Frequency of Pre-partum Negative Energy Balance and Post-partum Subclinical Ketosis and the Cow- and Herd-levels in North East Dairy Herds

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Introduction

Large increases in demands for energy and nutrients occur as dairy cows transition from the last weeks of pregnancy to the first weeks of lactation. If excessive, negative energy balance (NEB) in the pre-partum period and subclinical ketosis (SCK) in the post-partum period may be associated with poor reproductive and milking performance, as well as increased incidence of metabolic (e.g. DA) and infectious diseases (e.g. mastitis). Published research suggests that SCK is the most costly disorder of dairy cows in Ontario. The objective of this study was to measure the occurrence of NEB and SCK in a large sample of progressive dairy herds to determine if there is opportunity for better management of this critical time in a cow's life.

Materials and Methods

A convenience sample was selected from northeastern USA dairy herds and visited by study personnel. A few herds were submitted by participating veterinarians. In each herd, approximately 20 pre-partum cows 2 to 14 days prior to calving and 20 different post-partum cows 3 to 21 DIM were sampled. All appeared to be of normal health. Pre-partum NEB was assessed by measuring non-esterified fatty acids (NEFA) and post-partum SCK was assessed by measuring beta-hydroxybutyrate (BHB) in serum. The cut-points used to define NEB and SCK in individual cows were NEFA > 0.4 mEq/L and BHB > 14 mg/dl, respectively. A herd was defined to have NEB or SCK if > 15% of the sampled cows were above the cut-point. Using this sampling and interpretive criteria, the within herd prevalence can be estimated to 90% confidence.

Results

A total of 94 herds were sampled with a mean and median size of 821 and 760 cows, respectively. From these herds, 1879 and 1884 cows were sampled post-partum and pre-partum, respectively (mean parity of 2.3). 22.1% (20.5 – 23.7 90% CI) of cows were in pre-partum NEB. 12.3% (11.1 – 13.6 90% CI) of cows had post-partum SCK. 3.0% of cows were above 30mg/dl BHB indicating they had clinical ketosis. 65% of the herds had more than 15% of their sampled cows in NEB, while 14% of the herds had more than 35% of their sampled cows in NEB. 37% of the herds had more than 15% of their sampled cows with SCK, while 16% of the herds had more than 25% of their cows with SCK.–

Significance

This study shows that a large number of herds in NE USA have NEB and SCK challenges. These herds were not selected because they had a suspected problem with NEB or SCK indicating that the problem is likely under diagnosed. It is also worth noting the cows that were detected with clinical ketosis, as they were also not sampled because they had apparent health concerns, indicating that some cows with clinical ketosis are under-diagnosed. If on-going work shows SCK is as costly to NE USA dairies as it is to Ontario dairies there may room for improved transition cow management.