm. He has been very active in FFA and 4-H.

**Amanda Klingler**, Waldron, Michigan. Amanda is pursuing a degree in Agriscience Education. She has been active in FFA, 4-H and National Honor Society. She was captain of the basketball and volleyball teams at Waldron School.

The following Michigan State University students have been awarded a Michigan Dairy Memorial Scholarship for $2500 for the 1999-2000 academic year:

**Dana Kirk**, East Lansing, Michigan. Dana is a senior majoring in Biosystems Engineering and Animal Science. Dana has been a research assistant in the Department of Agricultural Engineering and has contributed to research on manure handling systems.

**Kerry Ackerman**, Jonesville, Michigan. Kerry is a junior in Agriscience with Agribusiness Management emphasis. Kerry has completed internships with Quality Stores, Inc., Northstar/Select Sires, Inc., and NOBA/CRI.

**Abby Gordon**, Saline, Michigan. Abby is a sophomore in the Agriculture Business Management program. Last summer she worked as an intern with the Washtenaw County 4-H youth...
NorthStar-Select Sires and Michigan DHIA Consider Merger

Kelly Bristle Ekovich
North Star-Select Sires

Boards of Directors of NorthStar-Select Sires and Michigan DHIA (MDHIA) met in Lansing, September 20, for a joint board meeting and agreed to merge the two organizations.

According to Mike Bills, NorthStar-Select Sires’ General Manager, the merger proposal is subject to a positive majority vote by the official delegate body at the MDHIA Annual Meeting, as well as the approval of amended bylaws by the NorthStar-Select Sires’ common stockholders. Upon a successful vote and approval of the amended bylaws, a 3-year merger transition plan will be implemented.

Merger Proposal to be Presented

“Throughout the next couple of months, we anticipate many questions regarding the merger,” stated Bills. “To assist in answering these questions, we will present the merger proposal in detail at both businesses’ district meetings and encourage all members to attend. Under no circumstances will this merger hinder the progress of MDHIA or NorthStar. In fact, the successful track records that the two businesses have established over the past 18 months only proves that a more permanent relationship is in the best interest of NorthStar and MDHIA members,” said Bills.

The agreement states that the merged entity will be named NorthStar Cooperative, Inc. (pending a successful name search), with Michigan DHIA and NorthStar-Select Sires becoming division names. In addition, the current bylaws and organizational structure of NorthStar-Select Sires, as amended by the merger proposal will serve as the bylaws and organizational structure of the merged entity.

According to Bob Cnossen, MDHIA President, upon a successful vote to merge the two businesses, a MDHIA Advisory Committee will be created to assist in member feedback and development of DHIA related products and services. In addition, the committee will be responsible for approving the individual who serves as the MDHIA product manager and for establishing and reviewing performance goals of
MDHIA-related business activities. Furthermore, two members of the MDHIA Advisory Committee will be elected annually by the committee to serve on the Board of Directors of the merged entity. The MDHIA Board of Directors, who are duly elected as of the date of the merger, will constitute the MDHIA Advisory Committee during the 3-year merger transition period.

The MDHIA Advisory Committee

“The role of the MDHIA Advisory Committee is essential in planning and preparing for the future,” said Cnossen. “By establishing the MDHIA Advisory Committee we will be able to continue to encourage member input, which has been vital to the success of our organization.”

Since August 1997, NorthStar-Select Sires has been responsible for management of MDHIA. During that time many changes have occurred at MDHIA, including utilizing PC DART as the primary dairy record management software, offering milk urea nitrogen (MUN) testing in-state at an affordable price, bringing together MDHIA and Indiana DHIA to form the DHIA Lab, L.L.C., and improving the laboratory’s turn-around time to 24 hours.

“We have had a very positive and successful working relationship over the past 24 months. Our track record shows that a merger is in the best interest of the owners of both organizations,” commented Bills. “Not only do both businesses have a significant overlap in members, but by merging we will be better able to create more effective, more efficient and more competitive product and service lines.”

Michigan Cattlemen’s Association Sponsors Holstein Sale

Kevin S. Gould
MSU Extension Livestock Agent,
Central Michigan
and Bridgette Voisinet
Executive V.P.,
Michigan Cattlemen’s Association

The Michigan Cattlemen’s Association established a pre-conditioned and graded feeder cattle sale in December of 1998. Just over 700 head were consigned in the first sale. That number jumped to over 1000 head at the second annual sale.

“The premise behind the sale is the reason for its success,” states Mike Karweik, Sale Committee Chairman. “The sale helps consignors add value to their end-product and provides buyers of the feeder calves a more sound investment in a risky business. The sale has proven to be a win-win opportunity for all involved.”

The Committee believes that this type of sale presents a tremendous opportunity for dairy producers, Holstein backgrounders, and feeders. As a result, the Committee expanded the program to include a Holstein only sale to be held in Clare on April 14, 2000.

“With the number of small and large dairy producers in the state, the number of feedlots specializing in feeding Holsteins, and the fact that there is a solid fed-Holstein market in the state, we believe the potential for this sale is practically unlimited,” remarked Karweik.

These sales are a unique opportunity for buyers in that they provide source-verified calves that have fulfilled a strict vaccination protocol. Calves also are sorted at sale time so buyers can count on purchasing calves of consistent background and similar frame sizes. The health protocol for all calves follows. Veterinarians or MSU Extension Agents must verify that the following protocols have been followed. Specific vaccines to be used will be listed on sale requirements sheets.

**First Vaccinations:** (5 to 13 weeks before sale)
- IBR,BVD,PI3,BRSV - modified-live vaccine
- Haemophilus somnus vaccine
- 7-way Clostridia vaccine
- Pasteurella vaccine - containing leukotoxoid

**Second Vaccinations:** (3 to 5 weeks before sale)
- Same as first vaccinations

For more information, producers and backgrounders can contact John Gernaat at 231/825-2849 or Bridgette Voisinet at the Michigan Cattlemen’s Association at 517/336-6780. Nominations are due by February 1, 2000. If you have Holstein feeders to sell this spring, don’t miss this unique marketing opportunity.

**Herd Health**

**Q & A: Dry-off, Colostrum Management, and Controlling Johne’s**

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

Q. I have noticed that a significant number of cows and heifers freshen with mastitis. Most of the cows were not infected at dry-off. Milk cultures have shown that the mastitis is caused by environmental organisms. Why does this happen and how is it corrected?

A. Several factors can come into play when dealing with environmental mastitis. Cows are most susceptible to environmental mastitis during two periods of time. The first
period is the 7 to 10 days following dry-off. The second period is from about 2 to 3 weeks before calving through 30 days after calving. There are numerous physiological changes that occur in the cow during these periods that make her particularly vulnerable to environmental bacteria.

Several management practices can help reduce new infections during the dry period. First, abruptly decrease milk production prior to dry-off. This reduces the possibility of milk leaking and minimizes trauma to the mammary gland when milking is stopped.

The following practices may help achieve the desired abrupt decrease in milk production at dry off:
1. stop administration of bST at least 1 month before dry-off date;
2. replace grain portion of ration with fibrous feeds; and,
3. limit water intake (exercise caution in hot weather).

Following the last milking, administer an effective commercial dry cow treatment to all quarters. This must be performed in an aseptic manner to reduce entry of bacteria into the quarter. Use of alcohol to clean each teat end before administering dry treatment reduces risk of new infections during the dry period.

Proper nutrition is important to optimize the ability of the cow to resist bacterial challenges. Feeding a balanced ration to both late lactation and to all dry cows is an important component of a successful management program. Proper vitamin and mineral supplementation is an area that is critical to the immune function of the cow. Too often, dry cow nutrition is overlooked on dairy farms which can reduce profitability.

Environmental mastitis is related to the number of bacteria to which the cow’s teats are exposed. Dry cow housing, especially during the early and late dry periods and at calving time is critical to the control of environmental mastitis. Dry cows should be housed in a clean, dry, and comfortable environment where bacterial populations are minimized. Calving pens, a source of environmental organisms that cause mastitis, should be kept clean, dry, and well bedded. Avoid manure packs, mud holes, water ponds, dirt lots, and any other potential sources of environmental mastitis-causing organisms.

Dry cows and heifers close to calving are very susceptible to environmental mastitis-causing organisms. Use of a California Mastitis Test (CMT) for fresh cows by the sixth milking can help monitor the effectiveness of your dry cow environmental management. A positive CMT reading from a quarter that was uninfected at dry-off is a strong indication of an environmental infection that originated during the preceding dry period.

Additional helpful information about procedures for drying-off cows can be found in the Michigan Dairy Review, Volume 1, Number 1, 1996 (2).

Further information regarding Environmental Mastitis may be found in Extension bulletins NCR-278, “Non-Ag Strep-

Infected Dairy Cows”, and NCR-267, “Coliform-Infected Dairy Cows”, available at your county MSU Extension Office.

Q. We often have health problems in our baby calves. The veterinarian tells us that colostrum is the key to calf health. What is the best way to ensure that our colostrum program is satisfactory?

A. Your veterinarian is correct. Calves are born with no disease resistance. They must rely on the absorption of colostral antibodies for immune protection. Colostral antibodies are large proteins that can be absorbed by the calf for only a short period after birth. In a recent study, approximately 40% of dairy heifer calves had blood antibody levels less than required for disease resistance. This suggests that many producers may need to adjust their colostrum program to correct this deficiency.

It has been demonstrated that feeding 4 quarts of colostrum within 3 hours after birth followed by another 2 to 4 quarts 8 to 12 hours later, resulted in greatly improved blood antibody levels. This recommendation assumes that the colostrum contained a sufficient level of antibodies. A colostrometer can be used to monitor the quality of colostrum (check with your veterinarian or Extension Dairy Agent for sources of colostrometers).

The colostrometer measures specific gravity (density) of colostrum. The density is measured on a color scale. Green color indicates greater than 100 grams of immunoglobulin (antibodies) per liter of colostrum. This colostrum is considered high quality. Colostrum that contains between 50 and 100 grams of immunoglobulin per liter will fall into the yellow zone of your colostrometer. This is medium quality colostrum. Poor quality colostrum contains less than 50 grams of immunoglobulin per liter and will be measured in the red zone on the colostrometer.

Freeze any surplus high quality colostrum for future use. Colostrum lasts up to a year when frozen and if thawed slowly is an excellent source of important antibodies for newborn calves.

Some calves may be reluctant to consume 4 quarts of colostrum at the first feeding. You may find that an esophageal feeder is very helpful to achieve your goal. You also may find that feeding 3 quarts immediately after birth followed by another 3 quarts 12 hours later works better on your farm. Remember, the higher the quality of colostrum that a calf gets and the sooner the calf receives it the more likely that calf is to be healthy and a profitable part of your milking herd in the future.

Q. I’ve heard that the Johne’s disease bacterium can be spread through colostrum fed to newborn calves. What can I do to eliminate this potential route of transmission?

A. There are two major strategies for control of Johne’s
TB Update: New Federal, State Rules and Regulations

John Molesworth, DVM
MSU Extension Livestock AoE Agent
Northeast Michigan

There have been many changes in the TB situation lately; too many to cover in detail here. There has been a newly discovered infected herd. There are also many testing and regulatory changes that are either already in effect or are coming into effect soon.

The latest herd, the fourth found to be infected with TB, was in Presque Isle County in the Millersburg area. It was a herd of 130 beef cattle. Five cows were considered reactors on the comparative cervical test. These cows all showed lesions and tissues were sent to the lab in Ames, IA and, as of this writing, four of them have been called positive by the PCR test. The herd was classified as a reactor herd and has been removed and taken for depopulation and necropsy. Because this herd was in the five-county area, there will be no great effect on the status of the remainder of the state.

The big news, which does affect everyone to some degree, is the new regulations. There are two documents, the Interim Rule and The Memorandum of Understanding (MOU). These documents contain the new rules and regulations. The Interim Rule is a United States Department of Agriculture (USDA) document and the MOU is an agreement between USDA, Michigan Department of Agriculture (MDA) and Michigan Department of Natural Resources (MDNR).

The Interim Rule has been in effect since October 20, 1999 and the public has until January 3, 2000 to make comments for consideration before it is finalized. I would encourage everyone to obtain a copy of the rule and make comments. You may obtain a copy by calling MDA at 517-373-1077. Directions for making comments are contained in the document. It is a large document so details cannot be covered here. In short, it allows USDA to zone Michigan. The state now has two zones of status, which are the non-modified zone and the free zone. The non-modified zone is the area from I-75 east to the Lake Huron and M-55 north to the lake, or what we have been referring to as the quarantined zone. This will now be called the Movement Restricted Zone (MRZ) and will contain two internal zones: the infected zone, which includes Alpena, Alcona, Montmorency, Oscoda and Presque Isle Counties, and the surveillance zone, which contains the rest of the area within the boundaries of the MRZ. The free zone is the remainder of the State of Michigan. The Rule also outlines new regulations for interstate movement and the expectations that USDA has for Michigan to control movement within its boundaries (infracante). The regulations contained in both the Rule and MOU affect cattle, bison, goats and captive cervidae.

The Nuts and Bolts of Regulations

The MOU was not signed as of December 20, 1999 and may or may not be by the time this publication reaches your hands. It contains many movement restrictions that not only affect the MRZ but also the free zone. This document has been referred to as the nuts and bolts of the regulations. It is a relatively large document and quite complicated. Anyone who does not have a copy of the MOU should request one from MDA. Comments to USDA on the Interim Rule may also contain comments on the MOU, as it is included in the Rule.

The testing and movement restrictions become progressively more restrictive as you progress from the free zone to the MRZ and also from the surveillance zone to the infected zone within the MRZ. There were four meetings held in the MRZ recently in an attempt to explain these new rules to the livestock producers in that area. There was serious concern voiced by many of the producers concerning their ability to comply with the new regulations and still remain a viable busi-

References
The State of Michigan may only contain two zones of status, and the boundaries of these zones must be contiguous. What happens if a case of TB, either in livestock or free ranging white tailed deer, is found outside the MRZ? If it is found close to the boundary, the boundary could be moved to encompass the new infection. If, however, TB were found in another area of the state, the entire state may lose its free status. All of the rules for the when, if, and how this will happen are contained in the Interim Rule and the MOU.

Without going into great detail, I have attempted to convey the message that these documents will not only affect the producers in northeast Michigan, but all livestock producers in the state. For the livestock industry to remain a viable entity in our state economy, we must eradicate tuberculosis not only from our livestock but from our wildlife as well. During this process we must take care to protect the integrity of our industry so that it will remain after the disease has been eradicated.

### New Requirements for Interstate Shipment of Cattle

Requirements for interstate shipment of cattle, especially in lieu of Michigan’s TB status, are uncertain. Each state has the right to impose regulations regarding the movement of cattle across its boundaries. The only way to definitely know these regulations is to contact the state livestock official or Animal and Plant Health Inspection Service (APHIS) Veterinarian in the state in question. For your information, phone numbers for nearby states are listed below.

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<th>State</th>
<th>Chief Livestock Official</th>
<th>APHIS Veterinarian in Charge</th>
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<tr>
<td>Michigan</td>
<td>517-373-1077</td>
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<td>Wisconsin</td>
<td>608-224-4872</td>
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### Calendar of Events

The Michigan Professional Dairy Farmer’s Association will be sponsoring educational meetings from 9:30 a.m.-3 p.m. at the Michigan State University Pavilion on February 2 and February 23. For more information contact Dr. Sherrill Nott at 517-353-4522.
Michigan Dairy Review

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