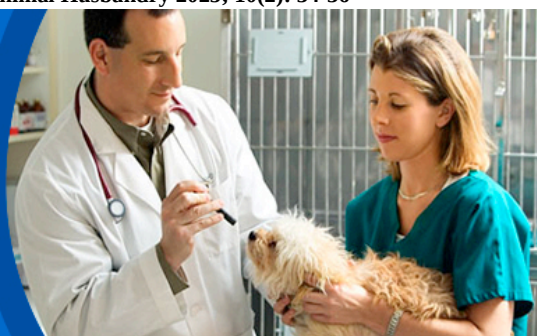




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Effect of supplementing concentrate feed to ewes in late pregnancy and creep feed supplementation to lambs on their growth

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Abstract

The present study was conducted with an objective to measure the beneficial effects on supplementing the concentrate feed (18% CP) during last trimester of gestation and creep feed (16% CP) to lambs. A total of 24 ewes (25 ± 1.4 kg) which were in their last trimester of gestation were selected and randomly allotted to two groups (control and treatment group) of 12 each. The ewes in treatment group were supplied with 250g of concentrate feed per day throughout the last trimester of gestation and continued till weaning period and the lambs born to treatment group were supplemented with creep feed @50g/day for first 15 days and then increased to 75g/day for next 15 days and afterwards with 100g/day for next 15 days. Supplementation of concentrate feed during last trimester of gestation has a profound effect on body weight gain of ewes (6.5 ± 1.5 Vs 4.9 ± 0.9 kg) which in turn affected the birth weight of lambs in a positive way (3.3 ± 0.2 Vs 2.2 ± 0.2 kg). Along with this, the occurrence of ROP and dystocia has drastically reduced in the treatment group by 25% and 16.7%, respectively. Further, supplementation of creep feed to lambs from young age (i.e., 15 days of age) has a profound effect on bodyweight gain (10.4 ± 0.5 Vs 6.8 ± 2.9 kg). This study proved that additional supplementation of concentrate feed to pregnant ewes and creep feed to lambs has a combined effect in acquiring higher body weight of lambs which in turn has a positive effect on benefit cost ratio of sheep farm.

Keywords: Supplementation, concentrate feed, creep feed, ewes, lambs, body weight, gestation

Introduction

As the flock economical efficiency was determined by its reproductive performance and lamb growth rate (Notter, 2012) ^[5], shepherds need to concentrate in this area to maximize the output of the flock within the confines of a cost effective, practical and adequate feeding program (Rook, 2000) ^[6]. When compared to reproductive efficiency, it is easy to intervene in terms of lamb growth rate as it can be easily achieved by showing some concern to the lamb before its birth i.e., taking care of lamb within the womb itself as there productive efficiency (prolificacy) is mainly associated with genetic factors (Rook, 2000) ^[6] and to the ewe in its late gestation as late gestational nutritional status directly correlated with the fetal growth and the lactation performance of the ewe which in turn affects the lamb growth rate (Wang *et al.* 2023) ^[10]. The principal factor which affects the birth weight of lamb and growth rate of lamb after birth is the nutritional status of the ewe during its pregnancy (Gardner *et al.* 2007) ^[2]. Inadequacy of nutrient supplementation during gestational period effects both ewe and lamb health in terms of low milk yield, increasing the chances of incidence of pregnancy toxemia (Rook, 2000) ^[6] and low lamb birth weight, low growth rate, compromising immunity function of lambs, respectively.

In developing countries such as India, shepherds follow extensive system of rearing, allowing the sheep to solely graze for a period of 8 hours/day without concentrate mixture. Even though it is satisfying the hunger of the animal, the nutritional availability to the animal in terms of quality was being compromised. Pregnant ewes require 50% over and above of the maintenance requirement of normal ewe (Melanie, 2022) ^[11], which cannot be met through only grazing demanding additional

supplementation of nutrients in their late gestation either through concentrate feed or grazing or feeding of high-quality legumes. Here, most of the cultivable land was occupied by either agricultural or horticultural crops sparing a little for fodder cultivation which in turn mostly utilized for dairy cattle as this place is one of the dominant habitats of dairy animal compromising available nutritionally qualitative grazing land for sheep. Hence, the present study was conducted to enlighten the shepherds in the way to provide sheep with balanced nutrition at least in utmost nutritionally critical period their physiological life.

Materials and Methods

The present study was conducted at shepherd's farms of Annamayya district of Andhra Pradesh under the leadership of Krishi Vigyan Kendra, Kalikiri of ANGRAU. 24 Nellore Jodipi ewes (2-3 years old having body weight 25 ± 1.4 kg) were selected which are in their last trimester of gestation and randomly allotted to two groups (control and treatment groups) with 12 animals of each. All the 24 animals were allowed for grazing for 8 hours per day and the treatment group was supplemented with concentrate feed (Bharamatiagro Ltd) with 18% CP in the shed during their last month of gestation and continued till weaning period was completed. After lambing, the lambs born to treatment group animals were supplied with creep feed (which was formulated by the shepherd by mixing 50 parts of ground maize, 24 parts of rice bran, and 25 parts of ground nut cake and 1 part of mineral mixture). The lambs were supplied with creep feed @50g/day for first 15 days and then increased to 75g/day for next 15 days and afterwards with 100g/day for next 15 days. During the trial period, body weights of sheep at the initial stages of trial, after lambing and at the end of trial and that of lambs at lambing time and at 3 months of age were recorded.

Statistical Analysis

Data obtained were subjected to one-way analysis of variance and the treatment means were ranked using Duncan's multiple range test with a significance at $p < 0.05$ (Duncan, 1955). All the statistical procedures followed were in accordance with Snedecor and Cochran (1994) [9] and conducted in SPSS (V.23.0).

Results and Discussion

The effect of supplementation of concentrate feed to ewes was presented in Table 1. The supplementation of concentrate feed during last trimester of gestation has a profound effect on body weight gain of ewes which in turn affected the birth weight of lambs in a positive way which was in synchronization with the statement given by Scales *et al.*, (1986) [8] and Rook (2000) [6]. These results were also supported by attaining healthy and more survived lambs at birth with additional effect on improved BCS and nutritional status of ewe which assisted in minimizing the chances of dystocia which may occur due to nutritional imbalance (Guard, 1999, Garden *et al.* 2007) [3, 2] by 25% in treatment group when compared to control group as dystocia was one of the reasons for lamb mortality (Rook, 2000) [6] which may be predisposed due to imbalanced nutrition of ewe in late gestation. Whereas the occurrence of ROP (retention of placenta) has also decreased by 16.7% in the treatment group. Effect of supplementation of creep feed to lambs from the age of 15 days has presented in the Table 2. Supplementing of creep feed at the early age (2 weeks) has a very profound effect on bodyweight gain which can be achieved due to augmented rumen development with the help of propionic acid and butyric acid which can enhance the development of rumen papillae results in efficient utilization of nutrients (Mentschel *et al.* 2001) [4]. Low mortality rate (8.3% in treatment group whereas 33.3% in control group) was also observed in the treatment group because of combined effect of higher lamb birth weight, better nutritional status of ewe (Scales *et al.* 1986; Rook, 2000) [6, 8].

Effect of supplementing concentrate feed to ewes in late pregnancy and creep feed supplementation to lambs from young age was presented in Table 3. Even though the total cost of maintenance and production were almost 1.7 times higher in treatment group, net income earned was 2.2 times higher within the particular period (i.e., 100 days of trial) due to getting healthy lambs, early returns due to faster growth rate than in that of control group. And it was also observed that the appearance of lambs in treatment group is good because of shiny and healthy hair coat which may be due to balanced nutrition of both ewes and lambs at their critical period of physiological life.

Table 1: Effect of supplementation of concentrate feed to ewes during last trimester of gestation

Parameter	Control group	Treatment group
B.W of sheep at initial stage of trial (kg)	25.1 $\pm$ 1.4	24.9 $\pm$ 1.5
B.W of sheep after 25 days of feeding concentrate feed (kg)	26.6 $\pm$ 1.5	27.5 $\pm$ 1.7
Weight gain of ewe during experimental period(kg)	1.5 $\pm$ 0.1	2.6 $\pm$ 0.2
Dystocia (%)	41.7	16.7
ROP (%)	25	8.3

Table 2: Effect of supplementation of creep feed to lambs

Parameter	Control group	Treatment group
BW of lamb during lambing (kg)	2.2 $\pm$ 0.2	3.3 $\pm$ 0.2
BW of lamb at 3 months stage(kg)	8.7 $\pm$ 3.7	13.6 $\pm$ 0.6
Weight gain of lambs (kg)	6.8 $\pm$ 2.9	10.4 $\pm$ 0.5
Lamb mortality %	33.3	8.3

Table 3: Cost economics of production per ewe during trial period

Parameter	Control group	Treatment group
Total cost of maintenance & production (Rs./animal)	650	1068
Total income (Rs./animal)	2803	5567
Net income (Rs./animal)	2153	4499
B:C ratio (per animal)	3.3	4.2

Conclusion

Supplementation of concentrate feed to sheep during their last trimester of gestation and supplementation of creep feed to lambs before weaning period has a positive effect on growth of lambs and their immunity status during their early stages of growth period.

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