

Effects of seasonal change and cow's parity on milk yield, milk component and milk fatty acid composition of Holstein milking cows in Taiwan ⁽¹⁾

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Received: Jun. 9, 2021; Accepted: Sep. 24, 2021

Abstract

The purpose of this study is to investigate the effect of seasonal change and cow's parity on milk yield and milk composition as detected by routine Fourier-transform infrared analysis including fat, true protein, and fatty acid of milk in Dairy Herd Improvement (DHI) milk samples. Data collected between January and December 2020 included cow information such as the average daily milk yield, test-day, and cow's parity from 156 Holstein herds in Taiwan. The result showed the following: that the spring milk samples had the highest daily milk yield (DMY) (26.44 kg/d) and was significantly higher than other seasons ($P < 0.05$); the winter milk samples had the highest milk fat (MF) (4.07%) and was significantly higher than other seasons ($P < 0.05$); the spring and winter milk samples had the highest milk protein (MP) (3.24%) and was significantly higher than that in summer and autumn ($P < 0.05$). The autumn milk samples had the highest de novo, mixed, and preformed fatty acids, and were significantly higher than other seasons ($P < 0.05$). On the other hand, the 3rd and 4th parity cows had the highest DMY (26.82 kg/d and 26.85 kg/d) and were significantly higher than the others ($P < 0.05$). The 1st, 2nd, and 3rd parity cows had the highest MF, and were significantly higher than the others ($P < 0.05$). The 2nd parity cows had the highest MP (3.23%). The 1st parity cows had the lowest de novo FA (23.03 g/100g of total FA) and mixed FA (32.09 g/100g of total FA), and were significantly lower than others ($P < 0.05$); the 1st parity had the highest preformed FA (39.31 g/100g of total FA), and significantly higher than other parities ($P < 0.05$). In summary, spring milk had significantly highest DMY, winter milk had significantly highest MF, and spring and winter milk had significantly highest MP. Autumn milk had the highest de novo and preformed FA content of total fat, and summer and autumn milk had the highest mixed FA content of total fat. The 2nd parity cows showed better MF and MP than others. The 1st parity cows had the lowest de novo and mixed FA content of total fat, while the 4th and over 5th parity had the lowest preformed FA content of total fat. The study explores the effects of seasonal change and cow's parity on milk yield, milk component of lactating cows to provide a more comprehensive data of dairy cow health evaluation.

Key words: Holstein milking cows, Season, Parity, Milk fatty acid.

(1) Contribution No. 2680 from Livestock Research Institute, Council of Agriculture, Executive Yuan.

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