

EFFECT OF NONGENETIC FACTORS ON BIRTH WEIGHT, WEANING WEIGHT AND PREWEANING GAIN OF BARBARI GOAT

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ABSTRACT

A study was conducted to analyse the effect of sex, season, type, parity and year of kidding on birth weight and weaning weight of Barbari goat. The average birth weight of male kids was 4.17 % higher than female kids. However, the average weaning weight of female kids at 3 months was 2.28 % higher than male kids. Birth weight of kids born during northeast monsoon and summer season were higher than southwest monsoon and winter seasons. Further, the weaning weight at southwest monsoon showed the highest value over weaning weights of other seasons. The birth weight and weaning weight of single born kids were of higher weight than twin birth kids. Birth weight of second parity was higher than first and third parity. The weaning weight and average pre weaning daily gain were also higher in second parity than first parity. Birth weight of kids born during year 2007 (1.98 ± 0.08 kgs) had higher values than year 2006 (1.85 ± 0.08 kgs) and year 2005 (1.81 ± 0.10 kgs). However, weight at 3 months had lower value during year 2007 (6.21 ± 0.51 kgs) than year 2006 (7.65 ± 0.47 kgs). The average daily gain was also more during year 2006 than year 2007. It was concluded that there was no significant effect of nongenetic factors on early production parameters of the Barbari goat.

Key words: Barbari goat, birth weight, weaning weight

INTRODUCTION

In India, we have 23 well defined goat breeds. The current world population of goats is 783 million, out of which Asia possesses 63.78 % and India possesses 15.33 % (Singh, 2006). Goat farming plays a major role in the upliftment of rural economy and in gainful employment of rural youth. This is because goats can thrive in hardy weather conditions and can be conveniently reared on uncultivable land where dairy farming is not economical. In India, the small

and marginal farmers including landless agricultural labourers, predominantly rear goats. Further, it is now well documented that goat production could be an important tool to ameliorate the conditions of resource poor rural women in developing countries, the same being seen as a source of women's emancipation by the development agencies. The Barbari goat is a well recognized goat breed in the northwestern part of India. The study on Barbari goat under organized farming conditions in peninsular India is very scanty. Production traits are affected by various nongenetic factors like sex, season, year

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and type of birth (Kumar *et al.*, 2007). Hence, an attempt has been made to know the effects of various nongenetic factors on the body weight at birth, weaning weight and preweaning weight gain of Barbari goat under northeastern agro-climatic conditions of Tamilnadu.

MATERIALS AND METHODS

The present work was undertaken to study the growth performance of 99 Barbari kids from birth to weaning age (90 days) and the influence of nongenetic factors like sex, season, type, parity and year on birth weight, weaning weight and preweaning weight gain at University Research Farm, Madhavaram Milk Colony, Chennai. Barbari kids born in summer (March – May), southwest monsoon (June-August), northeast monsoon (September-November) and winter (December-February) during the period between 2005 and 2007 were considered. The kids were weighed with a balance having sensitivity upto 50 g with in 4-6 hours after birth. All kids were reared under intensive system of standard managerial practices. The newly born kids were reared with dams in kidding pens for individual care for upto 3 days after kidding. Kids suckled their dams and were also allowed *ad libitum* feeding of greenish succulent fodder and creep mixture from the age of one month. Statistical analysis of the data was done with Least Square Maximum Likelihood package (Harvey, 1990) to examine the effect of sex, season, type, parity, and year on birth, weaning weight and preweaning gain.

RESULTS AND DISCUSSION

Mean with standard error for the effect of sex, season, type, parity and year on birth weight, weaning weight and preweaning average daily gain are presented in **Table 1**.

The average birth weight and weaning

weight of Barbari goat was 1.88 ± 0.57 kgs and 6.93 ± 0.30 kgs respectively and the average preweaning daily gain was 55.56 ± 3.31 gm. These values were higher than the reported earlier values in the breeding tract (Acharya, 1982) but, lower than the average birth weight of Kanniadu goats (2.08 kgs) which is the native breed of Tamilnadu (Anon., 2002).

The average birth weight of male and female kids was 1.92 ± 0.07 and 1.84 ± 0.07 kgs respectively. Even though male kids weighed 4.17 % higher birth weight than female kids, there was no significant difference observed. Das *et al.* (1989) reported that the birth weight of male kids of Barbari were significantly higher ($P < 0.05$) than female kids. Similar results were also observed by Singh *et al.* (1983).

Average weaning weight of female kids (7.01 ± 0.42 kgs) at 3 months had higher value than male kids (6.85 ± 0.40 kgs). In female kids it was 2.28 % higher than male kids. Hence average preweaning daily gain of female was also higher than male, but there was no significant difference observed in weaning weight and preweaning gain. Similarly, Seth *et al.* (1968) found non significant effect of sex on preweaning weight gain of Barbari goat. But, earlier reports stated that the male body weight at 3 month age was higher than female body weight (Das *et al.*, 1995). Birth weight of kids born during northeast monsoon season and summer season were of higher value than southwest monsoon and winter seasons, but no significant effect of season was observed. Mittal (1979) reported that winter was superior to summer as kidding season. Paul *et al.* (1990) reported that body weight was significantly affected by season of birth. Das *et al.* (1995) reported that birth weight of kids born during October-February had higher birth weight than March-September season.

Average weaning weight at southwest monsoon (8.00 ± 0.46 kgs) season showed the highest value

than other seasonal weaning weight of Barbari kids. The weaning weight of other seasons had similar values. Paul *et al.* (1990) observed that the body weight at 3 months was significantly ($P < 0.05$) affected by season. The maximal preweaning daily gain was observed at southwest monsoon (70.47 ± 8.84 gms) than summer (46.60 ± 5.01 gms), winter (50.94 ± 7.38 gms) and northeast monsoon (54.22 ± 5.56 gms). Similarly, earlier reports stated that the season of weaning age significantly influenced the average daily gain of the Barbari kids (Paul *et al.*, 1990 and Das *et al.*, 1995). The minimal preweaning gain in summer was due to poor feed intake accompanied by physiological stress caused by excessive heat and inadequate environmental conditions.

Birth weight, weaning weight and preweaning daily gain of single born kids and twin born kids were 1.94 ± 0.08 kgs, 7.16 ± 0.44 kgs and 55.56 ± 4.80 gms and 1.83 ± 0.06 kgs, 6.71 ± 0.40 kgs and 55.45 ± 4.41 gms respectively. Although, the birth weight and weaning weight of single born kids were higher than twin born kids, the effect was found non significant. The average daily gains of single and twin born kids were of similar values. Type of birth did not influence the growth rates. Mittal (1979) observed that the difference between single and twin born kids was non significant.

The effect of second parity on birth weight was more than first and third parity. The weaning weight and average preweaning daily gain had increased in second parity than first parity. Tomar *et al.* (1995) observed that the parity of gestation was found to have significant effect on the trait. Similar results have been reported by Prakash and Singh (1985) and Pandev and Kanaujia (1988).

Birth weight of kids born during the year 2007 had higher values (1.98 ± 0.08 kgs) than year 2006 (1.85 ± 0.08 kgs) and year 2005 (1.81 ± 0.10 kgs). The weaning weight had lower values during year 2007 (6.21 ± 0.51 kgs) than year 2006 ($7.65 \pm$

0.47 kgs). The average daily gain was significantly ($P < 0.05$) higher in year 2006 when compared to year 2007. Variation in the weather, nutrition and farm management from year to year might be responsible for the increased weaning weight for year 2006 than year 2007. Das *et al.* (1995) reported that year of birth had significant influence on weight gain upto 6 months of age.

From the above study it was concluded that there was no significant effect of nongenetic effects on early production parameters of the Barbari goat. However, it revealed a trend of growth pattern through the mean values. The existence of variation may not be evinced by a less quantum of data. This paper is a primary attempt to assess the adaptability and early growth traits under northeastern agro climatic conditions of Tamilnadu.

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Table: 1. Effect of non genetic factors on growth performance of Barbari goats (Mean \pm S.E)

Sl. No.	Effect	Birth weight (kg)	Weaning weight at 3 months (kg)	Prewaning Average daily gain (gm)
1	Overall mean (μ)	1.88 \pm 0.57 (99)	6.93 \pm 0.30 (44)	55.56 \pm 3.31 (44)
2	Sex			
	Male	1.92 \pm 0.07 (52)	6.85 \pm 0.40 (25)	53.34 \pm 4.41 (25)
	Female	1.84 \pm 0.07 (47)	7.01 \pm 0.42 (19)	57.77 \pm 4.59 (19)
3	Season of birth			
	Summer (March-May)	1.94 \pm 0.08 (33)	6.36 \pm 0.46 (17)	46.60 \pm 5.01 (17)
	Southwest monsoon (June-August)	1.89 \pm 0.13 (14)	8.00 \pm 0.46 (6)	70.47 \pm 8.84 (6)
	Northeast monsoon (September-November)	1.97 \pm 0.07 (33)	6.93 \pm 0.51 (14)	54.22 \pm 5.56 (14)
	Winter (December-February)	1.72 \pm 0.10 (19)	6.41 \pm 0.68 (7)	50.94 \pm 7.38 (7)
4	Type of birth			
	Single	1.94 \pm 0.08 (44)	7.16 \pm 0.44 (20)	55.56 \pm 4.80 (20)
	Twins	1.83 \pm 0.06 (55)	6.71 \pm 0.40 (24)	55.45 \pm 4.41 (24)
5	Parity			
	First	1.88 \pm 0.06 (55)	6.61 \pm 0.35 (32)	52.42 \pm 3.82 (32)
	Second	2.04 \pm 0.08 (31)	7.25 \pm 0.50 (12)	58.69 \pm 5.49 (12)
	Third	1.73 \pm 0.13 (13)	---	---
6	Year of birth			
	2005	1.81 \pm 0.10 (39)	---	---
	2006	1.85 \pm 0.08 (33)	7.65 \pm 0.47 (29)	65.25 ^a \pm 5.16 (29)
	2007	1.98 \pm 0.08 (27)	6.21 \pm 0.51 (15)	45.87 ^b \pm 5.54 (15)

Figures in parentheses indicate the number of observations.

Means with at least one common superscript in a column do not differ significantly ($P < 0.05$).