DIFFERENCES IN SERUM LEVELS OF α-TOCOPHEROL AND β-CAROTENE IN SWEDISH DAIRY HERDS WITH LOW AND HIGH CALF MORTALITY

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Previous studies have reported low mortality risks for calves in Sweden compared to other countries. However, recent reports indicate that mortality risks in larger herds are increasing. A recent study of risk factors for calf mortality in large Swedish dairy herds found low serum concentrations of fat-soluble vitamins in calves in high mortality herds. The aim of the present study was to investigate if inadequate serum concentrations of α-tocopherol and β-carotene in cows and/or calves could be a possible risk factor for calf mortality.

Twenty herds were enrolled in the study. The inclusion criteria were; herd size ≥ 120 cows, affiliation to the Swedish official milk recording scheme and a rank among the 15 herds with highest (HM) and lowest (LM) calf mortality in a region located in the south western part of Sweden. The first 10 herds from each group that expressed their interest to participate were selected. The mortality risk during the period 20080801-20090731 was 0% in all LM herds and 6-15% (median 9%) in HM herds.

All herds were visited two to four times during the housing season 2010. From each herd, blood samples were collected from up to 10 cows and 10 calves, 2-7 days post partum. All blood samples were analysed for serum concentrations of α-tocopherol and β-carotene. Farmers filled in a questionnaire about cows’ diet, vitamin supplementation and colostrum management. Concentration of α-tocopherol and β-carotene in serum from cows and calves in LM and HM herds were compared in a univariable analysis using linear regression, controlling for clustering within herd, and with the Wilcoxon rank-sum test.

Serum levels of α-tocopherol in cows’ blood tended to be higher in LM herds (p= 0.095) than in HM herds. Calves in LM herds had significantly higher serum levels of α-tocopherol (p= 0.031). The proportion of calves with adequate levels of α-tocopherol (concentration ≥1 µg/ml serum) was significantly higher in LM herds (p=0.026). In the univariable analysis, no differences were seen between LM and HM herds in concentration of β-carotene in serum from cows and calves.

The results indicate that vitamin status might play an important role for calf health in large Swedish dairy herds and that improved colostral management, and vitamin supplementation can reduce calf mortality. Preliminary multivariable results will be presented.