

SEASONAL EFFECT ON BLOOD METABOLIC INDICATORS IN HOLSTEIN FRIESIAN COWS

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One of the significant challenges in the dairy sector is the decline in milk production during hot seasons compared to cold seasons. Given that milk production is closely associated to the well-being of cows, the primary objective of this study is to determine effects seasons on metabolic indicators in dairy cows, specifically blood parameters considered as homeostasis indicators. The study involved 789 observations obtained from 400 healthy cows in mid-lactation with similar body weights. Blood samples were obtained between 2019 and 2021, covering winter, spring, summer and autumn. Using a linear mixed model for analysis, results indicate a significant ($p < 0.05$) seasonal effect on insulin and prolactin. Insulin levels exhibited significant differences among seasons. In spring, levels were (9.52 mIU/L), significantly higher than in winter (6.08 mIU/L) and autumn (6.17 mIU/L). Similarly, during summer, insulin levels reached (8.75 mIU/L), also significantly higher than those in winter and autumn. However, no significant difference was observed between spring and summer and between winter and autumn. Prolactin levels were significantly different among all seasons, with the highest levels in summer (10.95 ng/ml), followed by spring (8.82 ng/ml), winter (6.51 ng/ml), and the lowest levels observed in autumn (3.78 ng/ml). In contrast, no significant difference was found between seasons for the level of NEFA. In conclusion, hot seasons have a negative impact on prolactin and insulin levels, as these metabolic indicators follow the increase in the temperature humidity index (THI) during seasons. This confirms that heat stress adversely affects the homeostasis of cows. The research was funded by the National Research, Development and Innovation Office (VKE-1.3.1-2018-00033, “A novel research of using lecithin and substituting palm fat with domestic raw material in the diet of high yielding dairy cattle, with special regard to improve the reproduction parameters and the possibilities of producing functional milk”).