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## Effects of concentrate supplementary feeding on performance growth and reproduction in local goats

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### Abstract

A participatory action research was conducted among goat farmers of Puduchatram Block of Namakkal district, Tamil Nadu for promotion of balanced supplementary feeding practices. Three hundred goats carrying last trimester of pregnancy were utilized and divided into treatment (T1) and control (T0) groups having one hundred and fifty goats in each. In addition with grazing, treatment groups were fed with 250 gm of supplementary concentrate feed per day one month prior and after kidding. The control group was maintained with grazing alone. The reproductive, growth performance of does and kids were observed and data were subjected to statistical analysis. The results revealed that, average body weight gain of does significantly ( $P \leq 0.01$ ) higher in T1 group (1.30 Kg) than T0 group during the last month of gestation. The average birth weight of kids from T1 group (2.15 Kg) were significantly higher than control group (1.70 Kg) and maintained higher average daily gain up to weaning. Number of service per pregnancy in T1 was  $1.20 \pm 0.66$  less than control Group  $1.40 \pm 0.53$ . It could be concluded that the supplementary balanced feeding could improve the reproductive performance of does and produces positive impact on growth of kids.

**Keywords:** balanced feed, kidding, gestation, trimester, service

### Introduction

Small ruminant production is important due to the fact that it can easily be managed, requires small initial investments and its short generation interval (Otte and Chilonda, 2002) <sup>[6]</sup>. Small ruminants are kept for the purpose of meat, milk and wool production and income generation. Small ruminants are an important animal in subsistence agriculture because of unique ability to adapt and maintain themselves in harsh environments. Owing to their ability to thrive and reproduce fast even in harsh environments they used as source of risk mitigation during crop failures, property security, monetary saving and investment in addition to many of other socio-economic and cultural function (Markos, 2006) <sup>[4]</sup>. Sizeable goat population is present in Puduchatram block of Namakkal district of Tamil Nadu. Goats are maintained almost entirely on the grazing round the year. The nutrient availability and qualities of forages varies greatly. No supplementary feeds followed. The reproductive efficiency and growth performance of kids might be compromised due to nutritional deficiencies. In dry regions, only grazing could not meet out all the required nutrients especially during late gestation and early lactation periods and hence additional feeds are essential for grazing animals (Sirohi *et al.*, 2014) <sup>[9]</sup>. In this view, a participatory action research was conducted to study the effect of supplementary concentrate feeding of goats, as well as promotion of supplementary concentrate feeding practices among goat farmers.

### Materials and Methods

The study was conducted in a participatory action oriented approach for promoting supplementary balanced concentrate feeding practices among the goat farmers of Puduchatram block of Namakkal district in Tamil Nadu state. Three hundred goats carrying last trimester of pregnancy were utilized for this study. The selected does were divided into two groups and 150 does in each group, namely treatment (T1) and control group (T0). In treatment group the does feed with 250g of balanced concentrate feed in addition with grazing. In control group (T0) allowed only grazing without any supplementary feeding.

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The nutrient components of concentrate mixture as depicted in the Table no.1. The data were collected over a period of four months. Field visits were carried out once in two weeks to monitor the feed intake, to record body weight, health of goats, abortion, and kid's birth weight. The collected data were subjected to statistical analysis (Snedecor and Cochran, 1994) [10].

**Table 1:** The nutrient components supplement feed for does

Components (%)	Nutrient (%)
Dry matter	89.8
Moisture	9.1
Crude protein	17.93
Crude fibre	10.02
Sand and Silica	3.65
Ether Extract	3.40
Metabolizable energy (kcal/kg)*	2300

## Results and Discussion

### 1. Body weight gain of does

Body weight gains of does are presented in Table 2. During the period of gestation the average body weight gain of does in treatment group (T1) were significantly ( $P \leq 0.01$ ) higher than control group (T0). Supplemented concentrate feed significantly increased in weight gain among the does in T1 group. Bibliography (Praveena *et al.*, 2014) [8] reported an average body weight gain was highest in does supplemented with concentrated feed both during breeding period and during last two months of gestation. 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 (Sirohi *et al.*, 2014) [9]. It could be concluded that, supplementation of concentrate feed throughout the gestational period is might not be necessary; however they should not be underfed during late gestation (Nnadi *et al.*, 2007) [5] and (Osugwuh, 2007) [7].

### 2. Litter size (Number)

In treatment group the litter size was 1.7 and in control it was

1.1 which was depicted in Table 2. Higher litter size in treatment group might be due to supplemental feeds had great influence on litter size and parity (Praveena *et al.*, 2014) [8].

### 3. Kid's mortality (%)

There was a significant reduction in kid's mortality in supplementary feed fed group (3.10%) than control group (10.50 %) were presented in Table 2. The does on high protein diet delivered and weaned kids were significantly higher birth and weaning weights than those in control group, which are necessities for higher immunity of kids (Hassan, 2007) [2].

### 4. Growth performance of kids

The kids from supplemented feed fed does were born with higher body weight and maintained higher weight gain up to weaning (3 months). The male kid's birth weight and weaning weight were comparatively higher than female kids, presented in Table 2. These results were in accordance with that of bibliography (Praveena *et al.*,) [8] and (Sirohi *et al.*, 2014) [9].

### 5. Number of services per pregnancy

The numbers of services per pregnancy in treatment and control groups are presented in Table 2. Treatment group required less service (1.2) and control goats required 1.4 services per pregnancy. These results were in accordance with bibliography (Hossain *et al.*, 2004) [3] and (Chowdhury *et al.*, 2002) [1] goats fed with high levels of concentrate might be increase conception rate due to positive energy balance, and 1.4 in goats fed low levels under farming conditions.

### 6. Post-partum doe weight and placental weight

The weight of post-partum doe and placenta are presented in Table 2. There is no significant difference found between groups. Level of concentrate did not significantly affect the post-partum weights of does or placenta weight. Higher post-partum weight indicates the higher birth weight of kids (Markos *et al.*, 2006) [4]. On the other hand, placenta weight is mainly influenced by the litter size (Sirohi *et al.*, 2014) [9].

**Table 2:** Effects of concentrate supplementation on productive and reproductive performance of local goats

S. No	Parameters	Treatment group	Control group
1.	Prior treatment weight of does (kg )	21.70 <sup>a</sup> ± 0.32	20.10 <sup>a</sup> ± 0.38
2.	Near term body weight of does (kg )	25.17 <sup>a</sup> ± 0.27	22.15 <sup>b</sup> ± 0.20
3.	Body weight gain of Does (kg)	3.46 <sup>a</sup> ± 0.38	2.05 <sup>b</sup> ± 0.43
4.	Litter size (number)	1.72 <sup>a</sup> ± 0.13	1.01 <sup>b</sup> ± 0.41
5.	Kid's mortality (%)	3.10 <sup>a</sup> ± 0.24	11.50 <sup>b</sup> ± 0.61
6.	Birth weight of male kids (kg)	2.15 <sup>a</sup> ± 0.76	1.81 <sup>b</sup> ± 0.13
7.	Birth weight of female kids (kg)	1.91 <sup>a</sup> ± 0.76	1.73 <sup>a</sup> ± 0.13
8.	Male kids (Weaning wt )(kg)	12.39 <sup>a</sup> ± 1.03	10.28 <sup>b</sup> ± 0.07
9.	Female kids (Weaning wt )(kg)	11.71 <sup>a</sup> ± 0.33	10.00 <sup>a</sup> ± 0.46
10.	Number of service per pregnancy	1.20 ± 0.66	1.40 ± 0.53
11.	Gestation length (days)	149.0 <sup>a</sup> ± 1.31	151.6 <sup>a</sup> ± 0.84
12.	Placental weight (g)	230.00 <sup>a</sup> ± 1.51	175.40 <sup>b</sup> ± 0.03
13.	Post partum weight of doe (kg)	20.15 <sup>a</sup> ± 1.57	19.15 <sup>a</sup> ± 0.67

The means with different superscripts within a row differ significantly ( $P \leq 0.01$ )

## Conclusion

The results showed that concentrate supplementation feed increased the growth rate of goats under grazing condition. However, animals lost live weight without supplementation under the same feeding regime. Supplementary feeding practices were well received by the goat farmers and participatory action research might be an exemplary tool to promote scientific management practices for goat rearing farmers. Daily supplementation of 250g concentrate feeding

for pregnant and suckling goats in addition with grazing could be recommended.

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