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Effect of Vitamin E Alpha-Tocopherol Supplementation on Haemato-Biochemical Profiles of Race Stallions Horses in Khartoum State

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Abstract

This study was conducted with the objective of determining the effect of vitamin E alphatocopherol supplementation on haemato-biochemical parameters of stallion race horses in Khartoum State, Sudan. The study was carried out using 21 thoroughbred animals with an average body weight of 300 ± 60 kg and age range of 7 – 8 years. The horses were dosed with three different levels of vitamin E (0, 2000, 3000 IU kg⁻¹ feed dry matter) with 7 animals assigned per treatment. The experiment comprised two periods, namely winter (November to December 2016) and summer (March to April 2017). Blood samples were collected from the jugular vein at the end of each period. Whole blood and serum samples were used to determine haemato-biochemical parameters, and statistical analysis was performed using SPSS v20.

The results indicated that serum vitamin E level and clotting time increased significantly in both seasons. Packed-cell volume (PCV), Hb (hemoglobin), TRBCS (Total Red Blood Cells), mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH) and mean corpuscular haemoglobin concentration (MCHC) increased significantly with increasing level of vitamin E in both winter and summer season, whereas white blood cells (WBC) decreased in summer season, and neutrophil- and basophil-ratios decreased in winter season. With increasing vitamin E dosage, serum concentrations of triglycerides, cholesterol, albumin, globulins and uric acid decreased significantly, while concentrations of glucose and high-density lipoprotein increased in both seasons. Significant decreases in both seasons were also recorded for the concentration of liver enzymes (aspartate aminotransferase - AST; alanine aminotransferase - ALT; alkaline phosphatase - ALP) and kidney function indicators (creatinine and urea concentrations).

Since vitamin E supplementation had a positive influence on some haematological and serum biochemical parameters in stallion race horses, it is recommended to use vitamin E to enhance the animals' capacity for race performance.

Keywords: Haemato-biochemical parameters, Race horses, vitamin E alfatocopherol