

Session 2.2: Advances on monitoring welfare at group and individual level.

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A NEW MEASURE TO RANK COW PRODUCTION PERFORMANCE USING LIFETIME INCOME VALUES.

Mario Séguin, Robert Moore, René Lacroix, Débora Santschi.

Lactanet, Ste-Anne-de-Bellevue, Canada.

Cow production based on lactation (305, 365 days) or lifetime yields has been used to evaluate and improve dairy cows since milk recording started. However, comparing cows based only on yields can be misleading due to varying factors such as age at calving, lactation length, calving interval, milk persistency and price paid for milk components.

Various economic measures were developed in Canada and elsewhere in the world to assess cow production, such as \$/day of life achieved at the end of each lactation. These measures often use the projected 305 day yields on test date or an estimate of the cumulative yield on the day before the next calving to calculate an estimated milk income. We analysed the \$/day of life per parity with a dataset of 301,862 cows that had calved at least for a second time in 2021. Our analysis revealed that the percentile 99 for \$/day of life in 1st lactation cows had an average lactation length of 502 DIM, whereas the percentile 99 in 4th lactation cows completed their records with an average of 360 DIM per lactation. This finding illustrates that cows with an unusually long 1st lactation might be perceived as high performers early on, but are not the ideal cows for lifetime economic returns. This indicates that calculating cumulative yields or milk value based on lactations might cause a bias and is therefore not appropriate.

A new comparison concept for cow performances was therefore developed at Lactanet : the Cow Ranking by Income (CRI). Its innovative approach relies on the idea that the birthday of cows can be used to benchmark production and income of individual cows by Age class: 3 yr-old, 4, 5, 6, 7, 8, 9, 10+ yr-old cows. This method calculates the production yields (milk, fat and protein) achieved by individual cows to their birthdate. Cows are then grouped by breed and age reached in a calendar year (ex.: all Holstein cows having their 3rd birthday in 2022). This better reflects the income independently of lactation length.

This new Age class milk income measure is calculated using the average component price paid to dairy farmers in Canada. The Age class milk income is used to rank cows using percentile ranking within the age class group. The 1 – 99 ranking value allows for easy comparison of cow performance within and across herds. A new annual report was developed to allow herd owners to benchmark the cow performances of their herd by age class and the lifetime accomplishments of cows in comparison to the national peers. The CRI values were generated for the year ending 31st December 2022 for 438,717 cows, of which 87,168 (19.9%) reached age class 6 and older. The analysis by age class is showing that as cows mature with higher parity number and regular calving interval, the income per day of life keeps increasing. This new measure can be used in future research on animal welfare to identify factors that favor lifetime income and longer herd life.