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A study on the determination of body condition score and somatic cell count in Surti goats

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Abstract

The aim of the study was to evaluate body condition score (BCS) and somatic cell count (SCC) of milk in surti goats. Data were obtained from 16 Surti goats. The dams after parturition were grouped as singlet and twin kid bearing and each group had 8 does each. While Body condition and weight was recorded monthly during experiment. The level of condition was scored from 1.0 to 5.0 where score 1.0 was given to the emaciated and score 5.0 was given to the obese one. Goats with BCS between 2.5 to 4 were regarded as healthy. While palpating the lumbar region grasping of the processes with finger tips and hand was done to determine the condition. The amount of fat in each area was felt. BCS was recorded on day of kidding, 30th day and 60th day. Somatic cell count were analyzed using Lactoscan Milk Analyser (Milkotronic Ltd, Europe).

Keywords: Protein %, ash, fat, moisture % and total carbohydrate

Introduction

The Surti goat is a medium-sized goat breed from the South Gujarat region of Western India that is suitable for both milk and meat. These goats are mostly white in colour, with black and brown hair on various regions of their bodies. Surti goats are a high-yielding breed with an average lactation yield of 150 kg in a lactation duration of 150 days. The meat is likewise of good quality. The prolificacy of this breed is one of its main advantages. They usually have a singleton or twin birth once or twice a year (Bhattacharya, 2008) [1].

The Body Condition Score (BCS) is a measurement of an animal's fat and protein reserves. Animal husbandry procedures must be revamped in terms of feeding, management, production, and reproduction. Low body condition can have a substantial detrimental impact on foetal growth, the deposition of foetal fat reserves for use after birth, the development of the maternal udder, and the generation of colostrum or milk (Mellor, 1983; Mellor, 1988) [3, 4].

Review of Literature

1. Body condition score (BCS): Body condition score is used to determine the amount of body reserves in the form of lipid (fat) and protein (muscles) are present in the body for maintenance, reproduction and production. It serves as an important tool for livestock managers or producers to optimize the production (meat and milk), feeding, reproduction and welfare of the animals. High producing doe show low BCS during kidding and peak lactation so nutritional management should be done accordingly to maintain BCS.

Santucci *et al.* (1991) [5] conducted a study the Body condition score is an effective and simple method that can help goat breeders in proper management of nutrition in their herds. Under ideal condition, does should never be allowed to slip below a body condition score (BCS) of 2 and never reach a BCS of 5.

Gamit (2016) [2] conducted a study the 14 Surti goats bearing singlet and twin kids. BCS of the does carried out on 0 day (on day of parturition), 7 day, 15day, 30-day, 45 day and 60 days after parturition. It was observed that BCS of singleton bearing dams was significantly higher ($p < 0.05$) on 0, 7 and 15th day of parturition as compared to twin bearing does. BCS showed increasing trend from day 0 to day 60 in both singlet and twin bearing does. Overall BCS showed similar trend in singlet and twin bearing group. The BCS of the goats varied from 2.0 to 2.5.

Materials and Methods

Experimental animal: The research was carried out on 16 Surti goats. The dams after parturition were grouped as singlet and twin kid bearing and each group had 8 does each.

Table 1: Grouping of experimental animals

Group No	Basis of grouping	No. of animals
1	Singlet kid bearing goats	8
2	Twin kid bearing goats	8

Body condition score (BCS)

Body condition and weight was recorded monthly during experiment. The level of condition was scored from 1.0 to 5.0

where score 1.0 was given to the emaciated and score 5.0 was given to the obese one. Goats with BCS between 2.5 to 4 were regarded as healthy. While palpating the lumbar region grasping of the processes with finger tips and hand was done to determine the condition. The amount of fat in each area was felt. BCS was recorded on day of kidding, 30th day and 60th day as per the table. 2. The body condition score rating was done as follows:

Table 2: Body Condition Score Characteristics (Ockert, 2015)

BCS	Characteristics
1.0	The goat was visually emaciated and weak. The backbone remains highly visible forming a continuous ridge. The flank was hollow and the ribs are clearly visible. Fingers easily penetrate the intercoastal space as there was no fat cover.
2.0	Backbone was visible forming continuous ridge. Some ribs were seen and can be felt. Small amount of fat deposition. Intercoastal space smooth but fingers still penetrated.
3.0	Backbone not prominent. Ribs were barely visible. An even layer of fat cover over the ribs was there. Intercoastal space felt by applying pressure.
4.0	Backbone and ribs were not visible. Sleek appearance from the side of the animal.
5.0	Backbone was deep inside fat. Ribs were not visible. Excessive fat deposition was there

Method of Analysis of Milk Composition and Somatic cell count

Stages 1: Preparation of the raw milk: It is mandatory a raw milk, just milked or preserved with room temperature 15-25°C. The necessary minimum volume of milk is 30 mL.

Sample-stirred 4-5 times thoroughly with Vortex mixer. The sample must be no more than 50 ml, and must not fill the bottle with the sample to the cap in order to allow easier mixing with Vortex mixer or by hand.

Stages 2: Pipetting 100 µL raw milk in micro-tube with Sofia Green lyophilized dye: One micro tube containing SOFIA GREEN liquid dye was taken opened and placed on rack.

Stages 3: Stirring the sample: Micro-tube containing SOFIA GREEN dye and milk sample was taken and cover of microtube was closed sample mixed with sofia green was picked from the rack and place the tip of the micro-tube was placed on the opening of the stirrer Mini Vortex. Pressed and hold it pressed for 1-2 seconds and removed. Same steps repeated 8-9 times carefully in order to protect solution not to reach the cap of the microtube.

Stages 4: Interaction of milk with dye: For interaction milk and dye kept together for one minute as per standard procedure. If it is less 1 minute or more than 20, the analysis result may be with deviation 2-3%.

Stages 5: Repeated stirring the sample: Micro-tube containing the sample from the rack was picked and the tube was placed on stirrer mini vortex. Pressed and kept it pressed for 1-2 seconds then removed similar steps repeated 2-3 times, paying attention to place the tip of the container on the stirrer, for 1-2 seconds, then removed. Steps repeated 3-4 times paying attention during the stirring process so that the sample not to reach the cap of the container.

Stages 6: Pipetting 8 µL sample in the micro-fluidic camera of the LACTOCHIP x4: In order to load the solution into the micro-fluidic camera of LACTOCHIP x4, preliminary set to 8 µL automatic pipette was taken of the pipette was placed in the opening of the tip by slightly

pressing it and solution was loaded into. LACTOCHIP x4 by holding its side edges. The solution was pipetted and loaded at an angle of approximately 80° to the filling opening in semicircular shape. Pipetting was done by smooth pressing the working button of the pipette from the initial position to the first stop. The button kept holded at the first stop LACTOCHIP and smoothly release the button to the initial position of lactochip loaded with sample was placed.

Stages 7: Starting analysis: LACTOCHIP x4 using inbuilt software of instrument in the cartridge of the LACTOSCAN SCC to start the analysis.

Stages 8: Disposal: By using button of pipette the tip was removed and dropped inside the microtube with sample. The tip, microtube with sample residue and used LACTOCHIP x4 were disposed in suitable container.

Results and Discussion**Somatic cell count (SCC) in goat milk****Table 3:** Mean ± S.E of somatic cell count (SCC)

Day of observation	Singlet bearing goat	Twin bearing goat	P-value
30 th day	669375±13444.24	679375±8514.56	0.539
60 th day	53000±69461.96	561100±72203.4	0.813
Overall	603188±38210	620238±38295	0.754
F- value	3.500	2.646	

The results of Somatic cell count of singlet and twin bearing group and their body weight have been presented in table no. 3. The mean value of somatic cell count on 30th day and 60th day for singlet bearing goat was 669375±13444.24 and 53000±69461.96 and in twin bearing goat were 679375±8514.56 and 61100±72203.4 respectively.

Overall somatic cell count of twin bearing goat was higher than singlet bearing goat although the differences was not significant. Somatic cell count was also higher in twin bearing as compared to singlet bearing goats on 30th and 60th day though the difference not varied significantly F-value was not significant both the group.

Body condition score**Table 4:** Mean \pm S. E of body condition score singlet and twin bearing dams

Day of observation	Singlet bearing goats	Twin bearing goats	P-value
Day of kidding	2.75 ^a \pm 0.13	2.90 ^a \pm 0.13	0.421
30 th day	3.12 ^a \pm 0.12	3.28 ^b \pm 0.09	0.344
60 th day	3.56 ^b \pm 0.14	3.68 ^c \pm 0.09	0.483
Overall	3.14 \pm 0.10	3.29 \pm 0.08	0.288
F-value	8.979**	12.724**	

** indicates significance at $p < 0.01$ across rows respectively and means bearing different superscript within column differ significantly (** $p < 0.01$).

The results of Body Condition Score (BCS) of singlet and twin bearing group 3.12 \pm 0.12 and 3.56 \pm 0.14 on day of kidding, 30th and 60th day respectively and BCS of twin bearing goat was 2.90 \pm 0.13, 3.28 \pm 0.09 and 3.68 \pm 0.09 on day of kidding, 30th and 60th day of kidding respectively.

The overall mean value of BCS of twin bearing group was higher as compared to singlet bearing group though it was not significantly different. BCS was higher in twin bearing as compared to singlet bearing goats on DOK, 30th and 60th day through the difference was not significant. F-value was highly significant ($p < 0.01$) in both the groups. The mean of Body condition score (BCS) showed increasing trend from DOK to 60th day in both the groups. BCS on DOK and 30th day varied significantly with BCS of 60th day in singlet bearing group, moreover BCS on DOK varied significantly ($p < 0.01$) with BCS of 30th day and 90th day in twin bearing groups.

The score is given to an animal obtained by palpation of mainly two anatomical regions like the sternum and the lumbar vertebrae. A similar scale was also used by Gaten by (1995) [6] for sheep (score 0 for starving, score 1 for very thin, score 2 for thin, score 3 for moderate, score 4 for fat and score 5 for very fat), and by Steele (1996) [7] for goat the finger and thumbs were used to feel three points on the goat back: spinous processes, transverse processes and loin muscle.

Santucci *et al.* (1991) [5] reported that the Body condition score is an effective and simple method that can help goat breeders in proper management of flock.

However, Gamit (2016) [2] author emphasized to keep BCS between 2.0 to 4.0 which is in the range of present result observed that BCS of singleton bearing dams was significantly higher ($p < 0.05$) on 0, 7 and 15th day of parturition than twin bearing does was in agreement with present study.

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