

Effect of providing outdoor exercise ground at night on the health and milking performance of Holstein cows raised in tunnel-ventilated barn in hot summer ⁽¹⁾

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Abstract

The purpose of this study aimed to find the strategy for relieving heat stress from Holstein lactating cows. Cows raised in a tunnel-ventilated barn were offered the exercise ground at night to evaluate its health improvement potential and milking performance. Experiment was carried out for 90 days from June to August in 2021. A total of 24 heads of mid-lactating cows with average milk yield of 26.5 kg a day were divided into two groups. Cows in control group were raised in a tunnel-ventilated barn with fan, mist, and sprinkler all day, and cows in treatment group were provided exercise ground at night (between pm-milking and am-milking the next day). Environment condition, temperature and relative humidity for temperature-humidity index (THI) calculation, and milk production were recorded daily. The locomotion score (1 to 5 points, from healthy to severe lameness), milk compositions, and blood biochemical profiles were measured every 30 days. Results showed diurnal averaged THI for ambient air, barn inside, and exercise ground during night time were 78.9 ± 3.3 , 75.9 ± 1.7 , and 74.5 ± 1.5 , respectively. Milk yield, milk compositions, and blood profiles were similar between two rearing system. However, providing exercise ground 90 days for cows implied the trend in keeping foot health, with locomotion scores decreased from 2.34 to 2.04 ($P = 0.16$). In addition, cows raised with night exercise ground effectively cut down the mastitis occurrence by 60%, from 5/12 to 2/12. The results suggested that providing exercise ground at night in hot summer days for Holstein lactating cows is beneficial for the foot and mammary gland health and animal welfare, the saving of waste milk loss is also worthy of important value. Extra exercise ground is an effective strategy in relieving the adverse effect caused by heat stress for lactating cows.

Key words: Heat stress, Outdoor exercise ground, Holstein cows, Temperature-humidity index, Tunnel-ventilated barn.

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