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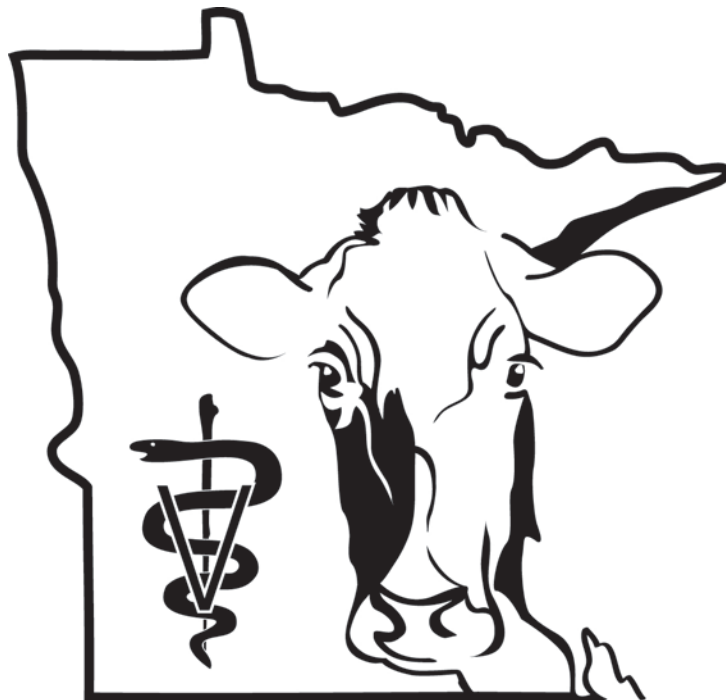


UNIVERSITY OF MINNESOTA

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College of Veterinary Medicine

VETERINARY CONTINUING EDUCATION



ST. PAUL, MINNESOTA  
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## History of Mastitis Control

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Mastitis occurs to some extent in many species but has become a more significant problem in the dairy cow. This change is most likely due to man's influences such as the selection for higher milk production, changes in housing and management and the use of the milking machine. History does not record exactly when mastitis was recognized as significant problem but listed below are some approximate dates of the significant events and developments is the attempt to control the disease and associated losses.

### **1916-** First attempt at Teat Dipping

Moak is credited with observing that dipping teats in a disinfectant after milking reduced mastitis. He used pine oil as his product. If he was looking for a control method, it seems reasonable that mastitis was a significant problem at this time.

### **1946-** New York mastitis control program was started

Thomas Dewy was the governor and owned a dairy herd that had a mastitis problem. He facilitated the funding that resulted in the formation of the organization. It began primarily as a Strep ag eradication service and started as a lab service. It is still operating today as a trouble shooting and monitoring service and has been involved in significant research over the years.

### **1947-**My first experience with mastitis.

When I was about 10 years old my father decided to expand the herd. He had added another 10 stanchions and installed a milking machine. Things seemed to going along well so he decided to add a second machine so he could milk faster. Soon he began to have problems with cows developing mastitis. He called the veterinarian who would test the milk by putting it in glass tubes, adding dye and could tell if a cow was infected if the milk turned dark blue or yellow. This was shortly after World War II and sulfas and penicillin were just becoming widely available. He tried treating these cows but treatment did not seem to work very well. The cows would clear up but the mastitis would return.

There were at least 3 cows which died of gangrenous mastitis. This was pretty high percentage of 12 or 15 cows. He was told that he could prevent the disease spreading by dipping the milking machine in disinfectant between cows (which was then and still is bad advice) He thought that sounded like a lot of trouble and had hand milked cows all his life and didn't mind it that much, so he would just go back to hand milking. He also was told it spread from cow to cow so he went to the drug store and got some test cards which turned from yellow to green (Ph indicators) if a cow was infected. He tested all the cows and sold all those that reacted. That got him down to 3 cows. However he had a lot of springing heifers so he disinfected the barn and just kept milking more cows as the heifers freshened. He never had another case of clinical mastitis. By the time my father passed away in 1951 we were milking 10 or 12 cows again and things were going well.

**1951-I was a Dairy farmer**

With the previous background I was of course afraid of milking machines but my uncle had been using one and getting along quite well. It was obvious that if I was going to keep milking I couldn't do it by hand so we decided to try a machine again. I was concerned about mastitis so I got a machine with a big enough vacuum pump and followed all the recommended procedures I got from my uncle and the Vo Ag teacher. I milked the herd for the 4 more years before I went to collage without a case of clinical mastitis.

**1956-Another look at post milking teat dipping**

About this time a number of researchers began looking at post milking teat dipping and started to see reduced infection rates with the use of the practice.

**1960-The era of the pipeline milker-The California Mastitis test comes into use**

Pipeline milkers were being used extensive in California and Mastitis problems were being seen with increasing frequency. The University of California (Schalm & Norlander) began to do field investigations and research on the problem. This work resulted in the development of the CMT and the consideration of the role of milking equipment in the disease.

**1961-** The national Mastitis Council was established. A group of processors, state regulatory people, researchers, veterinarians and producers got together to try to reduce the cost of mastitis and improve milk quality. It was argued that setting a Somatic Cell Count limit of 1 1/2 million would "put too many producers out of business".

**1962-I** came to Minn and started working in the area with Drs. Harvey Hoyt and Ned Olson.

**1963-** Dr. John Dahl brought concern and technology for evaluating the role of the milking machine in the disease on individual farms to the Midwest.

**1965-**Regulatory agencies began to look more at milk quality and started establishing screening programs. They also began discussing not allowing the sale of milk over 1 1/2 million SCC. There were still arguments that it would "put too many producers out of business".

**1966-** Work at the National Institute for Research in Dairying (NIRD) established that A "hygiene" program of;

- 1 Washing with separate towels soaked in disinfectant
- 2 Heat pasteurizing teat cups
- 3 Wearing of rubber gloves
- 4 Dipping teats in disinfectant after milking
- 5 Dry cow Treatment with antibiotics

Would reduce new intramammary infections with contagious organisms by 80%.

It was later shown that teat dipping alone would reduce infections by 50%.

Wisconsin Mastitis Test was developed and used in screening along with the Catalase test.

**1969-** Teat dipping Dry treatment programs were proven and considered to be valuable tools. Numerous agencies pushed for the adaptation. Every body with a bath tub got in the business of producing teat dip.

**1971-** Efforts were made to test and regulate effectiveness of teat dips.

**1975-**The use of Differential Bulk Tank Cultures began as a diagnostic tool begun. There was talk of “Stray Voltage” being a problem in New Zealand and in the US Northwest.

**1978-** Major effort in “stray voltage” testing and control began on farms in Minn. SV was being perceived as the major problem in mastitis.

**1980-**Minn, DHIA began to offer individual cow SCC as part of their program.

**1990s-**Changes in herd size and housing systems produced new challenges in mastitis control. Regulatory agencies continued to lower allowable SCC. We now argued that SCC limits of 750,000 would put too many dairymen out of business.

**1994-**In Minnesota Dairy Comp 305 along with a loop for downloading results became available as a part of the program from DHIA.

**2002-** It was noted that Minn. had the highest SCC of the top 10 dairy states. This fact caught the attention of the Director of Agriculture and he initiated action which resulted in The “Quality Counts” program, a major educational program throughout the state involving as many as possible of the persons working with the milk quality area and producers.

**2007-**Latest situation analysis and an idea for a new approach for control.

### **A Different Look at Somatic Cell Count Control**

(Courtesy Dairy Star, March 10, 2007)

In the dairy industry, it has long been considered that both clinical and subclinical mastitis infections could be divided into *contagious* and *environmental* based on the source of infecting organisms. However, control programs, such as the National Mastitis Council’s 5 point plan, have primarily targeted the *contagious* category. Recent data from DHIA cell counts and mastitis culture labs suggests that contagious organisms probably account for 10-15% of new infections. It appears that over the years with emphasis on and better control of contagious mastitis the infection patterns have changed, and in many herds *environmental* mastitis organisms are the primary cause of infections and high somatic cell count (SCC). As a result, it would be of benefit for dairy producers and those working with producers in trying to control or decrease SCC levels on farms to put an increased emphasis on finding ways to better monitor and manage the environmental mastitis organisms. Control of environmental mastitis is especially difficult because it involves careful attention to sanitation, especially teat cleaning during the milking process. Basically, every teat must be clean and dry at every milking. On today’s dairies with rapid throughput and milkers working long shifts this becomes difficult. Frequent feedback on the job milkers are doing is needed to allow them to know if the cow prep is adequate.

It has been repeatedly shown through research that, especially for environmental organisms, the infection rate correlates directly with the degree of bacterial contamination of the teats at the time the milking machine is attached. At this point the number of organisms left on the teat is what got on since the last milking minus what was not taken off during the cow prep process.

Measuring the degree of teat contamination can be done by differentially culturing the bulk tank milk because the milking process tends to wash the teats and add these organisms to the bulk tank milk. To be effective, this type of monitoring needs to be done on a continual and timely basis so milkers and managers know how well the cows are being cleaned prior to milking unit attachment. The complexity, logistics and cost of the standard bulk tank cultures have limited their usage and delayed the feedback process so that it has not been used effectively as a management tool. There are also numerous observations that show if environmental Strep levels can be continually kept below about 400 and Coliforms below about 100 in the bulk tank milk, the level of environmental mastitis declines and remains at a low level.

A simplified screening method has recently been developed by the Laboratory for Udder Health at the University of Minnesota diagnostic laboratory. This system can be used by individuals with little training and can be used in local milk receiving plants, veterinary clinics or even as an on farm culture system. It involves the use of special differential media which is inoculated with a standard cotton swab on a Bi plate. After incubation the colonies on each side of the plate can be counted and if more than 50 colonies are present on the Strep side or more than 10 on the Coliform side this is an indication there are too many colonies and attention to management and milking procedures at the dairy farm is needed. Milk line sampling can also be used to make the evaluation more specific such as for a milking shift or a string of cows. A dilution process can also be used if it is desired to determine the number of organisms more precisely in the case of higher organism numbers.

It is important to remember that environmental mastitis is a disease that can be controlled. However, the dairy manager and employees must take the appropriate steps in sanitation and/or all the milkers need to have consistent pre-milking teat end cleanliness. It also means keeping cows as clean as possible and avoiding over crowding in the housing facility. The use of this new simplified, more versatile bulk tank culture monitoring system on a regular basis can be a significant tool for the dairy farm in the battle to control somatic cell and clinical mastitis due to environmental sources.

For further information, visit the Extension Dairy web site at [www.extension.umn.edu/dairy](http://www.extension.umn.edu/dairy), then click on "Minnesota Easy Culture Environmental Monitoring System" to view the power point presentation; or contact one of us at the Laboratory for Udder Health, phone: 612-625-7053 or toll free at 1-800-605-8787 or e-mail [mastlab@umn.edu](mailto:mastlab@umn.edu)