

# Effect of postpartum milking strategy on plasma calcium concentration and risk of subclinical hypocalcemia in dairy cows

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## Introduction

Subclinical hypocalcemia affects most of multiparous dairy cows within the first 48 h after parturition. Most likely increased Ca requirements for colostrum synthesis at lactation onset drive the decrease in blood Ca concentration observed around parturition. The aim of the present study was to evaluate the effect of different postpartum milking strategies on plasma Ca concentration and risk of subclinical hypocalcemia in multiparous dairy cows.

## Materials and Methods

A total of 83 Jersey and Jersey × Holstein crossbreed cows of 2<sup>nd</sup> to 8<sup>th</sup> parity, were enrolled in the study before 1<sup>st</sup> postpartum milking. Milking strategies implemented during the first 2 days postpartum were: once-a-day milking (1M; cows were milked every 24 h; n = 24), twice-a-day milking (2M; cows were milked every 12 h; n = 21), delayed milking (DM; cows were not milked for the first 2 postpartum milkings and were milked every 12 h afterwards; n = 19), and restricted milking (RM; cows were milked 3 L every 12 h; n = 19). Blood samples for total plasma Ca analysis were collected from the coccygeal vessels into heparinized vacuum tubes starting before 1<sup>st</sup> postpartum milking, every 4 h up to 48 h and at 72 h postpartum. Plasma Ca concentration changes during the study period were evaluated using the MIXED procedure of SAS adjusted by Tukey for multiple group comparisons. Risk of subclinical hypocalcemia (SCH; plasma Ca ≤ 2.12 mmol/L) at 48 and 72 h postpartum was evaluated using the GENMOD procedure of SAS.

## Results

Prevalence of SCH before 1<sup>st</sup> postpartum milking was 48%. There were effects of treatment ( $P = 0.03$ ), parity ( $P = 0.01$ ; 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> or ≥5<sup>th</sup>), time ( $P < 0.001$ ), initial calcemic status ( $P < 0.001$ ; normocalcemic or subclinically hypocalcemic) and time by parity ( $P = 0.05$ ) and initial calcemic status ( $P < 0.001$ ) on plasma Ca concentration. Overall, plasma Ca concentration was lower for 2M cows (2.04 mmol/l) compared to DM (2.17 mmol/L;  $P = 0.05$ ) and RM cows (2.17 mmol/L;  $P = 0.05$ ), but no differences were observed with 1M (2.11 mmol/l). At 48 h postpartum the risk of SCH was lower for 1M (Risk ratio; RR = 0.27;  $P < 0.001$ ), DM (RR = 0.55;  $P = 0.02$ ) and RM cows (RR = 0.41;  $P < 0.001$ ) than for 2M cows. At 72 h postpartum the risk of SCH was lower for 1M (RR = 0.26;  $P < 0.001$ ) and DM cows (RR = 0.41;  $P < 0.001$ ) than for 2M cows.

## Significance

Our results suggest that postpartum plasma Ca concentration and risk of SCH may be influenced by postpartum milking strategies, warranting its study as a prophylactic strategy for hypocalcemia.