

# Cow- and herd-level prevalence of hypoglycemia in hyperketonemic postpartum dairy cows

J. Dubuc, DMV, MSc, DVSc; S. Buczinski, Dr Vet, MSc, DACVIM

Faculté de médecine vétérinaire, Université de Montréal, 3200, rue Sicotte, St-Hyacinthe, QC, J2S 2M2 Canada

## Introduction

A recent study suggested that postpartum dairy cows simultaneously affected by hyperketonemia (HYPERK) and hypoglycemia (HYPOG) could benefit from being treated with butaphosphan-cyanocobalamin in addition to the usual propylene glycol treatment (Gordon et al 2017, *J Dairy Sci* 100:3912-3921). However, it remains unclear at this stage if this situation (combination of HYPERK and HYPOG; defined as HYPERK+HYPOG) is frequent or not in dairy cows and dairy herds. The objective of this study was to quantify the prevalence of HYPOG in hyperketonemic cows in a context of systematic surveillance of HYPERK every 2 weeks in dairy herds.

## Materials and Methods

A total of 100 commercial dairy herds were recruited based on convenience to participate in this prospective observational study. Farms were systematically visited by a research technician every two weeks during a year to collect a blood sample from coccygeal vessels from all cows between 1 and 14 days in milk (DIM). At the time of sampling, a Precision Xtra (Abbott, Mississauga, ON) device was used to quantify glycemia and ketonemia (beta-hydroxybutyrate) using respective test strips. Results were noted and compiled in cow- and herd-level databases. Hypoglycemia was defined as glycemia < 2.2 mmol/L and HYPERK was defined as  $\geq 1.2$  mmol/L of ketonemia (according to Gordon et al, 2017). For both level of data analysis, the prevalence of HYPERK, HYPOG, and HYPERK+HYPOG were calculated.

## Results

A total of 5,810 dairy cows from 100 herds were enrolled in the study. At the cow level, the median DIM at time

of blood sampling was 8 (min: 1, max: 14). The median values of glycemia and ketonemia were 3.1 mmol/L (min: 0.5, max: 5.2) and 0.8 mmol/L (min: 0.1, max: 6.5), respectively. The overall cow-level prevalence of HYPERK, HYPOG, and HYPERK+HYPOG were 27, 15, and 13 %, respectively. The proportion of HYPOG within HYPERK cows was 41 %. At the herd level, herd median prevalence was 26 % for HYPERK (min: 5, 1st quartile: 13, 3rd quartile: 31, max: 75), 17 % for HYPOG (min: 0, 1st quartile: 5, 3rd quartile: 21, max: 25), and 13 % for HYPERK+HYPOG (min: 0, 1st quartile: 8, 3rd quartile: 17, max: 20). The herd median prevalence of HYPOG within HYPERK cows was 39 % (min: 0, 1st quartile: 26, 3rd quartile: 48, max: 63)

## Significance

Overall, these results showed that the prevalence of HYPERK+HYPOG is generally high and variable between herds when performing a systematic surveillance of HYPERK every 2 weeks. Treatment of hyperketonemic cows with oral propylene glycol is frequently recommended on farms. Based on a recent study, a benefit to add butaphosphan-cyanocobalamin to the usual glycol treatment in HYPERK+HYPOG cows was reported (Gordon et al 2017). The present study suggests that such situation (HYPERK+HYPOG) is frequent and that herds could potentially benefit from implementation of such treatment in their systematic treatment protocol. Further research is needed to assess, at the herd level, the optimal conditions for which such an approach would be beneficial.