

The Effect of Environmental Variation on Feed Consumption and Some Physiological Parameters of Arabi Sheep and Local goats: Blood pictures and concentration of some hormones

Ola M. Karam & Waleed Y. Kassim

University of Basrah / College of Agriculture / Department of Animal Production
waleed.yosief@uobasrah.edu.iq

Abstract: This study was conducted in the animal field of the College of Agriculture - University of Basra between 1/10 to 12/29/2021, to investigate the influence of environmental variance on some blood pictures and the concentrations of some hormones in Arabi sheep and local goats, Six male of Arabi lambs breed and 6 male of the local black Iraqi goat breed at the age of (7-8) months and with an average weight of (20.85, 20.30) kg were divided into two groups (each type in one group). The daily temperatures and humidity were recorded throughout the study period (to extract the average temperature and humidity during the months of the experiment). The results indicated that there was no significant effect of animal type on blood pictures (white blood cells, red blood cells, hemoglobin concentration, packed cell volume), while the concentrations of vitamin C, thyroxine and cortisol increased in sheep compared with goats. Values of red blood cell count, hemoglobin concentration, packed cell volume, vitamin C and cortisol significantly ($P < 0.05$) decreased as temperature decreased. However, the concentration of thyroxine increased during low temperatures.

Key words: Environmental variation, Sheep, Goats, Temperature, Humidity, Blood pictures, Hormone

Introduction

Maintaining livestock production at the height of climate change has become a difficult mission (Sejian et al., 2018). It has direct negative effects on animal production, due to limited availability of pasture, drought and increased spread of disease (Thornton et al., 2009). In the environments observed in arid and semi-arid areas around the world, climate change has led to an increase in the dry season as in them, and the irregularity of environmental conditions has led to a reduction in the production of agricultural animals in those areas (Miller and Lu, 2019).

Body temperature is one of the physiological trials that ruminants and most living organisms with relative thermal stability try to maintain properly because of its importance in the continuation of these organisms in performing their biological functions (Hansen, 2009). Manish et al., (2010) and Phulia et al., (2010) found that the change in environmental temperature and humidity in arid and semi-arid areas leads to physiological changes in the animal's body, a decrease in feed consumption and an increase in respiratory rate and heart rate.

The blood pictures have a close relationship in the health status and productivity of agricultural animals, and the environmental variance surrounding the animal has a clear effect on blood volume, expansion and distribution of blood in peripheral vessels (Silanikove 2000; AL-Jassim et al., 2006). The level of thyroxine hormone is affected by the seasons of the year, as there is a negative relationship between the temperature and the concentration of the hormone in the serum (Starling et al., 2005). Many factors directly influence thyroid hormone levels, including changes in temperature, season, and physiological status (Georgiev and Nikolov 2004). There are many hormones that are secreted during the animal's exposure to changes in environmental conditions, one of those hormones is cortisol, which affect on the production and growth of the animal (Archer, 2005). However, all endocrine glands are sensitive to variations in temperature, and their secretions change according to the change in nutritional level and environmental conditions, these glands include the thyroid and adrenal glands (Huszenicza et al., 2002).