

UNIVERSITY OF MINNESOTA

DAIRY

Initiatives

UNIVERSITY OF MINNESOTA DOCUMENTS
APR 03 2003



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Attention to Detail Brings Low SCC, Milk Check Bonus for Nathes

By JOSEPH KURTZ
University of Minnesota Extension Service

They market high-quality milk that earns a premium price, putting extra dollars into their milk check. That makes close attention to detail in their dairy operation well worth the effort, say members of the Nathe family of Stearns County.

The Nathes milk 200 cows on their 260-acre farm about a mile east of Meire Grove, with a herd average of 24,500 pounds. The operation includes John and Ginny, their son Jeron, and his wife, Brenda. John and Ginny's daughter Jana—a student at St. Cloud Technical College—also helps with milking. Irene Nathe, a neighbor and distant relative, is an employee who helps milk. High school students Chris Frieler and Nathan Lieser help keep stalls and barns clean.

The Nathes are among the top dairy producers in Minnesota when it comes to producing milk with a low somatic cell count (SCC), a standard measure of mastitis and milk quality. Their herd SCC for December 2002 was 92,000 as recorded by their milk plant, the Land O'Lakes plant in Melrose. In November it was 97,000, and for last year it was 146,000.

"That puts them up there with the elite," says Jeff Reneau, dairy scientist with the University of Minnesota Extension Service. There are about 6,500 herds in Minnesota and 3,500 on Dairy Herd Improvement Association (DHIA) testing. Of the DHIA herds, only 37 had a SCC under 100,000 for December and only 150 were under 150,000.

The Nathes earn a milk quality premium of 70 to 80 cents per hundredweight. This added \$3,572 to their milk check in December 2002, and their

monthly premium typically tops \$3,000. The low SCC also means higher milk production. "When the count is higher, cows don't milk as well," John says.

John, 62, represents the fourth generation of the family on the Nathe farm, and Jeron, 27, represents the fifth. It's a Century Farm, homesteaded by John's great-grandfather in 1868. John and Ginny were married in 1969 and took over the farming operation in 1970. They are the parents of Lori, Greg, Jeron, Karl and Jana.

When John and Ginny started farming in 1970 they milked 40 cows in a tie-stall barn. They built a 100-stall freestall barn in 1994, increased the milking herd to 100 cows, and converted the tie-stall barn to a flat-barn parlor and holding area.

Jeron joined the operation full time after completing a two-year farm management program at Ridgewater College in Willmar in 1995. He and Brenda, who grew up on a dairy farm near Sauk Centre, were married in 2001.

In 1999 the Nathes expanded to 200 cows, adding another 100-stall freestall barn. At that time they also put in a double-eight pit milking parlor with automatic take-offs.



John Bush ©2003

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Current information available from University of Minnesota Extension: <http://www.extension.umn.edu>.

Attention to Detail

Continued from page 1

The Nathes have worked to keep their SCC low for many years. "Typically in the tie-stall barn we were under 100,000," says John. "We lost a little bit in the flat-barn parlor. Our equipment wasn't functioning properly and we went up to 200 to 250,000. But we finally got it turned around."

In addition to earning bigger milk checks because of a low SCC, providing a high-quality product to consumers is important to the Nathes. And, as Ginny says, "it's more fun milking cows that are healthy."

They stress keeping the cows clean as one of the basics for achieving a low SCC. They use rubber-filled mattresses in the freestalls, and also bed the stalls with wood shavings and sunflower hulls. They clean the back half of the stalls and the alleys in the freestall barns twice a day. After cleaning they spread hydrated lime on each stall. Their goal is to keep the cows comfortable and stress-free.



The Nathe family dairy operation includes (from left) Brenda, Jeron, Jana, Ginny, and John Nathe.

Milking procedure is another key. About a year ago they made some changes in their milking routine, implementing a procedure developed and recommended by the University of Minnesota.

"The procedure involves dipping, rubbing the teats and especially the teat ends, stripping, and dipping again," Jeron says. "The idea is to get good stimulation and milk letdown. The teats are then dried using a cloth towel. The whole procedure is done in a timed sequence."

They watch cows closely at milking time for signs of mastitis, such as hard or swollen udder quarters. They also keep a close eye on individual cow SCC information from DHIA. If a problem shows up, they use the on-farm California Mastitis

Test (CMT) to check individual quarters. All cows with mastitis or high cell counts are cultured. If the culture shows contagious mastitis, the cow is moved to the last milking group. They also give each cow a CMT when she freshens and just before she is dried off.

They have two pails of disinfectant water in the parlor during milking. One is for washing hands. The other is to disinfect any milking unit that has come off a problem cow before the unit goes onto another cow.

The Nathes feel keeping equipment in good order is one of the keys to controlling mastitis. Darryl Droogsma, their Land O'Lakes milk production specialist, checks pulsators every four to six weeks to make sure they are opening and closing properly. Their equipment dealer, Stearns Veterinary Outlet Store of Melrose, checks their vacuum levels every two weeks and rebuilds pulsators once a year. The dealer also does other regular maintenance and addresses any equipment concerns the family has.

"We try to keep everything clean and running the way it's supposed to run," says Jeron. "We've been doing it so long it's automatic."

He notes that some dairies focus on cows milked per hour. "Here, we make sure everything gets done," he says. "We don't worry about cows per hour quite as much."

Droogsma, the Land O'Lakes milk production specialist, says cleanliness and attention to detail are the keys to the Nathes' success in controlling mastitis. "They have a super-clean working environment," he says. "That includes the cows, the parlor, everything. When you go there, it's not messy one day and clean the next. It's clean and dry every day."

The Nathes make sure everyone in their operation who milks uses the same milking procedure consistently, says Droogsma. "And they fine-tune things," he adds. "If they have a problem with a pulsator, they fix it. Some people say 'We'll get to it,' but they don't. The Nathes do preventive maintenance, rather than waiting for problems to show up."

Jim Salfer, regional educator at St. Cloud with the University of Minnesota Extension Service, says the Nathes do an excellent job with hygiene.

"Hygiene goes a long ways in controlling somatic cell count," he says. "They're so consistent in the way they do things and they're very meticulous. They do everything consistently well every single day." 🐄

.....
"We try to keep everything clean and running the way it's supposed to run. We've been doing it so long it's automatic."

Jeron Nathe

\$53 Million Gain Possible for Minnesota Dairies

MINNESOTA DAIRY FARMERS could gain \$53 million by lowering bulk tank SCC from the current 400,000 state average to 200,000.

This estimate is based on these assumptions:

- \$11/cwt milk price
- about 500,000 cows
- 18,000 lbs. of milk per lactation
- average milk quality premium of \$0.35/cwt.
- 33% of lactating herd are first-lactation cows

How does your herd stand? Using your herd DHI SCC values, milk price, and quality premium schedule, calculate what your potential gains could be. 

ESTIMATE OF PRODUCTION LOSSES DUE TO SUBCLINICAL MASTITIS

LACTATION GROUP	# COWS	AVG. LS	GOAL	PRODUCTION LOSS/UNIT LS	MILK LOST (LB./GROUP)
First Lactation:	_____	x (_____ - 2.0)		x 220 lb. = _____	
Other Cows:	_____	x (_____ - 2.5)		x 440 lb. = _____	
	_____	x _____		= _____	
	Total lb. lost			Milk price per lb.	Annual production loss to subclinical mastitis

ESTIMATE OF OPPORTUNITY FROM MILK QUALITY PREMIUMS

Maximum SCC premium from your milk plant:	\$ 0. _____ per cwt. (at 150,000 SCC)
Average quality premium received last year:	\$ 0. _____ per cwt.
Potential premium difference:	\$ 0. _____ per cwt.
_____ x _____	= _____ / 100 = _____
Rolling herd average # cows	Prem. diff. per cwt.
	Annual premium opportunity

For a more in-depth economic analysis, check out "Annual Losses Due to Mastitis Above a Desirable Baseline Level," an Excel spreadsheet developed by John Fetrow of the University of Minnesota College of Veterinary Medicine. You can find it at www.ansci.umn.edu/dairy/toolbox/toolbox.htm.

Dairy Leaders Roundtable Update

Meeting at the Minnesota Milk Producers Association (MMPA) convention in St. Cloud, the Dairy Leaders Roundtable received good news and bad news.

Minnesota Agriculture Commissioner Gene Hugoson told roundtable members that Gov. Tim Pawlenty has chosen to focus his administration's energy on reviving the state's dairy industry. Hugoson said the governor and his administration will work to lower producers' business costs and create a more farmer-friendly operating environment.

Toward that end, the Minnesota Department of Agriculture (MDA) has taken a leadership role in educating dairy farmers about the importance of improving somatic cell counts. The MDA recently appointed Kevin Elfering interim director of the department's Dairy and Food Inspection Division. Elfering has said he will focus on educating producers and helping them comply with regulations.

The bad news from Hugoson is that the state budget crisis will likely mean reducing funding in fiscal years 2004 and 2005 for the Dairy Development and Profitability Enhancement program and scaled-back inspection schedules for certain dairy and food facilities.

There was also a mix of good news and bad news in MDA's presentation of results from its recent dairy farmer opinion survey. The Minnesota Agricultural Statistics Service (MASS) surveyed roughly 3,000 Minnesota dairy farmers in late 2002 and received more than 700 responses.

The survey shows that while serious challenges continue to threaten the long-term viability of Minnesota's dairy sector, there is also reason for optimism. One of the more encouraging findings was that nearly 300 respondents said they intend to make on-farm investments by 2007. The farms most likely to make major investments are those with 100 or

more cows. MDA analysts project this on-farm investment could bring \$53 million to rural Minnesota. Total benefits from these investments would approach 4,800 new jobs and \$500 million in direct and indirect economic impact for rural Minnesota.

According to U.S. Department of Agriculture figures, the nation's top 10 dairy producing states average 232 cows per farm. Minnesota's herd average is around 70 cows per farm.

Other survey findings show that while the number of dairy farms will continue to decline in the next five years, the number of farm families involved in dairying will not drop as fast. The reason for this is that the average number of farm families supported by a particular farm is directly proportional to the size of the dairy herd. The smallest farms are the ones most likely to drop out of the business in the next five years, so the remaining farms are more likely to support multiple farm families. 



Industry Teams Up to Get SCC Down

By MIKE SCHOMMER
Minnesota Department of Agriculture

Leading the nation in some category of dairy production is usually a point of pride, but not when the category is somatic cell count. Unfortunately, that's the situation in Minnesota today.

Of the nation's top 10 dairy states, Minnesota ranks the highest in average SCC. The state's herds in 2001 had an average SCC of nearly 420,000.

For farmers, this isn't just a quality concern. It's also an economic concern. With processors adjusting milk checks up or down based on SCC, a farmer with a low somatic cell count (300,000 or lower) could earn up to \$2 more per hundredweight than a farmer whose herd average is near 750,000.

Minnesota's high SCC average is a problem beyond the farm, too. It hinders the efficiency and profitability of the state's processors. It's a potential trade barrier. It can also cause problems at the consumer level. One well-known activist group has kicked off a publicity campaign attempting to convince consumers that high SCC is a quality concern for consumers.

Recognizing the negative impact Minnesota's high SCC average has on quality and profit consid-

erations, the Minnesota Department of Agriculture, University of Minnesota, Minnesota Board of Animal Health, Midwest Dairy Council, processors, and producer groups are working together on a solution.

In January, the organizations agreed to team up to help Minnesota dairy farmers reduce the state's average SCC from 420,000 to 325,000 by June 2005. You'll be hearing a lot about this "Quality Counts" campaign in the months ahead.

Dairy farmers take great pride in their product, and there's no doubt they will understand the importance of lowering SCC. The bigger challenge will be maintaining consistent effort over time. Let's work together to reduce our state's SCC average, give ourselves a big pat on the back—then continue working hard to keep it that way.

If you have questions about SCC or want more information, please call 612-624-4995 and ask to speak with either Russ Bey, Ralph Farnsworth, or Jeff Reneau. You may also email them directly; Dr. Bey, beyxx001@umn.edu; Dr. Farnsworth, farns001@umn.edu; Dr. Reneau, renea001@umn.edu. 🐄



Dairy Cows Are Rural Economic Development Engines

By JOE CONLIN
Quality Dairy Management Services

More dairy cows on the Minnesota landscape will help revitalize Minnesota rural communities. A recent University of Wisconsin study shows each cow generates \$13,737 of economic activity. A 1993 Minnesota study estimated the impact of one cow to be \$11,671. This money ripples through the community in the form of jobs, goods, and services created by a cow. Each cow paid \$604 in state and local taxes in the Minnesota study and \$512 in the Wisconsin study. These estimates are in close agreement given that 10 years separated the time of the studies.

Many people in local rural communities benefit from the ripple effect. The farm family benefits from milk and animal

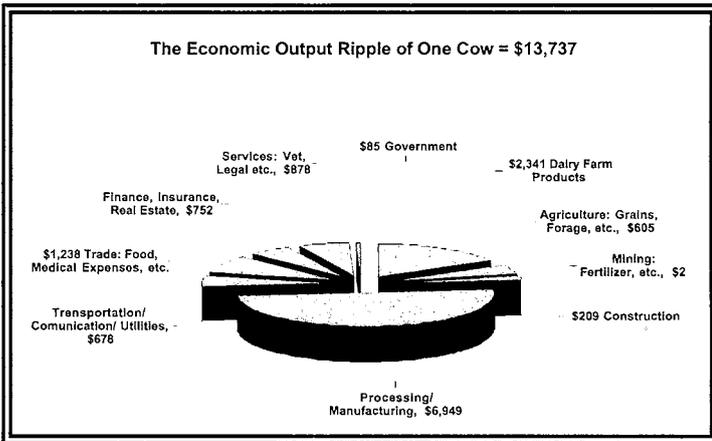
sales. Providers of goods and services benefit from sales to the farm. Processors add large value to milk products and employ many workers. These two dairy sectors create added business activity in the local community. Some of the statewide businesses benefiting from the cow include retail and wholesale trade, restaurant/bar, personal services, medical services, banking, insurance, electrical services, housing, and real estate.

Cows generate jobs. Every nine cows supported one job in the recent Wisconsin study. The number of jobs supported by the Minnesota dairy industry surpasses the combined employment of 3M, Target, and Northwest Airlines. A 1999 study showed the Minnesota dairy industry supported 53,595 jobs. The industry employed 44,529 people in dairy production, processing, marketing, and supply sectors. This created another 9,347 jobs through local spending. Dairy ranks fourth for employment in Minnesota's manufacturing industries.

The dairy industry adds \$600 million in value to Minnesota's crops each year. Minnesota cows convert about 60 million bushels of corn, 5.5 million tons of corn silage, 2.4 million tons of hay, and 400,000 tons of high-protein feed to the higher-value product of milk. In times of normal prices, the added value benefit of each \$1 of feed converts to \$3.68 in value of milk. The value of each \$2.60 bushel of corn contributes \$9.57 to the economic base of the community when marketed as milk.

Every 1,000 dairy cows within a community contribute approximately \$2.7 million in farm income, employ 12 people, and use 1,224 acres of corn and 621 acres of hay. Raising replacements in the community would increase this contribution by \$1 million. The purchased services for 1,000 animals would add \$65,550 in veterinary and breeding, \$167,232 in interest, \$63,835 in supplies, \$58,650 in utilities, \$57,600 in taxes and insurance, and \$342,985 in wages.

Cows encourage diversity in cropping systems through hay or cover forage crops and sustainable crop rotations. Among domestic animals, cows are the most efficient converters of these crops to high-quality food products. Hay crops provide protection to easily eroded soils that are found in many areas of the state. Good manure and nutrient management programs use manure as a crop nutrient resource to minimize pollution risks and sustain soil fertility and structure, reducing dependence on commercial fertilizers. The dairy industry is based on use of renewable resources and therefore is one of the state's most sustainable economic engines. 🐄



Potential Economic Impact of a Modern Dairy in Minnesota

	100	250	500	1000	2000
Number of Cows	100	250	500	1000	2000
Milk (million lb./yr)	2.2	5.5	11.0	22.0	44.0
*Industrial Output	\$1,373,712	\$3,434,280	\$6,868,560	\$13,737,121	\$27,474,241
Federal Taxes State & Local Taxes	\$78,159 \$51,192	\$195,397 \$127,979	\$390,793 \$255,958	\$781,587 \$511,916	\$1,563,173 \$1,023,832
Jobs	11.5	28.6	57.3	114.5	229.0

*Industrial output = total economic activity generated for the farm, the rural communities, and the state where the farm resides.

Source: Rethinking Dairyland: Background for Decisions About Wisconsin's Dairy Industry. Marketing and Policy Briefing Paper No. 78A, May 2002, University of Wisconsin.

Adapted with permission: Joe Conlin, Quality Dairy Management Services, 651-484-4776.

Milk Quality Is Key to Consumer Confidence

By **KIM POLZIN**
Midwest Dairy Association

On the surface, somatic cell counts seem like a topic that would interest only dairy farmers, veterinarians, and dairy processors. The impact of somatic cell counts on protein levels and cheesemaking seems far removed from things a consumer might think about while visiting the grocery store.

Enter People for the Ethical Treatment of Animals (PETA) and its "Got Pus?" campaign, which attempts to "alert consumers to impurities in the U.S. milk supply, particularly the high levels of bacteria-harboring pus." Their so-called proof? Somatic cell counts.

In a handout, PETA says, "The dairy industry knows that there is a problem with pus in milk. It uses the 'somatic cell count' to measure pus in milk." It goes on to discuss the Pasteurized Milk Ordinance and even uses a state-by-state list of average SCC counts published by Hoard's Dairyman as "evidence." These activists are asking the public to abandon milk—one of the most tested, wholesome, and nutritious foods available.

The dairy checkoff is working to make sure consumers are not swayed by PETA's ridiculous and incorrect claims. There is no pus in milk. All milk—including human breast milk—naturally contains somatic (white) cells, which are critical in fighting infection and ensuring good health.

This distasteful example points out the important link between milk quality and consumer confidence. Consumers are more concerned about food safety than farmers realize, accord-

ing to a survey of 1,002 consumers and 704 farmers conducted late last year by the American Farm Bureau and Altria (formerly the Philip Morris Company).

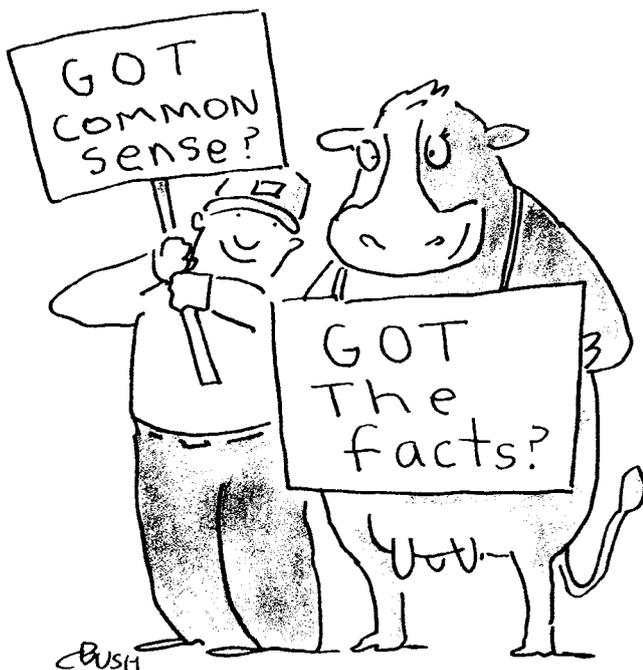
Research consistently shows that consumers want to know more about milk quality and on-farm practices, and they want to hear it directly from dairy farmers. Dairy farmers have an excellent reputation. A national survey found that the majority of Americans believe farmers contribute to society as much as firefighters or teachers and are hard working. Four out of 10 consumers in the survey said dairy farming is "the backbone of the American way of life." That's a powerful platform that can be used to tell people about the care farmers take to ensure that milk and dairy products are as safe and wholesome as can be.

From the supermarket checkout line to school meetings or the county fair, people who know you are a dairy farmer are likely to ask you about milk quality or other dairy farming issues. Your answers can be critical in promoting consumer confidence.

BASED ON WHAT CONSUMERS HAVE SAID THEY WANT TO KNOW, THE DAIRY CHECKOFF HAS IDENTIFIED SPECIFIC FACTS YOU CAN USE:

- Milk and dairy foods are among the most highly regulated and monitored food products in America. Strict laws and regulations require that milk be produced by healthy cows, and dairy farmers recognize that proper animal care is an important part of keeping cows healthy.
- Milk is doctor recommended. Dairy's role in a nutritious diet has long been established and lauded by the nutrition and science community, including the American Academy of Pediatrics, the American Dietetic Association, the National Institutes of Health, the U.S. Department of Agriculture, the National Osteoporosis Foundation, and many other reputable health organizations.
- Milk that doesn't meet the strict standards set by the federal Pasteurized Milk Order is dumped.
- Don't be fooled—PETA's campaign is simply a stunt to gain publicity for a vegetarian/vegan agenda.
- There is no pus in milk.
- Parents should get their family's nutrition advice from reputable, accredited health professionals who base their advice on sound medical science, not from animal rights activists.

Dairy farmers consistently earn high marks from consumers. Describing your devotion to quality is one of the best ways to be sure ridiculous claims don't harm dairy's excellent reputation. It's a simple but effective way to help maintain consumer confidence. 



Can SCC Be Too Low?

By JEFF RENEAU
and RALPH FARNSWORTH
University of Minnesota

Can SCC be too low? If so, how low is too low? The purpose of somatic cells within the mammary gland is to fight infection. While too high a SCC is undesirable from the standpoint of milk quality, some have feared that too low an SCC might result in more cases of mastitis due to the reduced germ-fighting capability.

A recent study in a single low-SCC herd indicated that very low SCC cows (those averaging 36,000) might be more likely to get mastitis than cows with higher SCC (average 112,000) when mastitis-producing bacteria were experimentally introduced into their uninfected mammary glands. The question is, do the findings in this single herd apply to your herd circumstances?

To answer this, let's first look at what's normal. A 1997 study reported in *Journal of Dairy Science*

showed that 95 percent of uninfected cows had less than 100,000 SCC except in the last months of lactation. Uninfected first-lactation cows had SCC levels near 50,000 or less.

A second study, also published in *Journal of Dairy Science* in 1997, showed no correlation between herd SCC and clinical mastitis under natural conditions. In other words, low SCC herds experience no more clinical mastitis than high SCC herds.

There probably is some SCC threshold under which a cow becomes more vulnerable to infection, but it has not yet been determined. And infection-fighting ability depends not only on the number of somatic cells, but also on the cells' ability to kill invading bacteria. Well-balanced diets that meet energy, vitamin, and trace mineral requirements (in particular vitamin E and selenium) are needed to maintain a strong immune system.

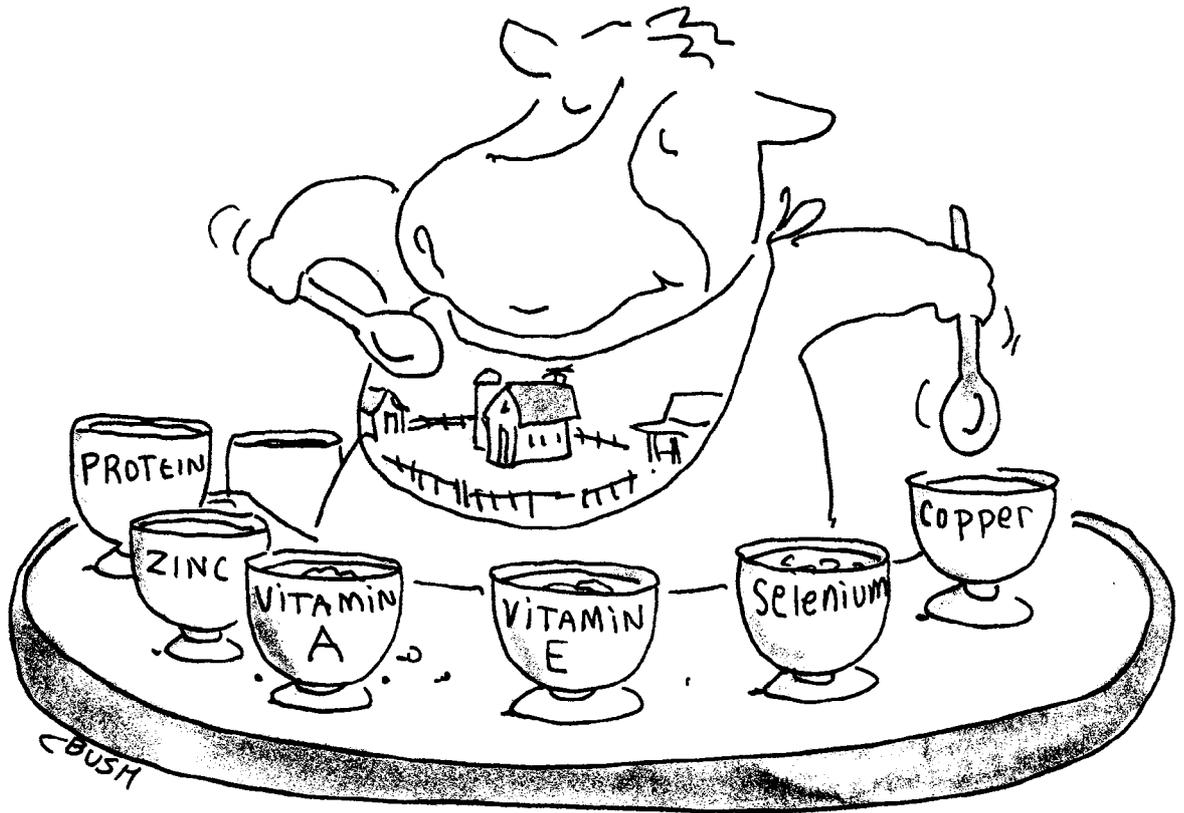
So what's the bottom line? Healthy, well-fed cows with individual SCC of 50,000 (maybe even less) do not appear to be more vulnerable to infection under natural conditions than are cows with higher SCC. Herd SCC counts of 150,000 or less are achievable and desirable for both cow health and productivity. 🐄

Healthy, well-fed cows with individual SCC of 50,000 (maybe even less) do not appear to be more vulnerable to infection under natural conditions than are cows with higher SCC.



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 causing organ-
 isms.



Good Nutrition Helps Fight Mastitis

By JIM LINN
 University of Minnesota

Some dairy producers say they've seen an increase in mastitis when they've switched feeds or fed more of certain feeds, particularly protein supplements. Research has not shown that common, high-quality feeds cause mastitis when fed in a balanced diet. However, we do know that certain nutrients are needed to build a strong immune system to fight off mastitis. Providing a diet that is balanced in nutrient content and contains high-quality feeds is the best way to help cows fight mastitis-causing organisms.

Iowa State veterinarian Jesse Goff recently reported a relationship between metabolic diseases at calving and the incidence of mastitis. Cows with milk fever are eight times more likely to develop mastitis than cows without milk fever. Ketosis increases the likelihood of mastitis twofold. A retained placenta probably does not cause mastitis, but is most likely symptomatic of a depressed immune system. His conclusion was that disruptions in nutrient balances leading to metabolic diseases are also very likely to be a major factor in the susceptibility of cows to mastitis organisms.

What can you do to ensure that your cows have the diet they need to support a strong immune system? First and foremost is to make sure they get enough energy. Goff estimates cows need 40 percent more energy than normal when they're fighting infection. For a 1,300-pound cow, this equals nearly 5 pounds of extra corn. To help cows fight infection, get plenty of energy into them right after calving and when they are sick.

Other nutrients that are particularly important for a healthy immune system are protein, vitamin A, vitamin E, selenium, copper, and zinc. Be sure to meet the requirements for these nutrients in all dairy cattle rations every day. The average lactating dairy cow should take in about 150,000 IU of vitamin A and 500 to 1000 IU of vitamin E per day. She should also get 10 to 20 parts per million (ppm) copper in the diet (about 350 milligrams per day), 0.3 ppm selenium in the diet (7 milligrams per day) and 40 to 80 ppm zinc in the diet (about 1,400 milligrams per day). Protein needs vary with level of milk production, but typical lactating cow diets should be 16 to 18 percent crude protein. 🐄



Senior Students in Gopher Dairy Club travel to California.

Dairy Horizons

By L.B. HANSEN
University of Minnesota

The Gopher Dairy Club senior trip in January was a fun-filled 12 days to California, including a ship cruise and lots of cows. Every year, seniors in the student club take a trip to California in early January to learn about dairying in that part of the country. This year's group included Betty Berning, Sadie Frericks, Ryan Griffin, Michelle Guzik, Erin Hammell, Troy Klassen, Bob Leuer, Emily Paul, Tara Sammon, Liz Schlicher, Kelly Sheehan, Morgan Strusz, and Julie Thompson. Bill Hansen, assistant scientist for the campus dairy herd, accompanied the seniors.

The agenda was packed with lots of educational experiences: a calf ranch with 12,000 calves, a Jersey dairy, a dairy that is crossbreeding Holsteins and Jerseys with European breeds, numerous large Holstein dairies, Hilmar Cheese Factory, Hollywood, celebrity hunting, a ship cruise to Ensenada (Mexico), a winery and a brewery, Alcatraz Island in San Francisco Bay, and a visit to Cal Poly.

"In all, everything went extremely well, and we made many memories that will last a lifetime," reports Frericks.

Profit from the club's Dairy Bar (north wall of the Cattle Barn at the Minnesota State Fair) covers the cost of this annual trip for seniors who have been active in the Gopher Dairy Club.



Designer Cows for Your Future

By L.B. HANSEN
University of Minnesota

Poor fertility and shortened herd life are two traits of dairy cows that cause dairy producers much frustration. Cow comfort is also a problem for many dairy producers because stalls were typically designed for cows with more moderate size than the cow of the 21st century. How should dairy producers select sires that transmit decent fertility, extra longevity, and moderate body size to their daughters? Designing cows with these attributes has become easier because of the traits Productive Life (PL) and Daughter Pregnancy Rate (DPR). New in February 2003, the trait DPR ranks sires for the ability of their daughters to become pregnant. Some pointers to get you started:

- Begin your sire selection by starting at the top of the Net Merit ranking, which is updated every four months by the U.S. Department of Agriculture. Net Merit appropriately weights traits for commercial settings. Those traits are production, SCS (lower is better), PL, udder, feet & legs, and body size (which receives a slight negative weight).
- Cows must become pregnant to stay in herds. Look at the genetic evaluations for DPR for sires, and eliminate sires from your breeding program that rank poorly for this new trait. Within one year, DPR will be included in Net Merit. In the mean time, you will need to look at this trait separately from Net Merit. Unfortunately, the majority of active A.I. sires are negative for DPR, because of the unfavorable genetic trend for daughter fertility. Request DPR evaluations from A.I. organizations if they are not forthright in providing evaluations for this new trait.
- Continual selection for cows with dairy character ("sharpness") in addi-

tion to selection for milk production has had a negative impact on the fertility and, consequently, the longevity of cows. Adequate body condition aids reproduction. The new trait of DPR has a substantial negative relationship with sharpness of cows. The designer cow of the future will have very high production, but she will maintain some body condition to aid reproduction and health.

- Cows that are more moderate in size (due to genetics, not to poor growth because of bad health) have advantages for fertility, longevity, and cow comfort compared with larger cows. Cows become larger every year because of genetic trends, yet stall sizes are often inadequate. When selecting for type, look at functional type traits (udder and feet & legs) rather than final score type, which strongly favors large cows that are very sharp.
- Inbreeding depression is a contributor to depressed fertility and decreased health. Pedigrees of cows must be compared to pedigrees of alternative sires. This is a job made for computers, and all A.I. organizations offer computerized mating programs. Be sure to furnish the pedigree information on your cows to the program, and check to see that the program looks for common ancestors at least five generations back in pedigrees.
- Some dairy producers are turning to crossbreeding to improve fertility and longevity of cows. New research is needed to determine the effects of crossbreeding, and research is underway to document the effects of crossbreeding using numerous dairy breeds from the United States and Europe. 🐄

Dairy Cows Are Good Land Stewards

By JOE CONLIN
Quality Dairy Management Services

Some critics claim that dairy farms are bad for the environment. In reality, dairy cows make good land stewards for several reasons.

First of all, the dairy industry is based on use of renewable resources. That means it's one of the state's most sustainable environmental and economic engines.

Cropping systems have been changing as dairy cows leave the Minnesota landscape. Minnesota had one dairy cow for every 54 acres of farmland in 2001 compared with one for every 19 acres in 1945. Hay and pasture cover crops are being replaced with less sustainable continuous row crops. This leaves our valuable soil resources vulnerable to water and wind erosion and reduces our ability to control weeds and crop diseases through cultural practices and natural crop diversity.

There is little use for pasture or hay crops without cows. Therefore, as the cows leave, our cropping systems have become dependent on continuous row crops, corn, and beans as cash crops.

Cows help keep the nutrient cycle in balance. Balanced, sustainable systems use nutrients more than once. Corn provides nitrogen, phosphorus, potassium, and essential nutrients the cow needs to produce milk. The cow excretes what

she doesn't use as manure. The manure from one cow contains enough nitrogen and phosphorus to grow 1 to 1.5 acres of corn, producing 150 bushels per acre, when used as a fertilizer. Without the cow, all of the crop nutrients need to be purchased as commercial fertilizer. In other words, cash cropping is like mining the soil of crop nutrients.

Both manure and commercial fertilizers are potential pollutants with improper handling and application. Modern dairy technology has made great strides in controlling and conserving manure nutrients to be more available to the crops and reduce the potential hazard to the environment. These systems provide storage for the manure nutrients year around to control and preserve nutrients for crop production. Manure application can now be timed to make the best use for crop production. Manure also can be injected into the soil to minimize runoff, volatilization loss, and control odor. Minnesota has very strict standards for storage basins. The standards take in to account soil types, topography, and other factors related to the proposed site. Present-day manure management plans ensure application rates of manure nutrients are kept in balance with crop needs to prevent potential pollution.

Manure management practices of the past such as daily hauling and surface spreading, keeping cows in open lots lacking drainage diversion from water sources, applying manure to the handiest areas, and stacking on in areas without runoff containment are discouraged. Our goal now is to make our environment safe for this and future generations. Minnesota has strict standards to reflect our new values, and great strides have been made with new technology to protect our environment. Perceptions based on the past don't hold. New science, technology, and standards have brought us to a new era of protecting our environment. Animal agriculture is an essential part of sustaining our environment for future generations. Dairy cows are good land stewards. 

Clean Up Your Act

By JEFF RENEAU
University of Minnesota

Recent University of Minnesota research indicates there is a direct correlation between cow cleanliness and SCC. We scored 1,096 cows in nine dairy herds for cleanliness and looked at the scores and SCC for each cow. The study found the cleaner the udders and/or rear feet and legs, the lower the SCC. In addition, a study in the Netherlands showed that herds with bulk tank SCC less than 150,000 had four times fewer dry cows with dirty udders than herds with bulk tank SCC greater than 250,000.

How clean are your cows? If environmental mastitis pathogens are the cause of your high bulk tank SCC, you could lower your herd average SCC 40,000 to 50,000 just by improving cow cleanliness by 1 unit cleanliness score. Many herds in Minnesota could lower bulk tank SCC 100,000 just by having cleaner cows. 

Scoring Cow Cleanliness

COW CLEANLINESS SCORING is a subjective method of assessing cow cleanliness. A score of 1 indicates a cow is absolutely clean, while a score of 5 indicates a very dirty cow.

This scoring method is useful because what appears dirty to one person may appear "normal" to another. Being able to put a number to a cleanliness condition will become increasingly important as higher expectations by consumers motivate dairies to further safeguard food quality and safety by improving cow cleanliness.

Get a free copy of the Cow Cleanliness Score Card at www.ansci.umn.edu/dairy/toolbox/toolbox.htm. See how your cows measure up.

What Do Bulk Tank Culture Results Mean?

By **RUSS BEY** and **RALPH FARNSWORTH**
 University of Minnesota

How do I use bulk tank culture results to reduce my cell count?

- Any contagious organisms (*Staphylococcus aureus*, *Streptococcus agalactiae*, or *Mycoplasma*) come from an infected quarter.
 - When looking for contagious organisms, take multiple bulk tank samples over three to four days.
 - There is usually an 85 to 90 percent correlation between the numbers of bacteria in the bulk tank and the number of cows infected—but not always. To know how many and which cows are infected, you may need to test individual cow milk samples.
- Elevated levels of environmental pathogens (non-ag streps or coliforms) are usually not due to infection of the quarter. However, elevated levels of pathogens indicate an increased potential for infection with an environmental pathogen. There is a strong correlation between the number of organisms on the teat at the time of milking machine attachment and infection rates.
 - Improve cow preparation. Target teat ends for cleaning.

- Improve bedding management. Groom sand stalls at each milking or clean and add fresh bedding to the back one-third of the stall daily.
 - Reduce overcrowding of animals in a pen.
- Staph species come from the teat skin.
 - Improve postmilking teat dip coverage. Be sure to consistently cover 80 percent of the teat.

Bulk tank culture dos and don'ts:

- Do use multiple-day samples. This increases accuracy of results due to intermittent shedding of bacteria by some cows.
- Do have bulk tank cultures performed monthly.
- Do use a high-quality laboratory. Ask your laboratory about quality control, personnel training, etc.
- Do agitate the tank well before sampling.
- Do take the sample from the top of the tank.
- Do freeze the sample immediately after taking.
- Do use a clean dipper.
- Do make sure the lab uses a reliable bulk tank culturing technique.

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TYPE OF BACTERIA	USUAL INFECTION SOURCE	MAJOR MEANS OF SPREAD	MASTITIS CONTROL MEASURES
Strep agalactiae	Infected udders of other cows in herd	Cow-to-cow by contaminated udder wash rag, teat cups, etc.	Use separate towels to wash/dry; use teat dip; treat dry cows; eradicate in special cases
Staph aureus	Infected udders of other cows; contaminated bedding from milk of infected cows	Cow-to-cow by contaminated udder wash rag, milkers hands, contaminated milking equipment, improperly functioning equipment	Use separate towels to wash/dry; use teat dip; treat dry cows; milk infected cows last; cull chronically infected cows
Mycoplasma	Infected udders of other cows, often purchased cows	Cow-to-cow by hands of milkers, equipment, and common towels; aerosol transmission from animals with respiratory signs; spread from a respiratory tract infection to the udder or joints	Use bulk tank and cow culture results to avoid buying infected cows; use separate towels to wash/dry; use teat dip; treat dry cows; milk infected cows last; cull any positive clinical cases
Non-ag streps	Environment of cow	Wet, dirty lots; contaminated bedding; milking wet cows; poor cow prep; milking machine air slips	Improve stall and lot sanitation; milk clean, dry cows; avoid air leaks and liner slips; change bedding frequently; keep cows standing after milking
Coliforms	Environment of cow	Wet, dirty lots; contaminated bedding; milking wet cows; poor cow prep; milking machine air slips; hot, humid weather	Improve stall and lot sanitation; milk clean, dry cows; avoid air leaks and liner slips; change bedding frequently; keep cows standing after milking
Staph species	Environment of cow	Poor teat dip coverage; poor cow prep; old bedding	Use teat dip consistently; adequately prep; change bedding more frequently



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What Do Bulk Tank Culture Results Mean?

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- Don't count on a single sample to tell you if you have contagious agents in your herd.
- Don't take the sample from the outlet valve.
- Don't assume all laboratories are equal. Some laboratories are more capable than others. You are going to make costly management decisions based on results. Therefore, be sure the lab can produce accurate, high-quality results.
- Don't use bulk tank cultures only. Always use culture data in conjunction with your herd SCC and individual cow records as well. 🐄

DAIRY *Initiatives*

Volume 12 Issue 1 Spring 2003

Dairy Initiatives is published quarterly by the University of Minnesota Extension Service, Dairy Initiatives Program, as an educational service to Minnesota dairy producers. Address correspondence to Jeff Reneau, 205 Haecker Hall, 1364 Eckles Avenue, University of Minnesota, St. Paul MN 55108; 612/624-9791; renea001@umn.edu.

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