Tuesday, February 27, 2024

Abstract Submission Form

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Preferred presentation Poster

Preferred session Session 2: SC Milk Analysis – New tools to extend the horizon of milk mid-infrared spectrometry

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Title of your paper Effects of Feeding Time on Fatty Acid Composition in Milk of Primiparous Dairy Cows During Early Postpartum Stage

Insert ABSTRACT text

Dairy cows typically experience negative energy balance after calving, meaning that their energy expenditure exceeds intake. In the first 1 to 4 weeks postpartum, cows often reduce their feeding and rumination time due to this energy deficit. The duration of feeding and rumination can affect the cow's nutrient intake and digestion, which in turn influences the composition of fatty acids (FA) in raw milk. We examined the relationship between the average daily feeding and rumination times and the FA content in the milk of 48 primiparous dairy cows during the first 1 to 4 weeks postpartum. The results showed that the average daily feeding time on the day before milking (1, 3, 7, and 14 days) positively correlated with myristic acid (C14:0), saturated FA (SFA), short-chain FA (SCFA), de novo FA, and mixed FA, and negatively correlated with stearic acid (C18:0), oleic acid (C18:1), unsaturated FA (UFA), monounsaturated FA (MUFA),

long-chain FA (LCFA), and preformed FA. There was no correlation between average daily rumination time and milk FA before milking (1, 3, 7, and 14 days). We further analyzed the FA content in the milk samples of high and low feeding time groups, divided based on a 2.5 hours per day of average of feeding time over the 7 days before the milk testing day. We found the number of weeks postpartum significantly affected the FA content in the milk, except for polyunsaturated fatty acids (PUFA) and SCFA. Feeding time also significantly affected the milk FA contents, except for palmitic acid (C16:0), PUFA, medium-chain fatty acids (MCFA), and mixed FAs. No interaction effect of postpartum weeks and feeding time was found on the FA content in raw milk. Overall, PUFA increased significantly from week 2 to week 4 in both high-feeding and low-feeding time groups. Preformed FA showed an increasing and then stabilizing trend in the high feeding time group, while it showed an increased and then decreased trend in the low feeding time group. SFA content consistently decreased from the 2nd week postpartum in the high feeding group, with no significant decrease in the low feeding group. This may be due to a more efficient utilization of feed energy by cows with higher intake, reducing the need to mobilize SFA from body fat storage. The de novo FA continuously decreased from the 2nd to the 4th week in the high feeding group, while in the low feeding group, it increased from the 2nd to the 3rd week and then decreased again in 4th week postpartum. This indicate that the feeding time and the number of weeks postpartum are important factors affecting the composition of FAs in milk, potentially related to the cow's postpartum metabolic state. This study highlights the importance of higher energy intake during the transition period for improving metabolic energy status and FA distribution in dairy cows.

Enter keywords milk, fatty acid, early postpartum stage