

The Impact of Milk Temperature Monitoring on Milk Quality on Ontario Dairy Farms

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Introduction

The Ontario dairy industry takes great pride in providing high quality milk products to the consuming public. Milk and milk products are an important part of the daily diet of most Ontario residents. Bacterial contamination of raw milk has a major negative impact on milk quality. Even though most milk is pasteurized prior to consumption, raw milk is consumed by some farming families and is used to manufacture some food products. Dairy Farmers of Ontario have required installation of Time Temperature Recorder's (TTR's) on all Ontario dairy farms, with the intention of preventing elevated bacteria levels in raw milk under the Canadian Quality Milk Program. The TTR has two sensors, one in the bulk tank that monitors the raw milk temperature and one in the pipeline to monitor wash water temperature during the wash cycle. The objective of this study was to evaluate the impact of TTR's on the bacterial content of raw milk and the loss of (dumped) bulk tank milk on Ontario dairy farms and to summarize the occurrences of the different TTR alarms.

Materials and Methods

Two study groups were compared in this study, a TTR and a Non-TTR group of herds. The TTR study group consisted of 497 herds that had a TTR installed for at least one year prior to the study. The Non-TTR group of 514 herds did not yet have a TTR installed during the study period. The study period was from April 2005 to March 2006. Multiple linear regression models were constructed to determine the effect of TTR installation on measures of milk quality. Firstly, the Bactoscan bacteria values within the TTR study group in the year prior to TTR installation, Sept. 2003 to Sept. 2004, were compared to the Bactoscan levels within the study period. Secondly, the TTR group was compared to the Non-TTR herds during the study period. Bactoscan levels during the year prior to TTR installations were compared within the TTR and Non-TTR study groups to determine if there was a difference in raw milk bacteria

levels prior to the study. Lastly, the occurrence of milk pick-ups in Ontario <50% of the expected volume for each farm was retrieved from DFO for all the TTR and Non-TTR herds for the period of one year and linear regression was performed to determine the effect of the TTR installation on the loss of (dumped) bulk tank milk. In addition, one year of alarm data was gathered from 200 farms within Eastern and Southwestern Ontario. The alarm data was categorized into the different alarm types and the season of year in which the alarm occurred. Alarm prevalence's were determined.

Results

The presence of a TTR was significantly associated with a decrease in bacteria levels in raw milk compared to farms without TTR's. In addition, there was a significant decrease in Bactoscan levels after TTR installation compared to the year prior to TTR installations on the same farms. Also, there was no significant difference between Bactoscan levels in the year prior to TTR installations within the two study groups. The higher risk of dumped milk data suggested that the producers within the TTR group were discarding more of their raw milk compared to the Non-TTR study group, and also that more bulk tank milk was being lost within the cooler months of the year. The most commonly occurring TTR alarms were the pipeline and bulk tank washing alarms, the slow cooling alarm and the high blend temperature alarm. In addition, the washing alarms were more prevalent in the cooler months of the year and the cooling alarms were more predominant in the warmer months.

Significance

The TTR study group had a significantly lower level of bacteria in raw milk samples, compared to prior to TTR installation and also compared to the Non-TTR study group. Therefore, the installation of the TTR's was a positive step towards the improvement of bacteria levels in raw bulk tank milk and the production of high quality milk products in Ontario.