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Determination of economic values for some important traits in Moghani sheep

H. Abdollahy[a,*], S. Hasani[a], S. Zerehdaran[a], A.A. Shadparvar[b], B. Mahmoudi[c]

[a] Animal Science Department, Gorgan University of Agricultural Sciences and Natural Resources, Gorgan, Iran
[b] Animal Science Department, Faculty of Agricultural Sciences, University of Guilan, Rasht, Iran
[c] Research Expert of Ardabil Jahad-e-Agriculture Organization, Ardabil, Iran

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ABSTRACT

Determination of economic values for important traits is one of the most important priorities in animal breeding. Therefore, a deterministic bio-economic model was used to estimate economic values for litter size, pre-weaning survival, post-weaning survival, ewe survival, birth weight, weaning weight, yearling weight, mature ewe live weight, dressing percentage, conception rate and wool weight in Moghani sheep breeding station herd located in Jafarabad-Moghan, including 432 ewe and 52 rams. Sensitivity analysis of economic values to price levels of input and output was also carried out. Sensitivity of EVs for traits was proportional to ±20% changes in prices of meat, wool, roughage and concentrate, because they are the most affective factors in system profit under the studied condition. Results of sensitivity analysis showed that relative economic values of traits except for birth weight and wool weight had the highest sensitivity to change in meat price, which was the most important component of profit. The most important trait in this study was litter size with relative economic value to wool weight of 76.36 followed by dressing percentage and ewe survival with relative economic values of 2.43 and 1.54, respectively. The lowest relative economic value was found for birth weight (−0.08). In this system, the economic values of all traits were positive except for birth weight, indicating positive effects of these traits on system profitability. Generally, traits which increased income and decreased costs through increase in extra lamb selling had higher economic values.

1. Introduction

A well-defined breeding objective is the first requirement of any genetic improvement program. Breeding objectives comprise those traits, which one attempts to improve genetically because they influence returns and costs to the producer (Kahi and Nitter, 2003). Definition of the breeding objective is generally regarded as the primary step in the development of structured breeding programs (Harris, 1970; Danell, 1980; Ponzoni, 1986). Animal breeding, generally, aims to obtain a successive generation of animals that will produce desired products more efficiently under future farm economic and social circumstances than the present generation of animals (Groen, 2000). The selection index theory established the basis for optimal combination of traits when selecting for more than one trait. Within this theory, the aggregate genotype may be defined as a linear function of additive genetic values of traits multiplied by their economic value (Fuerst-Waltl and Baumung, 2009). Economic values are defined by the value of one unit superiority of a trait keeping all other traits in the aggregate genotype constant (Hazel, 1943; Kosgey et al., 2004; Fuerst-Waltl and Baumung, 2009). While the terms economic value and economic weight are often used synonymously, they may also be defined as the absolute and the relative benefit of improving a trait, respectively

* Corresponding author.
E-mail address: aranaria63@gmail.com (H. Abdollahy).

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