G6G/Ovsynch to Increase Reproductive Performance

Researchers at MSU have developed a new pre-synchrony method, G6G, that improves synchronization outcomes to Ovsynch and allows more cows a chance to become pregnant. In two studies, G6G clearly outperformed traditional Ovsynch, which means adding G6G to an already present Ovsynch program will help optimize timed-AI in lactating dairy cows.

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Dept. of Animal Science

The daily challenge of getting cows pregnant is nothing new to any dairy producer. What is new is the variety of approaches that researchers are taking to understand the mechanisms underlying this problem and propose effective solutions to it. Our applied reproductive research program is focused on controlling ovarian physiology to optimize fertility of lactating dairy cows. Our goal is to develop and utilize new information to improve the fertility potential of Ovsynch.

Ovulation Synchronization

During the past decade, hormonal synchronization programs have been included in the toolbox of many successful reproductive management systems. With the advent of Ovsynch, dairy producers can synchronize ovulation and inseminate dairy cows by appointment, independently of heat detection without any negative effect on hard-earned conception rates. Ovsynch works by controlling follicular development and luteal function based on a scheme of injections of gonadotropin-releasing hormone (GnRH) and prostaglandin F2α (PGF2α). Ovsynch allows ovulation to be timed with insemination, so that both egg and sperm are available at the correct...
time for fertilization.

Chink in the Armor

Given that, you might ask why we continue to work on Ovsynch. Have you ever noticed those cows that come into heat around the time of administration of PGFα of Ovsynch or approximately 1 week after timed AI? If Ovsynch was working perfectly, those cows would not be showing heats. In fact, those heats are an indication of a chink in the armor of Ovsynch. Then, the question follows: how big is this chink in the armor? Is it worth getting concerned about it? Several research studies indicate that 10 to 30% of the cows treated with Ovsynch may fall in this category and may not have a chance to conceive (1-4). In these cows, ovulation is not synchronized with timed AI, which voids the already-low chances of a pregnancy...we are talking about up to 30% of your Ovsynch breedings!

New Program

Previous research indicated that ovulatory response to first GnRH of Ovsynch is a key determinant for a subsequent successful synchronization outcome (2, 4). Thus, in order to succeed, we needed to tackle Ovsynch where least expected: upfront. As easy as it sounds, ovulation to first GnRH of Ovsynch is not that simple to attain because of the variability among cows in the status of follicular development at any given time. So, we went back to the drawing board. We focused on designing a program that would maximize the percentage of cows in early stages of the estrous cycle in order to maximize the percentage of cows that respond to the first GnRH of Ovsynch. The outcome is a new program now being called G6G.

The scientific basis for G6G arises from previous research indicating that days 5 to 9 of the estrous cycle is the optimal interval of the estrous cycle to initiate Ovsynch (4, 5). How was G6G/Ovsynch designed to work? G6G consists of a set of two hormonal injections that precede Ovsynch (Figure 1). It starts with an injection of PGFα, which is intended to induce luteolysis of all mid and late cycle corpora lutea. Then, a GnRH injection follows 2 days later, aimed to induce an ovulation. Taken together, the two injections of G6G are intended to induce cows to initiate a new estrous cycle. It is no coincidence that Ovsynch is scheduled to start 6 days later. By this time, cows are already on day 6 of a new estrous cycle and are very likely to have a functional dominant follicle, capable of ovulating in response to the first GnRH of Ovsynch. In short, the design of Ovsynch was aimed at optimizing the physiological setting in which Ovsynch is initiated and intended to lay the ground work for a successful synchronization outcome to Ovsynch and the timed AI.

Putting G6G/Ovsynch to Work

The key question is: does G6G/Ovsynch work? Our research group put this idea to test on 137 first service, lactating dairy cows at Nobis Dairy, a commercial farm in St. Johns, Michigan. In addition to G6G, other alternative pre-Ovsynch treatments were compared with traditional Ovsynch in their effectiveness to synchronize ovulation. Transrectal ultrasonog-

![Figure 1. G6G/Ovsynch in lactating dairy cows: Schedule of injections, underlying ovarian dynamics and synchronization response (F is Follicle, CL is Corpus luteum, X is luteolysis, Ov is Ovulation).](image)

![Figure 2. Effect of treating dairy cows with Ovsynch or G6G/Ovsynch on percentage of cows that ovulated in response to first GnRH of Ovsynch and on percentage of cows in which an ovulation synchronized with timed AI was detected.](image)
Ovsynch for Reproductive Performance
Proposed Legislation to Impact Dairy Labor
Water Quality Risks of Mortality Compost Piles
Interpreting Cattle Behavior Practically
Persistently Infected with BVDV, Now What?
Cause and Prevention of Alfa-lfa Winterkill
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MSU Dairy Farm is the Gold Standard
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Milk Market Update
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Results

Despite the numerical difference observed between the groups in favor of G6G/Ovsynch, the data are not strong enough to claim an effect of G6G/Ovsynch on fertility of lactating dairy cows. However, it is only logical that cows that synchronize to Ovsynch are more likely to be inseminated at an optimum time relative to ovulation, and thus, to establish a pregnancy. Thus, the more cows that have a synchronized ovulation, the more cows that have a chance to become pregnant. In addition, in this study we identified three potential predictors of fertility in lactating dairy cows, namely concentrations of progesterone at the time of PGFα of Ovsynch, size of the ovulatory follicle, and preovulatory concentrations of estradiol at final GnRH of Ovsynch.

Recently, a second study re-confirmed the high synchronization rates of G6G/Ovsynch.

Our current and future research is to determine if the Ovsynch protocol can be manipulated to enhance fertility of

G6G/Ovsynch

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Figure 3. Example of a weekly schedule of injections for G6G/Ovsynch.
dairy cows. We believe that as heifers become cows the follicles and the eggs they hold are negatively affected by changes in reproductive hormones. Based on the studies discussed in this article, we believe we can alter Ovsynch to make the follicle growth of a cow more like that of a heifer, and thus improve the fertility of the cow.

Summary

If you are using Ovsynch in your reproduction program, the addition of G6G could optimize your synchronization response. If you are willing to try it, Figure 3 provides an example of the schedule of injections for G6G/Ovsynch within a weekly calendar. For more detailed information, check the complete scientific article in the September 2006 issue of Journal of Dairy Science and contact Dr. Richard Pursley, at the MSU Department of Animal Science, pursleyr@msu.edu or 517-432-6178.

References


Proposed Legislation to Impact Dairy Labor

A bill currently under consideration by lawmakers could have a big impact on Michigan farmers, especially those employing undocumented or temporary resident farm workers. The bill would offer such workers the opportunity to earn a status adjustment by fulfilling specified periods of agricultural employment. It also would streamline paperwork for employers and change wage and housing requirements. Although still under consideration, the measure’s potential impact on Michigan farmers makes it worth keeping an eye on.

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On January 10, 2007, the Agricultural Job Opportunities, Benefits, and Security Act of 2007 (AgJOBS) was introduced simultaneously in the Senate (S.237 sponsored by Feinstein, D-CA) and the House of Representatives (H.R.371 sponsored by Berman, D-CA) in a bi-partisan effort. A complete list of cosponsors and the full text of the proposed legislation is available by bill number at http://thomas.loc.gov). The AgJOBS compromise was originally reached in 2000 after negotiations among the United Farm Workers (UFW), several agricultural employer associations, and federal legislators.

If enacted, AgJOBS would create an opportunity for earned adjustment of status for up to 1.5 million undocumented farmworkers (temporary immigration status). It would provide them with a subsequent option to become permanent residents through continued agricultural work. AgJOBS would also revise the existing H-2A temporary foreign agricultural work program to improve its usability by agricultural employers.

Temporary Resident Status

Workers who can document having worked in U.S. agriculture for at least 150 days or 863 hours during the 24-month period ending December 31, 2006 may be eligible for the Temporary Resident Status Blue Card. Employment records from farmers or labor contractors will satisfy these requirements. In the absence of employment records, other forms of evidence may be accepted.

The 18-month application period would begin 7 months after the law is enacted. The maximum number of blue cards issued would be capped at 1.5 million over 5 years. While the immigration law provision of being in the country legally would be waived, other provisions could still negate a worker’s eligibility. These include having been convicted of any felony or a misdemeanor involving bodily injury, the threat of serious bodily injury, or harm to property in excess of $500. Eligible workers would have to pay an application fee (to be determined) and a $100 fine upon obtaining a blue card. The spouse and minor children of a blue card holder may be granted derivative status, if they reside in the U.S. Blue card holders would have up to 7 years after the enactment of AgJOBS to apply for permanent residency or they would lose their temporary status and be required to leave the country.

Permanent Resident Status

To obtain Permanent Residency Status and be issued a Green Card temporary residents must fulfill and document one of the following requirements.
Perform agricultural work for at least 100 work days per year for each of the 5 years after the date of enactment of AgJOBS.

Perform agricultural work for 150 work days per year for 3 years and 100 work days for one of the years during the 4-year period after enactment of AgJOBS.

Perform agricultural work for 150 work days per year for each of the 3 years after enactment of AgJOBS. Under AgJOBS, a work day would require at least 5.75 hours of work to be performed.

Application fees (to be determined) and a $400 fine need to be paid and workers would have to document payment of applicable federal tax liability. The spouse and minor children of eligible agricultural workers would also be granted immigration status if they meet other immigration law requirements. Conviction of a felony, three misdemeanors, or a single misdemeanor involving bodily injury, threat of serious bodily harm, or injury to property in excess of $500 would also end the temporary residency status.

H-2A Agricultural Guestworker Program

Currently, the agricultural guestworker program is limited to jobs not lasting longer than 10 months out of 12, and guestworkers have to leave the country for at least 2 months per year. However, the proposed AgJOBS bill would allow dairy workers and goat herders to join sheep herders in being eligible to participate in the H-2A program, even if they seek year-round employment. These workers would be eligible for up to 3 years of continuous employment, at which time they would become eligible to adjust status to permanent residency, if employment-based visas are available. Currently, the number of such visas is very limited. Other H-2A workers would not qualify to become permanent residents.

The following requirements of the H-2A program would remain unchanged.

Agricultural employers must advertise to and hire qualified U.S. applicants before and during the first half of the period for which an H-2A offer was made or a H-2A worker was hired.

Agricultural employers must pay an H-2A worker for at least 75% of the period for which the job was offered.

Workers’ compensation coverage is required.

H-2A workers must be reimbursed for their transportation costs from and to the place of residence (or equivalent arrangement).

Rather than requiring the current “labor certification,” the application process for H-2A would be streamlined to become a “labor attestation,” which would reduce paperwork, limit government oversight, and speed up the process. Currently, H-2A employers are required to provide free housing to the foreign workers, and also non-local U.S. workers. Under AgJOBS, employers could choose to provide a monetary housing allowance, if the state’s Governor has certified that sufficient housing for farmworkers is available in the area. Also, H-2A employers are required to pay at least the highest of the federal or state minimum wage ($6.95 in Michigan, scheduled to increase to $7.15 on July 1, 2007, and $7.40 on July 1, 2008); the local prevailing wage for the job; or the Adverse Effect Wage Rate (AEWR), which was $9.43 in Michigan for 2006. This provision is not limited to the foreign workers, but applies to each employee doing the same or a comparable job requiring similar qualifications. AgJOBS would reduce the AEWR to the 2002 levels and freeze them for 3 years. In Michigan, the 2002 AEWR was $8.57.

Finally, AgJOBS would give H-2A workers the right to file a federal lawsuit to enforce their wages, housing benefits, transportation cost reimbursement, minimum work guarantee, motor vehicle safety protections, and other terms of the H-2A job offer.

This is a summary of the proposed legislation. If you are interested in further details, consult http://thomas.loc.gov for the full text and status of the bill. As workers may approach past employers regarding work documentation, consult an experienced attorney if you need legal advice. Currently, any constructive knowledge of an employee’s status as illegal requires the termination of the employment relationship.

Sources


The AgJOBS bill is currently under consideration by U.S. lawmakers. Whether AgJOBS becomes law or not depends on the actions of the Senate and House of Representatives and the voices of their members’ constituents.

S. 237
Sponsor: Diane Feinstein (D-CA)
Last Action: 1/10/07, referred to committee

H.R. 371
Sponsor: Howard Berman (D-CA)
Last Action: 2/2/07, referred to subcommittee

The full texts of these bills are available at <http://thomas.loc.gov> and information is also available at <http://www.msu.edu/~bitsch>
Water Quality Risk of Uncovered Bovine Mortality Compost Piles

A pending change in laws surrounding animal carcass composting could be influenced by research recently performed at Michigan State University. By simulating rainfall on uncovered carcass compost piles, the study found that environmental risk varies depending on the amount of composting and amendments used in the composting process.

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Environmental concerns associated with animal tissue composting are responsible for the current Michigan law forbidding uncovered or open static pile composting. With this approach, composting is done without bins, roof, walls, or floor and generally is claimed to be a lower-cost composting arrangement for farms with large animal carcasses. Uncovered or open static pile composting has been approved by other states, but without data substantiating the environmental risk associated with leachate that may leave compost piles when exposed to precipitation. A recent study at Michigan State University addressed this question and found that the risk of leachate varies based on the amount of animal carcass composting done on farms and on the type of composting amendment used. This suggests farm operations employing uncovered or open static pile composting may require some type of mitigation or leachate treatment to avoid harming the environment around them.

Research

From late 2002 to early 2005, experiments involving the composting of mature dairy cow carcasses, laboratory columns (Fig.1), and 25-year, 24-hour storm rainfall simulations were conducted to assess the potential water quality impacts of large-animal mortality compost piles (1). Various compost management options and composting stages were “rained on.” Based on results from these studies, predictive models were developed to estimate the total pollution potential from an open-air, static pile mortality compost operation of a hypothetical 1000-cow dairy farm with a 5% annual mortality rate.

In large-scale open static piles with Holstein cow carcasses, storm rainfall simulations were applied (controlled mechanical application of predetermined amounts of rainwater), and effluent from compost piles containing whole cow carcasses was collected in three different controlled settings.

- Passing through a perforated raised platform
- In groundwater collected in constructed soil cells 3.9 ft beneath compost piles
- Runoff leaving compost piles along the soil surface

The results indicated that the majority of nutrients leaving mortality compost piles in effluent infiltrated the soil surface. Groundwater pollutant concentrations at 3.9 ft depth (sandy loam soil) were reduced as compared with effluent collected immediately after leaving mortality compost piles.

The laboratory column study used gravity flow through vertical PVC pipe containing one of four potential amendments.

- Corn silage
- Bovine manure
- Grass clippings
- Hardwood sawdust

A simulated 25-year, 24-hour storm was applied to the surface of each column. Resulting effluent was collected and analyzed for potential pollutants. Total mass of N and P in effluent from corn silage, bovine manure, and grass clipping amendments were all at least 10 fold higher than hardwood sawdust effluent, which produced the lowest load with all nutrient parameters.

Models were developed to determine the surface water and groundwater quality risk associated with various amendment selections and various sizes of operations. Total pollution potential was estimated when using the following amendments.

- Fresh hardwood sawdust and recycled mortality compost together
- Fresh hardwood sawdust and bovine manure together
- Corn silage
- Bovine manure
- Grass clippings

Results

The results of these models (Table 1) indicate that fresh hardwood sawdust alone would pose the least risk to surface water and groundwater of the amendments studied, while using
corn silage as an amendment would likely pose the greatest risk. A 25-year, 24-hour storm event on a hypothetical 1000-cow dairy mortality compost site using fresh hardwood sawdust amendment was predicted to load as much P in runoff as 5.4 acres of fallow soil subjected to the same storm, and load as much inorganic N into the soil surface as a single family home septic system would in 1.1 years. In comparison, the model predicted that these values would increase to 344.7 acres and 10.8 years respectively if corn silage were used as an amendment.

Summary

Research was conducted to determine the relative water quality risk of uncovered mortality composting. Specific objectives were to compare the nutrient contribution of potential composting amendments, and to determine the total mass of nutrients that may be delivered to the soil surface and groundwater. The results of this research indicate that properly managed uncovered static pile mortality composting systems will have variable surface and groundwater impacts depending on the amount of animal mortality and the type of amendment used in the composting process. Using fresh sawdust as an amendment provides the least environmental concern, but may be more costly and hard to source relative to the other amendment options. In addition, the compost process begins more slowly when only fresh amendment is used. Large operations, or those with site restrictions, may need to make use of buffer strips, constructed wetlands, septic systems, and holding ponds to effectively treat or collect runoff and/or leachate and avoid harming the environment around them.

References


Table 1. Estimated total phosphorus (P/grams) in runoff and infiltrating the soil from a 25-year, 24-hour storm event on a hypothetical uncovered mortality composting facility (1000 cow dairy herd, 5% mortality). Assumes approximately 5 cubic yards of amendment required for each pile.

<table>
<thead>
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<th>Amendment</th>
<th>P runoff</th>
<th>Acres</th>
<th>P infiltrating soil</th>
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<tr>
<td>Fresh sawdust</td>
<td>171</td>
<td>5.4</td>
<td>1254</td>
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<tr>
<td>Corn silage</td>
<td>10744</td>
<td>344.7</td>
<td>268644</td>
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<tr>
<td>Grass clippings</td>
<td>1116</td>
<td>35.8</td>
<td>27898</td>
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<tr>
<td>Reused finished compost</td>
<td>179</td>
<td>5.7</td>
<td>2025</td>
</tr>
<tr>
<td>Bovine manure pack</td>
<td>944</td>
<td>30.4</td>
<td>23595</td>
</tr>
<tr>
<td>Bovine manure pack 25% &amp; sawdust 75%</td>
<td>279</td>
<td>8.9</td>
<td>6984</td>
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</table>

* Total grams of phosphorus in runoff from a mortality compost site subjected to storm event.
* Acres of moderately textured soil which would provide an equivalent amount of phosphorus in runoff if bare or fallow and subjected to storm event.
* Total grams of phosphorus infiltrating the soil.
Interpreting Cattle Behavior Practically

When we ignore cows, we lose information. Each day cows send signals that an attuned herdsperson can interpret. Training employees to do so and taking action on what cows tell you is paramount. Understanding cow behavior can be good for cows and good for people and it does not cost very much in time or money.

Ben Bartlett
Extension Dairy Educator
The Upper Peninsula

Your cows do not talk but they can be communicating some very important messages. Are you listening? The way cows behave can tell us a lot about how they are handled, how comfortable their facilities are, and if management is causing or reducing stress. It’s easy to write off a cow’s opinion since college-trained people have scientifically taken care of all her nutritional and housing needs. Cow handling skills are not considered because the cow is confined in a barn and we can make her go where we want. Here are some reasons why we need to pay attention to our cows’ behavior.

Why Listen?

The public expects us to take good care of our animals. In 2006, the Arizona public voted by 61% to prohibit veal crates for calves and gestation crates for breeding pigs (1). Ben and Jerry’s announced that they would only buy their eggs from producers who use certified-humane cage free methods (2). Would your farm qualify if milk companies decided that they would only purchase milk from “certified–humane” dairy farms? Lameness is just one example of a health issue that seems to have gotten worse (3).

The most important reason to listen to your cows is the potential for increased profit. Happy cows do make more money. I will cite studies that demonstrate that good handling, facilities, and management can make a difference. It is important to remember that just because a cow gives a lot of milk does not mean that she is comfortable and healthy. Cows have their own “culture” and see or perceive the world differently than people do. To “listen” to cattle, we need to appreciate why what looks like a “dumb stunt” to us is perfectly natural to a cow.

The Cow’s World

How does a cow see her world? She sees a lot more because her eyes are on the side of her head so she can see everything except what’s directly behind her. But with poor depth perception, she doesn’t see her world as well as we do. In addition, she lacks the vertical vision we have and really can’t see where to put her feet unless she puts her head down.

This is why cows always “jump” over the gutter. Cattle can hear better than people in both volume and range and really don’t appreciate our hollering. In fact, a person hollering is as stressful as getting hit with a hot-shot (4). Cattle also are prey animals and feel safe in a group, will circle or put their head in a corner when threatened, and prefer to follow one another. Cattle are creatures of habit and it takes them a while to sort out anything new. One more important point, cows have their own social order and when moving animals, frequently the subordinate cow will be last. Sounds reasonable, but how many times do we try to make the little heifer push the boss cow in front of her. We end up with the heifer running over us to get away. I am sure she is thinking how can people be so dumb to ask her to push the boss cow. It’s much easier to push the 200 pound person!

The Benefits

Do good cow handling skills pay? Seabrook (5) found that when cows were handled aversively, in a way stressful to the cows, milk yield was reduced 1460 lb per year, cows took twice as long to enter the parlor, and defecated six times more often. Breuer and co-workers (6) found that heifers that were hit or rushed into a parlor produced 3 lb less milk per day, lost 30 lb more weight, and experienced more lameness than cows treated more calmly. Jan Shearer, a bovine foot specialist, believes that when cows are rushed to the holding area they suffer more lameness (7). Hemsworth (8) found that the percentage of cows approaching within 10 feet of an unfamiliar person was correlated positively with conception rate to first service. Think back to farms you have visited, some cows came right up to you and tried to eat your shirt and at other farms, the cows scattered like birds. What does that tell you about how they have been handled?

There are three kinds of people, a few are natural born cattle people, some people are not cattle people and should not work around cattle, and most of us are people who can learn to be good cattle people. Do you provide training for your staff so they can learn to handle cattle and be “good” cattle people?

Facilities and Management

Facilities and management also can play an important role in keeping the cow comfortable and productive. In work done with pre-fresh/early lactation first-calf heifers, milk production was 6.5 lb per day greater in the first 80 days when stocked at 80% capacity versus 120% of capacity (9). Lameness was 24% versus 11% in one survey when the stall surface was mattress versus sand. Interestingly, lame cows on mattresses spend more time standing in the freestalls. They spent 2 hours...
standing if on sand; 4 hours if moderately lame on mattresses, and 6 hours standing if on mattresses and severely lame (10). Researchers speculated that fear of slipping or difficulty in rising is what extended the standing times on mattresses. Lying time is very important since there is a 20% to 50% increase in udder blood flow in lying cows and 400 to 500 lbs of blood must flow through the udder for each 1 lb of milk produced. A simple management consideration like stall maintenance is important as demonstrated by a study that documented 10 minutes less lying time for each centimeter less of bedding depth (11). It has shown that regrouping cows can increase cow-interaction before a stable hierarchy is achieved, and this can reduce milk production 2 to 5% for a short period of time. A newly regrouped cow will be involved in 10 interactions per hour immediately after a move, twice as many as other cows in the group (10).

While it may sound obvious, comfortable cows are healthier and more productive. When you have a lot of “dumb” cows that want to lie in the alley, it may be time to measure the size and review the management of your freestalls. If your cows walk slowly and frequently fall down, maybe your floors need re-grooving. Don’t get in your cows’ way by overstocking or having them spend too much time in lockups or holding pens, and make sure feed is easy to reach. Yes, the cow can reach a long way with her tongue but she also could have her fill of feed and be resting, ruminating, and making milk in a free-stall instead of stretching for one more little bite.

Summary

Understanding cow behavior can be good for cows and good for people and it doesn’t cost very much in time or money. But, it does take a deliberate effort to make sure you and your staff are practicing good cow handling and your facilities are as comfortable as possible. Train your staff in good cow handling; don’t tolerate abusive behavior and reward those who are good with cattle. Good people can compensate for poor facilities but good facilities can never compensate for bad behavior by people. Review your facilities for weak links because good facilities will allow your staff and cows to do their best job possible for you. There are no free lunches but learning to listen to your cows comes pretty close.

References

5. Seabrook, M. F. 1984. The psychological interaction between the stockman and his animals and its influence on performance of pigs and dairy cows. The Veterinary Rec. 115: 84-87
Persistently Infected With BVDV? Now What?

Bovine viral diarrhea virus can result in abortion, pneumonia, fever, lameness and other ailments. Infections of BVDV have a negative effect on milk production and animal reproduction and represent a severe economic liability. Learning how to detect BVDV and reduce the risk of its spread throughout a herd is an important part of any thriving dairy farm. Further, there are steps cattle buyers and sellers should take to ensure transactions are ethical and mutually beneficial.

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Bovine viral diarrhea virus (BVD) is the most important viral infection of cattle in North America. Carriers of the virus, referred to as persistently infected (PI) with BVDV, are the major source of virus spread within and among farms. Persistent infections are the result of a fetal infection between 50 and 125 days of gestation. PIs can be born to either dams that are themselves persistently infected with BVDV or more commonly to cows that have undergone a transient (also called acute or primary) infection with BVDV during the critical time of gestation. PIs are infected for life and shed large amounts of virus in all of their secretions and excretions. Detecting and eliminating PIs is essential to controlling BVD.

**Detection**

Because PIs are loaded with virus, they are easily detected using standard laboratory tests. The ear notch test has become the preferred method for detecting PIs because of the ease of collecting the sample and its relatively low cost. A small skin notch about one-quarter inch wide is taken from the bottom edge of the ear using a pig ear notcher or a large diameter hole punch. The notch is placed in an individual labeled container (whirl bag, sandwich baggie or blood tube), and shipped to a diagnostic laboratory that performs the test. The samples need to be kept cool, but not frozen. The Diagnostic Center For Population and Animal Health (DCPAH) at Michigan State University performs the ear notch test for around $4 per sample. Results usually are reported in less than 1 week. If the test is positive, it is recommended to repeat the test in 2 to 3 weeks using either skin or blood to confirm persistence of the virus. DCPAH can be reached at (517) 353-1683.

**Solutions**

An important question is what to do with animals that are persistently infected with BVDV? First of all it is important to realize that they are a danger to the health of your cattle and any cattle they come in contact with. Keeping them around is not recommended, and selling them on the open market knowing they are a virus carrier is not very neighborly. There are several potential solutions.

1. Humane euthanasia. This is the preferred solution, but not necessarily the most economical. For young calves this solution would be recommended highly.
2. Sell them for slaughter only. To accomplish this, they should be sold through a grade and yield sale only. This ensures they are not returned to the farm of unsuspecting buyers. This solution could be employed for cattle that are near a reasonable slaughter weight. Please note, based on current knowledge, BVDV is not a human pathogen and not a risk to humans.
3. Raise PIs in isolation to slaughter weight. This is a solution only if you can maintain appropriate biosecurity between the PI’s and non-PI cattle! However, be warned that cattle persistently infected with BVDV are at high risk for developing severe and very often fatal secondary diseases. So, feeding them for extended periods of time is a risk economically. In general, we do not recommend this option, but realize that there may be an economical benefit to adding weight to these animals before sending them for slaughter.

Notice that we do not recommend selling PIs at the local auction markets in anything but grade and yield sales. Although not illegal, it certainly is unethi-cal to sell an animal on the open market that is known to be a carrier of BVDV.

**Smart Buying**

As a cattle buyer, what should you consider if you see an animal with an ear notch? First of all, do not assume that the animal has been tested for or is persistently infected with BVDV just because it has a notch in its ear! In fact, some people use ear notching for other purposes such as identification or to signify something specific about that animal. But for the sake of argument, assume the majority of ear notching today is done for the purposes of BVDV testing. So now what does that ear notch mean? It means the animal has been tested for
BVDV but it does not tell you if it was positive or negative and the only way to truly know the result would be to ask the seller or re-test the animal. In fact, more and more cattle are being screened for BVDV by ear notching and greater than 99% are negative! Hopefully, the few PI’s that are out there never make it to market (see above recommendations). In fact, as a buyer, groups of calves or cattle that have been notched should increase your confidence that they will be healthier and better performing, therefore you should be willing to pay more for them. Obviously, this is what the seller was hoping when they had the calves tested.

Finally, if you are buying cattle, consider asking that they be tested for persistent BVDV infection prior to purchase and be willing to pay a premium for this assurance. Some expanding dairy farms are making this a routine part of their purchase contract. Similarly, many heifer raisers are making this a requirement of all heifers entering their operation. Detecting BVDV PIs is an important and essential tool in controlling this virus. You are strongly encouraged to work with your veterinarian to determine how best to use BVDV testing in your herd.

THE EAR NOTCH test has become the preferred method for detecting persistently infected cattle. This method is inexpensive and relatively easy. A small skin notch one-quarter inch wide is taken from the bottom edge of the ear using a pig ear notcher or a large diameter hole punch and then tested for BVDV. As a buyer, seeing groups of cattle with notched ears should boost confidence, as nearly all BVDV tests return negative results.
What Causes Winterkill of Alfalfa and What Forage Alternatives Are Available If It Occurs?

Weather can be a real challenge, especially to alfalfa in the winter months. In order to reduce the risk of alfalfa winterkill, it is important to know what role factors like ice encasement, soil drainage and soil nutrients play in crop damage. But when winterkill leaves you without the forages you'd planned on, it's important to act quickly. Small grains can work well for late spring planting, and summer annuals can be a good early summer alternative.

Doo-Hong Min
Richard Leep
Dept. of Crop and Soil Sciences

Since weather is always variable, there are times when it causes significant problems in alfalfa production. Alfalfa is an expensive crop to establish and manage, but it is a very important forage crop that provides a good source of protein as well as necessary effective fiber, particularly for dairy cows. By understanding the factors affecting winterkill of alfalfa, producers may be able to reduce winterkill damage. This article discusses the causes of alfalfa winterkill, ways of reducing the risk of alfalfa winterkill and options of potential crops to grow if alfalfa is winterkilled.

What Causes Winterkill of Alfalfa?

1. Ice Encasement. One of the most important factors affecting winterkill of alfalfa is ice encasement. Heavy snowfall and moderate, fluctuating, sub-zero winter temperatures tend to create periodic ice formation, particularly in low lying, poorly drained areas that collect water. Ice can form as the snow melts and then re-freezes, which frequently occurs following mid-winter thaws. This ice generally penetrates into the soil surface and completely encases the upper regions of the alfalfa root and crown buds, which does not allow diffusion of gases such as carbon dioxide. Solid ice can kill the plants very quickly by suffocating alfalfa from lack of oxygen, but granular ice with interconnecting air passes is less severe. Alfalfa covered by ice for 3 to 4 weeks will most likely be injured or die. The presence of stubble from the previous crop is one way to reduce the risk of ice-encasement because crop residues or stubble tend to create channels and cracks in the ice through which gas exchange may occur. In addition, stubble tends to catch and retain snowfall which results in an insulation effect for the alfalfa crowns.

2. Soil Drainage. Good drainage is essential to prevent winterkill of alfalfa. In wet, poorly drained clay soils, alfalfa is much more subject to frost heaving during the late winter-early spring. Heaving can break the taproot and more often it forces the crown out of the ground, exposing it to drying winds and to mechanical injury during harvest. These weakened roots can be invaded easily by disease and sometimes these damaged alfalfa plants may die during the summer. Tile drainage can correct a poor drainage problem and surface drainage ditches in very level areas may be required to remove surface water in winter when soil is frozen. In addition, leaving enough stubble in the fall will provide more snow cover and less fluctuation in soil temperature.

3. Soil Potassium Level. A low potassium level in the soil can be one of the major factors resulting in alfalfa stand loss. Why? Because low soil potassium reduces storage of carbohydrates in the roots and crowns. High carbohydrate levels are needed to keep the alfalfa plants alive through the winter months as well as for new growth in the spring. Therefore, it is important to evaluate the soil potassium level in late summer or early September by obtaining a soil sample for analysis and applying a fertilizer if necessary.

4. Stand Age. The risk of winterkill in alfalfa increases with the increasing age of the alfalfa stand. Four- or five-year-old stands of alfalfa are more susceptible to winter injury or winterkill than one- or two-year-old stands when subjected to the same cutting schedule. This is because younger plants have lower disease infestations and have been exposed to less physical damage.

5. Varieties. Variety selection is one of the most important factors affecting winter survival of alfalfa because
 alfalfa varieties differ in winter hardiness and tolerance of disease or insects. Varieties with resistance to several diseases (Phytophthora root rot, Verticillium wilt, Bacterial wilt, and Fusarium wilt) and high winter hardness will have a lower chance of winterkill than those that are not winter hardy or not resistant to disease nor insects. Alfalfa varieties with high winter hardiness can be found in the Michigan State University Forage Information System website at <http://web1.msue.msu.edu/fis/>.

6 Harvest Management. The timing of harvest (whether by cutting or grazing) can affect potential winterkill and persistence of alfalfa. Several factors are involved: stage of maturity at cutting, the frequency of cutting per year, timing of fall cutting, and cutting height of the last harvest going into winter. If alfalfa is harvested at the vegetative stage frequently, the stands are going to be weak since the plants don’t have enough time to accumulate carbohydrate reserves in the roots. This is very important for regrowth after each cutting and for new growth in the spring. Therefore, it’s important to harvest alfalfa plants at late bud to early flowering stage to meet the goals of both forage yield and quality which results in better stand persistence. Leaving a 6 to 8 inch cutting stubble in the fall can be effective in catching snow for insulation.

Growing Degree Days (GDD) can be a useful tool in aiding late season cutting decisions. A GDD is the average of the minimum and maximum daily temperatures minus 41. Recent Quebec research (1,2) has shown that if 500 GDD accumulate after the last cutting in late summer, there will be enough regrowth for good carbohydrate accumulation before a killing frost. So growers can cut alfalfa in September as long as enough warm weather remains before a killing frost. The Quebec research also showed that cutting later in the fall was acceptable as long as there was less than 200 GDD accumulated after cutting. When less than 200 GDD accumulated, there would be little regrowth to use up valuable stored carbohydrates and proteins in the alfalfa roots. This would result in good winter survival of the alfalfa plants.

7 Deer Damage. Deer can seriously damage alfalfa stands by grazing the alfalfa down to the crown areas, thereby making them more susceptible to winterkill. Simple solutions are not available to prevent alfalfa damage from deer. Herd population control conducted in cooperation with the State DNR wildlife biologists is the best long term solution. Fencing also can be an effective way to reduce deer damage, but it is expensive. Legume-grass mixtures may be an option to reduce the alfalfa damage from deer.

Options for Winterkilled Alfalfa

Once you notice that most of your alfalfa plants are winterkilled, a decision needs to be made on what options are available for your situation as soon as possible. A small grain such as oats and peas, spring triticale and peas, barley and peas, oats, spring triticale, and barley are all good choices for planting mid-April to mid-May for those needing forage in early/mid summer. Whether the small grain is planted alone or mixed with peas, harvesting forage should be based on the maturity stage of the small grain (e.g., late boot for lactating dairy cows and soft dough stage for heifers and beef cattle).

If you miss the spring planting time for small grains after winterkill alfalfa, summer annuals would be an option. Forage choices for planting mid-May to mid-June are corn silage, sorghum-sudangrass hybrids (for hay or silage) and sudangrass (for hay or grazing). These crops can do well in drought conditions too. The seeding rate for sorghum-sudangrass and sudangrass is 20 to 30 lbs/acre and they can be cut whenever they reach about 30 inches height for high quality forage or 36 inches height for heifers and beef cattle.

Best choices for planting mid-June to early July will be sorghum-sudangrass hybrids, forage sorghum, sudangrass for highest yield for the remaining portion of the season until killing frost. When planted this late, forage sorghums will likely be killed by frost to dry sufficiently for ensiling. Harvesting within one week of a killing frost is recommended to reduce potential for prussic acid poisoning. Forage sorghums may not be the best choice if the year is average to cool in temperature because forage sorghums perform better in warm temperature (i.e., 90 to 95 degrees Fahrenheit). Previous studies on annual emergency crops have shown that corn silage results in the highest dry matter yields with the least risk of crop failure.

References

Feeding Practices Survey of High-Producing Herds in Michigan

Some herds produce more milk than others, but why? A recent study at Michigan State University looked at which practices some of the top producing herds in Michigan shared, and which they did not. The results suggest that while specific practices vary, top-producing herdpeople all place a great importance on feeding, nutrition, and herd management.

Erik Boterman
Herbert Bucholtz
Dept. of Animal Science

Feeding, nutrition, and herd management practices all have a great impact on milk production, herd health, and farm profitability. In April, 2004, DHI data indicated that 35 dairy herds in Michigan had rolling herd averages (RHA) greater than 29,000 pounds of milk. We conducted an on-farm survey with 18 of the 35 herds from late May to early July 2004 to identify feeding, nutrition, and herd management practices used in those herds. The objective of the survey was to help explain how those herds achieved their high DHI milk production. The results of the survey indicate that many of these herds’ owners and herdspersons made feeding and other herd management details a priority.

Survey Methods

Eighteen Michigan Holstein dairy herds with a RHA greater than 29,000 pounds of milk for the April 2004 DHI test date were selected randomly as survey participants. Feed, nutrition, and herd management practices were examined based on yearly RHA for milk production and herd size. The selected herds were assigned to four categories based on herd size: fewer than 250 cows, 250 to 500 cows, 500 to 1000 cows, and greater than 1000 cows.

From late May to early July 2004, we visited all selected herds. The herd owner or herdsperson assisted in completion of the survey form and data were validated. In addition, during the visit we had the opportunity to observe specific or unique feeding and herd management practices employed by these herds, and to record comments from the herd owners and herdspersons as to why they had implemented certain herd management practices.

Permission was obtained from the herd owners to access and use their DHI herd records. The survey herds’ DHI RHA for their July 2004 test date, averaged 29,989 pounds of milk with a range of 28,551 to 33,419. The nutritionists for the herds provided diet printouts for lactating and dry cow groups. The printouts were used to determine feedstuffs used in diets and the nutrient composition of diets. All herds were fed a totally mixed ration (TMR).

DHI Herd Information

A number of questions pertaining to herd size, percentage of cows in milk, milking frequency, age, and other general herd information were asked. Results were compiled and compared with the mean values for all 648 Michigan herds enrolled in DHI.

The RHA and peak milk, as expected, were the most notable differences between the 18-survey herds compared with the averages for all DHI herds in Michigan. Of the 18 herds surveyed, 15 herds milked three times daily and three milked two times per day. Other DHI herd management items such as days in milk and milk fat percentage certainly contribute to the 18 herds’ high production but no single DHI measure alone was greatly different when compared to all the DHI herds in Michigan. DHI annual herd turnover for the 18-survey herds was also similar to the average for all DHI herds in Michigan and suggests that the surveyed herds’ high milk production was not the result of a higher cow turnover.

General Herd Management Information

The number of cow groups varied between herds with the larger herds having more groups. This was expected. The criteria used to determine the assignment of cows to groups also varied, with reproductive status being the main criteria for assigning cows to groups.

The average number of lactating cows per freestall for all herds was 1.12 cows per stall (Table 1). However, the maximum stocking density for lactating cows was 1.47 cows per freestall and this occurred mainly in the larger herds with newer facilities. The stocking density “over-loading” by some of the herds was an interesting observation and greater than reported by Shaver and Kaiser (1).

The average feed bunk space for lactating cows was 1.72ft per cow for all groups on the day the herd was visited (Table 2). Feed bunk headlocks for the lactating cows were
used in five herds and not used in thirteen herds. Among the herds with greater than 500 cows only one herd used feed bunk headlocks.

**Feeding Management Information**

The number of feedings per day to the lactating cow groups varied between one and six times per day which is similar to that reported by Shaver and Kaiser (1). This was influenced by facility layout, feed bunk capacity and herd size. One herd had feeding six times per day due to elevated feed bunks with limited feed holding capacity. Herd size, group, mixer capacity, labor availability and feeding logistics influenced the number of feedings per day on individual herds. The average number of feed push-ups per day was 5.8, ranged from 2 to 12 times and was not influenced by herd size.

Monitoring of feedstuff dry matter (DM) varied by feed type and herd size. The average number of times per month haylage DM was determined was 2.34 (Table 3). Corn silage DM was 1.95 and high moisture corn DM was determined 0.9 times per month. Larger herds tended to determine DM feedstuff more often. A written record of feedstuff DM was done in 56% of the herds with the reported purpose that the data were used by the nutritionist and for on-farm ration adjustments.

Monitoring of daily feed intake of the lactating cow groups was done in various ways for the herds surveyed. Eleven herds, 65% of those reporting, kept a written record of daily feed intake. Those herds indicated the data were used to determine TMR batch sizes for the next feeding and for monitoring feed intake history by their nutritionist.

Most herds reported that feed bunks were cleaned daily. Orts from the lactating cow groups were re-fed mainly to growing heifers, steers or were disposed of. Some herds re-fed orts to low-producing groups and the close-up dry cows.

The proportion of time the main feeder did the feeding varied by herd size. For the herds of less than 250 cows the main feeder was the principal feeder because of a smaller labor pool.

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**Table 1. Number of lactating cows per free stall.**

<table>
<thead>
<tr>
<th>Group</th>
<th>Average</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-fresh</td>
<td>1.02</td>
<td>0.67</td>
<td>1.25</td>
</tr>
<tr>
<td>High-producing</td>
<td>1.14</td>
<td>0.94</td>
<td>1.47</td>
</tr>
<tr>
<td>Mid-lactation</td>
<td>1.18</td>
<td>1.08</td>
<td>1.47</td>
</tr>
<tr>
<td>Low-producing</td>
<td>1.10</td>
<td>0.73</td>
<td>1.36</td>
</tr>
<tr>
<td>1st lactation</td>
<td>1.16</td>
<td>1.05</td>
<td>1.44</td>
</tr>
</tbody>
</table>

**Table 2. Feed bunk space for lactating cows, ft/cow.**

<table>
<thead>
<tr>
<th>Group</th>
<th>Average</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-fresh</td>
<td>3.12</td>
<td>1</td>
<td>2.66</td>
</tr>
<tr>
<td>High-producing</td>
<td>1.67</td>
<td>1</td>
<td>2.69</td>
</tr>
<tr>
<td>Mid-lactation</td>
<td>1.79</td>
<td>1.36</td>
<td>2.08</td>
</tr>
<tr>
<td>Low-producing</td>
<td>1.55</td>
<td>0.72</td>
<td>2.18</td>
</tr>
<tr>
<td>1st lactation</td>
<td>1.47</td>
<td>1</td>
<td>1.81</td>
</tr>
</tbody>
</table>

**Table 3. Dry matter determination of feedstuff, times/month.**

<table>
<thead>
<tr>
<th>Feed</th>
<th>Herd Size</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;250</td>
<td>250-500</td>
<td>500-1000</td>
<td>&gt;1000</td>
<td>Average</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haylage</td>
<td>1.37</td>
<td>2.80</td>
<td>2.25</td>
<td>3.33</td>
<td>2.34</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Corn silage</td>
<td>0.83</td>
<td>2.00</td>
<td>2.25</td>
<td>3.33</td>
<td>1.95</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>HMC</td>
<td>0.31</td>
<td>0.68</td>
<td>1.23</td>
<td>1.29</td>
<td>0.90</td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

56% of herds (9 of 16) kept written record of feedstuff DM history.
For those with more than 1000 cows, one or two people were designated feeders. The herds from 250 to 1000 cows tended to have more different people involved with feedings.

Roughage Storage and Management

Most herds used bunkers for storing roughages with high moisture corn mainly stored in upright silos. Also, 14 of 15 herds covered haylage bunkers, 12 of 15 covered corn silage bunkers, and five of five covered high moisture corn bunkers. Our observation during the visit to the herds was that all herds were very careful to feed only the better appearing silages to the lactating cows. They did not feed silage from the top of the bunker or the silage near the sidewalls that appeared spoiled. All herds made particular mention of that practice. The silages in bunkers were well packed. The herd owners emphasized the importance of bunker packing during harvest.

In examining the methods used to decide when to harvest first cutting alfalfa, we found that six herds used alfalfa neutral detergent fiber (NDF) prediction methods such as growing degree days (GDD) or predictive equations for alfalfa quality (PEAQ). Most herds used more traditional methods for deciding when to harvest first cutting alfalfa. We asked this as part of the survey because we were interested in knowing if these high producing herds were implementing the predictive methods for alfalfa NDF content to decide when to harvest first cutting alfalfa. The results indicate that the use of predictive methods GDD or PEAQ was not as high as we expected.

All herds indicated they had goals for DM content ranges during harvest but only a few reported they had a standard protocol for monitoring DM during harvest. Blood meals, beet pulp, distiller’s grain, molasses, alfalfa, corn, and high moisture corn. Most herds used a “custom blended grain mix” and “custom mineral/vitamin mix” and for those mixes, many of the nutritional supplements and additives that were included in the diets. This listing included soybeans, canola and

Diets and Feedstuff Information

To obtain information on the nutrient composition of the diets for the lactating, early dry, and close-up dry cows we used the diet printouts that were provided to us from each herd’s nutritionist. All herds utilized a nutritionist for diet formulation and consulting. Sixteen of the herds used nutritionists who were associated with a feed company and two herds used a nutritionist that did not provide any of the ingredients used in the diets.

The nutrient composition for all the diets appeared to be within expected ranges of nutrient values.

We also were interested in the various feedstuffs used in the diets of the herds. For our study we asked the herd owners or herdspersons to list the ingredients and in particular the feed additives they used in the lactating, early dry, and close-up cow diets. They were able to provide a partial listing, but all referred us to their nutritionist for a complete listing. From the nutritionist’s diet ingredient printouts we were able to obtain a partial listing of particular nutritional supplements and additives that were included in the diets. This listing included soybeans, canola and

Conclusion

Among Michigan dairy herds with high DHI milk production, detailed attention to feeding and herd management appears to be a priority for herd owners and herdspersons. Some management practices did vary among the surveyed farms in this study. For example, the number of cow groups varied greatly among farms, as did the method of monitoring feedstuffs dry matter content. Conversely, most farms used bunkers for storing roughages and all herds utilized a nutritionist for diet formulation and consulting. These differences and similarities among farms suggest every farm has a different recipe for success, but that careful attention paid to feeding and herd management is often an important ingredient.

References

MSU Dairy Farm is the “Gold” Standard

The Michigan State University Dairy Teaching and Research Center (DTRC) has been recognized for its excellent milk quality as a gold winner in the annual National Dairy Quality Awards competition. Winners were announced by Hoard’s Dairyman magazine.

The MSU DTRC was one of 120 farms judged in the competition. The five platinum, 11 gold and 17 silver farms were evaluated for measures of quality, systems of monitoring udder health, milking routine, protocols for detection and treatment of clinical and subclinical cases of mastitis, and strategies for overall herd health and welfare. Ten other winners in the platinum, gold and silver categories were also Michigan dairies.

Philip Sears, Professor of Large Animal Clinical Sciences in the MSU College of Veterinary Medicine, submitted the nomination.

“It was a good time to let others know what a good job they do and give our dairy the recognition it deserves,” Sears said. “Over the past several months, the farm’s somatic cell count has been down below 50,000. Now that’s really, really high quality milk.”

According to the NMC (formerly the National Mastitis Council) Web site, the cell count for normal milk is nearly always less than 200,000 cells.

“The MSU dairy should have been nominated years ago, but I guess people forget about the university because they assume we’re doing it right,” Sears said.

Bob Kreft, manager of the MSU DTRC, attributes the success to team and technique.

“The credit really belongs to my crew, an excellent group of employees who care about milk quality,” Kreft said. “I am really proud that we received the award because the herd is here first and foremost for teaching and research.”

The MSU Dairy Teaching and Research Center is located south of campus along the west side of College Road between Forest and Jolly Roads. The herd is made up of 150 Holstein milking cows and 150 replacement heifers raised on the farm.

Since receiving the award, Kreft said, the farm’s milk quality has only improved.

“We looked pretty good during the time the award covered, but we’ve made even more progress since then,” Kreft said. “Our somatic cell count has been under 50,000 for 11 months.”

Kreft said the farm benefits from being the site of cutting-edge research taking place in the Department of Animal Science and the College of Veterinary Medicine. At any point in the year, multiple research projects can be simultaneously measuring feed quality, cow comfort, metabolism and reproduction for any number of animals in the herd.

“On our farm, we have contact with so many knowledgeable researchers,” Kreft said. “We have the opportunity to participate in research from the very beginning stages. We may learn a good idea early on that other producers may adopt in the future, or we may end up back at the drawing board.”

Other than the benefits of being a university farm, Kreft said, hard work and attention to detail are the tricks of the trade, just the same as at Michigan’s other 2,471 dairy farms.

The MSU Dairy Farm is open to the public for self-guided tours every day from 8 a.m. to 5 p.m. Maps and signs are in place to guide visitors through the farm and answer basic questions. The cows are milked at 4 a.m. and 2 p.m. daily.

The MSU Department of Animal Science has a 100-year tradition of educating outstanding students, providing excellence in research and engaging communities through Extension activities.
Beebe & Durst

Desi and Jeremy Beebe may be younger than the average Michigan dairy farmers, but speaking with them it’s clear they are not naïve. Along with Jeremy’s brothers Tim and Tom and parents Roger and Joanne they have built, from the ground up, a successful dairy and custom heifer raising farm. Working through that process with them, Jeremy says, was Michigan State University Extension Educator Phil Durst.

“Phil started around the time I got out of college and we’ve worked with Phil a lot over the years,” said Beebe. “A lot of times we’ll find ourselves kind of butting our heads against the wall and we’ll call Phil and see if we can get some perspective on things.”

That was the situation a few years ago when Desi and Jeremy were faced with an offer to expand their custom heifer raising business with a contract to raise 600 calves. It was more calves than they’d handled previously, but it seemed like something they could handle and profit from—at least on the surface.

“We broke it down into smaller pieces and looked at it and started realizing it wasn’t such a good idea,” Jeremy said. “But looking at the whole thing, it had seemed like something we might want to do.”

Jeremy and Desi began farming in 2000, the same year they married and 3 years after Jeremy completed the Agricultural Technology program offered by Michigan State University. They started milking 30 cows in a parlor built of second-hand equipment, but before long found themselves raising 300 heifers, as well.

“I think it’s good for producers to have somebody to talk to just to bounce ideas off of and think things through,” said Durst, talking about the collaborative role he thinks MSU Extension can play in big decisions.

He worked with Desi and Jeremy to develop marketing materials for the heifer raising business, but later found that the business involves more than just raising healthy heifers.

“There’s a bit more fickleness than we thought there would be,” said Durst, citing the unique personalities and broad contracts that characterize custom heifer raising, “but it’s a business in which Jeremy and Desi persevered and established a good reputation for themselves.”

Jeremy and Desi regularly attend Extension meetings including the “3-D” Durst, Dairy & Donuts meetings in West Branch and are part of the core group helping Durst to establish a regular group meeting of dairy producers younger than 35-years-old.

Branching out beyond the milking parlor has strengthened the farm, Jeremy said.

“We’re pretty diversified as far as dairy goes and that’s a big part of our success. If we were to just do one of those things we would have fallen flat,” Jeremy said. “We could always go back to just milking cows. That’s why it’s good to be diversified in dairy.”

Durst agrees, and says forward thinking like that is a benefit to Michigan dairying.

“When you’re young and go into business you have to be able to survive the downturns and he’s survived every one so far. The future of this business depends on young producers.”

Jeremy Beebe and MSU Extension Educator Phil Durst review a piece of literature about feed rations on Beebe’s farm. Beebe has tapped Durst for cooperation on several farm issues, including the decision to branch into custom heifer raising.

Photo by Jacob McCarthy
Growing up on his family’s dairy farm in Hillman, Galen Schalk saw the business changing. Other farmers were replacing equipment, increasing herd sizes and improving their practices. He worried that his family’s farm would be left behind.

“I was watching the neighbors as they progressed and got up-to-date equipment and we were still using equipment that was made in the 50s,” he said. “I remember one time my mom opened a milk check and it was less than $100. Things like that really leave the impression that there has to be a different way to do this.”

Schalk went to his first Michigan State University Extension meeting in 1973 and says that experience opened a door that has helped him thrive as a dairy farmer by encouraging him to adapt his techniques to match the advancing dairy industry.

“I had never heard so much information in my life and it really drove me to start making changes,” he said. “It was Extension that started the spark…I wondered, ‘why aren’t we doing that?’”

In the more than three decades since that first Extension meeting, Schalk has remained forward-thinking about farming practices and has continued to work with Extension Educators, particularly Phil Durst, to make informed decisions.

Perhaps one of the most pressing issues Durst and Schalk have collaborated on surrounds diseases such as Bovine Tuberculosis and Johne’s Disease. After finding Johne’s Disease in his herd several years ago, Schalk partnered with Durst and MSU faculty member Dan Grooms to reduce the prevalence of Johne’s on the farm. After finding 18% prevalence of Johne’s Disease in his herd the first year, Schalk made changes in his practice. He began milking cows suffering with Johne’s Disease last, separated calving and individual pens and got serious about making sure skid steers used to move feed didn’t come into contact with manure. Those measures have cut the prevalence rate of Johne’s Disease on his farm in half, Schalk said.

TB is another issue, though. Schalk has organized meetings of area producers to discuss responding to TB, which is especially prevalent in the northeastern lower peninsula. “I thought it was going to blow over and I thought it would get better soon but that light at the end of the tunnel gets farther and farther away,” Schalk said of TB. Today, after years of organizing meetings and influencing policy, Schalk said TB remains a concern. “Risk mitigation is a part of it but it’s just mitigation, there is still a risk. I could do every fence, every recommendation and I could still get hit with TB.”

Together, Schalk and Durst have traveled to the United States Animal Health Association meetings in North Carolina, Pennsylvania and Minnesota to make sure the voices of Michigan dairy producers are heard.

“Sometimes you wonder if it’s worth your time and expense to go and frankly we both believe it’s important to be representing animal agriculture in Michigan because there is a person working for everyone else there,” said Durst, adding that Schalk’s proactive approach to farming makes him a good candidate for influencing policy and practices. “One of the things that makes Galen a leader is that they know Galen Schalk and they know him for the right reasons, not the wrong.”

Schalk said he looks to Durst for advice on issues that affect his farm, and that the answers he’s gotten have strengthened his business. “Phil has been kind of a lean-on person in the area and a person I can bounce ideas off of,” he said. “Extension started the passion in me. If it hadn’t been for Extension I don’t know where I’d be. It’d be a lot different around here.”
Feed prices are the largest production expense and, therefore, greatly affect the supply of milk. Milk prices follow feed prices—although not immediately and not perfectly (Figure 1). The reverse is not true. That is, feed prices—especially grains—do not follow milk prices. This is a good thing for dairy farmers when milk prices are high and feed prices low. However, farmers are squeezed when feed prices are high and milk prices are sluggish to adjust.

The milk-to-feed price ratio is simply the price of a pound of milk divided by the price of a pound of feed. USDA calculates a representative feed price index using corn, soybean, and hay prices. The milk-to-feed price ratio can be represented as:

\[
\frac{\text{price of corn} \times 50}{56} + \frac{\text{price of soybeans} \times 8}{60} + \frac{\text{price of hay} \times 41}{2000}
\]

Of course, this is not likely any actual farm feed price. However, corn, soybeans, and hay are fairly common energy, protein, and forage components of some dairy rations and their prices are correlated with close substitutes that are available.

The milk-to-feed price ratio is the all-milk price divided by the feed index. All-milk is an estimate of the average market milk price at the farm level. It is not the mailbox price as it does not include over-order premium, check-offs and hauling costs. The milk-to-feed price ratio tends to move towards the range between 2.5 and 3.0. That is, when the ratio is below 2.5 there are strong signals to cut back on milk production. This happens through herds exiting and total cow numbers declining. This contraction in supply, if not interfered with by, for example, the Milk Income Loss Contract program, pushes milk prices up and the ratio recovers. Similarly, when the ratio rises above 3.0 there are strong signals to expand milk production.

### Table 1. All-milk prices to achieve milk-to-feed price ratios for given feed prices.

<table>
<thead>
<tr>
<th>Soybean Price ($/bu)</th>
<th>2.00</th>
<th>2.50</th>
<th>3.00</th>
<th>3.50</th>
<th>4.00</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All-milk price ($/cwt)</td>
<td>[\text{All-milk price} \times 100]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.00</td>
<td>12.19</td>
<td>13.33</td>
<td>14.47</td>
<td>15.61</td>
<td>16.74</td>
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<tr>
<td>6.50</td>
<td>12.36</td>
<td>13.50</td>
<td>14.63</td>
<td>15.77</td>
<td>16.91</td>
</tr>
<tr>
<td>7.00</td>
<td>12.52</td>
<td>13.66</td>
<td>14.80</td>
<td>15.94</td>
<td>17.08</td>
</tr>
<tr>
<td>7.50</td>
<td>12.69</td>
<td>13.83</td>
<td>14.97</td>
<td>16.11</td>
<td>17.24</td>
</tr>
<tr>
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<td>14.00</td>
<td>15.13</td>
<td>16.27</td>
<td>17.41</td>
</tr>
<tr>
<td>8.50</td>
<td>13.02</td>
<td>14.16</td>
<td>15.30</td>
<td>16.44</td>
<td>17.58</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Soybean Price ($/bu)</th>
<th>2.00</th>
<th>2.50</th>
<th>3.00</th>
<th>3.50</th>
<th>4.00</th>
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<tbody>
<tr>
<td>6.00</td>
<td>14.63</td>
<td>16.00</td>
<td>17.36</td>
<td>18.73</td>
<td>20.09</td>
</tr>
<tr>
<td>6.50</td>
<td>14.83</td>
<td>16.20</td>
<td>17.56</td>
<td>18.93</td>
<td>20.29</td>
</tr>
<tr>
<td>7.00</td>
<td>15.03</td>
<td>16.40</td>
<td>17.76</td>
<td>19.13</td>
<td>20.49</td>
</tr>
<tr>
<td>7.50</td>
<td>15.23</td>
<td>16.60</td>
<td>17.96</td>
<td>19.33</td>
<td>20.69</td>
</tr>
<tr>
<td>8.00</td>
<td>15.43</td>
<td>16.80</td>
<td>18.16</td>
<td>19.53</td>
<td>20.89</td>
</tr>
<tr>
<td>8.50</td>
<td>15.63</td>
<td>17.00</td>
<td>18.36</td>
<td>19.73</td>
<td>21.09</td>
</tr>
</tbody>
</table>
which brings milk prices down.

In recent years, changes in the milk price have been driving the milk-to-feed price ratio as feed prices—especially corn—have been low and stable. That has changed with the movement to ethanol production and the subsequent demand for corn. Whereas the 10-year average (1997-2006) US price for corn is $2.49/bushel, the current price is $3.50/bu or more and likely to stay in that area for the foreseeable future. These high corn prices will have a trickle down effect of pulling acres from soybeans and hay production which will raise those feed prices. These high feed prices are the opportunity cost of feeding homegrown crops to cows and, thus, the true cost to farms. Farmers will respond by using substitute feed products, like cottonseed and distiller’s grains, where possible and perhaps achieve a lower feed price than the inflexible USDA-defined feed price index would suggest.

As of January 2007, the milk-to-feed price ratio was 2.36 which strongly encouraged a cut-back in milk production (Figure 2). This ratio included a corn price of $3.23/bu.

The recent announcement that the Cooperatives Working Together (CWT) program would remove 54,000 cows could reduce milk supplies. However, 2007 still looks like a tough year.

We can invert the milk-to-feed price ratio to ask: what all-milk price will be required to achieve a 2.5 or 3.0 milk-to-feed price ratio given corn, soybean and hay prices? This question is answered in Table 1 where the top set of values is the all-milk price required to achieve a milk-to-feed price ratio of 2.5 with hay prices set at $110/ton (just slightly above the 10 year nominal average price) and corn and soybean prices varying by row and column. For example, in order to achieve a 2.5 milk-to-feed price ratio with corn prices at $3.50/bushel, soybean prices at $7.00/bushel, and hay at $110/ton, the all-milk price would need to be $15.94/cwt. To achieve a milk-to-feed price ratio of 3.0 with the same feed prices would require an all-milk price of $19.13/cwt.

In the past 10 years, the difference between the Michigan all-milk price and the Class III price has been about $1.50/cwt (although the difference varied substantially and the difference usually has been smaller when Class III prices are higher). Using that “basis” as a benchmark, we can begin to relate the current Class III prices to the implied all-milk price. With Class III futures price at $15.50/cwt or more, that might translate to all-milk prices of $16.50 to $17/cwt. That all-milk price will be sufficient to maintain a milk-to-feed price ratio of 3.0 only if corn is less than $3.00/bushel. Thus, we would conclude that, given the current feed price outlook, milk prices are none too high.
11th Michigan Dairy Expo to Be Held in July

Joe Domecq
Dept. of Animal Science

Michigan Dairy Expo (MDE) and 4-H Dairy Days will be held July 16-20, 2007 at the MSU Livestock Pavilion. MDE is one of the largest dairy events held in Michigan and continues to grow each year. The primary goal of the MDE is to showcase the Michigan dairy industry, and there is something for everyone at the MDE. Michigan youth are provided the opportunity to learn more about the dairy industry and compete in various educational events. Over 500 of the finest dairy animals in Michigan are exhibited by over 200 exhibitors. Dairy producers can purchase cattle during two sales held during the week. In addition, the Great Dairy Adventure, which is held on Wednesday during MDE, provides the opportunity for over 2000 children, parents, and educators to learn more about the dairy cows and dairy products.

Approximately 200 youth participate in various educational programs and competitions throughout the week including a youth dairy show, 4-H Quiz Bowl and Dairy Skillathon, and Dairy Judging Contest. Youth compete for premiums, scholarships, and opportunities to represent Michigan at national competitions held throughout the United States. Two $1,000 scholarships also are available to youth who demonstrate a wide range of knowledge and abilities during the event.

Youth also have the opportunity to participate in the Michigan Dairy Heifer Replacement Project and sell a heifer that they have raised and shown. A youth awards program is held on the last day of MDE and highlights the many achievements of the youth involved at MDE.

Premiums were available to open dairy show exhibitors for the first time in 2006 and were directly responsible for the largest number of cattle ever exhibited MDE. These premiums, partially supported by a grant from the Michigan Department of Agriculture, will be available for both youth events and open show exhibitors in 2007. Information for each open breed show is available from breed representatives or the Michigan PDCA at (517)353-7855. Premium books, schedule of events, and entry information will be available in early May in County Extension Offices, or on the web at <www.canr.msu.edu/ansckids/dairy.html>. Or, please call the Michigan 4-H Dairy office at (517)353-7855.

Many organizations across Michigan are involved in supporting, planning, and conducting MDE including Michigan State University and the Department of Animal Science, Michigan 4-H, the United Dairy Industry of Michigan, the Michigan Purebred Dairy Cattle Association and each state dairy breed organization, Michigan Milk Producers Association, and Michigan Farm Bureau.
Calendar of Events
April - June

Michigan Dairy Expo & 4-H Dairy Days
July 16-22, 2007
MSU Campus
East Lansing
Contact: Joe Domecq, 517-353-7855

Market Plan$:
April 24
Sandusky
http://www.dairyteam.msu.edu
Contact: 810-648-2515, 989-345-0692

Market Plan$:
April 26
St. Johns
http://www.dairyteam.msu.edu
Contact: 810-648-2515, 989-345-0692

Market Plan$:
May 30
Sandusky
http://www.dairyteam.msu.edu
Contact: 810-648-2515, 989-345-0692

Market Plan$:
May 31
St. Johns
http://www.dairyteam.msu.edu
Contact: 810-648-2515, 989-345-0692

Market Plan$:
June 26
Sandusky
http://www.dairyteam.msu.edu
Contact: 810-648-2515, 989-345-0692

Market Plan$:
June 28
St. Johns
http://www.dairyteam.msu.edu
Contact: 810-648-2515, 989-345-0692

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