www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; SP-10(4): 65-67

www.thepharmajournal.com
Received: 01-02-2021
Accepted: 06-03-2021

R Selvam
Livestock Farm Complex, Veterinary College and Research Institute, Tirunelveli, Tamil Nadu, India

R Venkataramanan
Livestock Farm Complex, Veterinary College and Research Institute, Tirunelveli, Tamil Nadu, India

T Ravimurugan
Livestock Farm Complex, Veterinary College and Research Institute, Tirunelveli, Tamil Nadu, India

SC Edwin
Livestock Farm Complex, Veterinary College and Research Institute, Tirunelveli, Tamil Nadu, India

Corresponding Author:
R Selvam
Livestock Farm Complex, Veterinary College and Research Institute, Tirunelveli, Tamil Nadu, India

Effect of non-genetic factors on productive traits in goat breeds

R Selvam, R Venkataramanan, T Ravimurugan and SC Edwin

Abstract
The objective of this study is to analyze the impact of non-genetic parameters such as Breed and Sex on body weight at different ages of goat breeds. The data on the body weight of Kanni Adu, Kodi Adu, Jamunapari and Tellichery goat breeds were collected and the body weights at different ages and average daily gains were estimated. Statistical analysis of the data was done using R software. The overall birth weight, weaning weight, one year body weight of all goat breeds were 2-2.9 kg with the mean of 2.35±0.05, 6.7-11.1 kg with the mean of 8.06 ±0.25, 15.4-25.3 kg with the mean of 18.48±0.5, respectively. The pre-weaning and post weaning average daily weight gain of goat breeds ranges from 0.04-0.09 kg and 0.01-0.05 kg with the mean of 0.06 and 0.04 kg, respectively. There is no significant difference between sex in birth weight, weaning weight and pre/post weaning average daily weight gain. But significant difference between male and female goats observed in 6 months, 9 months and 1 year body weight. The least square means of birth weight of Kanni Adu, Kodi Adu, Tellichery and Jamunapari were 2.29±0.04, 2.34±0.04, 2.50±0.04 and 2.64±0.04; weaning weight were 7.84±0.23, 7.73±0.22, 10.12±0.25 and 7.52±0.22b; one year body weight were 18.5±0.334, 18.3±0.32, 22.5±0.37 and 17±0.36, respectively. Different estimates could be due to differences in genetic merit of breeds. From the above study it was concluded that there was significant effect of non-genetic factors namely sex and breed on production parameters of the studied goat breeds.

Keywords: Non-genetic factors, goat, body weight, breed and sex

Introduction
Goat plays an important part in affording additional revenue and occupation to many farmers and landless agricultural laborers of India. According to 20th livestock census of India the total Goat Population in the country is 148.88 Million during 2019. Total Goat has increased by 10.14% over previous livestock census (2012) and about 27.8% of the total livestock is contributed by goats. In recent years research works are focussed on increasing the goat productivity. To increase the goat productivity it is mandatory to identify and estimate the genetic and non-genetic factors affecting the economically important traits (Hamed *et al*., 2009) [1]. Genetic improvement can be achieved by selection where effect of non genetic factors on productive traits is most important. Knowledge about environmental factors namely climate, breed, sex, type of birth and age of the dam, etc., is essential for the production of goats (Zinat Mahal *et al*., 2013) [2]. In this background, this study aims to analyse the impact of non-genetic parameters such as Breed and Sex on body weight at different ages of goat breeds

Materials and Methods
The data on the body weight of Kanni Adu, Kodi Adu, Jamunapari and Tellichery goat breeds belongs to both sex maintained at Livestock farm complex, VCRI, Tirunelveli, Tamil Nadu, India were collected over a period of 10 years (2009 - 2018). The body weights at different ages i.e. at birth and at three, six, nine and 12 months were recorded. The average daily gains in live weights from birth until weaning and from weaning until the age of 12 months were estimated. Statistical analysis of the data was done using R software (R version 4.0.2, https://www.r-project.org/) to examine the effect of sex and breed on birth, weaning weight and pre/post weaning gain.

Results and Discussion

The overall total number of animals including all the goat breeds analyzed at every stage, the minimum, maximum, range, mean with standard deviation and standard error, median, skewness and kurtosis of body weight of goat at birth, weaning (3 months), 6, 9 and 12 months, body weight and pre weaning average daily weight gain and post weaning average daily weight gain are given in the table 1.

Table 1: Descriptive Statistics of Goat Breeds

Trait	No.	Min	Max	Range	Mean	sd	se	Median	Skew	Kurtosis
B wt	20	2	2.9	0.9	2.35	0.24	0.05	2.33	0.88	0.14
W wt	20	6.7	11.1	4.4	8.06	1.11	0.25	7.58	1.31	0.74
6M wt	20	8.25	16.55	8.3	12.51	2.17	0.48	13.25	-0.7	-0.42
9M wt	20	11	21.75	10.75	15.95	2.43	0.54	16.3	-0.13	0.3
12M wt	19	15.4	25.3	9.9	18.48	2.19	0.5	17.65	1.58	2.46
Pre W ADG	20	0.04	0.09	0.05	0.06	0.01	0	0.06	0.91	0.35
Post W ADG	20	0.01	0.05	0.04	0.04	0.01	0	0.04	-1.35	4.08

B wt: Birth weight; W wt: Weaning weight; M: months; Pre W ADG: pre weaning average daily weight gain; Post W ADG: Post weaning average daily weight gain; min: Minimum body weight; Max: Maximum body weight; Sd: Standard deviation; se: Standard Error

The overall birth weight of all goat breeds ranges from 2-2.9 kg with the mean of 2.35±0.05. The weaning weight ranges from 6.7-11.1 kg with the mean of 8.06 ±0.25. The one year body weight of goat breeds ranges from 15.4-25.3 kg with the mean of 18.48±0.5. The pre-weaning and post weaning average daily weight gain of goat breeds ranges from 0.04-0.09 kg and 0.01-0.05 kg with the mean of 0.06 and 0.04 kg, respectively. The body weights of goats at the different ages were within the range of values observed in earlier reports (Acharya, 1982) [3].

The variations in least-squares means (± S.E.) for body weight at different ages between male and female goat is presented in Table 2.

Table 2: Least-squares means (± S.E.) of body weight (kg) Male and Female of Goat breeds at different age groups

Factor	B wt	W wt	6M wt	9M wt	12M wt	Pre W ADG	Post W ADG
Sex	**	NS	NS	**	**	NS	NS
Male	2.62±0.04a	8.55±0.22a	13.4±0.31a	17.4±0.32a	20.2±0.32a	0.07±0.00a	0.04±0.00a
Female	2.26±0.02a	8.06±0.13a	12.3±0.18b	15.6±0.18b	18±0.2 b	0.06±0.00a	0.04±0.00a

There is no significant difference between sex in birth weight, weaning weight and pre/post weaning average daily weight gain. But significant difference between male and female goats observed in 6 months, 9 months and 1 year body weight. Higher birth weight in male may be attributed to the anabolic effect of male sex hormones. High birth weight of male kids and significant effect of sex was also reported in Barbari (Bharathidhasan *et al*., 2009) [4], Tellichery goat (Thiruvenkadan *et al*., 2009) [5], Jamunapari (Roy *et al*., 1997) [6] and Boer graded goats (Selvam, 2018) [7]. The results are also agreed with the finding in Anglo-Nubian, Alpine, Toggenburg and Saanen goats (Castillo *et al*., 1976) [8] and Markhoz Goat (Rashidi *et al*., 2008) [9].

The least-squares means (± S.E.) for body weight at different ages between goat breeds are presented in Table 3.

Table 3: Least-squares means (± S.E.) of body weight (kg) and Average Daily gain (kg) of Goat breeds at different age groups

Factor	B wt	W wt	6M wt	9M wt	12M wt	Pre W ADG	Post W ADG
Kanni Adu	2.29±0.04c	7.84±0.23b	13.7±0.32b	17±0.33b	18.5±0.334b	0.06±0.00b	0.04±0.00ab
Kodi Adu	2.34±0.04c	7.73±0.22b	13.5±0.3b	17±0.31b	18.3±0.32b	0.06±0.00b	0.04±0.00b
Tellichery	2.50±0.04b	10.12±0.25a	14.8±0.35a	19.3±0.36a	22.5±0.37a	0.08±0.00a	0.05±0.00a
Jamuna pari	2.64±0.04a	7.52±0.22b	9.3±0.3c	12.8±0.32c	17±0.36b	0.05±0.00b	0.03±0.00b

The least square means of birth weight of Kanni Adu, Kodi Adu, Tellichery and Jamunapari were 2.29±0.04, 2.34±0.04, 2.50±0.04 and 2.64±0.04; weaning weight were 7.84±0.23, 7.73±0.22, 10.12±0.25 and 7.52±0.22b; one year body weight were 18.5±0.334, 18.3±0.32, 22.5±0.37 and 17±0.36, respectively. Different estimates could be due to differences in genetic merit of breeds. The effects of breed have been shown to be important sources of variation for all traits. These results obtained from this research are in agreement with results reported in previous studies (Selvam, 2018) [7] & (Singh Satbir *et al*., 2002) [10].

From the above study it was concluded that there was significant effect of non-genetic factors namely sex and breed on production parameters of the studied goat breeds. It exposed a growth trend through the mean values. However, the variation found may not be signified due to less volume of data. This study may be further continued with increased number of breeds and data with additional parameters to analyze the impact of non-genetic factors on economic traits which would be immense helpful to formulate management policies.

Acknowledgement

The authors are very much grateful to the Tamil Nadu Veterinary and Animal Sciences University, Chennai-600 051 for providing necessary facilities for conducting the study.

References

1. Hamed AM, Mabrouk M, Shaat I, BATA S. Estimation of genetic parameters and some nongenetic factors for litter size at birth and weaning and milk yield traits in Zaraibi goats. Egyptian Journal of Sheep & Goat Sciences 2009;4(2):55-64.
2. Zinat Mahal M, Khandoker AMY, Haque MN. Effect of

non genetic factors on productive traits of Black Bengal goats. Journal of Bangladesh Agricultural University 2013;11(1):79-86.

3. Acharya RM. Sheep and Goat Breeds of India. FAO Animal Production and Health Paper 30, Food and Agriculture Organisation of the United Nations, Rome 1982, viii +190.
4. Bharathidhasan A, Rita Narayanan, Gopu P, Subramanian A, Prabakaran R, Rajendran R. Effect of nongenetic factors on birth weight, weaning weight and preweaning gain of Barbari goat. Tamilnadu Journal of Veterinary & Animal Sciences 2009;5(3):99-103.
5. Thiruvenkadan AK, Murugan M, Karunanithi K, Muralidharan J, Chinnamani K. Genetic and non-genetic factors affecting body weight in Tellicherry goats. South African Journal of Animal Science 2009;39(1):107-111.
6. Roy R, Saxena VK, Singh SK, Khan BU. Genetic analysis of body weight at different ages in Jamnapari goats. Indian Journal of Animal Science. 1997;67:337-339.
7. Selvam R. Genetic and non-genetic factors affecting the birth weight of Boer graded goats and non-descript goats. International Journal of Science, Environment and Technology 2018;7:900–904.
8. Castillo J, Garcia O, Verde SO, Peraza, F. Growth of kids of four imported goat breed. Merori Association Latino americana de production Animal 1976;11:29-30.
9. Rashidi A, Sheikhahmadi M, Rostamzadeh J, Shrestha JNB. Genetic and Phenotypic Parameter Estimates of Body Weight at Different Ages and Yearling Fleece Weight in Markhoz Goats. Asian-Australasian Journal of Animal Sciences. 2008;21(10):1395-1403.
10. Singh Satbir, Rana ZS and Dalal DS. Genetic and non-genetic factors affecting growth performance in goats. Indian Journal of Animal Research. 2002;36(1):12-16.