

Abstract Submission Form

Title (Mr./Mrs/Dr./Prof.)

Dr.

Presenting author

Yi-Hsuan Chen

Institute

Institute/company: Northern Region Branch, Taiwan Livestock Research Institute, Ministry of Agriculture

Address: No.207-5, Pitoumian, Xihu Township

ZIP/Postal code: 368003

City: Miaoli

Country: Taiwan

Insert all authors and institutions

Y. H. Chen(1), P. A. Tu(1), M. K. Yang(1), Y. H. Yeh(1), J. W. Shiau(1) & J. F. Huang(2)

(1)Northern Region Branch, Taiwan Livestock Research Institute, Ministry of Agriculture, No.207-5, Pitoumian, Xihu Township, Miaoli 368003, Taiwan

(2)Taiwan Livestock Research Institute, No.112, Farm Road, Hsinhua, Tainan 71246, Taiwan

Preferred presentation

Poster

Preferred session

Session 5: SC Milk Analysis – How to relate on farm sustainability and milk analysis?

Email of corresponding author

jfhuang@mail.tlri.gov.tw

Title of your paper

Comparative Dynamics of Milk Fatty Acids for Primiparous and Multiparous Holstein Cows in Early Lactation

Insert ABSTRACT text

The milk fatty acid (FA) profile is a valuable indicator of a cow's nutritional and metabolic status, potentially aiding in assessing metabolic status at the individual cow level. However, limited knowledge exists regarding milk fat composition changes with parity. Understanding these changes during early lactation could enhance our understanding of dairy cow physiology. This study aimed to investigate whether milk FA composition differed between Holstein cows of different parities in early lactation. We characterized the milk FA profiles from day 7 to day 60 postpartum in primiparous (PP) and multiparous (MP) cows. A total of 26 Holstein Friesian dairy cows, including 12 PP and 14 MP, were included in the study and divided into two groups based on parity. Milk samples were collected on days 7, 14, 21, 30, and 60 post-calving and analysed for milk FA profiles, including saturated FA (SFA), unsaturated FA (UFA), mono-unsaturated FA (MUFA), poly-unsaturated FA (PUFA), short-chain FA (SCFA), medium-chain FA (MCFA), long-chain FA (LCFA), total de novo FA, mixed FA, and preformed FA, using MilkoScan FT+ 300 equipped with Fourier-transform infrared spectra. Blood samples were collected on days 7, 14, and 21 postpartum for the analysis of non-esterified fatty acids, β -hydroxybutyrate (BHBA), glucose, and

triglycerides, as well as for evaluating body condition scores (BCS). Partial Least Squares Discriminant Analysis (PLS-DA) was used to analyse the changes in milk composition over time in PP and MP. The results of PLS-DA showed changes in milk FA over lactation in both groups. PP had higher levels of UFA, MUFA, preformed FA, and LCFA compared to MP ($P < 0.05$). MP had higher levels of SFA, de novo FA, and SCFA compared to PP ($P < 0.05$). PP with BHBA > 1.2 mmol/L reached the threshold for subclinical ketosis, indicating a more severe negative energy balance after calving compared to MP. However, the average postpartum BCS and preformed FA were higher and BCS loss and de novo FA were lower in PP than in MP. In the early lactation stage of dairy cows, the cow mobilizes stored body fat to meet high energy demands, leading to an increase in metabolic products such as ketone in the blood. PP cows may release higher levels of preformed FA during early lactation because their higher BCS. PP cows might also be more inclined to allocate energy to continued growth and milk production in the early stages of lactation. This could lead to a higher release of preformed fatty acids from stored body fat to meet the demands of milk production. These findings could inform nutritional management strategies to better meet the requirements of cows in early lactation.

Enter keywords

body condition score, energy balance, parity