An Investigation into the Effect of Sampling Time, Cow Factors and Feeding Management Factors on Diurnal Variation in Milk Urea Nitrogen

Sandra Godden[1], **K Lissemore**[1], **D Kelton**[1]
KL Leslie[1], **JH Lumsden**[2], **J Walton**[3]
[1] *Department of Population Medicine*
[2] *Department of Pathobiology*
[3] *Department of Animal & Poultry Science*
University of Guelph
Guelph, Ontario, Canada
N1G 2W1

Abstract

As part of the process of developing criteria by which to accurately interpret milk urea nitrogen (MUN) measurements and correctly use this information in the nutritional management of dairy herds, it is important to understand how certain factors related to sample collection, sample type and sample handling may effect these measurements. Research by Gustaffson and Palmquist (J. Dairy Sci. 76:475-484) and by Carlsson and Bergstrom (Acta Vet. Scand. 35:67-77) has demonstrated that there may be considerable diurnal variation in MUN levels, with peak MUN levels being reached 3 to 5 hours post-feeding. Although feeding schedules were identified as a major factor influencing diurnal variation, it is possible that other factors may be involved. Herd level and cow level factors such as the rations fed, feeding frequency, feeding management system, stage of lactation, parity and level of production may each play a part in influencing diurnal variation in MUN levels.

Milk samples, as they are currently collected by milk recording agencies, may be either a pooled sample (am and pm samples combined) or a separate am or separate pm sample, depending on the type of service requested by the producer. It needs to be determined if the time of sample collection, as it relates to the diurnal variation of MUN, should be a factor which is taken into consideration when trying to interpret MUN measurements. The first objective of this study was to determine if significant differences exist between MUN levels from am samples, pm samples and pooled samples collected by milk recording agencies. The second objective was to identify if and how certain herd level and cow level factors affect diurnal variation in MUN levels.

Sixteen herds were selected to participate in a pilot study, with herds representing both TMR and conventionally fed (i.e. component fed) herds, and representing both 2X and 3X milking schedules. Milk samples were collected by the Ontario Dairy Herd Improvement Corporation (Ont.DHI), during the regular test day visit, for each herd. In addition to the regular pooled milk sample normally collected, a separate am, pm and mid-day (if 3X milking) milk sample was collected. All samples were submitted to Ont.DHI for analysis of MUN levels, in addition to analysis for regular milk components.

Information will be presented resulting from the following analysis: Data will be analysed to determine if am, pm and mid-day (if 3X milking) samples differ from each other, or from regular pooled samples. If significant differences are found to exist between the MUN levels from the different types of samples, further analysis will be performed to investigate the influence of certain cow factors (e.g. parity, DIM and level of production) and herd level feeding management factors (e.g. feeding schedule, feeding frequency and TMR vs non-TMR herds) on MUN levels.