

Impact of simplified methods of growth recording on genetic parameter estimates of Tunisian local goat population under a low input production system

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ABSTRACT

The study aims to simulate the alternative methods of simplifying weight recording of Tunisian local kids and assesses the impact of their use from a genetic point of view to set up the basis for the future improvement of this important component of efficient production. A total of 13,095 weight records of 945 kids, progeny of 285 females and 19 males were collected over a period of 16 years in the caprine herd of the Arid Areas Institute of Médenine (South East of Tunisia). Weights were taken at six standard ages (10, 30, 60, 90, 120 and 150 days) at a weekly pace. Alternative simplified schemes were simulated by skipping from 1–7 weeks of recording and performance in terms of predicting weights at the standard ages was evaluated. In addition, random regression model (RRM) including age of females, interaction sex × type of birth, interaction year × month of birth was used as fixed effects. Also, animal- and maternal permanent environmental as random effects, were fitted to the data set. Alternative simplified recording systems were then evaluated in terms of modifications in estimated genetic parameters and correlations among estimated breeding values. Results showed that 1–3 weeks of time between recordings yielded accurate estimates of weights at the standard ages. The effect of the simplified weight recording was especially relevant at the extreme weights, at 10 and at 150 days of age, that the spacing of successive controls affects the accuracy of the estimate. The lack of registration of birth weight showed a significant deterioration in the estimate of weight at 10 days. Only the simplification of the weights recording to one and two-week resulted in direct and maternal heritability's for the different growth traits of local kids, similar to those obtained by the standard age growth recording. Selecting the critical ages that define changes in growth components seems to be more critical than using more frequent weighing in terms of estimation of the genetic components of weight of kids in this population.

HIGHLIGHTS

- This type of local kids measurement simplification can be seen as an alternative:
 - To enhance the economical aspect of the sheep recording scheme.
 - Reduce animal disturbance.
- According to the results of this study, the adoption of a common growth control system seems difficult since the breeding objectives and for farming systems are not the same.

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Introduction

The majority of livestock is raised generally under medium to low input production environments (Gallal et al. 2000). Introducing and maintaining effective breeding strategies in these less economically developed countries similar to those implemented in developed countries, has met many difficulties and has been severely limited due to a lack of capacity and financial resources (Najari 2005). Under these circumstances,

breeding alternatives based on simplified procedures should be sought and applied in order to sustain management and improvement of the existing rich animal genetic reservoir (Bethiaf et al. 2000).

Goat meat production is a significant source of income of farmers in the Southern regions of Tunisia. Local breeds are often used because of their adaptation to the harsh conditions, but they are characterised

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