International Journal of Advance Research in Science and Engineering
Volume No.07, Special Issue No.04, March 2018
www.ijarse.com
IJARSE
ISSN: 2319-8354

Effect of concentrates and probiotics supplementation in peripartorient goat on performance and coccidian invasion level of their kids

Aaliya Fayaz Bhat[1], Sanober Rasool[2] ,R.A Patoo[3]

[1]*Division of Livestock Production Management, Skuast k, (India)*

[2]*Division of Veterinary and Animal husbandry extension, Skuast k, (India)*

[3]*Division of Livestock Production Management, Skuast k, (India)*

Faculty of Veterinary Science and Animal Husbandry, Shuhama SKUAST-K 190006,

ABSTRACT

The present study has been conducted on pregnant does at Mountain Research Centre for Sheep and Goat (MRCSG) of Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir.20 selected animals were divided into four groups (T1Control, T2, T3, and T4) of 5 animals each. The study was conducted in periparturient period.In T1 does were fed normal daily ration. Normal ration consists of 1.2 kg hay and 577.5g of concentrates to achieve TDN of 105g/day and DCP of 918.6g/day according to 3.5% of body weight. T2 Does were fed normal daily ration + extra concentrate @ 150 gram /head/day. In treatment group T3 does were fed normal daily ration + extra concentrate @ 150 gram /head/day and probiotic@ 2.5 x (10^{10}CFU) gram/head/day respectively (probiotics = Saccharomyces cerevisiae)and in T4 does shall be fed normal daily ration + extra concentrate of 150g supplemented + probiotic@ 4 gram/head/day respectively. The aim of this study was to investigate the use of concentrates and probiotics as will affected production performance and coccidian invasions of kids. The fresh kid's individual fecal sample were collected directly from the rectum of kids 45 days after parturition. The Mc Master counting technique was applied for kids respectively. The average birth weight of kids from T4treatment group was (3.37±0.10)which was significantly higher than control group T1 (2.66±0.92).However no significant effect was seen between T2, T3 and T4.It could be concluded that the supplementary balanced feeding could has positive impact on birth weight of kids. There is a significant effect of on the mortality of kids.The mortality was higher for T1 (33%) followed by T2 (20%) and followed by T3 and T4 (16%).However there was non-significant effect on the twinning percentage. Also There was non-significant($P<0.05$) effect of supplementation non the Oocytes per gram (OPG) and thus prevalence occurrence of Coccidiosis.

Keywords : Kids, Does, Periparturient, Coccidia, Mortality

I.INTRODUCTION

Goats are the backbone of the economy of small and marginal farmers and landless labours in India. It is an insurance against crop failure and provides alternate sources of livelihood of farmers round the year. Goat is a poor man's cow because of their immense contribution to the poor people economy. It is regular source of additional income for poor and landless or marginal farmers being small sized animal the goat can easily be managed by women and children (Prasad, 2010). Goats and sheep are common small ruminants that are valuable sources of meat, hide and skin, organic manure and other by-products (Masika and Mafu, 2004).

Pregnancy in ruminant animals is characterised by stress (Harmeyer and Schlumbohm, 2006) and several other metabolic processes such as high demand for glucose and the release of pregnancy-related hormones (Bell and Bauman, 1997).Ruminant animals may not be able to withstand the physiological stress during pregnancy unless their energy balance meets up with the body demands (Blache et al 2008). Reduced foetal growth may occur due to catabolism of amino acids for meeting the increased requirements of glucose during late gestation.The energy balance of goats is usually stabilized from nutrients in animal feeds and which play an essential role in improving the metabolic processes of dams during the demanding period of pregnancy (Hefnawy *et al*., 2010). As pregnancy advances to the third trimester, the daily nutrient requirements for pregnant goats increase to about 2.5 times more than that of the non-pregnant.The rate of increase of post-natal death of kids is also a great challenge that has led to decreased productivity in goat husbandry. One of the reasons provided for the high neonatal mortality rate in the developing countries was under nutrition of dams during pregnancy. 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). Kids with less birth weights and increased post natal kid losses could be expected in the absence of careful feeding management of the dam during this period. Kids with less birth weight affect the overall profitability of the goat rearing production system.

Therefore by increasing the concentrate in the diet will help to meet the increased energy demands during late pregnancy and in addition to it probiotics will help in increasing the appetite of animals which lead to increase feed intake. Consequently increase the performances of the treated animals. It also has positive effects on rumen ammonia disappearance, positive effects on rumen pH, promotes metabolism digestion, increase in fiber digestibility and increase in microbial protein and amino acids content in large intestine.

Coccidiosis is a worldwide economically important parasitic disease with high prevalence in goats (Abo-Shehada and Abo-Farieha, 2003). It has been demonstrated that coccidiosis reduces body weight gain and general productive performance of goats. Coccidiosis is caused by intestinal protozoan parasite of the genus Eimeria(Silva and Lima 1998). A significant association has also been recorded between body condition score and Eimeria infection. Higher coccidian infection rate in sheep with poor body scores than in good body scores has been reported (Khan *et al.*,2011). This might be due to the weak immune status of poorly scored animals as a result of malnutrition. Dam's immune system is stressed few weeks before parturition and through lactation and the number of oocytes excreted may rise (peri-parturient oocytes rise). This oocyte per gram increased during the late pregnancy in does which may favoured a doe-kid transmission mechanism. It is most frequentlyobserved in kids 2 to 4 week of age.

Thus main aim of this study was to observe the effects of concentrates and probiotics on countering the stress during periparturient period to improve kid performances and reduce the prevalence of coccidian infection in their kids.

II.MATERIALS AND METHOD

The present study was conducted on pregnant does at Mountain Research Centre for Sheep and Goat (MRCSG) of Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir. The study was conducted in periparturient period (four weeks before kidding to four weeks after kidding). 20 selected pregnant does were randomly divided into four groups (T1 control, T2, T3, and T4) of 6 animals each. . In T1 Does was fed normal daily ration. Normal ration consists of 1.2 kg hay and 577.5g of concentrates to achieve TDN of 105g/day and DCP of 918.6g/day according to 3.5% of body weight. In T2 Does was fed normal daily ration + extra concentrate @ 150 gram /head/day. In T3 Does was fed normal daily ration + extra concentrate @ 150 gram /head/day and probiotic@ 2.5 x (10^{10}CFU) gram/head/day respectively (probiotics = *Saccharomyces cerevisiae*). In T4 Does was fed normal daily ration + extra concentrate of 150g supplemented + probiotic@ 4 gram/head/day respectively.The grouping was based on the body weight and parity of the animals. The animals at a particular parity was equally distributed among the four groups. These animals was allotted to different groups in such a way that between group average body weight differences should be statistically non-significant.

Following parameters are to be recorded

Birth weight.

The twinning rate was calculated at the time of birth.

Number of twinning / Total number of birth.

Mortality was calculated upto one month of age.

Number of mortality / Total number of births.

The fresh kid's individual fecal sample were collected directly from the rectum of kids 45 days after parturition. The Mc Master counting technique was applied for kids respectively.

Data so obtained was subjected to standard statistical procedure as per Snedecor and Cochran (1994) using Statistical software SPSS 20.00. One way analysis of variance was carried out and significant differences among means were tested by Duncan's multiple range test (DMRT).

III.RESULTS AND DISCUSSION

Table 1: Average of Birth weight and Oocyte per gram of different treatment group kids

Treatment	Birth weight (kg)	Oocyte per gram
T1	2.66±0.92[a]	134±6.9
T2	3.24±0.11[b]	127±10.4
T3	3.14±0.10[b]	134±8.8
T4	3.37±0.10[b]	125±6.7

Columns having superscript are significant.

Table 2 Average of Mortality and Twinning percentage of different treatment group kids

Treatment	Mortality %	Twinning %
T1	33[a]	20
T2	20[b]	0
T3	16[c]	20
T4	16[c]	20

Columns having superscript are significant.

Birth weight

The birth weights of all the experimental kids have been presented in table 1 .The average birth weights among the four treatment groups T1, T2,T3 and T4 were as2.66±0.92, 3.24±0.11, 3.14±0.10 and 3.37±0.10Kg respectively. Comparison among the four treatment groups by LSD revealed that average birth weight of T4 kids were significantly ($p<0.05$) higher as compared to than control T1. However non-significant effect were seen in between treatment group T2, T3 and T4. Therefore the average birth weights in supplemented groups were significantly ($p<0.05$) higher than in control. The feeding of additional ration during advanced phase of gestation can increase energy status in goats around kidding and the kids from these dams are born with higher body weight.

Oocyte per gram

The oocyte per gram of all the experimental kids has been presented in table 1.the average oocyte per gram among the four treatment groups T1,T2,T3 and T4 were134±6.9,127±10.4,134±8.8,125±6.7 respectively oocytes per gram Comparison among the four treatment groups by LSD revealed that average oocyte per gram were non-significant different.

Twinning percentage

The twinning percent of all experimental groups has been presented in table 2.There was no significant effect seen in twinning percentage.

Kid's mortality percentage

The mortality percent of all experimental groups has been presented in table 2.The kid mortality percentage was significantly higher in control group T1 (33%) followed by T2 (20%) and then in T3 and T4(16%). Therefore there was a significant reduction in kid's mortality in supplementary feed fed group than control group .The does on high protein diet delivered were significantly higher in birth weight which are necessities for higher immunity of kids

IV.DISCUSSION

Does in treatment groups performed better in terms of birth weight of their kids in comparison to the does in control. These findings are in agreement with earlier findings (Chaturvedi *et al.,* 2009; Meyer *et. al.,* 2010).An understanding of prenatal factors influencing the variation in birth weight is of primary importance with regard to immediate (neonatal)and longer term health and viability (Godfrey & Barker 2001) as the birth weight has been associated with growth, production and reproduction traits. Many studies in the past have revealed that maternal nutrition during pregnancy has some influence on the birth weight of their kids although occasional discrepancies (Heasman *et al.,* 2000).

Some studies on different stages of gestation in relation to birth weight of kids have revealed that maternal energy intake from early to mid-gestationhas little influence on kids birth weight in comparison to late gestation since absolute foetal growth is greatest at the latter stage (Gardner *et al*., 2007). Reduced foetal growth may occur due to catabolism of amino acids for meeting the increased requirements of glucose during late gestation (Lemons and Schreiner, 1983). The results of our study can thus be explained on the basis of extra nutritional requirements of the dam at this stage which may be sufficed through supplementary feeding, resulting in higher birth weights of kids. Further during the immediate post-partum period, the kids is more or less completely dependent on the does in terms of nutrition (colostrums/milk).The kids can thus be expected to perform better if the milking performance of its does is adequate. The results of present study thus highlight the importance of feeding management during the peri-partum period in ewes as it could be suitably exploited to achieve better gains in terms better birth weight and growth performance of their kids.

There was a significant reduction in kid's mortality in supplementary feed fed group (6.49 %) than control group (15.92 %). The does on high protein diet delivered and weaned kids were significantly higher birth and weaning weights than those in conventional system, which are necessities for higher immunity of kids (Nnadi, P.*et al.,* 2007)

High level of oocyte per gram observed at the end of the pregnancy due to immunosuppression and there was the rapid increase of oocyte per gram levels in feces of kids after kidding seems to be related to the risk of kids to acquire the infection and develop coccidiosis during the first weeks of life. (Hashemnia, M *et al*., 2011)

V.CONCLUSION

The birth weight of kids of supplemented groups was higher compared to the kids of control group .However, there were comparatively no effect on twin births from all the treatment group. Also there was non-significant effect on then oocyte per gram of kids. Therefore there was a significant reduction in kid's mortality in supplementary feed fed group than control group.Based on the results, it could be concluded that supplementation of concentrate feed for does during late gestation and early lactation periods creates positive impact on growth performance of kids. Supplementary feeding practices were well received by the goat farmers and participatory action research might be an exemplary tool to promote scientific management practices among rural farmers.

LITERATURE CITED

[1.] Prasad J. Goat Industry in India.Animal Husbandry andDairy Science. 2010, 111-113.

[2.] Masika P J and Mafu J V 2004 Aspects of goat farming in the communal farming systems of the central Eastern Cape South Africa. Small Ruminant Research 52: 161-164.

[3.] Harmeyer J and Schlumbohm C 2006 Pregnancy impairs ketone body disposal in late gestating ewes: Implications for onset of pregnancy toxaemia. Research in Veterinary Science 81:

[4.] Hefnawy A E, Shousha S and Youssef S 2011 Haematobiochemical Profile of Pregnant and Experimentally Pregnancy Toxemic Goats. Journal of Basic and Applied Chemistry 1: 65-69

[5.] Bell A W and Bauman D E 1997 Adaptations of glucose metabolism during pregnancy and lactation. Journal of Mammary Gland Biology and Neoplasia 2: 265- 278. 254-264.

[6.] Blache D, Maloney S K and Revell D K 2008 Use and limitations of alternative feed resources to sustain and improve reproductive performance in sheep and goats. Animal Feed Science and Technology 147: 140-157.

[7.] Hefnawy A E, Shousha S and Youssef S 2011 Haematobiochemical Profile of Pregnant and Experimentally Pregnancy Toxemic Goats. Journal of Basic and Applied Chemistry 1: 65-69.

[8.] Tygesen, M.P., Nielsen, M.O., Norgaard, P., Ranvig, H., Harrison, A.P. and Tauson, A.H. 2008. Late gestational nutrient restriction: effects on ewes' metabolic and homeorhetic adaptation, consequences for lamb birth weight and lactation performance. *Archives of Animal Nutrition* **62**(1): 44-59.

[9.] Abo-Shehada M.N., Abo-Farieha H.A. Prevalence of *Eimeria* species among goats in northern Jordan. *Small Rumin. Res.*, 2003, **49**, 109-113.

[10.] Silva A.C., Lima J.D.: *Eimeria*minasensis n. sp. (Apicomplexa: Eimeriidae) in the Domestic Goat Capra hircus, from Brazil. *Mem.Inst. Oswaldo.Cruz.*,1998, **93**, 741-744.

[11.] Khan M.N., Rehman T., Iqbad Z., Sajid M.S., Ahmed M., Riaz M.: Prevalence and associated risk factors of Eimeria in Sheep of Punjab, Pakistan. *World Acad, Sci, Eng, Tech.,* 2011, **5**, 334-338

[12.] Chaturvedi, O.H., Mann, J. S. and Karim, S.A. 2009. Production performance of ewes grazing on community rangeland supplemented with high energy concentrate during late gestation **.***The Indian Journal of Small Ruminants.***15** (1). 34-69.

[13.] Meyer, A. M., Reed, J. J., Neville, T. L.,Taylor, J. B., Hammer, C. J., Reynolds, L. P., Redmer, D. A., Vonnahme, K. A. and Caton, J. S. 2010. Effects of plane of nutrition and selenium supply during gestation on ewe and neonatal offspring performance, body composition, and serum selenium. *J. Anim Sci.***88**:1786-1800

[14.] Godfrey, K.M. and Barker, D.J. 2001. Fetal programming and adult health. *Public Health Nutrition.***4**: 611–624.

[15.] Heasman, L., Brameld ,J., Mostvn, A., Budge ,H., Dawson ,J., Buttery, P., Stephenson, T. and Symonds, M.E. 2000. Maternal nutrient restriction during early to mid-gestation alters the relationship between insulin-like growth factor I and bodyweight at term in fetal sheep. *Reproduction, Fertility and Development.***12**: 345–350.

[16.] Gardner, D .S., Buttery, P .J.,Daniel, Z. and Symonds, M .E. 2007.Factorsaffectingbirthweightin sheep: maternal environment. *Reproduction* .**133:** 297-307.

[17.] Lemons, J. A., and Schreiner. R. L. 1983. Amino acid metabolism in the ovine fetus. *Am.J. Physiol.***244**:E459.

[18.] Nnadi, P.A.; Kamalu, T.N. and Onah, D.N. 2007. Effect of dietary protein supplementation on performance of West African dwarf (WAD) does during pregnancy and lactation. Small Ruminant Res. 71:200 .

[19.] Hashemnia M., Khodakaram--Tafti A., Razavi S.M., Nazifi S.: Changing Patterns of Acute Phase Proteins and Inflammatory Mediators in Experimental Caprine Coccidiosis. Korean J. Parasitol., 2011, 49, 213-219.