

Effect of Soya Milk and Ewe's Milk Blend on the Growth Performance of Suckling Mecheri Lambs

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Abstract: About 1 week old Mecheri lambs having average weight of 2.2 kg were selected and divided into three groups such as control, fed exclusively with ewe's milk, treatment 2, fed with 50% of soya milk and 50% of ewe's milk and treatment 3, fed with 75% soya milk and 25% ewe's milk. All the lambs were fed with 10% of their body weight. The control group had a mean body weight (kg) of 3.43, 6.34 and 8.57 at 30, 60 and 90 days of age, respectively. The T₂ group had a body weight (kg) of 3.69, 6.34 and 9.99 at 30, 60 and 90 days of age, respectively. The T₃ group had a body weight (kg) of 3.74, 6.89 and 10.33 at 30, 60 and 90 days of age, respectively. The growth performance of the treatment groups T₂ and T₃ were significantly higher than the control group ($p < 0.01$). The higher weight gain was observed in the T₃ as compared to T₂, this might be due to higher protein, total solids content of the respective soya milk and ewe's milk blends fed. This investigation reveals that the feeding of soya milk and ewe's milk blend will be beneficial for feeding orphan lambs.

Key words: Soya milk, growth performance, Mecheri lambs, body weight, control group

INTRODUCTION

In India, little attention has been paid to the incorporation of plant protein sources in substantial amounts in animal's milk for pre-ruminant lambs as a milk replacer (Sissons, 1982). Soya bean (*Glycine max*) is rich in protein content. Feeding of soya beans as soya meal, soya milk and soya based milk replacers are reported by many scientists (Chakrabarti and Gangopadhyay, 1990; Ouedraogo *et al.*, 1998). Feeding of soya milk along with ewe's milk can be fed to orphan lambs (Belal *et al.*, 2010). The objective of the study was to prepare soya milk and ewe's milk blend and to replace the ewe's milk partially in the diet of suckling Mecheri lambs thereby assessing the growth performance.

MATERIALS AND METHODS

A total of 250 g of soya bean were roasted until the bean get brown colour. The roasted soya beans were cooled under the room temperature for short period and followed by soaking at over night in water containing 0.3% sodium bicarbonate solution (Ouedraogo *et al.*, 1998). After, the toasted beans were washed with portable water at least 2-3 times and blanched in boiling water for

45-60 min by gentle stirring. There after the beans were manually dehulled. Along with the dehulled soya beans 2 kg of luke warm water was added and ground well. The mix was boiled for 2 min and filtered through a muslin cloth to remove the solid particles. Finally, the collected soya milk was analyzed for its composition. The ewe's milk was collected from the lactating ewes of the respective lambs. Then, the milk samples were pooled and thoroughly mixed for the compositional analysis. The fat percentage in the soya milk and ewe's milk was estimated for standardization of fat percentage in soya milk and ewe's milk blend. The fat percentage in the soya milk and ewe's milk blend was standardized to 6% by adding butter oil by using Pearson's square method.

Selection of experimental animals: About 1 week old Mecheri lambs having average weight of 2.2 kg were selected randomly from the Mecheri Sheep Research Station, Pottaneri, Salem district of Tamil Nadu State. The lambs were divided into three groups such as control (TC) fed exclusively with ewe's milk, treatment 2 (T₂) fed with 50% of soya milk and 50% of ewe's milk blend and treatment 3 (T₃) fed with 75% soya milk and 25% ewe's milk blend. All the lambs were fed 10% of their body weight (Lalles *et al.*, 1995). Growth performance of

Mecheri lambs in different treatment groups were calculated in 30, 60 and 90 days of age. The data collected on various treatments were subjected to Analysis of Variance (ANOVA) procedure. The data were analyzed by approved statistical methods of Snedecor and Cochran (1989).

RESULTS AND DISCUSSION

The soya milk contained (in percentage) 1.65 fat, 5.30 protein, 2.75 carbohydrate and 10.73 total solids and the Mecheri ewe's milk contained (in percentage) 6.33 fat and 4.00 protein, 3.90 carbohydrates and 14.97 total solids, respectively (Table 1).

The fat percentage in the soya milk and ewe's milk blend (Table 2) of the both the treatments T_2 and T_3 were standardized to 6% by adding butter oil. The fat corrected soya milk and ewe's milk blend (T_2) had 6.00 (in percentage) fat, 4.65 protein, 3.33 carbohydrate and 14.71 total solids and the fat corrected soya milk and ewe's milk blend (T_3) had (in percentage) 6.00 fat, 4.98 protein, 3.05 carbohydrate and 14.76 total solids, respectively (Table 2).

The control group had a mean body weight (kg) of 3.43, 6.34 and 8.57, the T_2 group had 3.69, 6.34 and 9.99 and the T_3 group (Table 3) had 3.74, 6.89 and 10.33 at 30, 60 and 90 days of age, respectively. No significant difference was noticed among the treatment groups on 30 days of age. But there was a significant difference was

noticed among the treatment groups on 60 and 90 days of age. The growth performance of the T_2 and T_3 showed significantly higher ($p < 0.01$) weight gain than the control group. Among the three groups the higher weight gain was observed in T_3 , this might be due to the higher protein, total solids content of the respective soya milk and ewe's milk blend fed. The lambs growth performance in control group showed significantly lesser weight gain than the treatment groups might be due to lower protein per cent in their ewes milk.

According to Marwaha *et al.* (1994), newly born Jersey and Jersey x Red Sindhi calves were reared by feeding calf starter (T_1) vis a vis T_2 and T_3 milk replacers up to 90 days age. The respective body weight gains were observed to be significantly higher ($p < 0.05$) both under T_1 and T_3 groups as compared to that of T_2 group. The high weight gain calves of T_1 and T_3 groups were due fortification soya meals along with their feed as compared to T_2 group. Reproductive performance of lactating Sarda ewes were improved while flushing the ewes with soybean meal at Bonassai Research Institute (Molle *et al.*, 1997).

Sissons (1982) was studied various effects of soya bean products on digestive process in the gastrointestinal tract of preruminant calves after treating of soybeans by steam heating or toasting to reduce activities of protease inhibitors and lectin. In addition, Belal *et al.* (2010) also supported that the changing the degradability of the soybean meal by non-enzymatic browning (Maillard reaction) to improve the growth performance when compared to the untreated soybean meal in finishing diets containing 16% CP. In contrast to the above experiment, Sheehan and Hanrahan (1989) showed that lamb growth rate increased as the protein content of the diet increased and the response was greatest at the lower levels of protein. Fish meal gave better lamb performance than soyabean meal in all three experiments but the differences were not statistically significant. The present results are in agreement with the opinion of Marwaha *et al.* (1994), Molle *et al.* (1997). Sissons (1982) and Belal *et al.* (2010).

CONCLUSION

The present investigation reveals that the feeding of soya milk and ewe's milk blend fed at the 50:50 and 75:25% level increased the growth performance of suckling Mecheri lambs and further similar feeding programme of this type will be beneficial for orphan lambs for improving the growth performance at a steady state.

Table 1: The composition of soya milk and ewe's milk (n = 12)

Particulars	Percentage			
	Fat	Protein	Carbohydrate	Total solids
Soya milk	1.65±0.01	5.30±0.05	2.75±0.01	10.73±0.01
Ewe's milk	6.33±0.04	4.00±0.05	3.90±0.02	14.97±0.02

Table 2: The composition of fat standardized soya milk and ewe's milk blend of different treatments (n = 12)

Particulars	Percentage			
	Fat	Protein	Carbohydrate	Total solids
(T_2)	6.00±0.04	4.65±0.01	3.33±0.03	14.71±0.01
(T_3)	6.00±0.03	4.98±0.01	3.05±0.01	14.76±0.01

T_2 : 50% soya milk and 50% ewe's milk blend; T_3 75% soya milk and 25% ewe's milk blend

Table 3: Growth performance of Mecheri lambs in different treatments

Treatments	Growth performance of Mecheri lambs		
	Tc	T2	T3
30 days weight ^l ^{NS}	3.43±0.06	3.69±0.10	3.74±0.11
60 days weight*	6.34±0.06	6.81±0.11 ^a	6.89±0.09 ^b
90 days weight*	8.57±0.17	9.99±0.12 ^a	10.33±0.16 ^b

Mean±SE shows the ±values; *Mean bearing (n = 6) different superscripts within the treatment differ significantly ($p < 0.01$); NS: Not Significant

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