Feeding behaviour of dairy cows at peak lactation

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Introduction
New technology has been developed that allows the passive monitoring of feeding behaviour of cows fed via a feed alley in a free-stall barn. The objectives of this research were to: 1) objectively define meal criteria (minimum interval between meals) of free-stall housed cows fed via a feed alley, 2) determine which measures of feeding behaviour were most repeatable, and 3) describe changes in these measures over peak lactation.

Materials and Methods
- The GrowSafe™ system recorded cow presence (hits, 6 s resolution) at the feed alley for 21 cows for two 8-d periods: period 1 starting at 57±16 (mean±SD) DIM, and period 2 starting at 94±16 DIM.
- Meal criterion (27.74 min) was calculated using a mixed distribution model to fit the log_{10} frequency distribution of the intervals between hits. This criterion was used to calculate total daily meal time (min d\(^{-1}\)), meal frequency (meal d\(^{-1}\)), and meal duration (min meal\(^{-1}\)). Feeding activity (hits d\(^{-1}\)) and feeding intensity (hits per meal min) were also calculated.
- Linear regression was used to determine within cow repeatability and changes in measures of feeding behaviour from period 1 to period 2.

Implications
These results illustrate that some measures of feeding behavior are highly repeatable within cows, but variable between cows and across periods of lactation. Thus, tests of treatment effects on feeding behavior should be within cow and control for days in milk.

Results
- The log_{10} frequency distribution shows a first distribution corresponding to intervals within meals and the second distribution representing the intervals between meals (Figure 1).
- Within cow repeatability was highest for feeding activity (Figure 2a) and feeding intensity (\(R^2=0.91\)), moderate for total daily meal time (\(R^2=0.50\)), and lowest for meal frequency (\(R^2=0.22\)).
- Cows with high feeding activity and intensity during period 1 showed proportionally greater increases during period 2.

Acknowledgements: Thanks to Agriculture and Agri-Food Canada (Lethbridge, AB), NSERC, DFC, BC Dairy Foundation, and others for their financial support.