Dairy Connection

Vol. 15, No. 3 September 2005

■ EDITORIAL

Faster than the change of our weather, and it seems more quickly than time itself, we're into fall routines. Some events you'll want to put on your calendar include:

Date	Event
Oct. 4-8, 2005	World Dairy Expo, Madison, Wis.
Nov. 2-3, 2005	Managing and Marketing Quality Holstein Steer Conference, Rochester, Minn.
Dec. 8-9, 2005	Joint MPA Dairy and NDDPC Swine conventions, Doublewood, Bismarck, N.D.
Jan. 11-12, 2006	Value-added Livestock Summit II, Seven Seas, Mandan, N.D.

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Take special note of the dairy steer conference on Nov. 2 -3. North Dakota, South Dakota, Minnesota, Iowa and Wisconsin have been planning this event for several months.
Its intended audience includes dairy heifer and beef growers, milk producers, allied businesses, veterinarians, consultants and Extension Service educators. A conference on this subject hasn't been held since 1991. So if you have interest in this area, plan now. Conference headquarters is the Kahler Grand Hotel in Rochester.

Following are the results of this year's annual state dairy cattle judging event, the George Fisher Memorial Dairy Judging Contest.

TEAM RESULTS

Senior 1st: Ward County	Ashley Kohler, Jonelle Monti, Katie Finken, Marcy Kohler (alternate)
Senior 2nd: Oliver County	Kortney Johnson, Emily Schmidt, Andrew Alderin
Senior 3rd: Nelson County	Brooke Franzer, Kristen Swenson, Mykal Ryba, Carrie Anderson (alternate)
Junior 1st: Ward County	Britney Klein, John Klein, Cody Lies, Chelsey Lies (alternate)

INDIVIDUAL RESULTS

Senior		County
1	Kortney Johnson	Oliver
2	Ashley Kohler	Ward
3	Jonelle Monti	Ward
4	Emily Schmidt	Oliver
5	Mykal Ryba	Nelson
6	Katie Finken	Ward
7	Kristen Swenson	Nelson
8	Andrew Alderin	Oliver
9	Brooke Franzer	Nelson
10	Marcy Kohler	Ward
11	Carrie Anderson	Nelson

Junior		County
1	Brian Alderin	Oliver
2	Britney Klein	Ward
3	Kaylee Lackman	Oliver
4	John Klein	Ward
5	Cody Lies	Ward
6	Chelsey Lies	Ward

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■ FORAGE

Higher cutting improves silage

University of Delaware researchers found that increasing the cutting height of silage corn from 5 inches to just under 19 inches improved its nutritive value but reduced silage yield about 10 percent.

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Extension Service
North Dakota State University

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Three leafy silage hybrids were cut at both stubble heights at black layer and half milk-line stages. The higher-cut silage was higher in dry matter and starch than the lower-cut corn, but crude protein and ADF were lower. NDF and lactic acid also tended to be lower.

When fed to dairy cows, the higher-cut silage showed tendencies for greater NDF digestion, higher milk production and improved feed efficiency.

Troubleshooting common silage problems

Keith Bolson, professor emeritus, Kansas State University, covers some of the problems encountered when ensiling forages.

- **High acetic acid concentrations, particularly in corn and sorghum silages that were too wet at harvest**

  Indicates forage underwent prolonged, heterolactic fermentation. Silage will smell vinegary. Seeing a 1- to 2-foot layer of bright yellow, sour-smelling silage on bunker floors, trenches or drive-over piles is common.

  Solutions:

  – Ensile all forages at correct dry matter (DM).
  – Use a homolactic inoculant to ensure efficient conversion of drop sugars to lactic acid.

- **Heat-damaged silage**

  Will be dark brown and have a strong burned-caramel or tobacco smell. Signals significant reduction in digestibility of "bound" (Maillard chemical reaction) protein and energy.

  Causes:

  – Ensiled forage temperature increases more than 10 to12 F above ambient at harvest, or exceeds 115 to 120 F during the first two weeks in the silo.
  – Presence of oxygen allows continued plant and microbial respiration, which creates heat.

  Solutions:

  – Harvest at correct maturity.
  – Ensile at correct forage DM.
  – Chop hay crop forages no longer than 1 inch and whole plant corn or sorghum to ¼ to ½ inch for ideal composition.
  – Fill silo uniformly and quickly.
  – Achieve minimum packing density of 15 pounds of DM/cubic foot.

- **Deteriorating corn silage during feedout**

  Solutions:

  – Harvest at correct maturity.
  – Ensile at correct forage DM.
  – Do not chop longer than ¾ inch if the crop is processed, or d to ½ inch if not run through a kernel processor.
  – Achieve minimum packing density of 15 pounds of DM/cubic foot.
  – Uniformly and rapidly progress through the silage during feedout.
  – Avoid feeding from large silos during warm weather.
  – Do not leave silage-based rations in feed bunks for extended periods of time, particularly in warm weather.

- **Excessive "surface spoilage" in sealed bunker, trench and drive-over pile silos**

  Solutions:

  – Densely pack forage within the top 3 feet of the silage surface.
  – Slope surface to drain water off bunker or pile.
  – Seal silo immediately after filling.
  – Apply sufficient, uniform weighting material to plastic sheet.
    * Overlap sheets by a minimum of 4 to 6 feet.
    * Use whole truck tires that touch to weight overlap.
    * Whole tires are preferred over tire walls, and truck tire walls are preferred over car tire walls.
  – Prevent damage to plastic sheet.

Beef and dairy producers can save forage and money if they implement and share these solutions with the entire silage team.

■ NUTRITION

Water: It is critical

Water is paramount to survival. With warm weather, water becomes even more critical. Water is the most limiting nutrient for milk production. Milk typically is 87 percent water, so a cow producing 100 pounds of milk a day must drink 10 gallons of water to provide for the production of milk. The cow also must drink water to provide for metabolic processes, water loss in urine and feces and water loss in respiration.

While the average dairy cow consumes at least 25 gallons of water per day, an individual cow often will double that water intake, especially in hot weather. Can your cows get the water they need? The first item to check is if the water is safe. An old saying is that "the dairyman should want to drink out of his water troughs." Are water troughs clean? Are they filled with algae or mud? Producers also should test the water to be sure it is free of bacteria or excess minerals.

The second item to check is the number of water troughs and their location. Does the operation have enough water troughs so cows can get a drink when they want? Ideally, the troughs should be close to the feeding area since cows like to eat, get a drink and return to eating. Can one or two cows block the water trough so no other cows can drink? Ideally, the water trough should be easily accessible for several cows.

The water trough should be shaded like the feeding area to encourage cows to drink. Water from wells at 60 F will be more palatable, as cool water will encourage cows to drink more, than water at 90 F in the direct sunlight.

Do not limit your milk production because your cows are not getting the water they need.

- Source: L.O. Ely, Extension dairy scientist, University of Georgia

Nutrition section continued after insert

Did you lose milk during the hot weather?

Even though the hot weather episodes are past, it's not too late to analyze what happened and apply this to fall rations. When the weather got hot, the best rations were those that were the most digestible.

Feeding more digestible feeds, such as grains, and/or using forages that are less mature and lower in fiber and lignin can increase digestibility. Digestible rations will have a faster rate of passage out of the gastrointestinal system and result in greater feed intakes than with rations of lesser digestibility. The exception can be situations where rumen acidosis occurs due to overfeeding grains or starchy feeds.

The roughage requirement must be met first. Sodium bicarbonate can be added to buffer higher levels of grain. Add one-third to one-half pound per cow per day. Some fat can be added to rations during hot weather to increase energy density. Do not exceed 6 percent fat in the dry matter, however.

Avoid overfeeding protein because excreting excess nitrogen takes energy. This is energy that animals can use for milk production. Rations greater than 18 percent protein usually are not advisable and sometimes less than this is adequate, depending on production level. Also avoid rations that have high levels of rumen protein degradability (greater than 65 percent degradable) for the same reason.

Research has demonstrated that hot weather increases the need for certain minerals. This is due to increased sweating and urination resulting in animals excreting more minerals. Potassium should be at least 1.5 percent of the ration dry matter, sodium .45 percent and magnesium .35 percent.

Other considerations for maintaining dry matter intake are feeding more frequently to keep feed fresh, feed during cooler times of the day, providing adequate feed bunk space so cows can eat without crowding, providing plenty of cool water and maintaining air flow with fans. Keeping cows eating is the key.

Source: C.C. Stallings, Extension dairy scientist, Virginia Tech Institute

■ HERD HEALTH

Top five reasons calves get sick

Getting colostrum into a calf (1 gallon within the first six hours of birth) is the most important factor in determining how well a calf's immune system can fight off disease. And when you've done a good job, that calf will have a total serum protein count greater than 5.5. However, at least five other factors can affect the calf's immune system:

- High exposure to pathogens such as bacteria, viruses and Crypto in its environment
- Inadequate caloric intake
- Not enough crude protein in the diet
- Low selenium
- Low trace minerals

Cow behavior in sand vs. mattress free-stall barns studied in relation to lameness

University of Wisconsin School of Veterinary Medicine researchers conducted a study to identify behavioral differences between cows housed in free stalls bedded with deep sand and cows housed in free stalls with rubber crumb mattresses to help explain differences in lameness prevalence observed between the two types of farms.

Mean lameness was significantly higher in mattress-stall herds than in sand-stall herds. Mean lying time averaged 12 hours per day for normal cows in both sand and mattress herds. Time standing in the stall with all four feet on the platform or perching with two feet on the platform and the rear feet in the alley was significantly different between the two groups. Normal cows in the mattress-stall herds stood in stalls for 2.4 hours per day, compared with cows in the sand-stall herds that stood 1.7 hours per day. Time up in the stall for slightly lame cows in the mattress herds was 4.4 hours per day, compared with 2.1 hours in sand herds. For moderately lame cows, time up in the stall was 6.1 hours per day in mattress herds, compared with 1.8 hours in sand herds. Moderately lame cows in mattress-stall herds had 46 percent fewer lying sessions per day, and lay down for only 10 hours per day.

Researchers speculated that the surface traction that sand provided allows lame cows to rise and lie down more easily, without fear of slipping, thereby maintaining normal lying session behavior in cows with sore feet. The pain and fear of slipping associated with rising and lying in lame cows on a mattress-stall surface leads to extended bouts of standing in the stall during the laying session. Extended time spent standing in the stall may be detrimental to claw health, increasing the duration of lameness in mattress-stall herds.

If you don't have access to sand, or have a manure system that cannot accommodate sand (such as we do at NDSU), mattress stalls are a great management choice that can improve cow health and milk quality. We are very satisfied with ours.

Source: The AABP Proceedings, September 2004; pg 194 (Cook, et al).

Dry period best time to treat Staph *aureus* infections

Although a difficult therapeutic challenge, intramammary infections that *Staphylococcus aureus* cause are not necessarily incurable. Depending on the herd, 30 percent to 70 percent of individual quarters may be cured during the dry period. Thus, if producers exercise a little judgment in selection of cows as therapeutic targets, treatment can be reasonably effective and economical.

The dry period offers the best time to administer therapy because milk withholding expenses are negligible, residue risks are reduced, and it is the optimum time in the lactation cycle of the cow to enhance the synergy between antimicrobial activity and the immune system.

Source: 2001 NMC Regional Meeting Proceedings, pg. 60 (Erskine)

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A cowboy's guide to life . . .

- Most of the stuff people worry about never happens.
- Lazy and quarrelsome are ugly sisters.
- Don't squat with your spurs on.
- Don't judge people by their relatives.
- When you lose, don't lose the lesson.
- Talk slowly, think quickly.

Authors unknown

Drugs prohibited from extralabel use in food animals

Drugs prohibited from extralabel use in food animals in the U.S. (listed in chronological order of prohibition) include:

- Diethylstilbestrol (DES)
- Chloramphenicol
- Nitroimidazoles (including dimetridazole, metronidazole and iponidazole)
- Sulfonamide use in adult dairy cattle*
- Clenbuterol
- Dipyrone**
- The fluoroquinolones (examples enroflaxacin and danofloxacin)
- The glycopeptides (example vancomycin)
- Nitrofurans (including nitrofurazone, furazolidone, topical use prohibited as well)
- Phenylbutazone use in adult dairy cattle*

* The FDA defines lactating (adult) dairy cattle as dairy cattle 20 months of age or older, regardless of whether they are milking or dry. The only sulfonamide available for use in dairy cattle older than 20 months of age is sulfadimethoxine (SDM). In adult dairy cattle, this drug may be used only on-label. Administering higher doses or sustained-release SDM products is prohibited.

Aside from the above AMDUCA list, regulations related to the Pasteurized Milk Ordinance (PMO) prohibit the presence of dimethyl sulfoxide (DMSO) and colloidal silver on dairies. In addition, the use of ionophore compounds (i.e., monensin, lasalocid) in lactating dairy cattle rations is prohibited.

** Because dipyrone-containing products are not available for either humans or animals, it is not typically included on lists of extralabel prohibitions that the DVM publishes. Old stockpiles of the drug, however, occasionally do surface. Any use of dipyrone in food animals remains a violation of the Food Drug and Cosmetic Act.

Source - www.farad.org/prohibit.html

■ MILK QUALITY

Listen for liner slips and fall-offs

When evaluating milking performance, monitor the number of times that operators must adjust the units because of slipping or fall-off. A practical goal is less than 5 percent of cows milking requiring the operator's correction. Heavy clusters, uneven weight distribution within the cluster, blocked air admission holes and cows kicking at clusters are common causes of slips and fall-offs.

Note the stage of milking when the slips and falls occur. Flooding clusters or milk lines tend to cause slipping or falling early in milking. Poor liner design, uneven distribution of weight between the four teat cups within a cluster, and cows kicking at clusters are the most common causes of slipping and falling late in milking.

Does freezing milk affect samples?

Most mastitis-causing organisms survive refrigeration for several days or freezing for several weeks. Isolation of most staphylococci and streptococci is not affected greatly when samples are stored at 4 degrees Celsius for one week or frozen for up to six weeks. *Nocardia* spp. are an exception to this general rule, as storage of samples for only a few hours or freezing can reduce the likelihood of isolating these organisms. Freezing samples may reduce the sensitivity for isolation of *Escherichia coli*.

Source - Microbiological Procedures for the Diagnosis of Bovine Udder Infection and Determinationn of Milk Quality, pg. 2 (2004)

Raw milk bulk tank analysis

For a producer dealing with milk quality or mastitis issues, a bulk tank analysis is a good starting point to pinpoint possible problem areas. A bulk tank analysis should not be used to replace quarter milk samples when attempting to solve a mastitis problem. The results will identify the predominant types of bacteria in the bulk tank.

A bulk tank analysis includes a standard plate count (SPC) and a bulk tank milk culture (BTM). A high SPC (>15,000) may indicate poor udder preparation or intramammary infections (mastitis). A high PI (>30,000) indicates improper sanitation of equipment or cows, dirty equipment or cows, or contaminated water. A high LPC (>200) indicates poor cleaning of equipment or bulk tank. A high SCC (>200,000) indicates mastitis and you should review milking procedures, improve sanitation of cattle housing areas and check for proper equipment function.

The BTM culture gives an actual count of the various species of bacteria present in milk. One of the best uses of BTM cultures is to indicate the presence of Staph. Aureus and Strep. ag., two indicators of mastitis. To ensure accurate results, a proper sample must be taken from the bulk tank and delivered to the lab in a timely fashion (within 48 hours). The bulk tank should be agitated for at least five minutes (longer for larger tanks) and a sanitized dipper used to collect the sample. The sample should be refrigerated or kept on ice until delivered to the lab. Using these results, your veterinarian, field representative or state inspector then can determine what steps to take to resolve the problem.

Is your milk cold enough?

Cool milk immediately after milking to reduce bacterial growth. Bulk tanks should operate to maintain milk temperatures below 40 F (4C) and above freezing. Every degree above 40 increases bacteria counts and reduces the shelf life of finished products. A properly operating milk cooling system should:

- Cool milk below 40 F within 30 minutes after the first milking
- Hold the milk at 36 to 38 F (3C)
- Prevent blend temperatures from rising above 45 F (7C) during the addition of milk from subsequent milkings

While these goals are stricter than most state and national regulations, they are necessary to meet today's standards for producing high-quality milk. Maintenance of your cooling system is important to meet the above listed goals. Some early warning signs of system malfunction include:

- Excessive running time of compressor
- Dirty condenser
- Oil spots and leaks in refrigerant line
- Bubbles in the sight glass
- Refrigerant line after flow control is not cold
- Refrigerant line from compressor to condenser is not hot

If your milk isn't cooling properly and staying cold, or you notice any of the above problems, contact your local equipment service to have the system checked. Better yet, have routine service checks to avoid these problems. By properly cooling and storing milk, producers can receive quality premiums and avoid penalties for high-bacteria milk.

Source: A.G. Grove, Extension area dairy agent, Valley of Virginia

■ REPRODUCTION

Maximizing genetic selection is no bull!

Many think AI and DHIA procedures cost more than they can afford. However, maximizing genetic selection and measuring animal production is essential to good management. Developing a high producing herd is possible, as proven by a long-term experiment conducted at the Dairy Experiment Station at Lewisburg, Tenn. The experimental group was bred to the top bulls available through AI at any given time, while the controls were bred only to those AI sires available at the start of the study.

After 13 years, the experimental group's rolling herd average was 2,816 pounds of milk and 105 pounds of fat ahead of the controls. The income over feed cost (IOFC) favored the test group by $336 per year. So improving the genetic ability of the herd through AI has long been proven to be possible.

In a Virginia study, the loss of lifetime income from using herd bulls is shown in the following table:

Replacement sires from non-AI bulls	Herd size 50	100	500
	Loss in lifetime income*		
10%	$439	$877	$4,385
30%	$1,316	$2,631	$13,156
50%	$2,193	$4,385	$21,927

* From one year's replacements at 30 percent culling rate and $135 PTAMFP$ (Predicted Transmitting Ability Milk Fat Protein Dollars) advantage AI.

Source: B. Cassel, Virginia Tech Institute

To complicate matters, when money gets tight, usually AI and DHIA are the first things to go. DHIA and AI account for only 2 percent of the total cash expenses.

Steps for CIDR use

The CIDR (Controlled Internal Drug Release) releases progesterone intravaginally and is approved for use on dairy heifers and lactating cows. For best results, follow these simple steps:

1. Wear protective gloves whenever handling the CIDR insert.
2. Prepare a container of clean water with disinfectant solution. Wash the applicator between uses.
3. Fit the body of the insert into the applicator with the tail along the slot. The two wings should be pushed together, protruding about 1 inch above the top of the applicator.
4. Apply a generous amount of lubricant to the tip of the insert.
5. Shift the animal's tail to one side and clean the vulva.
6. Make sure the tail of the CIDR is on the underside of the applicator pointing down. You may want to clip the tail of the insert so that about 2½ inches protrude from the vulva. This will minimize possible removal by pen mates.
7. Open the lips of the vulva and insert the applicator at a slightly upward angle, moving forward over the pelvic bone until it meets resistance.
8. Dispense the insert from the applicator by depressing the plunger, then slowly withdraw the applicator.
9. Give prostaglandin on day six, one day before insert removal.
10. Withdraw the insert on day seven. Give the tail a gentle but firm pull.
11. Days eight to 11 heat detect and inseminate heifers seen in standing heat.
12. Dispose of used CIDRs in a sealed, plastic container in accordance with applicable local, state and federal regulations.
13. Heifers not seen in heat may be short cycled with prostaglandin 10 days after first injection.

Visit *www.cidr.com* for more information.

Crossbreeding in dairy

The art and science of crossbreeding in the dairy industry has had little attention for at least 30 years. The most popular has been the Holstein x Jersey or Ho-Jos. Most of that discussion has been among courageous producers who are doing the experimenting.

Recently, the University of Minnesota has been examining the effects of crossbreeding several traits, including reproduction. While crossbreeds will take a "hit" on milk production compared with Holstein on a per-lactation basis, improvements in conception rates have captured the focus of Minnesota researchers.

Using crossbreeds of Normande-Holstein, Montbeliard Holsteins and Scandinavian Red-Holstein as a comparison to pure Holstein from seven commercial dairies in California, they looked at milk production during the first 150 days of first lactation, dysplasia and stillbirths, and fatality measures for days to first breeding, first service conception rate, days open and survival. In brief, the following table compares these crossbreeds to the pure Holstein.

Trait	NxH	MxH	SxH
production	–7%**	–1%	+2%
dysplasia	+1.4%	–2%	–5.1%**
stillborns	–5.3%**	–7.4%**	–7.6%**
days to first breeding	–7 d**	–4 d**	–3 d**
first conception rate	+13%**	+9%**	+8%**
days open	–27 d**	–19 d**	–21 d**

** Means significantly different (P<0.01)

In addition, all crossbred groups survived significantly (P<0.05) longer than Holstein during first lactation.

After just recently completing the State Dairy Show, where only registered purebred cattle are featured, information such as this certainly draws attention to problems in reproduction. The question to address is what is the value of performance and functionality traits of greater value when compared with improvements in such lowly heritable traits as fertility. You be the judge, and remember, crossbreeding is a business decision that cannot easily be undone. Plan carefully, execute well.