

Contents lists available at Sjournals

Scientific Journal of
eterinary advancesJournal homepage: www.Sjournals.com**Short communication****Effect of diurnal variation and ascorbic acid administration on rectal temperature, pulse and respiratory rates in sheep during wet season in Sokoto****B. Saidu^{a,*}, A.1. Ja'afaru^a, H.M. Ibrahim^a, U.M. Nuruddeen^a, O.M. Mamman^a, A.A. Abubakar^b, N.N. Pilau^c, A. Bello^d, N. Suleiman^a, B. Garba^e**^aDepartment of Physiology and Biochemistry, Faculty of Veterinary Medicine Usmanu Danfodiyo University, Sokoto.^bDepartment of Surgery and Radiology, Faculty of Veterinary Medicine, UDU, Sokoto.^cDepartment of Medicine, Faculty of Veterinary Medicine, UDU, Sokoto.^dDepartment of Anatomy, Faculty of Veterinary Medicine UDU, Sokoto.^eDepartment of Public Health and Preventive Medicine, Faculty of Veterinary Medicine UDU, Sokoto.

*Corresponding author; Department of Physiology and Biochemistry, Faculty of Veterinary Medicine Usmanu Danfodiyo University, Sokoto.

ARTICLE INFO

ABSTRACT

Article history:

Received 30 September 2012

Accepted 25 October 2012

Available online 31 October 2012

Keywords:

Diurnal

Variation

Temperature

Pulse rate

Respiratory rate

The research was conducted to study diurnal variation and effect of ascorbic acid supplementation on rectal temperature, pulse and respiratory rates of sheep during wet season in Sokoto. The study was conducted on ten (10) apparently healthy Oudah breed of sheep with mean age and weight of 15.9 ± 11.0 months and 24.7 ± 11.67 kg respectively. The animals were grouped into two groups of five animals each. 100mg/kg Ascorbic acid was administered daily for eight days to the experimental group while the control group was not given anything. Rectal temperature, pulse and respiratory rates were taken at 6am, 10am, 2pm and 6pm. Finding indicate that rectal temperature at 6am are significantly ($P < 0.05$) lower than those at 2pm and 6pm with no significant difference ($p > 0.03$) between 2pm and 6pm temperature. At 10am the temperature was significantly lower ($P < 0.05$) than those of 2pm and 6pm in the control group but not in the experimental group. The pulse rate at 2pm was significantly higher ($P < 0.05$) than those of 6am, 10am and 6pm in the experimental group. The respiratory rates at 6am were significantly lower ($P < 0.05$) than those of 2pm and also 6pm in the experimental

group. Ascorbic acid administration did not significantly cause any decrease in the rectal temperature, pulse and respiratory rates of the experimental group compared to the control group with the experimental group slightly higher than the control group.

© 2012 Sjournals. All rights reserved.

1. Introduction

Diurnal variation in body temperature of sheep is normal which is lowest at the early morning and highest at late afternoon (Boden et al., 2005). Rectal temperature is found to be of value in the assessment of meteorological stress in farm animals (Bianca, 1976). This is because it is the true reflection of the internal body temperature of an animal and thus a reliable index of thermal balance (Bianca, 1976). Rectal temperature, heart rate and respiratory rate have been shown to be of value in determination of the health status and adaptability of domestic animals in stress situation (Ayo et al., 1998).

Ascorbic acid (Vitamin C) is a known antioxidant and has been widely used to manage stress conditions in animals. Endogenously ascorbic acid is assumed to be sufficient to meet the demands of ruminants (Sen., 2001). However, researchers have shown that under specific environment and Physiological conditions the amount of ascorbic acid produced by the animal may be insufficient to meet its requirement (Pardue et al., 1985). Under heat stress, free radicals are generated in the body in such a large quantity that the natural antioxidant defence systems of the body are overwhelmed. This results in lipid peroxidation of cytomembranes and consequently, cell damage and destruction (Cunningham et al., 2007). Antioxidant supplementation may provide beneficial effect against stress induced tissue damage (Sen., 2001).

2. Materials and methods

Ten (10) Oudah sheep comprising of 2rams and 8ewes with mean age and weight of 15.9 ± 11.05 and 24.7 ± 11.67 kg obtained from Usmanu danfodiyo University teaching and research farm were used. The animals were conditioned for two (2) weeks and vital parameter taken thrice daily prior to the commencement of research.

The animals were randomly divided into 2 groups A and B comprising of a male and four females in each group and housed in two pens measuring 10.5x10.5 feet. The animals were fed *ad libitum* on wheat Bram, bean husk and fresh forage, the experimental group was given Ascorbic acid 100mg/kg per os and respiratory rates were taken at 6am, 10am, 2pm and 6pm using the method described by FAO (2009). Pulse rates were taken also at 6am, 10am, 2pm and 6am by palpating with fingers lightly resting on the femoral artery as described by FAO (2009). Respiratory rates were also taken at 6am, 10am, 2pm and 6pm by observing the rise and fall of the flank as described by (FAO, 2009). Temperature was also taken using clinical thermometer inserted into the rectum as described by FAO (2009). Parameters were taken for 2 weeks.

2.1. Statistical analysis

Data was presented in Table 1 as mean \pm standard deviation. The pair wise comparison of the mean was done using Tukey-Kramer pair wise comparison test using Kyplot statistical package.

Means with ($P < 0.05$) are considered significant.

3. Results and discussion

The result obtained in this study showed that there is a variation in rectal temperature of sheep which changes with the hours of the day with minimum record obtained at 6.00am and maximum at 14.00hours of the day which slightly reduced at 6pm (Table 1). This variation corresponds with the finding of Selesyanky, 1975 who found out that rectal temperature varies with ambient temperature. The variation in body temperature is due to increase in vapour pressure which resulted in increased respiratory rate and increased humidity thereby reducing the effectiveness of sweating to cool the body by reducing evaporation or perspiration from the skin which in turn results in increased body temperature. This increase in body temperature results in increase activity of the heart to

pump more blood to the peripheral circulation to regulate the temperature thereby resulting in increased pulse rate observed at 2.00pm when there is intense heat from solar radiation.

Table 1

Study diurnal variation and effect of ascorbic acid supplementation on rectal temperature, pulse and respiratory rates of sheep.

Group	Time of the day	Parameters			N
		Temperature (°C)	Pulse (Beat/min)	Respiratory rate (Cycles/min)	
Control	6.00am	38.57 ^a ±0.37	74.4 ^a ±3.88	25.8 ^a ±1.99	40
	10.00am	38.56 ^a ±0.26	76.5 ^a ±3.78	25.08 ^a ±2.35	10
	2.00pm	39.08 ^a ±0.26	76.5 ^a ±3.25	26.55 ^a ±2.03	40
	6.00pm	38.92 ^a ±0.36	75.5 ^a ±2.63	25.73 ^a ±2.45	40
Experimental	6.00am	38.61 ^a ±0.31	74.55 ^a ±3.11	24.38 ^a ±2.60	40
	10.00am	38.74 ^a ±0.25	74.8 ^a ±3.29	26.4 ^a ±4.27	10
	2.00pm	39.13 ^a ±0.36	77.15 ^a ±3.03	26.8 ^a ±2.02	40
	6.00pm	38.99 ^a ±0.06	75.35 ^a ±2.98	26.2 ^a ±2.30	4

Data is given as mean± standard deviation.

^{abc}Means with different superscript differ significantly (P<0.05).

4. Conclusion

In conclusion, this research indicated that Ascorbic acid supplementation appeared to have negative effect during wet season in sheep in this part of the world. The values recorded from the experimental group indicate significant changes in increase in rectal temperature, pulse rate and respiratory rate with minimum values recorded at 6am and highest values at 6.00pm. This increase may be due to the drug preparation, the drug used is a human preparation which could have affected the ability of the normal rumen microbial flora to produce the desired quantity of Ascorbic acid to meet the demand of the animal.

References

- Ayo, J.O., Oladele, S.B., Ngams, Fayomi, A., Afilayan, S.B., 1998. Diurnal fluctuation in rectal temperature of the red Sokoto Goats during the harmattan season. Res. Vet. Sci. 66, 7-8.
- Bianca, W.K., 1976. The significance of meteorology in animal productions. Inter. J. biometeorol. 20, 139-156.
- Boden, E., 2005. Blacks veterinary dictionary 21st edition A &C Black publishers Limited, 38 Soho square, London W1D 3H
- Cunningham, J.G., Klein, B.G., 2007. Text book of veterinary physiology 4th edition p, 642.
- FAO, 2009. A manual for primary animal health care workers.
- Pardue, S.L., Thaxton, J.P., Brace, J.J., 1985. Role of ascorbic acid in chicks exposed to high environmental temperature. Appl. Physiol. 58, 1511-1516.
- Selyansky, V.M., 1975. Microclimates in poultry houses. Kolos publishing house, Moscow, p.77-90.
- Sen, C.K., 2001. Antioxidant in exercise, nutrition, sport and medicine, 31,891-908.