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# W148-Milk Quality and the Tennessee Quality Milk Initiative

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## Tennessee Quality Milk Initiative

### Milk Quality and the Tennessee Quality Milk Initiative

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According to records, in 1995, there were more than 1300 dairy farms in Tennessee. In 2007, the number declined to fewer than 600 dairies (9). There are several reasons for this mass exodus from the dairy industry in Tennessee: low milk prices, shortages of qualified labor, high feed costs, high fertilizer costs, high fuel costs, etc. In addition, many dairy producers in Tennessee and in the Southern Region are at risk of losing their milk market due to below average milk quality. Milk quality continues to be a topic of intense debate in the dairy industry. Dairy producers in the United States are not competitive in the global marketplace because regulatory standards in the U.S. are not as stringent as other developed countries. Until U.S. regulatory standards are tightened, export markets will remain closed to U.S. dairy producers. Additionally, the scientific literature shows very clearly that a high milk somatic cell count (SCC) is associated with a higher incidence of antibiotic residues and the presence of pathogenic organisms and toxins in milk (1,2,4,6,8). Although pathogenic organisms do not survive proper pasteurization, breakdowns in the process occasionally occur, resulting in contamination of the retail product. Consequently, consumers and processors are demanding a safe and high-quality product. Therefore, processing plants have adopted more stringent standards for raw milk.

The Pasteurized Milk Ordinance (PMO) is a document that specifies safety standards of Grade A milk. Public health standards for somatic cells in raw milk are designed to protect public health, not to maximize dairy product quality and shelf life (3). There is continuing pressure from a variety of groups to reduce the regulatory limit for somatic cells in milk from the current 750,000 cells/ml to 400,000 cells/ml or less to increase the safety of dairy products and to be competitive in the global dairy marketplace. However, a mandated reduction in the number of somatic cells in milk via regulatory intervention may not be necessary, because in the near future milk buyers may set their own standards and only purchase milk of excellent quality. Recently, some dairy processing plants in Tennessee and in surrounding states have made changes to their milk quality requirements for incoming raw milk (7). These changes have occurred, in part, by demands from retailers and major food service companies for milk with a higher quality and a longer shelf life. For example, Dean Foods implemented some new, more restrictive requirements on bacteria counts and milk temperature at the processing plants they control. Eventually, changes in SCC requirements and perhaps even some requirements for raw milk to be free of specific bacteria could be implemented (7). Thus, SCC limits and bacteria count limits for raw milk to be acceptable at dairy processing plants may decrease to levels much lower than they are now. Producers who cannot meet these higher standards are at risk of losing their milk market.

The most current milk quality situation in Tennessee and in the Southern Region was published in a report released by USDA Animal Improvement Program Laboratory (5) on SCC data from herds enrolled in the Dairy Herd Improvement testing program for 2005 (Table 1). The good news was that the national SCC average for 2005 was 296,000 cells/ml of milk,

which was slightly higher than the previous year, following three consecutive years of decline. The bad news, however, was that states in the Southern Region continue to have the poorest quality milk in the nation. The average SCC in the Southern Region was 37 percent higher than the national average. Tennessee ranks last in milk quality, with an average SCC of 504,000 cells/ml and was the only state to have an average SCC > 500,000 cells/ml. Additionally, Tennessee had the highest percentage of producers with a SCC over the legal limit of 750,000 cells/ml.

The future of dairy production in the South can be brighter. However, there are a number of factors that could limit the industry from progressing. Some of the challenges and constraints to producing high-quality milk are mentioned below.

**Table 1.** Characteristics of DHI herd test days for milk yield and SCC in the Southern Region during 2005 (Miller and Norman, 2006).

State	Avg. SCC (cells/ml)	Herd test days with SCC greater than			
		750,000 cells/ml (%)	600,000 cells/ml (%)	500,000 cells/ml (%)	400,000 cells/ml (%)
Alabama	433,000	5.2	13.4	23.6	47.5
Arkansas	448,000	11.9	20.5	29.4	42.2
Florida	473,000	16.0	32.9	46.4	65.8
Georgia	433,000	11.3	21.7	34.4	50.5
Kentucky	392,000	11.3	20.3	30.8	45.1
Louisiana	416,000	9.7	20.9	33.0	54.5
Mississippi	386,000	6.0	11.8	20.7	37.5
N. Carolina	358,000	7.5	13.8	23.0	37.7
Oklahoma	363,000	5.8	12.2	23.3	37.0
Puerto Rico	429,000	17.3	25.2	33.9	47.5
S. Carolina	387,000	4.2	11.1	20.9	33.7
<b>Tennessee</b>	<b>504,000</b>	<b>18.9</b>	<b>33.5</b>	<b>46.5</b>	<b>61.3</b>
Texas	346,000	3.1	7.6	17.2	33.2
Virginia	320,000	3.6	7.8	14.4	28.5
<b>SE avg</b>	<b>406,000</b>	<b>9.4</b>	<b>18.1</b>	<b>28.4</b>	<b>44.4</b>
<b>U.S. avg</b>	<b>296,000</b>	<b>4.7</b>	<b>9.2</b>	<b>15.3</b>	<b>25.8</b>

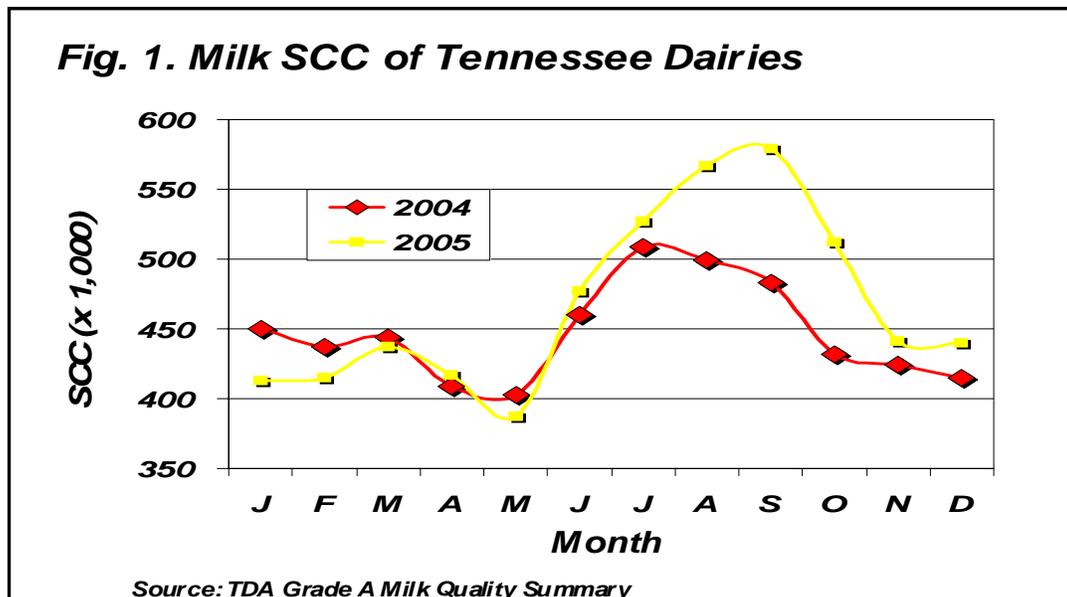
**I. Safety and quality of dairy products must begin on the farm.** Pasteurization has certainly improved the safety and quality of dairy products. However, pasteurization alone cannot solve all of the problems associated with poor-quality raw milk. It is not a magic tool that can transform a poor-quality, inferior raw product into a high-quality end product that

will be accepted by the consumer. It is the consumer who decides which food products to purchase, and the safety and quality of a product are significant determining factors. To remain profitable, the dairy industry must be aware of its responsibility to produce and market a safe and high-quality product. This responsibility starts with the dairy producer. It is imperative that producers be proactive and adopt practices that will result in a high-quality, safe and nutritious product that meets consumers' demands and expectations.

**2. Continuing to follow tradition.** Many dairy producers make decisions or carry out practices based on tradition, often with a lack of appreciation and/or understanding of advances in the knowledge or technology available in dairy production. Too often, milking cows becomes a way of life and producers become fixated on "how things have always been done." In the past, this way of life may have generated enough income to survive. However, producers must now become more business-oriented and flexible in their production practices. Milk quality must become a priority for producers to be more profitable and to be more competitive in the national and international market.

**3. Lack of belief that high-quality milk can be produced in the South.** Indeed, the climate of the Southern Region creates some unique challenges for the production of high-quality milk. Data from the Tennessee Department of Agriculture clearly point out a seasonal trend where milk SCC on Tennessee dairy farms is highest from June – October (Figure 1). However, during months when Tennessee's climate is conducive to producing high-quality milk, the average SCC was still above acceptable levels. There was only one month during a two-year time period that the average SCC was below 400,000 cells/ml. Controlling mastitis pathogens and bacteria in the environment during hot and humid summer months is more difficult than in more temperate climates. However, high-quality milk can and *is* being produced in the South. Although climatic conditions likely contribute to regional differences in the number of somatic cells in milk, differences between geographically close or adjacent states were substantial. For example, the average milk SCC in North Carolina, Mississippi, South Carolina and Kentucky were substantially lower (358,000, 386,000, 387,000 and 392,000 cells/ml, respectively) than in Tennessee (504,000 cells/ml). This suggests that mastitis control regimens can have an impact under similar climatic conditions and that improvement in milk quality is possible through implementation of cost effective mastitis control strategies.

**4. Perceived lack of economic incentive.** The price a producer is paid for raw milk is a major economic factor determining profitability of the farm. In recent years, dairy producers have received record high and record low milk prices. When prices are at their lowest, producers must strive to be as efficient as possible. Based on Tennessee's average SCC, it is obvious that there are many producers with substantial rates of subclinical and clinical mastitis, which drives up costs and lowers production. Additionally, there are some quality premium programs available for which Tennessee producers are not currently eligible because of high SCC and/or bacteria counts. Surviving today's milk pricing climate requires dairy producers to take advantage of every opportunity to lower costs, maintain or improve production and increase profitability.



**5. Failure of effective education/communication from the scientific-research level to the production level.** Many methods and production practices have been shown repeatedly to improve animal health and milk quality and to be economically beneficial to producers. However, some of these methods have not necessarily been adopted on a wide scale. Too often, pieces of knowledge are addressed individually, and the whole picture or how all of the pieces fit together is overlooked. If a producer wants to know how to improve milk quality, information is available. Unfortunately, it is not easy to find all of the answers, because this information is not packaged in a complete and comprehensive program.

### **Tennessee Quality Milk Initiative (TQMI)**

Tennessee dairy producers must become competitive with producers throughout the nation to be profitable. They must put into action practices that result in higher-quality milk to meet the demands of processors and consumers. The goal of the TQMI is to improve profitability and sustainability of dairy farms in Tennessee and in the Southern Region by enhancing milk quality. The TQMI is a blend of education, research and outreach and consists of three phases that will be carried out simultaneously:

**Phase I: Education.....**This phase of the TQMI is an intensive, comprehensive bilingual educational program designed to provide the latest science-based information to improve milk quality. Program material will start at the basic levels of quality milk and build into how to produce high-quality milk and control on-farm factors that diminish quality. As the TQMI progresses, additional material will be provided, focusing on all aspects of producing high-quality milk. Experts from the dairy industry and academia will be utilized to assist with the development of this material. The program will be presented to Extension agents, dairy consultants, veterinarians, dairy producers and milking personnel. Information provided will help dairy producers reduce mastitis, improve milk production, reduce costs, and increase the quality and value of raw milk.

**Phase 2: Bulk Tank Milk Study.....**The second phase will be to conduct a comprehensive analysis of bulk tank milk quality on Tennessee dairy farms. Most of the data currently available on bulk tank milk quality are based on SCC. However, industry quality standards are placing more emphasis on bacteria counts. The TQMI team will take bulk tank milk samples from approximately 25 percent of dairy farms in Tennessee and determine the influence of bulk tank SCC on other bulk tank quality parameters, including standard plate count, preliminary incubation count, lab pasteurized count and coliform count. Understanding the relationships among these parameters is vital for controlling milk quality, and results will be made available through the educational phase. Additionally, bulk tank milk samples will be screened for the presence of *Mycoplasma* species on a herd basis.

**Phase 3: On-farm Demonstration and Research.....**This phase will be conducted on commercial dairy farms representing the size and management styles typical for Tennessee. Farms in this demonstration will be evaluated at the beginning and end of the trial to determine if development and implementation of mastitis control and milk quality plans were effective and economical. A four-stage approach will be followed: (A) pre-trial evaluation of dairy farm management practices and development of an objective mastitis control and milk quality plan, (B) implementation of the mastitis control and milk quality plan, (C) evaluation of the mastitis control and milk quality plan, and (D) analysis of data and development of science-based educational and outreach materials to be disseminated throughout Tennessee and the Southern Region.

**It is very clear that milk quality in Tennessee and in the Southern Region must improve if the dairy industry is to survive!** Dairy producers in Tennessee and in the Southern Region will continue to be under pressure to enhance the quality of milk produced on their farms. To address this increased pressure, effective milk quality improvement and mastitis control programs must be implemented to meet increased milk quality requirements. The consequences of doing nothing will result in many dairy producers being forced out of business because they will not be able to produce milk of suitable quality to meet the more stringent requirements of milk processors. Producing high-quality milk is a must for dairy producers of today and of the future. Through education, research and outreach, the TQMI will assist producers in improving their milk quality. It will also assist producers to reduce their costs associated with mastitis and improve milk production, thereby improving profitability. The TQMI will play a role in sustaining the dairy industry in Tennessee and the Southern Region.

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