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Effects on morphometery of kids whose does were fed extra concentrates and probiotics during the periparturient period

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Abstract
Present study was conducted to study the effect of extra concentrate supplementation with or without probiotics during periparturient period on the performance of does. Twenty-four pregnant healthy Boar x local cross does in the last month of gestation (day 120) were selected randomly and allotted to 4 groups (T1, T2, T3 and T4) of 6 animals each. The does were maintained under stall feeding conditions and offered a daily ration consisting of oats hay @ 1.2 kg/head/day and commercial pelleted feed @ 577.5 g/head/day during periparturient period (one-month pre-partum to one-month post-partum). Does in treatment groups T1 were offered normal daily ration without supplementation. In T2 group were offered normal ration and extra concentrate @ 150 gram /head/day, T3 group were offered normal ratio and extra concentrate @ 150 gram/head/day with probiotic (Saccharomyces cerevisiae $x10^{10}$ CFU) @ 2.5 gram/head/day and in T4 groups were offered normal ratio and extra concentrate 150g + probiotic (Saccharomyces cerevisiae $x10^{10}$ CFU) @ 4 gram/head/day. Results indicated that there was significant ($P<0.05$) difference in kids body length, chest girth, abdominal girth, and height at wither in T2, T3 and T4 as compared to T1 (control) group during first month after parturition while as non-significant difference was observed in body measurements at second and third month of age.

Keywords: Kids, morphometry, periparturient period

Introduction
In recent years, the livestock sector has emerged as one of the key components of agricultural growth in developing countries. Indian livestock system is the endeavor of small holders and it is a centuries old tradition. Over 70 percent of the rural households in India depend on livestock farming for supplementary income. From livelihood perspective, livestock farming is considered as an important instrument to alleviate poverty (baba *et al.*, 2011) [4]. Economy of Jammu and Kashmir is agriculture dependent and livestock rearing occupies an important source of additional income for the rural people of the State. Due to the presences of abundant alpine pasture and high demand of livestock products, sheep and goat rearing is the core activity of rural masses in Jammu and Kashmir state. Sheep and goat rearing plays a vital role in socio- economics upliftment of weaker sections of the society. Goat rearing is important for agrian economy particularly where dairy farming plays vital role. Goats efficiently convert low quality grazing matter that is less desirable for other livestock into quality lean meat. Furthermore, goats can be reared in a relatively small area of pasture and limited resources. It also fulfils the high demand for proteins in human food products, there by adding nutritional value to food products for its consumers. They also meet the specific needs of the mankind, particularly by producing clothing through fibre and providing other by-products like pelts, skin etc. (Bruinsma, 2003) [5].
During three weeks before and three weeks after kidding (periparturient period) there is a negative energy balance in does, which is considered as primary cause for the development of the ketosis/ hyperketonemia in does resulting in their decreased performance or even mortality (Van Saun, 2000) [11]. Further during late gestation, there is reduction in the rumen capacity especially in twin and triplet-bearing animals owing to the presence of foetus and the subsequent pressure of the gravid uterus on rumen resulting in decreased dry matter intake and hence, loss of performance (Andrews *et al.*, 1996) [1]. Nutrient restrictions during this period also results in foetal losses.

This necessitates increasing nutrition density for meeting the requirements. Increase in energy density in ration will help does from relying on body fat reserves as an energy source and potentially becoming ketotic (Wani, 2001) [11]. Suppression of foetal growth in-uterus and a negative influence on the lactation performance have been attributed to nutrient restriction during late gestation (Tygesen *et al.*, 2008) [10]. Feeding of high level of concentrate increases the energy status of does during gastation and the kid born form these does are having higher body weight. Kids born from highly nourished does were heavier at birth. Maternal nutrition resulted in improved colostrum and/or milk availability for offspring, therefore increases survival rate at weaning. Supplementation of concentrate in does during periparturient periods showed positive impact on performance of does and their kids. Increase in the nutrient density by increasing the concentrate ratio may lead to a major change in rumen microbial populations due to rapid growth of lactic acid producing bacteria. High concentrations of lactic acid accumulation cause rumen pH to drop to less than 5.0. The body systems are most susceptible to such stressful conditions. Probiotics like yeasts may stimulate growth and enzymatic activity of cellulolytic bacteria, improve microbial protein synthesis, increase in fiber digestibility, and change in microbial protein and amino acids in large intestine.

Materials and Methods

The present study was conducted to explore the possibility of improvement in performance of periparturient does through extra concentrate with or without probiotics supplementation. The experiment was conducted at Mountain Research Centre for Sheep and Goat (MRCSG), Shuhama, SKUAST-K from November 2017 to January 2018. Twenty-four pregnant healthy Boar x local cross does in the last month of gestation (day 120) were selected randomly and allotted to 4 groups (T1, T2, T3 and T4) of 6 animals each. The does were maintained under stall feeding conditions and offered a daily ration consisting of oats hay @ 1.2 kg/head/day and commercial pelleted feed @ 577.5 g/head/day during periparturient period (one-month pre-partum to one-month post-partum). Does in treatment groups T1 were offered normal daily ration without supplementation. In T2 group were offered normal ration and extra concentrate @ 150 gram /head/day, T3 group were offered normal ratio and extra concentrate @ 150 gram/head/day with probiotic (Saccharomyces cerevisiae $x10^{10}$ CFU) @ 2.5 gram/head/day and in T4 groups were offered normal ratio and extra concentrate 150g + probiotic (Saccharomyces cerevisiae $x10^{10}$ CFU) @ 4 gram/head/day. Body measurements (inches) were taken monthly upto weaning of kids. The measurements were taken using standard measuring tape. Following body measurements were recorded:

I) Body length: Body length (inches) was taken as the distance from point of shoulder to pin bone. The measurements were taken on either side of the body. The average value of these measurements taken on either side was taken as the final body length.

II) Height at wither: The kids were kept in standing position. Height at wither (inches) was taken as distance of the top of wither from the ground level.

III) Heart/Chest girth: Heart/ chest girth (inches) was taken as the girth just behind the axillary region of the animal.

IV) Abdominal girth: Abdominal girth (inches) was taken as the girth just in front of the udder while the animal was kept in standing position.

Results and Discussion

Body measurement of at day 30, 60 and 90 is presented in the Table 1, 2 and 3. There was significant (P<0.05) difference in body length, chest girth, abdominal girth, and height in T2, T3, T4 as compared to T1. Highest body length, chest girth and abdominal girth 17.46±0.30, 18.00±0.15 and 18.80±0.27 (inches) was observed in T2 group and height at wither 17.80±0.25 (inches) was observed in T4 group while as lowest body length, chest girth, abdominal girth and height at wither 14.28±0.20, 15.78±0.48, 16.44±0.66 and 15.74±0.31 (inches) was observed in T1 treatment group kids at 30 day of age, respectively. There was no significant difference in all the body measurements in different treatment groups kids at 60 and 90 days of age. Kochewad *et al*. (2009) [6] found that there was no effect of probiotic supplementation in Osmanabadi kids on mean value of body height (cm), chest girth (cm) and body length (cm) at three months of age. Pathodiya *et al*. (2004) [8] reported that body morphometry of Sirohi kids at birth as 32.18 cm height, 28.54 cm body length and 31.07 cm body girth. Ahmad *et al*. (2009) [2] conducted a study on morphological characters of Kutta sheep breed and found that Kutta breed was a short sized with average body length of 23.9 ± 0.34 cm, thin tail and slightly convex nose. Head was of medium size, slightly bulging forehead, tapering face and shining eyes. Horns have average length of 24.9 ± 0.93 cm in Rams and ewes were polled, horns run backward and outward somehow spirally in mature males. Ears were of small size (average length of 10.5 ± 0.22 cm and blade-width of 5.3 ± 0.08 cm). Mondal (2009) [7] studied morphometric traits in local sheep and goats in Kargil region (Ladakh) found that Chest girth in sheep between 0–3 and 3–6 months age group had significantly (P<0.05) lower body length than 6–12 and >12 months age group. Body length was significantly higher (P<0.05) in the sheep and goat between 3–6 and 6–12 months age groups than 0–3 months, whereas it was highest at >12 months age group. Height at wither between 6–12 and > 12 months age group had non-significant difference but significantly higher (P<0.05) than other two age groups, whereas in sheep between 3–6 months, and 6–12 months age significantly (P<0.05) higher height at withers than between 0–3 months age group was observed. Pervage *et al.* (2009) [9] studied morphometry of indigenous sheep in Bangladesh livestock research institute (BLRI) and found body length (cm), heart girth (cm), wither height (cm) and horn length (cm) were 73.60 ± 1.96, 64.42 ± 1.32, 65.70 ± 1.13, 67.60 ± 2.62; 67.73 ±2.41, 58.57 ±1.37, 60.20 ±1.48, 67.50 ±2.28; 52.33±1.93, 47.71±0.80, 48.50 ±1.06, 56.30±1.63 and 11.26 ±1.70, 3.42 ±0.20, 7.50 ±1.80, 13.50 ±0.83, respectively. Arora *et al.* (2010) [3] observed the morphological characters of adult Ganjam sheep and found the average measurements for body length, height at withers, chest girth, ear length and horn length were 60.7 ± 0.50 cm and 58.7 ± 0.36 cm; 67.7 ± 0.48 cm and 64.9 ± 0.45 cm; 72.7 ± 0.68 cm and 69.5 ± 0.47 cm; 11.6 ± 0.52 cm and 12.0 ± 0.55 cm and 20.9 ± 1.5 cm in males and females, respectively.

Table 1: Mean (±SE) Body measurements of kids at 30 days of age whose does were supplemented with or without probiotics.

Treatments	BL	CG	AG	WH
T1(control)	14.28±0.20[a]	15.78±0.48[a]	16.44±0.66[a]	15.74±0.31[a]
T_2	17.46±0.30[b]	18.00±0.15[b]	18.80±0.27[b]	17.28±0.12[b]
T_3	17.34±0.43[b]	17.68±0.23[b]	18.22±0.09[b]	17.70±0.33[b]
T_4	17.44±0.42[b]	17.78±0.24[b]	18.26±0.08[b]	17.80±0.25[b]

Mean with different superscript in a column differ significantly. BL= Body length, CG=Chest girth AG= Abdominal Girth HW= Height at wither

Table 2: Mean (±SE) body measurements of kids at 60 days of age. whose does were supplemented with or without probiotics.

Treatment	BL	CG	AG	WH
T1(control)	16.56±0.23	17.34±0.58	18.00±0.43	17.36±0.25
T2	17.66±0.18	18.14±0.15	18.96±0.22	17.46±0.16
T3	17.56±0.41	17.82±0.23	18.32±0.06	17.84±0.24
T4	17.64±0.41	17.86±0.24	18.36±0.06	17.98±0.17

Means of different treatment groups in columns does not differ significantly at $P<0.05$. BL= Body length, CG=Chest girth AG= Abdominal Girth HW= Height at wither

Table 3: Mean (±SE) Body measurements of kids at 90 days of age whose does were supplemented with or without probiotics

Treatment	BL	CG	AG	WH
T1(control)	17.28±0.96	17.94±0.40	18.70±0.37	17.56±0.23
T2	17.84±0.28	18.18±0.17	18.98±0.13	17.66±0.15
T3	17.62±0.48	17.92±0.21	18.44±0.22	17.98±0.26
T4	18.80±0.19	17.98±0.25	18.46±0.22	18.20±0.21

Means of different treatment groups in columns does not differ significantly at $P<0.05$. BL= Body length, CG=Chest girth AG= Abdominal Girth HW= Height at wither

Conclusion

Present study revealed that supplementation of does during periparturient period increases the energy status of does during pregnancy and the kids born form these does are having higher body weight thus has positive impact on body morphometery of kids.

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