Effect of environmental heat stress on pregnancy rate of imported dairy cattle

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The decline of reproductive efficiency under heat stress is a drawback in dairy industry. The objective of this study is to evaluate whether there is a relationship between the reproductive performance of cows and the Temperature Humidity Index (THI), and to improve the reproductive indices in the imported cows by using a synchronization protocol followed by Artificial Insemination (AI). Eight medium scale farms in Matale, Kandy and Kurunegala districts of Sri Lanka were selected. A group of first parity, healthy cows (n=205) were synchronized using Ov-synch synchronization protocol using intramuscular hormonal injections (Day 0: 2ml GnRH, Day 07: 2ml Cloprostinol sodium, Day 09: 2ml GnRH). Sixteen to eighteen hours after the third injection, AI was performed. After 35-45 days, pregnancy diagnosis was performed using per-rectal ultrasonic scanning method. On each farm visit, the THIs at the farms were calculated. Pregnancy rate was below 6% in 3 farms in which most of the days THI was beyond 78 causing moderate heat stress and the body temperature of the cows in those farms were between 102.9 - 104.5°F. Average THI of the farms with a pregnancy rate beyond 20%, was below78 and none of them were exceeding the cut off THI for moderate heat stress zone and the body temperature of the cows was below 102.5°F. There is a negative effect of high THI and high body temperature on pregnancy rate among the imported temperate dairy herds to tropical environments. Although metabolic heat generation is sufficient to maintain the body temperature, further absorption can continue due to the high environmental temperature leading to heat stress. Thus it is essential to implement appropriate measures to reduce heat stress in order to enhance their reproductive performances.

Keywords: dairy cattle, reproduction, heat stress, temperature humidity index