

Effectiveness of Vermont's Milk Quality Enhancement Program

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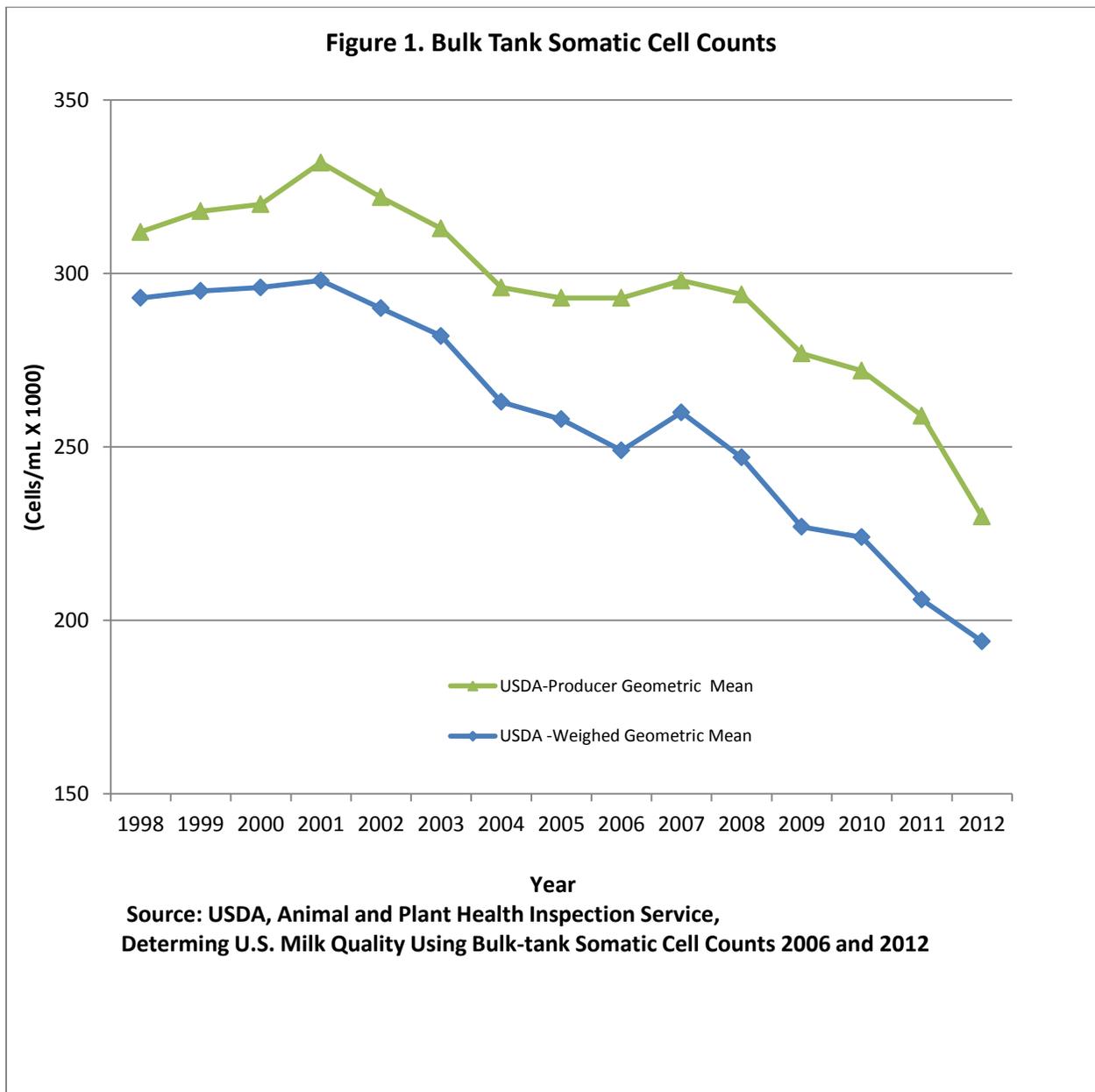
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INTRODUCTION

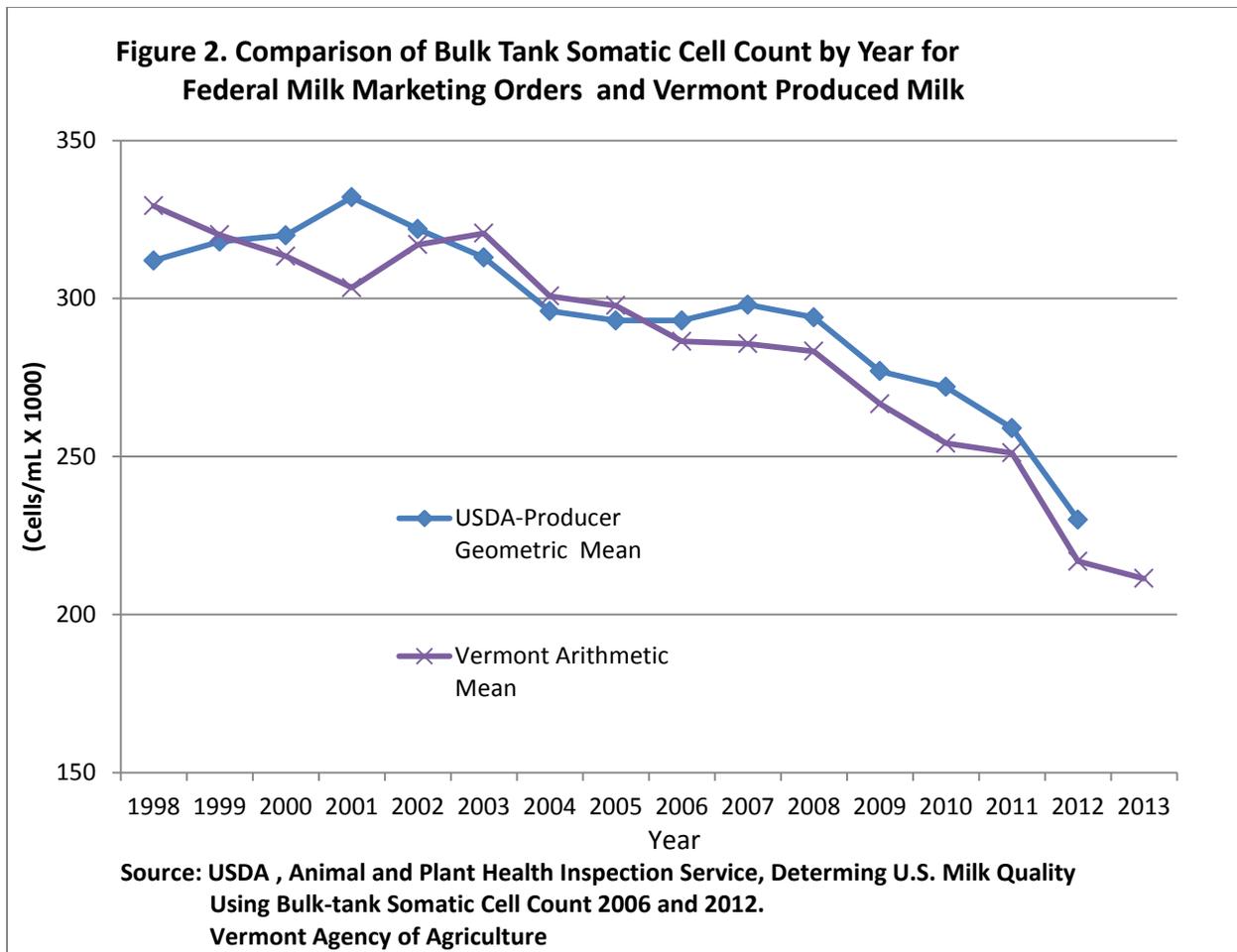
Vermont's Milk Quality Enhancement Program promotes and implements a statewide program to monitor and improve the quality of milk and dairy products produced in the state of Vermont. It provides technical and advisory support involving the identification and resolution of dairy herd health and environmental problems affecting milk quality by promoting practices to eliminate the cause of substandard milk production on small and large dairy farms. Its personnel visit Vermont farms having abnormal milk problems to evaluate the farm's milking equipment, milking procedures, its animal's environment, animal hygiene, presence of stray voltage, and efficacy of the farm's milking equipment wash systems to diagnose area of mastitis control and alleviate high milk bacteria counts. They also collect milk samples for laboratory analysis and assist interpreting the results to identify causes of problems and effective remedial action to solve the problems. They provide technical assistance to veterinarians, extension agents, milk processors and fieldmen, inspectors, dairy equipment company personnel, utility company linemen, electricians, feed company personnel and others involved in milk production to improve competitiveness of Vermont's dairy producers.

COMPARING VERMONT'S TO THE NATION'S SOMATIC CELL COUNTS

Figure 1. shows data collected by USDA's Animal and Plant Health Inspection Services from four of the Nation's ten Federal Milk Marketing Orders representing around 80 to 90 billion pounds of milk or about 46.0 % of the National milk production. The graph shows a general and gradual decline in bulk tank somatic cell counts since 2001. The producer mean represents the average of all the producer's bulk tank somatic cell counts and the weighted mean takes into account the amount of milk shipped by the producer, so the weighted mean more closely represent the somatic cell count of the pooled milk supply.



Bulk tank somatic cell counts of Vermont produced milk compared to the four Federal Milk Marketing Orders monitored by USDA is shown in Figure 2. However, USDA's data is a geometric mean of the producer's somatic cell count values and Vermont's data is an arithmetic mean of the producer's somatic cell count data provided from bulk milk haulers' official regulatory milk samples. It's important to note, a geometric mean lowers the impact that outlying data values have on the mean and a geometric mean will always be lower than an arithmetic mean calculated on the same set of numbers, unless all of the numbers in the set are equal. Therefore, if Vermont's data had been calculated as a geometric mean the values would be lower than those represented in the graph. In spite of how Vermont's data is represented, the graph shows that Vermont's bulk tank somatic cell counts have been consistently decreasing since 2003 and have been lower than USDA's mean since 2006. One can infer, as years have progressed and bulk tank somatic cell counts have decreased, the milk supply has been produced by herds with an increasingly higher percentage of cows with healthy udders. Also, Vermont produced milk has been produced by cows in herds with a higher percentage of healthy udders when compared to milk produced by cows in the four Federal Milk Marketing Orders monitored by USDA.



The Council of Dairy Cattle Breeding (CDCB) Research Reports SCC1 through SCC15 has summarized the Nation's DHI's somatic cell count data by State since 1998. Figure 3 compares yearly averages of somatic cell count data for Vermont herds enrolled in DHI's milk testing program with the averages for the Nation's herds. Since 2001, Vermont's herds have had lower somatic cell counts than the national average. From 1998 through 2001, about thirty percent of the States had lower somatic cell counts than Vermont. More recently, from 2010 through 2013, on average only seven percent of the States have had lower counts than Vermont. In 2012, the CDCB Research Report SCC14's Table 1 showed Idaho alone, with an average count of 159,000 for the year, had a lower somatic cell count than Vermont's 161,000. New Mexico's and Nevada's somatic cell counts of 147,000 and 150,000, respectively, were the only states with lower counts than Vermont's 157,000 in 2013 (CDCB Research Report SCC15, 2013). If one assumes that each herd was tested monthly, dividing each State's total number of test days for the year by twelve would show the approximate numbers of farms tested in each state. In 2013, Vermont, New Mexico, and Nevada would have had approximately 268, 10, and 6 herds tested, respectively. USDA's National Agricultural Statistics Service, Agricultural Statistics Board's Milk Production Report released in February 2014 reported Vermont, New Mexico, and Nevada had 930, 140, and 20 licensed dairy herds in 2013. Comparing the estimated DHI herd numbers with the numbers of licensed dairy herds would show about 29% of Vermont's and 30% of Nevada's but only 7% of New Mexico's herds were represented in 2013's DHI data.

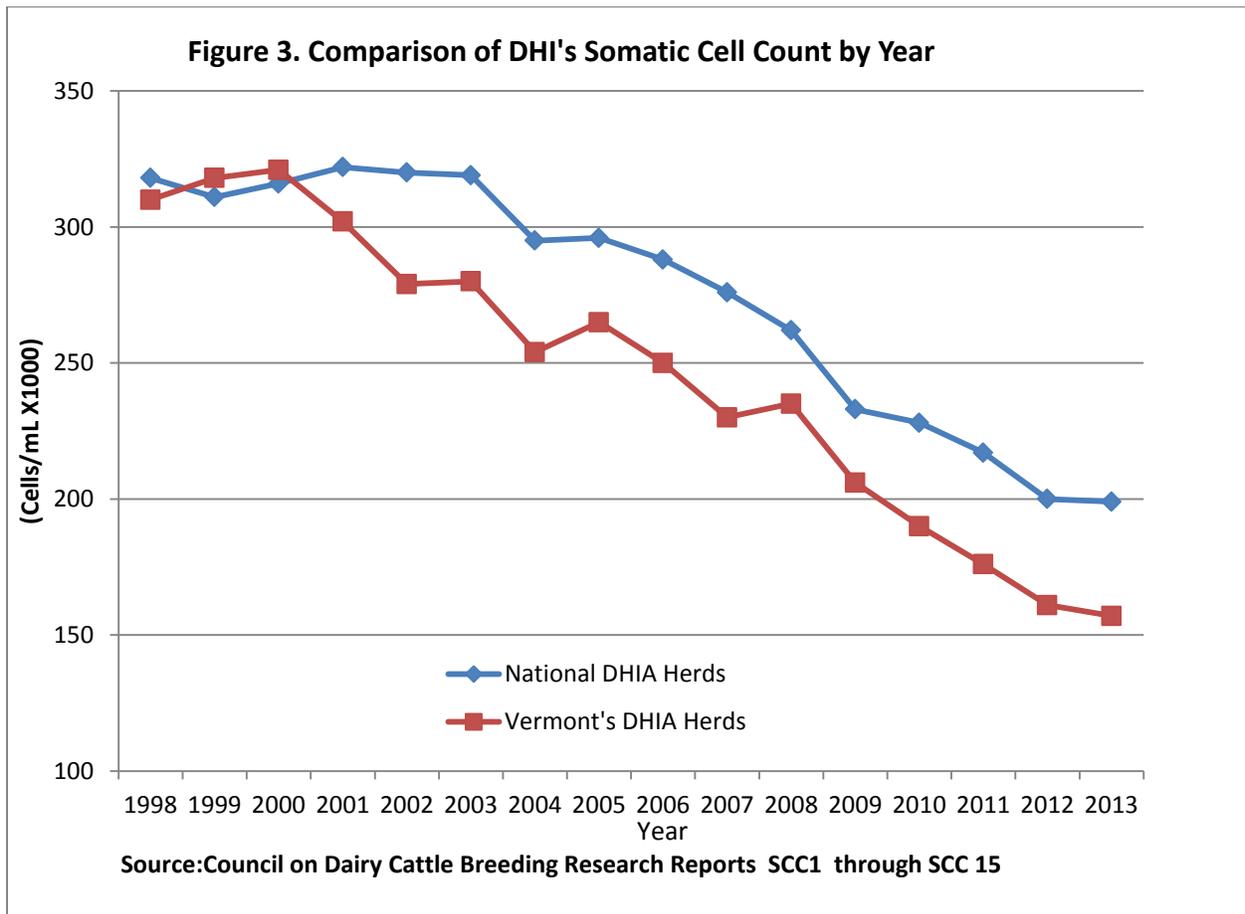


Figure 4. shows that Vermont's DHI enrolled herds have consistently had a higher percentage of test day somatic cell count values equal to or lower than 400,000 when compared all herds enrolled in DHI. Since 2010 more than 90% of Vermont farm's test day data has been 400,000 or less. Similarly, a higher percentage of Vermont's official samples have been less than 400,000 when compared to USDA's summary of data provided by four Federal Milk Marketing Orders (Figure 5). In 2012 and 2013 over 90% of Vermont's official samples had somatic cell counts less than 400,000 and in 2012 nearly 90% of the four Federal Milk Marketing Orders farm shipments were less than 400,000.

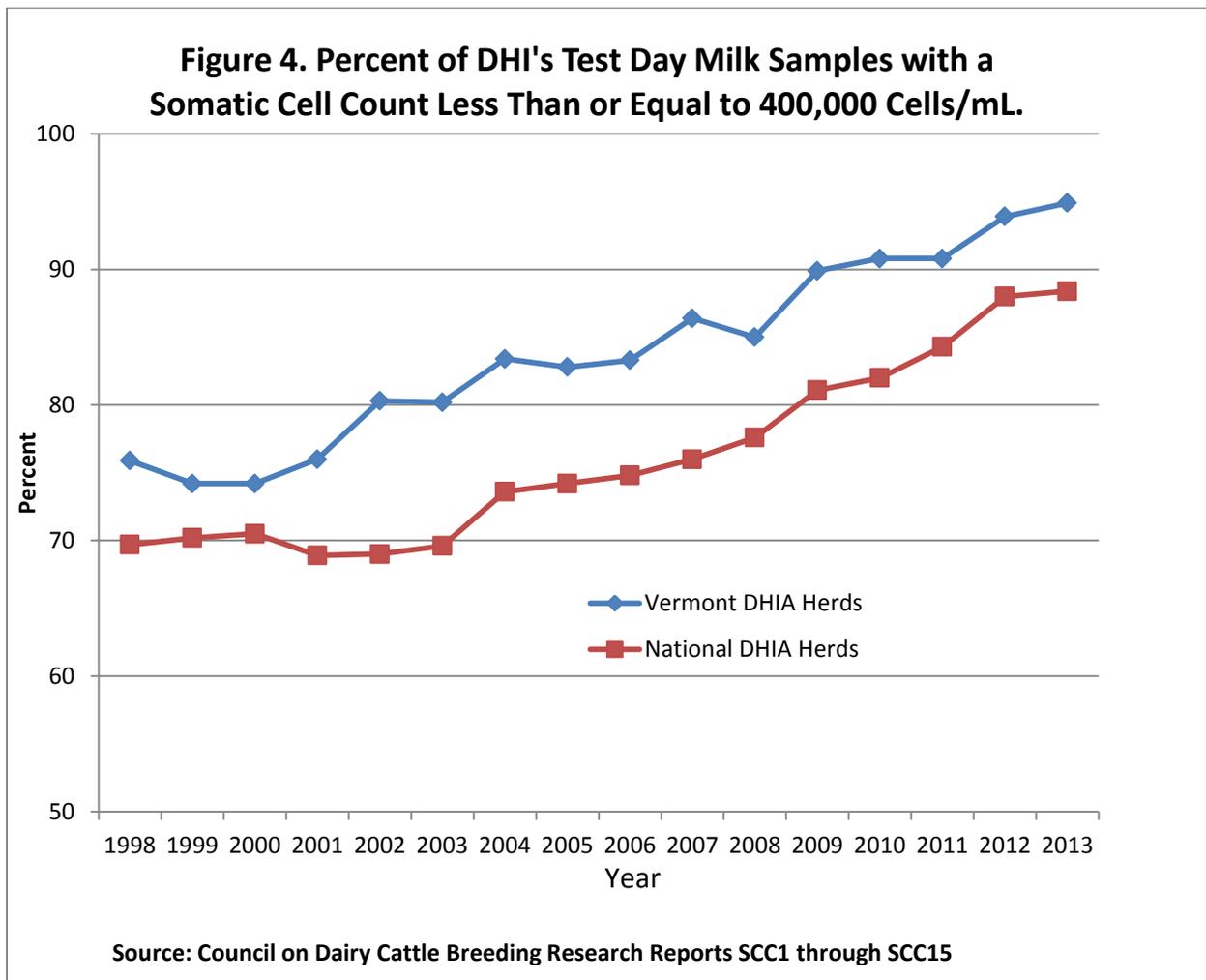
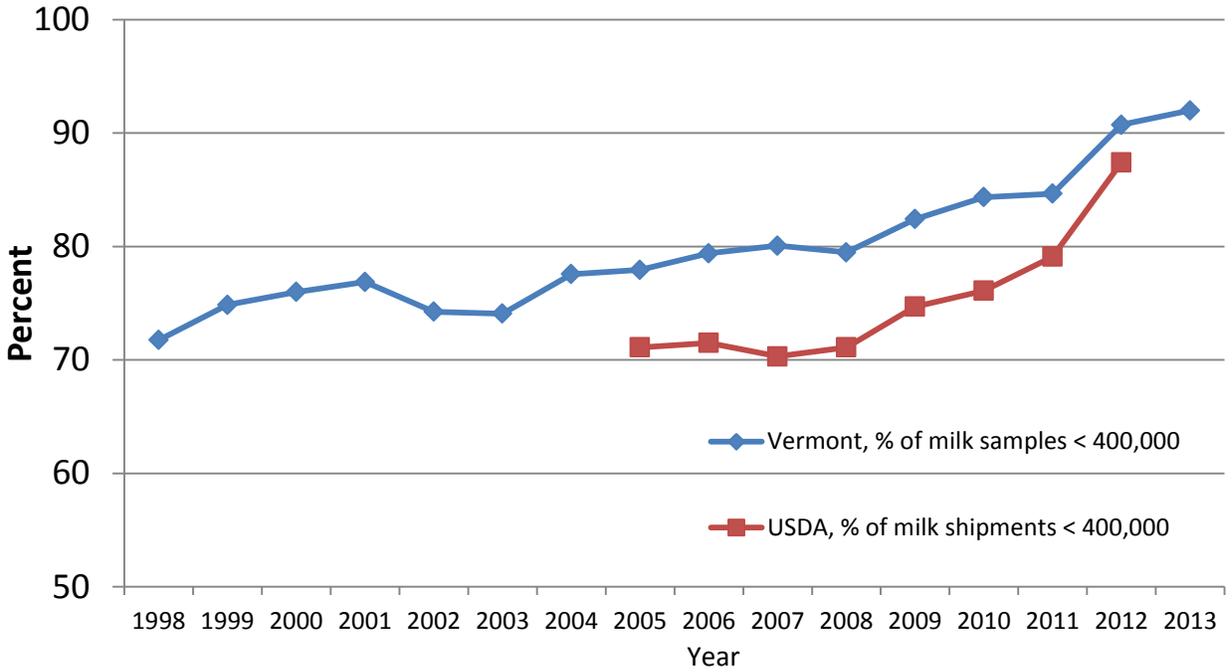


Figure 5. Percent of Milk Samples with a Somatic Cell Count Less Than 400,000 Cells/mL

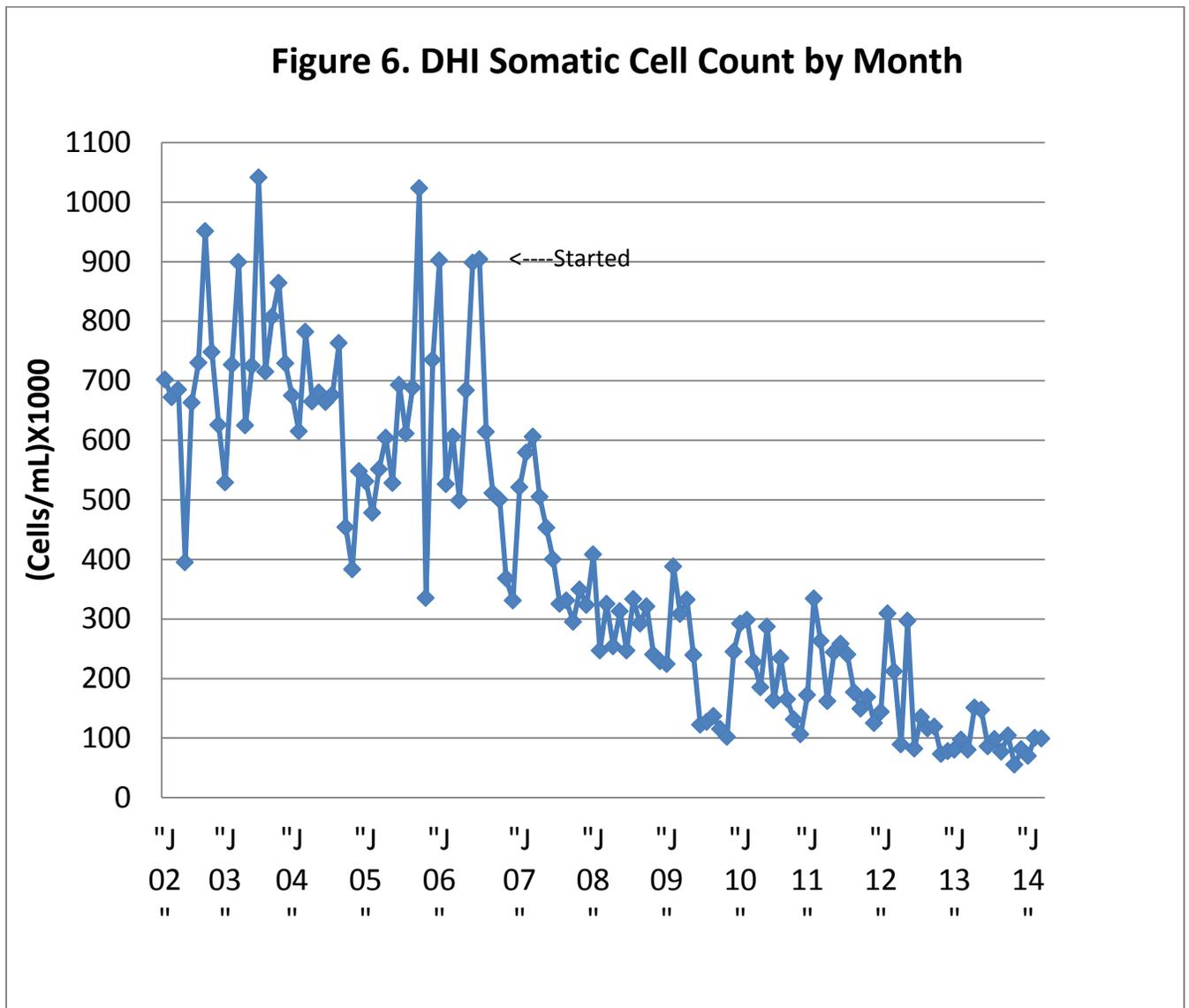


Source: Vermont Agency of Agriculture.

USDA , Animal and Plant Health Inspection Service, Determining U.S. Milk Quality Using Bulk-tank Somatic Cell Counts 2005 through 2012.

EXAMPLE RESULTS ON VERMONT FARMS

Figure 6. shows a graph of a Vermont producer’s Dairy Herd Improvement’s monthly somatic cell counts starting in January 2002. Prior to August 2006 the yearly average somatic cell count for the herd averaged about 700,000 and the herd’s somatic cell count was less than 400,000 only on three monthly test in the previous four and a half years. No stray voltage was detected and the milking system was functioning adequately. We sampled and cultured all quarters on all cows with a DHIA somatic cell count above 200,000. About fifty percent of the herd had contagious mastitis. He consulted his veterinarian for a treatment protocol and began managing his herd to lower the risk of spreading mastitis between cows. We continued sampling high risk cows, based on their monthly somatic cell count data, and managed them based on their culture results. The graph shows a gradual decline in the herd average somatic cell count. Currently his DHI rolling herd average somatic cell count for the last year is 92,000.



An organic producer's somatic cell count summary is shown in Figure 7. After a year of increasing somatic cell counts through transitioning from conventional to organic milk production in March, 2007 he contacted his organic milk processor to set up his milk shipments. He seemed surprised (and angry) when he realized that the processor required their suppliers to ship milk with less than 400,000 somatic cell count. His veterinarian asked him to contact Vermont's Milk Quality Enhancement Program for help. We checked and suggested some adjustments to the equipment and milking procedures. We cultured cows with a DHI somatic cell count above 200,000 and found about twenty-one percent of the herd with *Staphylococcus aureus* mastitis in at least one quarter. The dairyman implemented plans to lower the bulk tank's somatic cell count and reduce the risk of transmitting *Staphylococcus aureus* to uninfected cows. His current DHI yearly somatic cell count rolling herd average is 184,000.

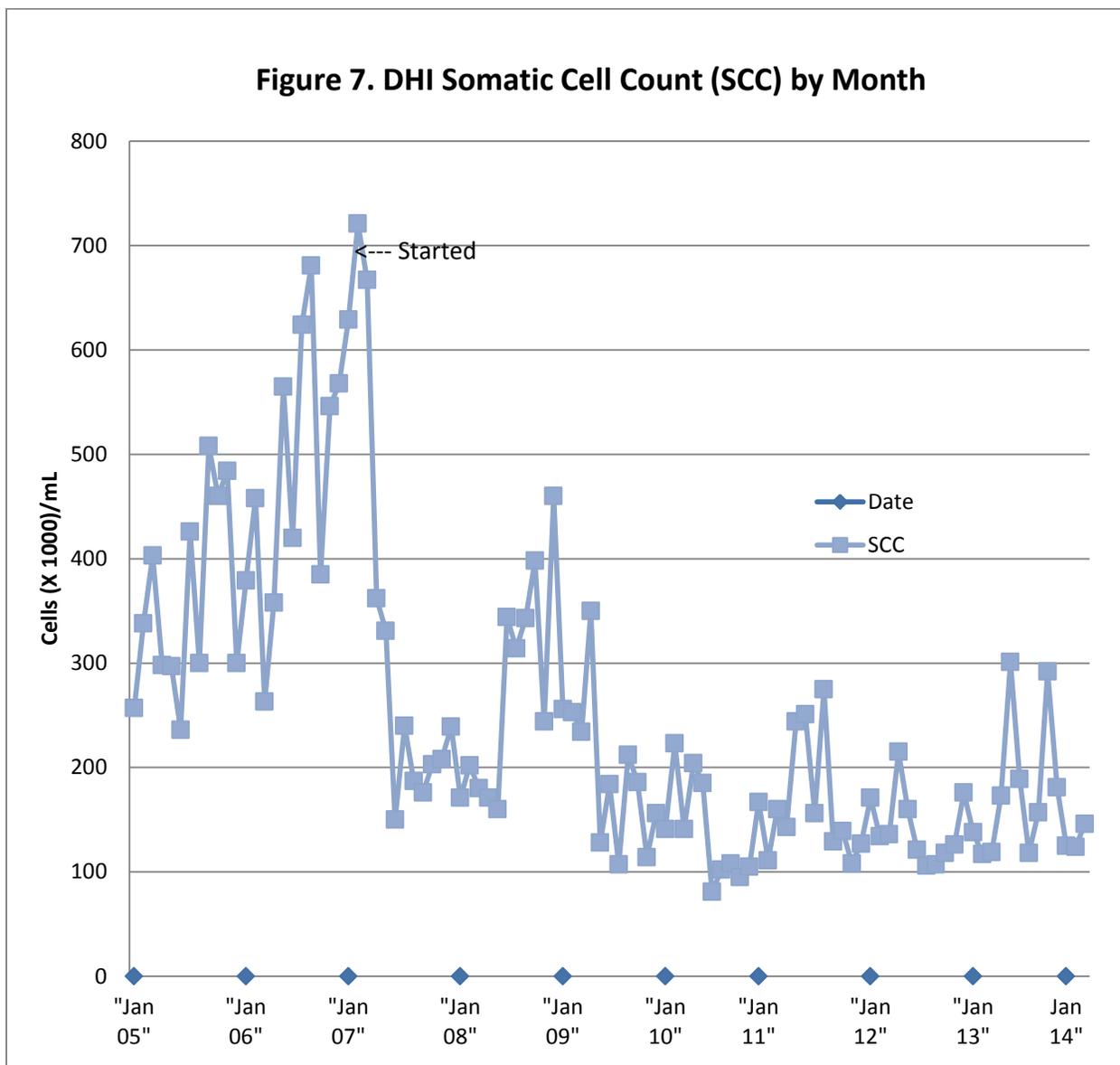


Figure 8. shows DHI test day somatic cell count for an organic milk producer’s herd who was referred to the Milk Quality Enhancement Program by his veterinarian in December 2011. The producer requested help improving his herd’s somatic cell count to increase his quality payment. After doing the usual milking system, cow environment, and milking protocol checks and suggesting modification where necessary; we sampled twenty cows in the herd that had somatic cell counts above 200,000. The culture report showed nine of the twenty had Staphylococcus aureus infections in at least one quarter. Only seventy-four percent of his milking herd had a linear score of 3.0 or less (somatic cell score < 142,000). Currently he has three known Staphylococcus aureus infected cows and eighty-seven percent of the milking herd have somatic cell linear score of 3.0 or less. His current DHI yearly somatic cell count rolling herd average is 92,000 and he has increased his quality payments.

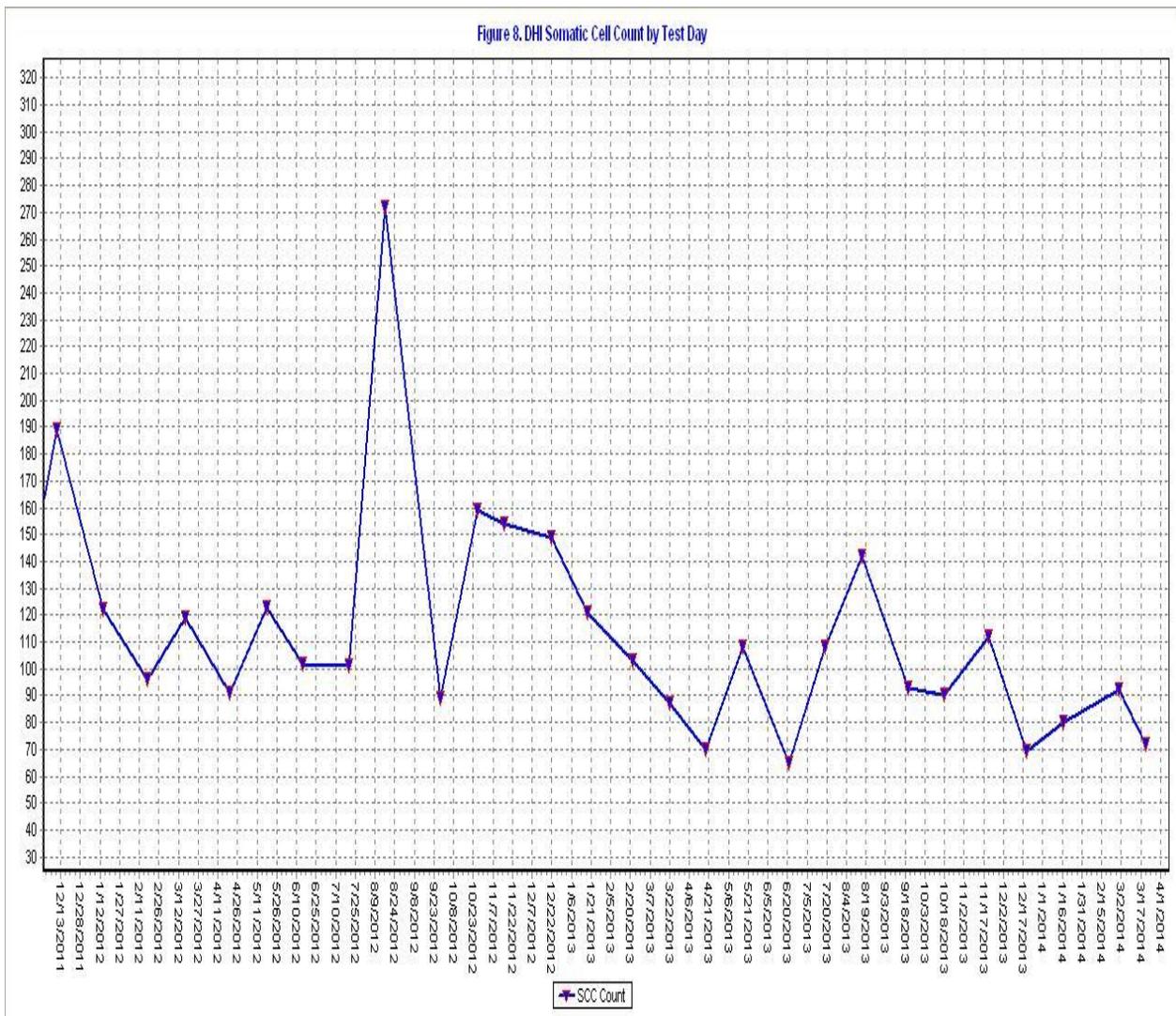
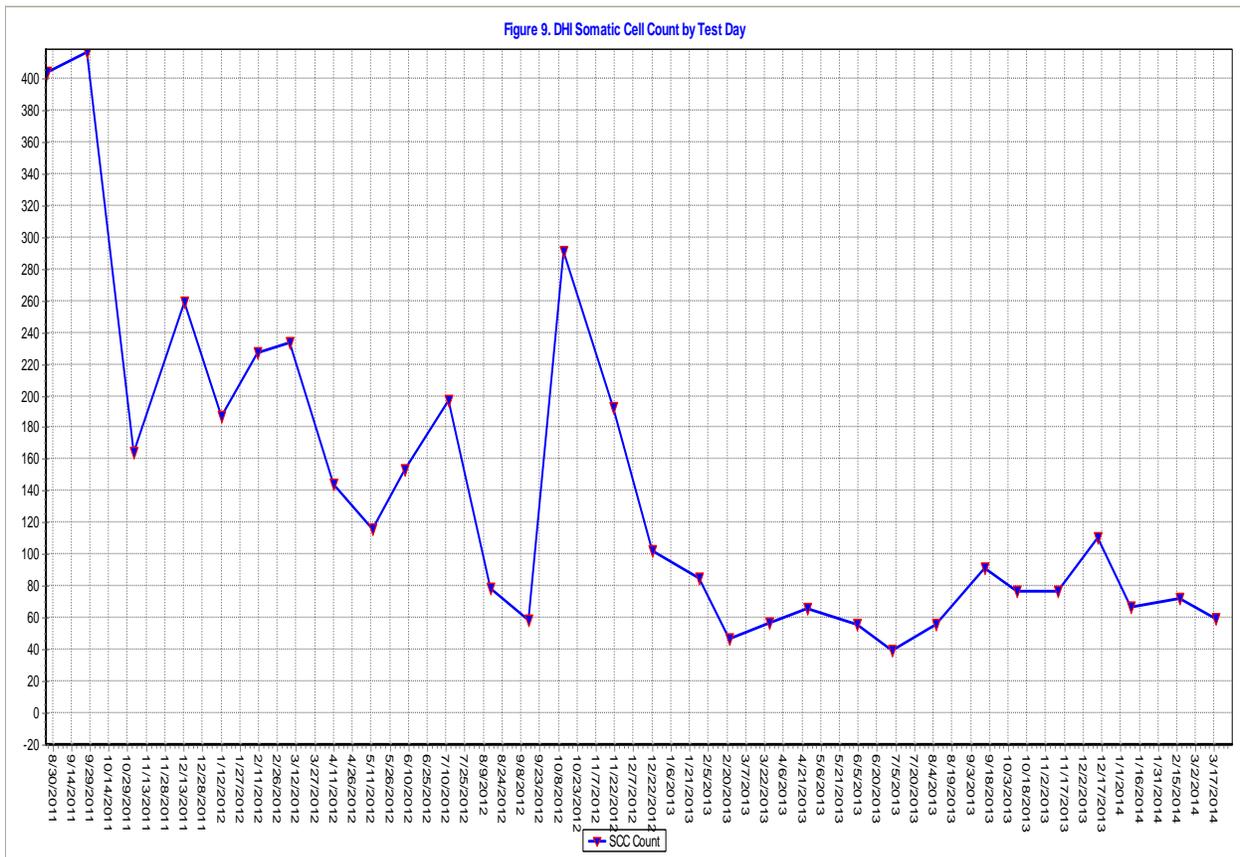
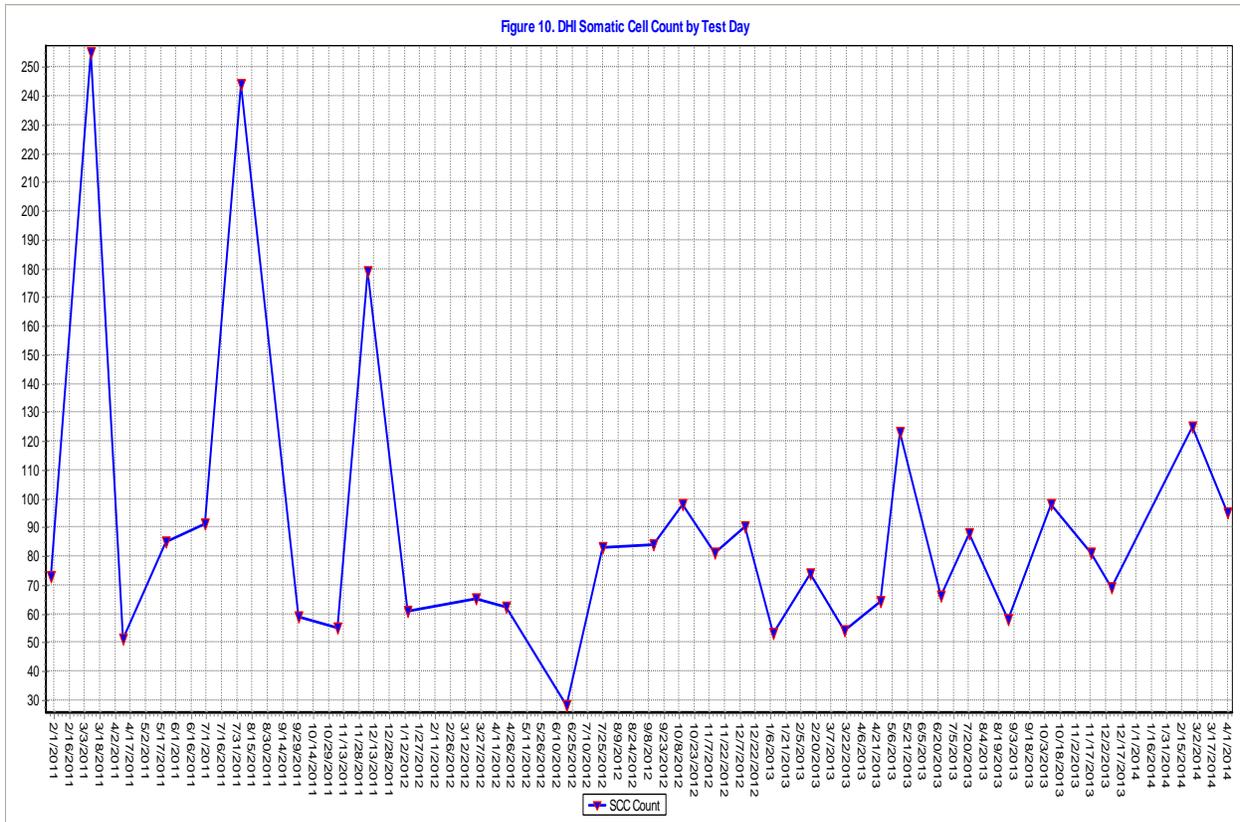


Figure 9. shows the results of a producer that called in August 2011, on the recommendation of their veterinarian. The producer's goals were to lower the herd's somatic cell count and eradicate *Staphylococcus aureus* mastitis from their herd within three years. Dry cow treatment appears to have cured a few staphylococcus infected cows and others are being managed to reduce the risk of spreading infections to other cows. The current DHI yearly somatic cell count rolling herd average is 69,000.



The results of a producer that started using DHI to monitor their herd's progress in April 2010 are shown in Figure 10. They have used culture results to help manage mastitis control since before April 2010. Currently, their yearly DHI somatic cell rolling herd average is 87,000 and they have earned over \$20,000 in premium payments over the last year.



The previous examples represent results that many Vermont producers have realized. However, a few producers have had similar results, then reverted back to their old habits, and lost the progress they had gained. Some of them have requested assistance and restarting their program and some have given up, quit farming and started new careers or retired. Each month the Milk Quality Enhancement Program has received new requests for assistance lowering their somatic cell counts. Whether they have had a gradual increase in their somatic cell counts or their counts have been high, long enough, that they want assistance to avoid requesting derogation in order to continue shipping milk, the Milk Quality Enhancement Program has been available for assistance.

Another frequent request the Milk Quality Enhancement Program receives is trouble shooting high bacteria counts. All milk processors have a set of quality standards. The minimum standard allows acceptance of the producer's milk, but reaching the highest standard can result in a significant increase in compensation for each cwt of milk a producer ships. Occasionally there have been requests to resolve high standard plate counts. However, often producers have requested assistance alleviating high preliminary incubation counts or an elevated laboratory pasteurized counts. Sometimes more than one farm visit has been required to resolve the problem, but usually a solution has been found. No data is available to show the efficacy that the Milk Quality Enhancement Program has had resolving high bacteria counts, but personal communication from producers and processor's field staff would lead one to believe it's an important part of the program.

The Milk Quality Enhancement Program has detected, found sources, and helped farmers get assistance eliminating stray voltage affects on their production. Just as important, farms have been checked and no stray voltage found, allowing them to move on checking other areas that may have had impact their production. Another niche area that Program has helped, concerns very small producers. Very small producers may have a family cow or two, may be milking a few cows or goats and selling raw milk, or may be someone with a very small herd producing artisan cheese. Many of these producers want to produce high quality wholesome products and have asked the Milk Quality Enhancement Program for assistance when milk quality issues have arisen.

SUMMARY

The Nation's milk quality has improved over the last ten years, as indicated by nearly a 20% drop in the producers average somatic cell count. Similarly, Vermont producer's average somatic cell counts have dropped 34% since 2003. Also, in 2013, only 0.44 % (47 out of 10706) official bulk tank samples had somatic cell counts of 750,000 or more, compared to 3.63 % of the samples taken in 2003. With assistance and cooperation by all stake-holders, Vermont's dairy producers have continually improved their product's quality until it's among the highest in the country.

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