

RESEARCH PAPER

Effect of genetic and non-genetic factors on growth traits of Osmanabadi goats

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ABSTRACT

The data on 1297 growth records of Osmanabadi goats maintained at P.G.Goat Unit, M.P.K.V., Rahuri (Maharashtra) over a period of 12 years (1993 to 2005) were utilized. The overall least squares means of body weight at birth, 3, 6, 9, 12, 18 and 24 months of age were averaged 1.90 ± 0.02 , 7.06 ± 0.84 , 10.80 ± 0.82 , 13.94 ± 1.13 , 16.94 ± 2.26 , 24.42 ± 1.27 and 28.66 ± 0.71 kg, respectively. The various non-genetic factors exhibited variable effects on the body weight at different ages. Period of birth indicated significant effect on body weight season had significant influence on body weight at all the growth stages. The males exhibited their superiority for body weight at all stages of life over female. Type of birth had significant ($P<0.01$) influence up to 9 months of age, whereas the birth weight group significantly influenced the body weight at 3, 6 and 9 months of age. The genetic and phenotypic correlations among the body weights were positive and significant ($P<0.01$) with moderate to high value. The heritability estimates for these traits varied from moderate to high. The regression of body weight at succeeding stage of growth on body weight at its preceding stage of growth was positive and highly significant.

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Goat is important economic species of livestock in developing countries. It provides major source of income to pastoral communities and poor villagers in India. Osmanabadi is an important medium sized breed found predominantly in arid and semi-arid region of Maharashtra. Osmanabadi goat is hardy, capable of walking long distance and has strong disease resistance. In present investigation, an attempt has been made to evaluate its genetic potential for growth in order to adopt effective selection criteria and suitable breeding plan.

MATERIALS AND METHODS

The data related to 1297 growth records of Osmanabadi goats maintained at P.G. Goat Unit, Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra for the period of 1993-2005 (P_1 - P_4) were collected and used for present study. The data were classified according to period of birth (P_1 - P_4), season of birth (S_1 - S_3), sex, type of birth and birth weight group (W_1 - W_3). The least squares analysis was carried out to study the effect of genetic and non-genetic factors (Harvey, 1990). The estimates of heritability (h_2) and genetic (rg) and phenotypic correlations for body weights were determined by paternal half sib correlation method. The standard error of h_2 was calculated as per Swiger *et al.* (1964). The simple regression coefficient of preceding body weight on succeeding body weight was estimated as per Snedecor and Cochran (1994).

RESULTS AND DISCUSSION

The overall least squares means of body weight at birth, 3, 6, 9, 12, 18 and 24 months of age were averaged 1.90 ± 0.02 , 7.06 ± 0.84 , 10.80 ± 0.82 , 13.94 ± 1.13 , 16.94 ± 2.26 , 24.42 ± 1.27 and 28.66 ± 0.71 kg, respectively Table 1. Broadly similar values for some traits were reported by Malik and Kanaujia (1992) in crossbreds, Das *et al.* (1995) in Barbari, Deshmukh (1996), Ananyous (2001) and Mandakmale (2002) in Osmanabadi goats. Comparatively higher body weight in other Indian goat breeds were reported by Rai *et al.* (2003 and 2004), Roy *et al.* (2003) and Swami *et al.* (2006).

Period of birth significantly influenced the body weight at 3, 6, 9, 12 and 24 months of age. These results were in agreement with Nahardeka *et al.* (2001), Mandakmale (2002), Singh *et al.* (2002), Singh and Khan (2002), Rai *et al.* (2004) and Tomar *et al.* (2004). Significant differences due to period on birth might be attributed to fluctuation in environmental conditions and or occurrence of epidemics during any period under study.

Season of birth was found significant source of variation for all the growth stages of Osmanabadi goats. Winter season born kids were significantly heavier at birth, 6, 18 and 24 months of age. Whereas rainy season born kids were significantly heavier at 9 and 12 months of age. Hence, attempt be made to breed goat to get maximum kidding during rainy and winter seasons. Results are in agreement with the findings of Roy *et al.* (1997 and 2003).