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Comparative performance of purebred and crossbred Tellicherry kids

A K THIRUVENKADAN[1], K KARUNANITHI[2], J MURALIDHARAN[3] and K SENTHILVEL[4]

Mecheri Sheep Research Station, Pottaneri, Tamil Nadu 636 453, India

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Salem Black goats are distributed in north-western part of Tamil Nadu and are reared mainly for meat and the primary by-product is skin. They are hardy in nature and well adapted to semi-intensive and extensive form of rearing (Thiruvenkadan and Karunanithi, 2006). Tellicherry goats are one among the milch breed of goats in India and are also reared extensively in different parts of Tamil Nadu and well adapted to intensive system of rearing (Thiruvenkadan *et al.* 2007). Hence a crossbreeding programme was made to produce the dual-purpose crossbred goats by crossing Tellicherry and Salem Black goats. The performance of the purebred and crossbred kids were compared under identical management condition. This will help to reveal the superiority in terms of growth performance of purebred and crossbred kids under uniform managemental conditions.

Study on comparative performance of purebred and crossbred Tellicherry kids was made at Mecheri Sheep Research station, Pottaneri, from 2002 to 2005. For crossbreeding programme a total of 20 does (10 Salem Black and 10 Tellicherry goats) and 5 bucks (4 Tellicherry and 1 Salem Black goats) were utilized for the production of Tellicherry × Salem Black crossbred kids with 50 % blood level of both the breeds. In this experiment, purebred Salem Black does were mated with purebred Tellicherry bucks and vice versa for the production of crossbred kids. In addition pure breeding of Tellicherry goats was also carried separately with 20 Tellicherry does and four bucks. The adult animals and their kids were maintained under intensive system of management. They were fed with tree leaves, grasses and legumes along with concentrate mixture. Crossbred kids (21 males and 22 females) and 40 purebred Tellicherry kids (21 males and 19 females) were obtained. The body weight of the kids was recorded at fortnight intervals up to three months of age and at monthly intervals from 4th month to 12th month of age. Six crossbred and 6 purebred kids with incomplete records due to mortality were not included for analysis. The data were subjected to basic statistical analysis as per Snedecor and Cochran (1989). In addition correlation between body weight at different age groups and prediction equation for predicting body weight at three, 6 and 12 months of age were made by using multiple regression analysis as described by Harvey (1990).

Present address: [1]Assistant Professor, Department of Animal Genetics and Breeding, [3]Assistant Professor, Department of Livestock Production and Management, [4]Assistant Professor, Department of Veterinary Parasitology, Veterinary College and Research Institute, Namakkal 637 002.

[2]Professor and Head, Mecheri Sheep Research Station, Pottaneri 636 543.

Sex ratio

The overall sex ratio (male:female) of Tellicherry purebred kids was 48.8% male to 51.2% female (i.e., 1:1.05). For crossbred kids, the sex ratio was 52.5% male to 47.5% female (i.e., 1:0.90). The sex ratio between males and females of purebred and crossbred kids was not significantly different. It is similar to the reports of Soundararajan and Sivakumar (2006) for the same breed.

Comparative performance of purebred and crossbred kids

Mean (±SE) body weight of purebred and crossbred Tellicherry kids are presented in Table 1. The birth weight of purebred Tellicherry male and female kids observed in this study was higher than the values reported for the same breed (Sivakumar and Thiagarajan 1999). The body weight at different ages observed in purebred Tellicherry goats in the present study was comparable to the values reported by Thiruvenkadan *et al.* (2007). The body weight of the Tellicherry purebred and crossbred kids increased linearly as the age advanced. The growth rate of purebred and crossbred kids was almost similar up to fifth month of age, afterwards, the body weight of the purebred kids was slightly higher than crossbred kids but it was not significant. Sankhyan *et al.* (1997) also reported no difference in body weight of purebred and crossbred Malpura ewes. In general, in both purebred and crossbred kids, the body weight of male kids was higher than female kids and it was not significant except at 12 months where the body weight of Tellicherry males and females was significant ($P<0.05$). On the contrary, Jangam *et al.* (2003), Yadav *et al.* (2003) and Kumar *et al.*

Table 1. Mean (±SE) body weight of Tellicherry and Tellicherry × Salem Black crossbred kids

Age group	Tellicherry purebred kids			Tellicherry × Salem Black crossbred kids		
	Male (n=17)	Female (n=17)	Pooled (n= 34)	Male (n=17)	Female (n=20)	Pooled (n=37)
Birth	2.3±0.1[a]	2.2±0.1 [a]	2.2±0.1 [a]	2.2±0.1 [a]	2.1±0.1 [a]	2.1±0.1 [a]
15th day	3.9±0.2 [a]	3.2±0.2 [a]	3.5±0.2 [a]	3.5±0.2 [a]	3.6±0.2 [a]	3.6±0.2 [a]
30th day	5.0±0.3 [a]	3.9±0.3 [a]	4.5±0.2 [a]	4.4±0.3 [a]	5.0±0.3 [a]	4.7±0.2 [a]
45th day	5.7±0.3 [a]	4.6±0.4 [a]	5.1±0.3 [a]	5.0±0.4 [a]	5.6±0.4 [a]	5.3±0.3 [a]
60th day	6.2±0.3 [a]	5.4±0.4 [a]	5.8±0.3 [a]	5.5±0.4 [a]	6.2±0.4 [a]	5.9±0.3 [a]
75th day	6.8±0.3 [a]	6.1±0.4 [a]	6.4±0.3 [a]	6.4±0.4 [a]	6.9±0.5 [a]	6.6±0.3 [a]
90th day	7.6±0.4 [a]	6.7±0.5 [a]	7.2±0.3 [a]	7.1±0.5 [a]	7.5±0.5 [a]	7.3±0.4 [a]
4 month	8.7±0.4 [a]	7.7±0.6 [a]	8.2±0.4 [a]	8.1±0.5 [a]	8.4±0.5 [a]	8.3±0.4 [a]
5 month	10.0±0.5 [a]	8.8±0.6 [a]	9.4±0.4 [a]	9.1±0.6 [a]	9.2±0.6 [a]	9.1±0.4 [a]
6 month	11.3±0.5 [a]	9.8±0.6 [a]	10.5±0.4 [a]	10.2±0.6 [a]	9.8±0.6 [a]	10.0±0.4 [a]
7 month	11.9±0.5 [a]	11.2±0.7 [a]	11.6±0.4 [a]	10.8±0.6 [a]	9.9±0.5 [a]	10.3±0.4 [a]
8 month	12.6±0.6 [a]	12.1±0.8 [a]	12.3±0.5 [a]	11.3±0.6 [a]	10.3±0.5 [a]	10.8±0.4 [a]
9 month	14.4±0.7 [a]	13.3±0.8 [a]	13.8±0.5 [a]	12.3±0.5 [a]	11.2±0.5 [a]	11.7±0.4 [a]
10 month	15.3±0.7 [a]	13.8±0.8 [a]	14.6±0.5 [a]	13.5±0.6 [a]	11.8±0.6 [a]	12.6±0.4 [a]
11 month	16.7±0.8 [a]	14.6±0.7 [a]	15.6±0.6 [a]	15.0±0.5 [a]	13.1±0.5 [a]	14.0±0.4 [a]
12 month	18.1±0.8 [a]	15.7±0.7[b*]	16.9±0.6[a]	16.3±0.6 [a]	14.4±0.6 [a]	15.3±0.4 [a]

Means bearing same superscript do not differ significantly, * significant (P<0.05).

(2007) reported significant difference in body weight at different ages between sexes.

Within the crossbred kids, the growth rate of kids produced between Tellicherry does and Salem Black bucks and vice versa was studied. The pooled means for body weight of crossbred kids at birth, 3, 6 and 12 months of age were 2.1±0.1, 7.0±0.5, 9.7±0.6 and 15.2±0.6 kg, respectively, for cross between Tellicherry bucks and Salem Black does and 2.2±0.1, 7.5±0.5, 10.1±0.6 and 15.4±0.6 kg, respectively, for cross between Tellicherry does and Salem Black bucks. The study revealed that the growth rate of kids in both types of crossing was of similar magnitude and did not differ significantly.

The pre-weaning (0 to 3 months) body weight gain of Tellicherry purebred male and female kids were 59.53±4.04 and 51.00±4.73 g/day and the values for crossbred kids were 55.06±4.74 and 59.55±5.37 g/day respectively. The post-weaning (>3 to 12 months) body weight gains of Tellicherry purebred male and female kids were 38.78±2.98 and 33.33±2.16 g/day respectively and the corresponding values for crossbred kids were 34.11±1.66 and 25.85±1.92 g/day respectively. The pre-weaning and post-weaning weight gains of Tellicherry purebred kids were higher than those observed in crossbred kids and were not significant. In both purebred and crossbred kids, the body weight gain was higher in 0–3 months age group. It is in accordance with the report of Jangam *et al.* (2003), Yadav *et al.* (2003) and Kumar *et al.* (2007). In Tellicherry kids the post-weaning weight gain was almost similar in >3–6, >6–9 and >9–12 months periods, whereas, in crossbred kids the growth rate was higher in >9–12 months of age, when compared to >3–6 months and >6–9 months period. In both purebred and crossbred kids the body weight gain in males was higher than female kids of all the age groups and it was not significant except at >9–12 months of age where it was significant (P<0.05).

Growth rate of single and twin born lambs

The body weight of Tellicherry purebred single born kids pooled over sexes at birth, 3, 6, 9 and 12 months of age were 2.3±0.1, 7.3±0.5, 10.6±0.5, 14.0±0.8 and 16.8±0.8 kg respectively and for twin born kids these values were 2.1±0.1, 7.1±0.4, 10.5±0.6, 13.7±0.7 and 17.1±0.9 kg respectively. The body weight of Tellicherry crossbred single born kids pooled over sexes at birth, 3, 6, 9 and 12 months of age were 2.2±0.1, 7.4±0.4, 10.3±0.5, 12.0±0.4 and 15.4±0.4 kg respectively and for twin born kids these values were 2.0±0.1, 7.0±0.7, 9.0±0.9, 10.8±0.8 and 15.1±1.3 kg respectively. In general, kids born as single were heavier than twins at all age groups and it was not significant. The higher body weight observed in kids born as singles was due to the fact that dams with single kid provide more nutrition to their kids during prenatal and suckling period and the same has been reflected in later periods. It is in accordance with the reports of Yadav *et al.* (2003) and Sharma and Pathodiya (2006). In general males were heavier than females in both purebred and crossbred kids and it was not significant, except in twin born crossbred and purebred kids, where the body weight of males and females were significant after fifth months of age. This might be due to better growth rate of male kids than female kids.

Correlation coefficient and fitted regression

The correlation coefficient between birth weight and 3, 6, 9 and 12 months weight was 0.511, 0.443, 0.290 and 0.260

respectively. Three months weight had higher correlation (0.820) with 6 months weight and 6 months weight had a correlation of 0.731 with 9 months weight and a correlation of 0.706 with 12 months body weight. The multiple regression analysis revealed that the birth weight explained only 26.1% of variation in 3 months body weight. On the other hand 67.3 % of variation in 6 months weight was explained by 3 months weight. This indicated that the 3 months weight plays a major role in determining the body weight at 6 months of age. Sivakumar and Thiagarajan (1999) reported higher R^2 values for predicting the birth weight and 18 months body weight in Tellicherry goats.

SUMMARY

Study on growth performance of purebred and crossbred Tellicherry kids revealed that the overall means for body weight of purebred Tellicherry kids at birth, 6 and 12 months of age were 2.2±0.1, 10.5±0.4 and 16.9±0.6 kg respectively and the values for crossbred kids were 2.1±0.1, 10.0±0.4 and 15.3±0.4 kg respectively. In general, the purebred Tellicherry kids were heavier than crossbred kids but it was not significant. Further study on reproduction performance and adaptation to the extensive system of management (prevailing in the farmers field condition) are warranted before introduction of the crossbred kids into the farmers fields conditions.

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