



Tropentag, September 17-19, 2014, Prague, Czech Republic

“Bridging the gap between increasing knowledge and decreasing resources”

Evaluation of Performance and Estimation of Genetic Parameters for Milk Yield and some Reproductive Traits in Sheep Breeds and Crosses in the West Bank

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Abstract

This study was conducted to evaluate sheep productivity in the West Bank, and estimate genetic parameters (heritability and repeatability) for milk yield and prolificacy traits. The data included a total of 1711 milk records from 1243 ewes and a total of 3682 lambing records from 1837 ewes of the Awassi breed (AW), two Awassi-derived-lines (Improved Awassi, IA and Afec Awassi, AA), Assaf breed (AF) and Awassi × Assaf crosses (XB). The data were from the demonstration farms of the Small Ruminant Middle East Regional Program in the West Bank, collected during the years 2003 to 2010.

The data were analysed using two linear models: a fixed-effects model for testing breed differences and other fixed environmental effects, and a mixed-model for estimation of genetic parameters. Genetic parameters were estimated using REML procedure. The fixed effects investigated for milk traits were: location-breed (LB), parity (PR), year-season of lambing (YS), treatment for induction of estrus (TRT: natural or PMSG sponges), number of lambs born per ewe lambing (NLB), number of milking tests (NMT), and lactation length (LL). For prolificacy traits, the fixed effects were: LB, PR, YS, and TRT.

The results of milk traits showed that LB, PR, and YS had high significant effects on all milk traits ($p < 0.001$), while the effect of NLB was not significant ($P \geq 0.05$) for any milk trait. The effect of LL was highly significant ($P \leq 0.001$) on TMY, while NMT was not significant ($p > 0.05$). For prolificacy traits, LB, PR, and YS had significant effects ($p < 0.05$) for all studied traits, while TRT was significant for NLBA only.

Estimates of heritability (h^2) of TMY ranged from 0 in XB to 0.11 in AW. For TMY120 and TMY150, heritability ranged from 0 in XB to 0.16 in AW. Estimates of h^2 of NLB varied from 0 in XB to 0.09 in AW, and for NLBA it ranged from 0 in XB to 0.15 in AW. For LI it was 0.03 in AW and 0 for other breeds and crosses.

The results of this study indicate that Assaf and Awassi × Assaf sheep are the recommended breeds for raising in the northern areas of the West Bank. The study also emphasizes the need for full recording of performance and pedigree data in sheep farms as part of good management practice which should be part of a national recording system.

Keywords: Assaf, Awassi, genetic parameters, lambing interval, total milk yield, West Bank