

RESEARCH PAPER

Heritability estimate of different traits in Osmanabadi goat under scarcity zone of Maharashtra

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ABSTRACT

Osmanabadi goats maintained at Network Project on Osmanabadi goats was used for studying the heritability and different traits in Osmanabadi goat. The heritability for body weight at birth was not precise however, it was 0.099 ± 0.008 , 0.051 ± 0.012 , 0.0223 ± 0.103 and 0.562 ± 0.118 for weight at 3, 6, 9 and 12 month of age, respectively. Very high heritability estimate was noticed for wither height ($0.984 = 0.271$) and chest girth ($0.905 = 0.437$) at 12 month age. The heritability for age at puberty, age at first service, age at first conception, age at first kidding, kidding interval, gestation period were 0.156 ± 0.012 , 0.153 ± 0.016 , 0.094 ± 0.003 , 0.081 ± 0.010 , 0.0317 ± 0.098 and 0.292 ± 0.086 , respectively. The heritability for average test day milk yield, lactation length and dry period were 0.045 ± 0.009 , 0.101 ± 0.079 and 0.157 ± 0.063 , respectively.

Key words : Heritability, Osmanabadi goat, First puberty, First service, First conception.

The most striking attribute to living organisms is their ability to transmit hereditary characteristics from cell to cell and generation to generation. Heritability of a particular character gives an approximate idea of the genetic variability to that of total variation present in a given population. Osmanabadi goats play a vital role in rural economy of scarcity zone. Mostly, the people from weaker sections of the society are rearing goats under traditional system. Osmanabadi is meat breed of Maharashtra recognized for genetic improvement of non-descript indigenous goat breed. The profitability of goat farming is mostly depending on the reproductive ability and prolificacy of the goat. A study was conducted to evaluate the heritability for various growth, reproduction and production performance of Osmanabadi goat.

MATERIALS AND METHODS

The data pertaining to growth, reproduction and production traits maintained at Network Project on Osmanabadi goats (P.G. Goat Unit) was collected and analyzed by Least Square Analysis techniques (Harvey, 1966) to assess the influence of non genetic factors on traits under study, and is adjusted for the various significant effects according to the following formula of model used for estimating the sire component:

$$Y_{ij} = \mu + S_i + e_{ij}$$

where as,

Y_{ij} is j^{th} observation of i^{th} sire. e_{ij} is uncontrolled environmental and genetic variation associated with the

individuals with in the sire groups.

All the effects were assumed to be independent, random and normally distributed with their sum of expectation equal to zero.

Since the number of progeny under each sire were unequal, the value of 'K', was calculated by using the following formula :

$$K = \frac{1}{S-1} \frac{(N - \sum n_i^2)}{N} \quad N = \sum n_i$$

where,

K = Weighed number of daughters under each sire.

S = Total number of sires.

N = Total number of observations.

N_i = Number of observations. under i^{th} sire.

The value of σ^2_s (sire component) was calculated from the observed means squares as follows :

$$s_e = MS_e$$

$$s^2_s = \frac{MS(S) - ME(E)}{K}$$

The interclass correlation 't' was calculated as follows :

$$t = \frac{s^2_s}{s^2_s + s^2_e}$$

The heritability for various traits was calculated by using the following formula :

$$h^2 = \frac{4(s^2_s)}{s^2_s + s^2_e} = 4t$$

where,

h^2 = heritability estimate

t = Interclass correlation.