

## **Bacteriological Quality of Bulk Tank Milk in Pennsylvania**

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### Introduction

Studies conducted over the last two decades have shown that examination of bulk tank milk (BTM) is useful for diagnosing multiple problems (current and potential) that might exist in a dairy herd related to milk quality and mastitis pathogens. In recent years, milk producers and cooperatives view BTM analysis as an important part of their quality assurance program(1). An extension and research program was conducted in Pennsylvania from April 2000 through March 2001 focused on BTM analysis. The research project involved surveying BTM quality in Pennsylvania. The findings of the study are presented in this paper.

### Materials and Methods

A total of 126 dairy producers from 14 counties in Pennsylvania participated in the study. Four BTM samples were collected at interval of 15 days from each of the participating dairy producers. The BTM samples were examined for bulk tank somatic cell count (BTSCC) and differential bacterial counts including; 1) Standard plate count (SPC), 2) Preliminary incubation count (PIC), 3) Laboratory pasteurization count(LPC), 4) *Staphylococcus aureus* (SA) count, 6) Coagulase negative staphylococcal (CNS) count, 7) Streptococci and streptococci-like organisms (SSLO) count, 8) Coliform count (CC) and 9) Gram-negative non-coliform (NC) bacteria. Somatic cell count and bacteriological tests were done as described by previously (1).

### Results and Discussion.

The mean BTSCC of the 126 dairy producers who participated in the study was 363,214 cells/ml (Table 1). Pennsylvania ranks 20th with a state average of 331,000 cells/ml of milk. It was observed that 95 of 126 (75%) BTM samples had BTSCC cell count of > 250,000 cells/ml, while 22 of 126 (17%) had BTSCC > 500,000 cells/ml. This observation is supported by the finding that a considerable number of BTM samples had contagious and environmental mastitis pathogens (Table 3). The bacterial counts in BTM are shown in Table 2. With respect to SPC, about 56, 19, and 25% of BTM samples had SPC <5,000, 5,000-10,000, and >10,000 cfu/ml, respectively. It was observed that 48, 16 and 36% of BTM samples had PIC <10,000, 10,000 - 20,000 and >20,000 cfu/ml, respectively. (Table 3). These observations suggest that dairy herds need to address one or more milk quality and mastitis issues on their farm, addressing these issues related to milk quality and mastitis could enhance their profitability.

### References

1. Jayarao, B. M., S. R. Pillai, D. R. Wolfgang, D. R. Griswold, and L. J. Hutchinson. 2001. Herd level information and bulk tank milk analysis: tools for improving milk quality and heard udder health. *The Bovine Practitioner*. 35:23-35.

Table 1. Bulk tank somatic cell counts

<b>BTSCC (cells/ml)</b>				
<b>Mean</b>	363,214	<250,000	250,000-500,000	> 500,000
<b>Median</b>	347,500	( n= 31)	(n=73)	(n=22)
<b>Range</b>	9520-737,500	187,278	372,521	580,236

Table 2. Bacterial counts in bulk tank milk

<b>Test</b>	<b>Bacterial counts expressed as cfu/ml</b>			<b>Standard error</b>
	<b>Mean</b>	<b>Median</b>	<b>Range</b>	
SPC	7672	4193	180-62,825	796.48
PIC	22,913	12,250	500-139,750	2452.82
LPC	388	133	5-6400	66.6585
SA	45	34	0-275	4.078
CNS	1246	693	60-15,175	173.86
SSLO	1390	890	15-11,402	152.62
CC	159	60	5-4130	41.81
NC	838	226	0-15475	203.43

Table 3. Distribution of bacterial counts

<b>Test</b>	<b>Category</b>		<b>No. of samples (n=126)</b>	<b>%</b>	<b>Count (cfu/ml)</b>
SPC	< 5000	A	71	56	2610
	5000-10,000	B	24	19	7601
	> 10,000	C	31	<b>25</b>	<b>19,321</b>
PIC	< 10,000	A	61	48	4777
	10,000=20,000	B	20	16	14519
	>20,000	C	45	<b>36</b>	<b>51227</b>
LPC	<200	A	74	59	98
	200-400	B	25	20	274
	> 400	C	27	<b>21</b>	<b>1290</b>
SA	< 1	A	4	3	0
	1-50	B	82	65	24
	> 50	C	40	<b>32</b>	<b>92</b>
CNS	<500	A	46	36	299
	500-1000	B	41	33	787
	>1000	C	39	<b>31</b>	<b>2846</b>
SSLO	<500	A	33	26	260
	500-1000	B	36	29	727
	>1000	C	57	<b>45</b>	<b>2464</b>
CC	<50	A	58	46	25
	>50	B	68	<b>54</b>	<b>272</b>
NC	<200	A	54	43	238
	>200	B	72	<b>57</b>	<b>1287</b>

