

Trends in quarter-level somatic cell count and implications for quarter milk separation

K. J. Koebel,¹ BS; K. F. Reed,² PhD; D. V. Nydam,¹ DVM, PhD; R. D. Watters,¹ MS, PhD;
M. Wieland,¹ DVM, DECBHM, PhD; P. D. Virkler,¹ DVM

¹Department of Population Medicine and Diagnostic Sciences,
Cornell University College of Veterinary Medicine, Ithaca, NY 14850

²Department of Animal Science, Cornell University College of Agriculture and Life Sciences, Ithaca, NY 14850

Introduction

The sale of quarter-separated milk is prohibited under the Pasteurized Milk Ordinance; all milk harvested from a cow with 1 or more abnormal quarters must be discarded. However, the milk produced by unaffected quarters may still be of acceptable quality, i.e. low somatic cell count (SCC). With the increasing popularity of automatic milking systems (AMS) and real-time udder-level SCC monitoring, milk quality must be investigated as future technology may allow for automated quarter-level testing and separation. This study sought to evaluate SCC trends in quarter-separated milk samples from cows with differing numbers of high SCC quarters, in order to determine if unaffected quarters continue to produce low SCC milk.

Materials and methods

Fifty-one thousand, eight hundred and eight (51,808) quarter-level milk samples were obtained from 397 4-quartered multiparous Holstein cows during Summer 2020 and 2021. The study location was a 500-head western New York freestall dairy utilizing automatic milking systems. Individual quarter milk samples were analyzed for SCC by flow cytometry. Observations were subset into “high” and “low” quarters using a threshold of 200,000 cells/mL, and by the number of high quarters for each cow-day. Mean and median low- and high-quarter milk-weighted average SCC (wavgSCC) were calculated for cow-day observations with differing numbers of quarters above the SCC threshold.

Results

The mean (\pm SD) low-quarter wavgSCCs for cow-days with 0, 1, 2 and 3 quarters above 200,000 cells/mL were 26.3 ± 20.5 , 38.5 ± 27.7 , 51.6 ± 38.0 and 61.0 ± 51.3 thousand cells/mL respectively. Similarly, median values were 19.3, 29.8, 39.5 and 40.0 thousand cells/mL (1st and 3rd quartiles of 12.0-34.8, 16.7-54.3, 19.5-76.5 and 22.0-90.0). The relative proportion of low-quarter SCC measurements below 50,000 cells/mL was at least 50% for cow-days with any number of high quarters.

Significance

These results indicate that milk from unaffected quarters in cows with at least one high SCC quarter remains of an acceptable quality, based on SCC evaluation. While low-quarter wavgSCC does numerically increase with increasing number of high quarters, the increase is inconsequential. The practice of quarter-level milk separation should be re-evaluated in the context of these findings.

