

Study on Physiological Parameters of Sub-Clinical Ketosis Goat

¹Sampurna Nand Yadav, ¹Debendra Nath Kalita, ¹Arabinda Phukan,
¹Tolan Chandra Dutta, ²Gauranga Mahato, ³Shantanu Tamuly, ¹Ditul Barman and ⁴Abdus Saleque
¹Department of Veterinary Clinical Medicine, Ethics and Jurisprudence,
²Department of Veterinary Epidemiology and Preventive Medicine,
³Department of Veterinary Biochemistry, College of Veterinary Science,
Assam Agricultural University, Guwahati, Assam, India
⁴Goat Research Station, Assam Agricultural University, Bymihat Assam, India

Abstract: The aim of this research was to evaluate the effect of sub-clinical ketosis on certain physiological parameters (temperature, respiration rate and pulse rate) of goats. A total of 210 pregnant and lactating goats were screened for sub-clinical ketosis. Goats having blood ketone (β -hydroxybutyrate) $>0.4 \text{ mmol L}^{-1}$ and glucose $<30 \text{ mg dL}^{-1}$ were considered positive for sub-clinical ketosis. Out of 210 goats 30 animals were diagnosed as sub-clinical ketotic. Affected goats were divided in to four groups for physiological studies with six animals in each group and another six animals were kept as healthy control for comparative studies. Goat suffered from sub-clinical ketosis had non significant change (with in normal limit) physiological parameters from healthy animal. The above result manifested that there is no remarkable alteration in physiological parameters in sub-clinical ketosis testifying the fact that physiological parameters changes only in clinical form of the disease.

Key words: Goat, pregnancy, lactation, sub-clinical ketosis, physiological, parameter

INTRODUCTION

Goats are at risk of developing metabolic condition termed as “ketosis” which occurs in two stages. Pregnancy toxemia which occur due to the disruption in glucose homeostasis during pregnancy and the other during early lactation (lactational ketosis). Pregnancy toxemia is more common than lactational ketosis and occurs predominantly in improved breed (Smith and Sherman, 2010). Pregnancy toxemia in goat is observed in later part of pregnancy and is much more common in dam carrying multiple fetuses (Khan and Line, 2010). Advancement in the knowledge of physiology and biochemistry has drawn attention of clinicians towards the clinico-biochemical aspects of production diseases in cattle and sheep but the same have not been extensively studied in goat (Dore *et al.*, 2013) evaluated accuracy of an electronic farm test of beta hydroxybutyrate concentration in dairy goat and reported excellent accuracy for measuring Blood β -Hydroxy Butyrate (BHBA) concentration in dairy goats as compared with the gold standard test. Electronic hand held devices is suitable for the measurement of β -Hydroxybutyrate (BHBA) in whole blood in dairy goats (Pichler *et al.*,

2014). Barakat *et al.* (2007) studied the clinical sign in naturally affected pregnancy toxemia in goat temperature and pulse are within normal limit and respiration is usually normal until later stage (Vihan, 2010).

An attempt was made to study the physiological parameter in goats suffering from sub-clinical ketosis under farm and individual rearing system. Goats considered under the study were mostly from the individual family, deworming and vaccination records were available. Goats of the organized farm received a daily concentrate ration of 300 g. Goats reared by the individual family were not supplemented concentrated ration instead fed on rice gruel in majority times. Animal under taken in this study were either in the latter part of pregnancy, i.e., 120-135 days and at the early lactation stage, i.e., first week of lactation possessing normal health and appetite.

MATERIALS AND METHODS

Experimental design: The study was carried out in and around Guwahati City, Assam (26.1833°N , 91.7333°E) at Goat Research Station, Assam Agricultural University

and few private farms for a period of one year (July, 2014 to June, 2015). The study procedure compiled with institutional animal ethics committee guidelines, Assam Agricultural University. Animals were selected based on the history of gestation and lactation. Goats under the study were Assam hill goat, Beetal and Assam hill and Beetal cross. Affected goats were divided in four groups with six animals in each group namely group 1-5 and another six healthy animal were kept as group 5 irrespective of breed and age.

Physiological parameters: Rectal temperature was recorded with digital thermometer. Respiration rate was recorded by observing the flank region. Pulse rate was measured by touching the base of the tail. All the parameter were recorded on 0, 3rd, 6th and 9th day.

Statistical analysis: Data obtained were subjected to standard statistical procedures using Split Plot (repeated over time) design and with the help of software viz., SPSS 15.0 and JMP 10.0 of SAS 9.3. Software available at Biostatistics Unit, CVSc, Khanapara under NAIP (Comp-1), ICAR, Govt. of India.

RESULTS AND DISCUSSION

The mean±SE values of temperature (°C) were ranging from 102.67±0.13-102.60±0.07, 102.60±0.07 to 102.77±0.16, 102.60±0.07 to 102.67±0.07, 102.57±0.06 to 102.53±0.07 and 102.70±0.04 to 102.58±0.05 in group 1-5, respectively on 0, 3rd, 6th and 9th day of observation.

The mean±SE values of respiration rate were ranging from 25.83±0.75 to 25.33±0.88, 26.17±0.60 to 25.67±0.67, 25.83±0.60 to 26.50±0.67, 25.67±0.67 to 25.33±0.49 and 26.33±0.67 to 25.83±0.60 in Group 1-5, respectively on 0, 3rd, 6th and 9th day of observation.

The mean±SE values of pulse rate were ranging from 75.17±0.70 to 73.83±0.54, 74.67±0.76 to 74.17±0.54, 74.33±0.61 to 73.83±0.54, 74.33±0.49 to 74.50±0.50 and 74.67±0.56 to 75.17±0.70 in group 1-5, respectively on 0, 3rd, 6th and 9th day of observation.

Statistical analysis revealed no significant difference between different groups, days and interaction effect between treatment group and days of treatment. The body temperature, respiration rates and respiration rate of all the animals of treatment group (group 1-4) remained within the normal level with variation in degrees on different

days of observation in comparison to healthy control group (group 5). The mild to moderate degree of hypoglycemia in sub-clinical ketosis had no significant effect on the ther moregulatory mechanism of the body.

As these were sub-clinical ketosis clinically no observable sign were recorded. Similar observations were also made by Baishya (1996) during sub-clinical ketosis of crossbred cattle. Vihan (2010) reported that during ketosis temperature and pulse rate are within the normal limit, respiration usually normal until the later stage.

CONCLUSION

Temperature, pulse rate and respiration rate are within normal range in the sub-clinically affected goats.

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