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A survey on the effect of plasma vitamin C on white blood constituents under heat stress condition for dairy cows

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1 ABSTRACT

The objective of this study was to investigate the effect of seasonal change in thermal environment on plasma vitamin C (VC) concentration, white blood constituents and their relationship in heat stress conditions, in dairy cows under Mediterranean climate conditions of north-west of Tunisia. Two experiments were carried in two different periods: spring P_1 (from 1st February to 15th March) and summer P_2 (from 1st to 30 August), using 48 Holstein cows. Cows were classified according to level milk production either high or low productive cows (HPC, LPC). Mean Temperature Humidity Index THI values were 65.62 ±1.32 and 83.27 ±1.90 in P_1 and P_2, respectively. Leucocytes cell counts and VC concentrations were affected by test period (P<0.001). However, Decrease in plasma VC concentration in P_2 was positively correlated to lymphocytes and neutrophils (P<0.01) and negatively correlated to eosinophils (P<0.05) and monocytes (P<0.01) in HPC and LPC .The coefficient of determination R^2 value suggested that a large part of the variation leucocytes percentages could therefore be attributed to decrease in plasma VC in heat stress. However, the decrease of VC concentration during summer compared to spring could be considered as an evidence of the suppression of cows' immune system under heat stress.