

Shortened title: Milk  $\beta$ -hydroxybutyrate relative to the time of milking

**Milk  $\beta$ -hydroxybutyrate concentration measured by Fourier-transform infrared and flow-injection analyses from samples taken at different times relative to milking**

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## SUPPLEMENTARY FILE

### *Herd information*

All cows were housed in tie-stall barns except cows in one herd which were housed in a free-stall barn and milked in a milking parlour. Herd sizes ranged from 32 to 550 (median = 73) and from 45 to 127 (median = 105) cows as well as 305-d milk production averaged 9 908 and 8 306 kg for Holstein and Ayrshire herds, respectively. To join the study, herds were required to record milk production through Valacta (Dairy Production Centre of Expertise, Québec and Atlantic Provinces, Sainte-Anne-de-Bellevue, Québec, Canada), to milk cows twice daily, to use routine FTIR analysis for BHB concentration in DHI milk samples and to have at least 15% of early lactating cows with elevated milk BHB concentration ( $\geq 0.15$  mmol/L) at their last milking test. Dairy producers that met the above conditions were phone contacted and participation to the study was on a voluntary basis.

### *Statistical analyses*

Fixed effects of the mixed model were milk BHB concentration analysis method (i.e. FTIR or flow-injection), sampling time, breed (i.e. Holstein or Ayrshire), parity (i.e. first, second or third and greater), DIM category as well as milk BHB concentration analysis method  $\times$  sampling time. Herd was considered as a random effect. Seven covariance structures were tested as data were collected according to unequal time intervals (spatial power, spatial Gaussian, spatial exponential, spatial linear, spatial spherical, first-order antedependence and unstructured). Unstructured was chosen as it was the

one with smallest fit statistics. When an interaction was significant or a tendency, the SLICE option in the LSMEANS statement of SAS was used to help interpretation.

Logit transformation after conversion to binomial distribution was performed on these data regarding the Proc GLIMMIX. Fixed effects were the same as previously described above for Proc MIXED. Same covariance structures as cited above were evaluated and spatial exponential was the one with smallest fit statistics and the one with a generalized chi-square to degrees of freedom ratio closest to 1.00. The SLICE option in the LSMEANS statement was used when an interaction was significant.

A Tukey test was performed when results reached significance or a tendency.