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Hematological and hormonal profiles of indigenous sheep populations in contrasting agroecological zones of the Sidama region, Ethiopia

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Abstract

Hematological and hormonal parameters are widely used indicators of health and physiological adaptation in livestock and are essential for optimised flock management and productivity. This study was conducted to evaluate hematological characteristics and thyroid hormone profiles in indigenous sheep raised across contrasting agroecological zones in the Sidama region. A total of 180 apparently healthy sheep of both sexes were sampled from three districts, including 87 animals during the wet season and 93 in the dry season. Blood samples were collected aseptically using disposable syringes. Two milliliters of blood were drawn into EDTA-coated vacutainer tubes for hematological analysis, and the remaining three milliliters were drained into a clot activator tube for thyroid hormone analysis. The effects of agroecological zone, sex, season, and their interactions on hematological and thyroid hormone parameters were analysed using the General Linear Model procedure in SAS. Agroecological zone had a significant effect ($p < 0.05$) on total white blood cell count, with higher values observed in sheep reared in highland areas, followed by lowland agroecological zones. Sex had a significant ($p < 0.05$) effect on the proportions of lymphocytes, eosinophils, and basophils, whereas neutrophils and monocytes were not affected. Seasonal variation significantly influenced hematocrit, mean corpuscular hemoglobin concentration, and platelet counts, indicating a physiological response to environmental and nutritional changes. The interaction between agroecological zone and sex affected only red cell distribution width, while the interaction between sex and season showed no significant effect on any of the studied hematological parameters. Thyroid hormone levels were not affected by agroecological zone or sex but showed significant seasonal variation. The results of this study provide useful baseline information for improving the interpretation of laboratory data and support accurate clinical diagnosis and treatment in indigenous sheep. Further study is recommended to establish standardised hematological reference values for healthy indigenous sheep using the reference value estimation method.

Keywords: Agroecological zone, hematology, hormones, indigenous sheep, season, sex

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