

Effect of Climatic Parameters and Temperature - Humidity Index on Milk Production of Imported Dairy Cattle in Ridiyagama NLDB Farm, Sri Lanka

Sankalpa D.V., Silva G.L.L.P.* , Samaraweera A.M.¹ and Vidanapathirana T.²

Department of Animal Science,
Faculty of Agriculture, University of Peradeniya, Peradeniya, Sri Lanka

The objective of this study was to assess the effectiveness of in-house temperature regulation via humidifiers and fans on the daily milk production in temperate dairy cattle breeds managed in Ridiyagama National Livestock Development Board (NLDB) farm. Daily milk yield records of 3154 Jersey and Jersey x Friesian crossbreds in their first lactation were collected. Daily in-house milking parlor minimum and maximum temperature and relative humidity were collected for the same period from 2016 to 2017 to derive the Temperature Humidity Index (THI). The data cleaning and analysis were performed using the R programming language. The mean THI was 80.21 and 78.22 during 2016 and 2017, respectively, and daily THI ranged from 71.81 to 85.88. A linear mixed effects model was fitted with THI, breed, days in milk, season, and milking duration as fixed effects, and animal as the random effect. All fixed effects including the THI were significant ($P < 0.05$). The Jersey-Friesian crossbreds produced 1.2 L more than the Jersey cows. The daily milk yield was decreased by 0.03 L with one unit increase in THI. Even though the daily THI were within the accepted range for temperate dairy cattle breeds according to the literature, the association between THI and daily milk yield suggests that cows were prone to heat stress. In conclusion, the THI within the milking parlour is a significant determinant of cows' daily milk production, and Jersey-Friesian crossbreds outperformed Jersey cows under heat stress. Improving the THI prior to milking might reduce the heat burden and loss of milk yield thereof.

Keywords: Heat stress, Daily milk yield, Temperature humidity index, Temperate dairy cattle, Dry zone

¹Angus Australia, 86 Glen Innes Road Armidale NSW, Australia

²National Livestock Development Board Farm, Ridiyagama, Sri Lanka

*pradeepas@agri.pdn.ac.lk