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SHORT COMMUNICATION

Influence of Non-Genetic Factors on Birth Weight of Tellicherry Kids Reared under Intensive Goat Farming in Tamil Nadu

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ABSTRACT

A study was conducted in sixty numbers of tellicherry kids at a well managed private farm, Chennai in 2014. The factors assessed were sex of the kid, type of birth (single, twin and triplet), age of the doe and weight of the doe at the time of kidding. Statistical analysis was performed using SAS statistical package program (SAS, 1998). Difference between two means was evaluated using Duncan's Multiple Range Test. The overall least squares mean of birth weight and type of birth in Tellicherry goats was 1.95±0.08 and 2.27±0.09 respectively. Our findings revealed that type of birth, sex of the kids and age and weight of the doe exerted a significant effect (P<0.001) on birth weight of kids. It was concluded that famers should consider the age as well as weight of the dam before breeding for bet er birth weight of kids.

Keywords: Nongenetic factor, birth weight, tellicherry goat, type of birth

Birth weight is an economically important trait in livestock production and it is controlled by polygenes. The birth weight of kids depends upon the nutrition which is received by the dam

during pregnancy. Birth weight has high correlation with weight gain until weaning (Karakus *et al.* 2010). The birth weight trait provides useful information for early selection of breeding program. Tellicherry breed is considered as a unique genotype exhibiting higher multiple birth percentages and higher milk yields (Meenakshi Sundaram *et al.* 2012). The genotypes 175/185 of BM1329 and 104/106 of TGLA68 in Tellicherry were found to be related to a higher litter size. For the allele 104 bp of TGLA68, highest frequency (0.4545) was observed in triplets followed by twins (0.2177) and singles (0.1847) in Tellicherry goats (Seena *et al.* 2012). Tellicherry goats are reared in Tamil Nadu mainly for breeding purpose. Compared to native goat breeds of Tamil Nadu such as Kanni and Kodi, an adult Tellicherry female ranges in weight from 30 to 40 kgs, whereas an adult male ranges between 40 to 50kgs. Twinning is also common in tellicherry.The present study was conducted to analyse the effect of sex, type of birth and age and weight of does on birth weight of Tellicherry goats.

The data were collected from sixty Tellicherry goat kids born in a well organized private goat farm in 2014. Sex of the kid, type of birth , age and weight of the doe at the time of kidding and birth weights (kg) of these kids were recorded. Statistical analysis was performed using SAS statistical package program (SAS, 1998). Difference between two means was evaluated using Duncan's Multiple Range Test. Correlation was also carried out to know the relation of these factors (doe's body weight, type of birth and age of doe) with the birth weight of kid.

The assumed linear model for analyzing the data is given below:

Yijk = μ+Si+Lj+Ak+eijk

Yijkm = t the dependent variable

μ = the overall mean;

Si = effect of sex;a

Lj = effect of type of birth (j = 1 (singles), 2 (twins); 3 (triplets))

Ak = effect of doe's age (k = 1 (upto 1year), 2 (1-2 year), 3 (2-3 year), 4 (3-4 year), 5 (4-5 year))

eijk = effect of residual.

Least squares means of birth weight and type of birth in tellicherry kids were presented in Table 1. The overall least squares mean of birth weight and type of birth of tellicherry goats was 1.95±0.08 and 2.27±0.09 respectively. Significant (P<0.001) difference between birth weight of kids and sex of the kids was found (Table 1). Male kids were significantly heavier than female kids. Karna et al. (2001) and Afzal et al. (2004) reported the same results in Cheghu kids and in Beetal kids respectively.

Table 1: Least squares means of birth weight and birth type of Tellicherry kids

Factors	No of observation	Least squares means of birth weight
Overall	60	1.95 ± 0.077
Sex		
Female	23	1.87 ± 0.12[a]
Male	37	2.00 ± 0.10[b]
Type of birth		
Single	8	2.063 ± 0.20[a]
Twines	28	1.97 ± 0.20[a]
Triplets	24	1.90 ± 0.12[a]
Age group of dams		
Age group 1 (up to 1year)	6	1.60 ± 0.20[a]
Age group 2 (>1-2 year)	10	1.32 ±0.10[a]
Age group 3 (>2-3 year)	11	1.36 ±0.10[a]
Age group 4 (>3-4 year)	18	2.40 ±0.07[b]
Age group 5 (>4-5years)	15	2.40 ± 0.08[b]
Least squares means of birth type		
Overall	60	2.267 ± 0.09
Age group 1 (up to 1year)	6	2.00 ± 0.45[a]
Age group 2 (>1-2 year)	10	2.00 ± 0.00[a]
Age group 3 (>2-3 year)	11	2.27 ± 0.27[ab]
Age group 4 (>3-4 year)	18	2.56 ± 0.17[b]
Age group 5 (>4-5years)	15	2.20 ± 0.11[ab]

Values with different superscripts differ for each factor significantly (P<0.001)

Tellicherry goats are prolific breed and incidences of multiple births were very common. The incidence of single, twins and triplets recorded in the present study were 26.67, 46.67 and 26.67 per cent respectively. Our findings revealed that single kids were heavier than twins and triplets. and it is concurred with the findings of Afzal et al. (2004) and Mia et al. (2013). In this study birth weight of single, twin and triplet kids were 2.06±0.20, 1.97±0.20 and 1.90±0.12 respectively. But the type of birth has no statistical significance on birth weight of kids. Negative correlation (-0.092) was found between birth weight of kids and type of birth indicating that the average birth weight of kid decreases with increase of lit er size (Table 2)..

The results are agreed with the findings of Bharathidhasan et al. (2009) and Banerjee and Jana (2010) who reported that heavy weight of single kid at ributed to uterine environment in which the fetus does not have to share with its lit ermates, there by at aining higher body weight than the twin and triplet born kids.

The results of the present study showed that age of the doe on birth weight and lit er size was more significant (P<0.001). Fig. 1 and 2 shows that the relationship between doe's age and kid's birth weight. Kids born from dams with age group of 4 & 5 were 2.40 Kg, which was significantly heavier than others .As age advanced there was significant increase in birth weight of kids and lit er size. Overall lit er size was recorded as 2.27±0.09. Lit er size in Tellicherry goats ranges from 2.00 to 2.56.

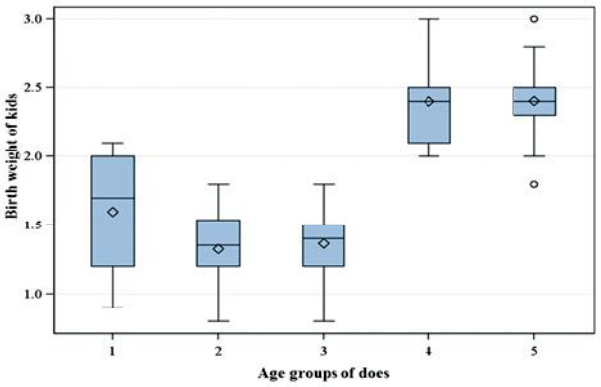

Fig. 1. Distribution of Tellicherry kids birth weight

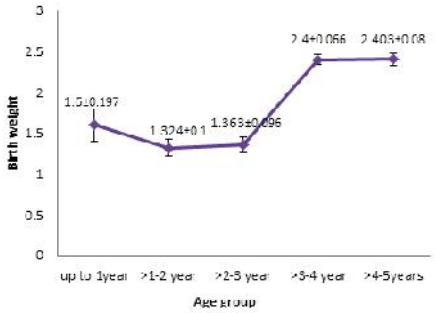

Fig. 2. Relation between birth weight of kid and age of doe

The average weight of the dams in our study was 29.96 ± 0.52 (30). In our study the weight of the dam also had significant bearing on birth weight of the kids and the result is concurred with the results of Banerjee and Jana (2010). Birth weight of kids were significantly (P<0.01) positively correlated with age (+0.68) and body weight of does (+0.46). Phenotypic correlations were estimated for age and body weight of does, type of birth and birth weight of kids (Table 2). It was concluded that farmers should consider the age as well as weight of the dam before breeding for bet er birth weight of kids.

Table 2. Estimation of phenotypic correlation between traits

	Does body weight	Birth weight of kids	Type of birth	Age of does
Does body weight	1	0.460**	0.107	0.805**
Birth weight of kids	**0.460****	1	–0.092	0.676**
Type of birth	0.107	–0.092	1	0.136
Age of does	**0.805****	**0.676****	0.136	1

** Correlation is significant at the 0.01 level

SUMMARY

Effect of nongenetic factors such as sex of the kid, type of birth, age and weight of the doe at the time of kidding on birth weight of tellicherry was assessed. Our findings revealed that type of birth, sex of the kids , age and weight of the doe exerted a significant effect (P<0.001) on birth weight of kids. So farmers should consider the age as well as weight of the dam before breeding for bet er birth weight of kids.

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