

EUROPEAN UNION BULK TANK SCC STANDARDS AND PROPOSED US STANDARDS: COMPLIANCE BASED ON DATA FROM FOUR FEDERAL MILK MARKETING ORDERS

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Abstract

The objective of this study was to evaluate the percentage of US dairy herds and milk not currently meeting the current and proposed bulk tank somatic cell counts (BTSCC) limits. Five different limits of BTSCC were evaluated for compliance: 750K, 600K, 500K, and 400K cells/ml using the current US methods and 400K cells/ml using the geometric mean method used by the EU. For the 12 month period ending October 2010, 1.0% of herds and 0.2% of milk exceeded the current US limit of 750K; 4.7% of herds and 1.4% of milk would have exceeded the proposed 600K limit; 11.0% of herds and 3.8% of milk would have exceeded the proposed 500K limit; and 23.3% of herds and 10.1% of milk would have exceeded the 400K cells/ml limit. The percentages of herds and milk not meeting the geometric mean method used by the EU were 16.1% and 6.7%, respectively. Examination of monthly BTSCC patterns reveal July through October is the period where the percentage of herds and milk above the proposed limit are highest. For herds shipping <900 metric tonnes of milk in the 12 month period, 44.5% would have exceeded the proposed 400K cells/ml US limit while 8.0% of herds shipping more than 9,000 metric tonnes would have exceeded the proposed 400K cells/ml US limit. If implemented, and BTSCC counts remain unchanged, the proposed phased in reduction to a 400K cells/ml BTSCC limit would result in a substantial increase in herds and milk that exceed the regulatory limit.

Introduction

The legal limit of bulk tank somatic cells counts (BTSCC) in the US for “Grade A” milk is currently 750,000 cells/ml and has been at this limit since implemented in 1993 when it was lowered from 1,000,000 cells/ml (FDA 1991). The US limit for BTSCC is higher than limits in many other countries including the European Union (400,000 cells/ml) (Hillerton and Berry, 2004), Australia and New Zealand (400,000 cells/ml) (Smith and Hogan, 1998), and Canada (500,000 cells/ml) (Canadian Food Inspection System, 2005).

In addition to having different limits for BTSCC, there are differences in methods for determining if a herd has surpassed the legal limit. The US Pasteurized Milk Ordinance (PMO) (FDA 2009) outlines the legal limit and how enforcement is applied for the US. If a herd has 2 out of 4 consecutive shipments exceed the 750,000 cells/ml limit (usually tested 30-45 days apart), a written notice is issued and an additional sample is tested within 21 days. If 3 of the last

5 counts exceed the 750,000 cells/ml, regulatory action is required, which includes one or more of the following: suspension of producer's Grade A permit; milk in violation is not sold as Grade A product; and/or monetary penalties. In the European Union, a geometric mean (GM) BTSCC is calculated based on the previous 3 months of BTSCC data. If the GM exceeds the 400,000 cells/ml limit, then the herd is placed on a watch list. The herd is removed from the watch list if any of the next 3 tests result in the GM are $\leq 400,000$ cells/ml. If the GM is $>400,000$ cells/mL for all 3 of the additional tests, the herd can no longer market milk until corrective action is taken (Europa, 2009).

Since milk exported from the US to the EU must meet their legal limit for BTSCC, all milk used in dairy products shipped to the EU must have a BTSCC of 400,000 cells/ml or less. In addition, the EU requires that BTSCC testing on this milk must be done on individual farms rather than at the silo or tanker. An audit conducted in June 2009 by the EU's Food and Veterinary Office (FVO) revealed that testing of US milk used in dairy products exported to the EU was being conducted at silos and tankers, in violation of EU requirements (AMS, 2010). In January 2010, the USDA's Agricultural Marketing Service notified the US dairy industry that milk used for dairy products sent to the EU would be required to meet EU's testing requirements by October 1, 2010 which was subsequently pushed back to December 1, 2010.

The objective of this study was to evaluate the percentage of US herds and milk supply not currently meeting the current and proposed BTSCC limits.

Materials and Methods

Data used in this analysis were obtained from 4 Federal Milk Marketing Orders (FMOs) - Upper Midwest, Central, Mideast, and Southwest – on a monthly basis and included herd ID, date, FMO order, kg of milk produced for the month, and the official herd BTSCC. Herds with at least 15 months of data from the period January 2009 through October 2010 were included in the study. Five different limits of BTSCC were evaluated for compliance: 750K, 600K, 500K, and 400K cells/mL using the current US methods and 400K using the EU GM method. Percent of noncompliant herds was determined by dividing the number of herds and the kg of milk that didn't meet the limits by the total number of herds and total kg of milk, respectively, eligible for inclusion in the study. For the current and proposed US limits, noncompliance was based on 3 of 5 tests being above the limit. For the EU compliance, a 3-month geometric mean ($SCC_g = \sqrt[3]{(SCC_1)(SCC_2)(SCC_3)}$) was calculated and the method described above was used to determine eligibility to ship milk. Since herd size information was not available, rolling herd average milk production of approximately 9,000 kg/cow/yr was used to estimate the number of cows per herd. The amount of milk shipped was used to create categories approximating herds of less than 100 cows, 100-499 cows, 500-999 cows, and ≥ 1000 cows. Milk shipped was categorized into four groups: < 900 metric tonnes, 900 to 4500, 4501 to 9,000, and $> 9,000$ metric tonnes. All analysis was completed using commercially available statistical software (SAS version 9.2).

Results

The total number of herds meeting the inclusion criteria was 27,759 while the total number of shipments monitored was 325,690. The percentage of herds and milk supply exceeding current

and proposed limits is presented in Table 1. For the 12 month period ending October 2010, 1.0% of herds and 0.2% of milk exceeded the current US limit of 750K; 4.7% of herds and 1.4% of milk would have exceeded the proposed 600K limit; 11.0% of herds and 3.8% of milk would have exceeded the proposed 500K limit; and 23.3% of herds and 10.1% of milk would have exceeded the 400K cells/ml. The percent of herds and milk not meeting the EU geometric mean method of implementation were 16.1% and 6.7%, respectively.

Table 1. Percentages of Federal Milk Order herds¹ and milk supply noncompliant for current and proposed US SCC standards and current European Union (EU) SCC standard by end date of test period for SCC standard.

End date Year Month ²	Current US standard (>750,000 cells/ml)		Proposed US standard (cells/ml)						Current EU standard (>400,000 cells/ml)	
			>600,000		>500,000		>400,000			
	Herds, %	Milk supply, %	Herds, %	Milk supply, %	Herds, %	Milk supply, %	Herds, %	Milk supply, %	Herds, %	Milk supply, %
2009 June	0.9	0.3	4.7	1.5	11.3	4.0	23.4	10.1	16.9	7.3
July	0.8	0.2	4.5	1.4	11.1	3.9	23.7	10.2	17.2	7.5
August	0.8	0.2	4.7	1.5	11.6	4.1	24.9	10.9	17.6	7.7
September	0.9	0.2	5.1	1.6	12.0	4.4	25.8	11.8	17.9	7.9
October	0.9	0.2	5.1	1.5	12.0	4.3	25.5	11.5	17.9	7.8
November	0.8	0.2	4.6	1.4	11.1	3.9	24.1	10.6	17.1	7.4
December	0.7	0.1	4.0	1.1	9.9	3.2	21.7	9.0	15.8	6.5
2010 January	0.7	0.1	3.8	1.0	9.4	2.9	20.5	8.4	15.0	6.0
February	0.9	0.2	4.1	1.1	9.8	3.0	20.7	8.2	14.6	5.7
March	1.0	0.2	4.9	1.5	10.9	3.7	22.0	9.3	14.8	5.6
April	1.0	0.2	4.8	1.6	10.5	4.1	21.6	9.6	14.8	6.0
May	1.2	0.3	5.1	1.6	11.2	4.2	23.2	10.7	16.2	7.0
June	1.0	0.2	4.4	1.4	10.6	3.9	22.4	10.0	15.8	7.0
July	0.9	0.2	4.6	1.4	10.9	3.9	23.3	10.1	16.4	7.2
August	1.1	0.2	5.2	1.5	11.9	4.2	26.0	11.2	16.9	7.0
September	1.3	0.3	5.6	1.6	13.1	4.7	27.7	12.4	17.5	7.3
October	1.3	0.3	5.6	1.6	12.8	4.3	27.3	11.9	18.0	7.5
Weighted mean for last 12 months	1.0	0.2	4.7	1.4	11.0	3.8	23.3	10.1	16.1	6.7

¹Monthly number of herds ranged from 24,458 to 27,635.

²For US standards, last month of 5 consecutive months; for EU standard, last month of 4 consecutive 3-month geometric means.

Examination of monthly BTSCC patterns reveal that July through October is the period where the percent of herds and milk above the proposed limit are highest. For herds shipping <900 metric tons of milk in the 12 month period, 44.5% would have exceeded the proposed 400K US

limit, while 8.0% of herds shipping more than 9,000 metric tonnes would have exceeded the proposed 400K US limit.

Discussion/Conclusion

If implemented and BTSCC counts remain unchanged, the proposed phased in reduction to a 400K cells/ml BTSCC limit would result in a substantial increase in herds and milk exceeding the regulatory limit. An immediate reduction to the proposed 400K cells/ml limit would have resulted in almost a quarter of herds exceeding the proposed limit at some point during the 12 month period ending October 2010. Interestingly, implementation of the US method of a 400K cells/ml limit resulted in 30% more herds and milk supply that was noncompliant compared to implementation of the EU (GM) method. The proposed 400K cells/ml limit would have the largest impact on herds shipping <900 metric tonnes where 28.1% of herds and 24.3% of milk supplied by herds in that category would exceed the limit. Smaller herds have the potential for fewer cows to have a larger impact on the BTSCC compared with larger herds. More small herds would be forced to implement management practices to reduce BTSCC or risk being noncompliant with reduced BTSCC limits.

An interesting comparison can be made between this study and a study evaluating the effect of the same proposed limits using data from Dairy Herd Improvement Association (DHIA) herds. The percentage of FMO herds exceeding each of the proposed standards was approximately double the percentage of DHIA herds (Norman, et al., 2011). The herds in the FMO and DHIA data sets represent different herds in terms of BTSCC levels. DHIA herds are generally believed to be more progressive, use information from DHIA to better manage their herds, and have lower BTSCC. The FMO data set included very few herds from California or the southeastern US in comparison to the DHIA data. It is not known what overall impact the proposed limits would have if BTSCC data from all herds in these areas were included.

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