



EFFECT OF NUTRITIONAL FLUSHING ON THE BIRTH WEIGHT AND BODY WEIGHT GAIN OF MALABARI KIDS

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ABSTRACT

A study was conducted to assess the effect of nutritional flushing on Malabari does on the birth weight of kids and their productive performance. Twenty Malabari does were randomly divided into two groups (T₁ and T₂) of ten each. All the does were on natural grazing for four hours daily, provided with potable water and *ad-libitum* supply of jack fruit leaves/grass. All the animals were provided with 200g commercially available pellets, daily as a maintenance ration. The second group was provided with 250g flushing ration (18% DCP and 70% TDN) individually for two weeks prior to breeding. The conception rate, kidding rate and twinning rate was higher by 20%, 20% and 3.2% respectively in flushed does as compared to that of non-flushed. The birth weight of the kids was higher ($p < 0.01$) in T₂ (3.05 ± 0.03 kg) than in T₁ (1.97 ± 0.05 kg). Furthermore the study of growth of kids revealed a better Average Daily Gains in T₂ than in T₁, indicating the carryover effect of flushing on the body weight gains of Malabari kids.

KEY WORDS: Flushing, Birth weight, Body weight gain, Malabari.

INTRODUCTION

Flushing is a common practice to improve the reproductive efficiency of different species. This practice consists of increasing the level of energy offered prior to mating to until approximately 21 days (Luginbuhl and Poore, 1998). Nutrient supplementation especially protein and energy prior to breeding is important for increased number of kids, better birth weight and their survivability. Unscientific feeding practices during these periods may lead to huge economic loss resulting from either abortion or early kid mortality. Flushing induces positive energy balance, stimulating post kidding oestrus activity, ovulation rate, fertilization and survival of ova and the maintenance of the resultant embryos to term as viable kids (Gunn, 1984; Hosseini, 2008). Inadequate nutrition, depresses the reproductive performance of Indian breeds of goats (Satchdeva, 1973). Studies have proven that flushing can improve ovulation rates and foetal implantation. In this context, a study was conducted on 20 Malabari does at ILFC, Pookode to find out the effect of flushing on conception rate, kidding rate, twinning rate, birth weight and body weight gain of Malabari kids

MATERIALS AND METHODS

1. Study area and animals

The study was carried out at the Goat farm unit, Instructional Livestock Farm Complex, College of Veterinary and Animal Sciences, Pookode, Wayanad, which is situated at latitude 11° 32' 18.5 (North) and longitude 76° 01' 14.15 (East), at an altitude of 867 m above the mean sea level. The location of study is endowed with humid climate with maximum rain fall by south west monsoon from June to September and north east monsoon from October to November. A total of 20

Malabari does (2-3 years of age) were randomly divided into two groups (T₁ and T₂) of 10 each.

2. Feeding management

The does of the two groups were on natural grazing (Congo signal grass) from 8.00 am to 12.00 pm and were sheltered during the rest of the time in raised animal sheds. Both the groups were provided with potable water and *ad-libitum* Jack fruit leaves and greens. The T₂ does were flushed with concentrate feed with 18% DCP and 70% TDN (Ranjhan, 1998) at the rate of 250g per animal for two weeks prior to breeding and both groups were provided with 200g commercially available pellets, daily as a maintenance ration. The ingredient composition of flushing ration is presented in Table 1 and the chemical composition was assessed by proximate analysis, is depicted in Table 2.

3. Reproductive parameters

Ultrasonography technique was used for pregnancy diagnosis in does. Animals after breeding were observed for specific signs of pregnancy from 25 days onwards until kidding, at weekly intervals. The pregnancy, twinning and kidding data were recorded in a format prepared for the purpose.

4. Kids performance

Birth weight and weekly body weight of kids were recorded for eight weeks post-partum

Economic analysis

The relative economics based on one doe unit was worked out taking into account the market cost of different feed ingredients and selling price of kids at the farm.

Statistical analysis

Initial body weight of the group was compared using independent t-test. Differences in the final body weight

were compared by using analysis of co-variance. Analysis was done by using the software SPSS version 21.0.

RESULTS & DISCUSSION

The conception rate, kidding rate and twinning rate was higher by 20%, 20% and 3.2% respectively in flushed does as compared to that of non-flushed. The relative birth weight of the kids was significantly higher ($p < 0.01$) in T₂ (3.05 ± 0.03 kg) than in T₁ (1.97 ± 0.05 kg) and the growth rate of kids was more in T₂ than the kids of T₁. The net profit was Rs. 967.50 per doe in T₂ while it was only Rs. 858.00 in T₁.

Reproductive performance of does

Conception rate

The conception rate of T₂ does, in which the flushing was carried out was 80% and in the control group T₁ it was only 60%. The conception rate was increased by 20% in flushing group. This might be due to the increased fertility of ovum attained by positive nitrogen balance and better supply of minerals and vitamins due to flushing. This finding is in agreement with authors who observed that feed supplementation before mating increases prolificacy and pregnancy rate in pigs, cattle, sheep and goats (Boland *et al.*, 2000 and Mc William *et al.*, 2004) and also Chaturvedi *et al.* (2006) who reported high conception rate (79.2 per cent) in ewes supplemented with 1.5 per cent of body weight of concentrate during breeding period than those without supplementation.

Kidding rate

The kidding rate was higher (66.6%) in flushing group than in control group (46.6%). From the above findings it can be concluded that the flushing will increase kidding rate which supports the observations of Kulkarni *et al.* (2014) who reported an increase in kidding percentage (90 per cent) when Osmanabadi goats were supplemented with extra concentrate mixture at the rate of 250g/doe/day during breeding compared to goats that were maintained in the prevailing farmer’s feeding practices (80 per cent).

Twinning rate

The twinning rate among flushed does was higher (90%) than in non-flushed does (80%) indicating that flushing has influence on fecundity of goats. The results are similar to Gunn *et al.*, (1992) and Kulkarni *et al.* (2014) who observed that increase in litter size was related to an increased ME intake which affect the ovulation rate directly resulting in more twinning.

A. Production performance of kids

Birth weight

The birth weight of the kids born from the does which were flushed (3.05 ± 0.03 kg) was significantly higher

($p < 0.01$) than non-flushed group (1.97 ± 0.05 kg) indicating that lower nutritional plane of the does limited growth of kids in-utero and increasing the plane of nutrition of the does prior to breeding can significantly improve the birth weight of Malabari kids. This finding is similar to the findings of Chaturvedi *et al.* (2006) who reported an increase in the average birth weight (3.47 kg) of lambs born to ewes fed with concentrate pellets at the rate of 1.5 per cent of their body weight.

Growth rate

The body weight gain of the kids from 1st week to 8th week is depicted in fig.5. As the initial body weight itself shows a significant difference, Analysis of Covariance was done for comparing the eighth week bodyweight among the two groups. This will helps to find out whether the difference observed in the eighth week of age is only because of the differences observed in the birth weight or a real difference occurred between the groups. Results of ANCOVA show that there exists no difference at the end of the eighth week. However, mean body weight for the kids born from the flushed group is 6.65 ± 0.13 kg and that of non-flushed group is 4.87 ± 0.11 . By this it can be concluded that the difference in the mean body weight is only because of the difference in the initial body weight. The findings are similar to Idris *et al.* (2011) who reported a significant increase in the Average Daily Gain of lambs before weaning when the ewes were flushed prior to breeding. This indicates carry over effect of flushing on the future body weight gains of kids.

B. ECONOMICS

The relative economics of two groups was carried out at the end of experiment and the results are presented in table. 4. The cost of feeding flushing does was Rs. 73.50 per doe. The average additional body weight gain of kids was 1.79 kg in T₂ group over the control group. Since the net live weight gain of kids was high in T₂ than T₁, the respective output price @ Rs.300.00/kg live weight were Rs. 858.00 and Rs. 1041.00. The net profit was Rs. 967.50 per doe in T₂ while it was only Rs. 858.00 in T₁. Flushing in T₂ was 1.13 times more economical than T₁, prior to breeding along with maintenance ration. Thus flushing of Malabari does was found to be economical.

From the present study, it can be concluded that the nutritional flushing had significant impact on the reproductive performance of Malabari does and production performance of their kids. The supplemented group performed better than non-supplemented group managed under natural grazing condition with higher rates of pregnancy, kidding and twinning.

TABLE 1: The per cent of ingredient composition of flushing ration

Ingredients	Percentage
Groundnut cake	35
Coconut cake	10
Rice bran	25
Yellow Maize	27
Mineral mixture	2
Salt	1
Total	100

TABLE 2: Chemical composition of Flushing Ration (mean \pm SE)

Moisture (%)	9.88 \pm 0.09
Crude Protein (%)	21.87 \pm 0.16
Ether Extract (%)	5.17 \pm 0.04
Crude Fiber (%)	5.09 \pm 0.03
Ash (%)	6.81 \pm 0.12
Nitrogen free extract (%)	53.51 \pm 0.10
Digestible energy (in Kcal/kg DM)	2951.00

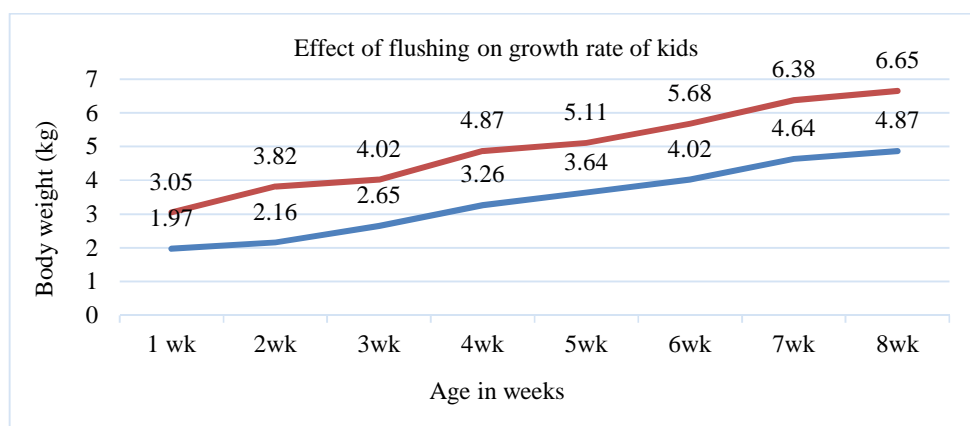
TABLE 3: Productive parameters of two groups

Parameters	T ₁	T ₂
Litter size	1.8 \pm 0.13	1.9 \pm 0.1
Initial body weight (kg)	1.97 \pm 0.05 ^a	3.05 \pm 0.03 ^b
Final body weight (kg)	4.87 \pm 0.10	6.65 \pm 0.13
Total gain (kg)	2.89 \pm 0.08	3.59 \pm 0.11
Average daily gain (g)	51.7 \pm 1.55	64.23 \pm 1.97

Mean values with different superscript differs significantly (p<0.01)

TABLE 4: Relative economics of flushing on performance of Malabari does compared to conventional system of rearing

Particulars	T ₁	T ₂
A. Input		
Cost of concentrate mixture during flushing @ 250g/d- 14 days @ 21 Rs/kg	Nil	735.00
Total cost of concentrate mixture (Rs)	0.00	735.00
B. Output		
Total weight of the kids produced in eight weeks/group	28.6	34.7
C. Price for live weight obtained by the kids (cost/kg live weight @ Rs. 300/kg)	8580.00	10410.00
D. Total Returns (Rs.) (C-A)	8580.00	9675.00
E. Total returns (Rs.) / doe	858.00	967.50

**FIGURE- 1****REFERENCES**

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