Abstract Submission Form

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Preferred presentation   Oral

Preferred session

Session 6: SC Dairy Cattle Milk Recording – Presentation and evaluation of new analytical parameters in herd management for dairy farms

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Title of your paper   Transition Management Index: a new tool to assess the transition period success

Insert ABSTRACT text

An objective tool to assess the quality of the transition management practices is an important aid in maximizing the performance and profitability of dairy farms. Our objective was to create an index to assess the transition period of dairy cows using Canadian data (Transition Management Index; TMI) and benchmark current practices. The methodology was inspired by the Transition Cow Index® developed by Nordlund (2006). We used over one million DHI cow records from 2017-2020 from all provinces in Canada. included cows from lactation 1 to 7, from 8 breeds (Holstein, Jersey, Ayrshire, Brown Swiss, Guernsey, Canadian, Milking Shorthorn, and others), and 3 milking systems (pipeline, parlour, and robotic systems). Models were developed separately for primi- and multiparous cows using mixed-effect linear regression in R (lme4 package) with the fixed variables breed, lactation start reason, milk testing scheme, age at first calving (primiparous only), milking frequency, and estimated breeding values for milk, fat, and protein, and a random herd effect. The models for multiparous cows also included previous lactation start reason, DIM, peak DIM, peak milk yield, 305-d milk yield, average somatic cell score (SCS), days dry, and

lactation number. The TMI consists of the difference between the expected milk production estimated by the model and the 305-d projection at the first milk test (5-45 DIM), which also accounts for DIM, beta-hydroxybutyrate (BHB), SCS, and 24-h milk yield. The novelty of the TMI in comparison to the previous index is the inclusion of new traits potentially associated to transition management as well as the calculation of an index for first lactation cows. The TMI herd average in 2022 was -27 (range of −1737 to 1334), and 49% of the cows had a negative TMI. Older cows have a lower TMI than younger cows (Lact 1 = 24; Lact 2 = -34; Lact 3+ = -55). Robotic herds had a greater average TMI (20) than pipeline (−66) or parlour systems (−120). There is a positive correlation (R = 0.64) between TMI and milk production. An increase of 100 points in the TMI is equivalent to an increase of 100 kg of milk and 3.5 kg of butterfat per standard lactation. A total of 5,070 Canadian herds were classified in percentiles according to the average TMI and their herd performance and profitability were compared. The top 20% of the herds have a daily milk yield 4.5 kg higher, produce 5.7 kg more at peak lactation, and produce 1,584 kg more milk and 62 kg more butterfat per lactation than the average. In addition, the top 20% of the herds have a yearly milk revenue of C$1,307/cow higher and a revenue per day of life of C$0.90/cow higher than the average. Higher herd TMI was associated with greater average milk value (R = 0.61), a lower SCC average (R= -0.35), a lower percentage of cows with elevated or low MUN levels (R= -0.25), and a lower percentage of cows with elevated BHB in milk at first test (R= -0.11).   In addition, higher herd TMI was associated (R= -0.26) with shorter calving intervals. We are developing an interactive TMI dashboard to be launched in 2024. The main page features TMI cow records, annual averages, and provincial benchmarks, as well as KPI indicators and drill-down functions on related transition management aspects such as udder health, energy status, rumen health, and dry period that enable producers and their advisors to assess the transition practices and identify opportunities for improvement.

Enter keywords   Transition Period, performance, management