A STUDY OF PRODUCTION SYSTEMS IN LOCAL SHEEP

BY

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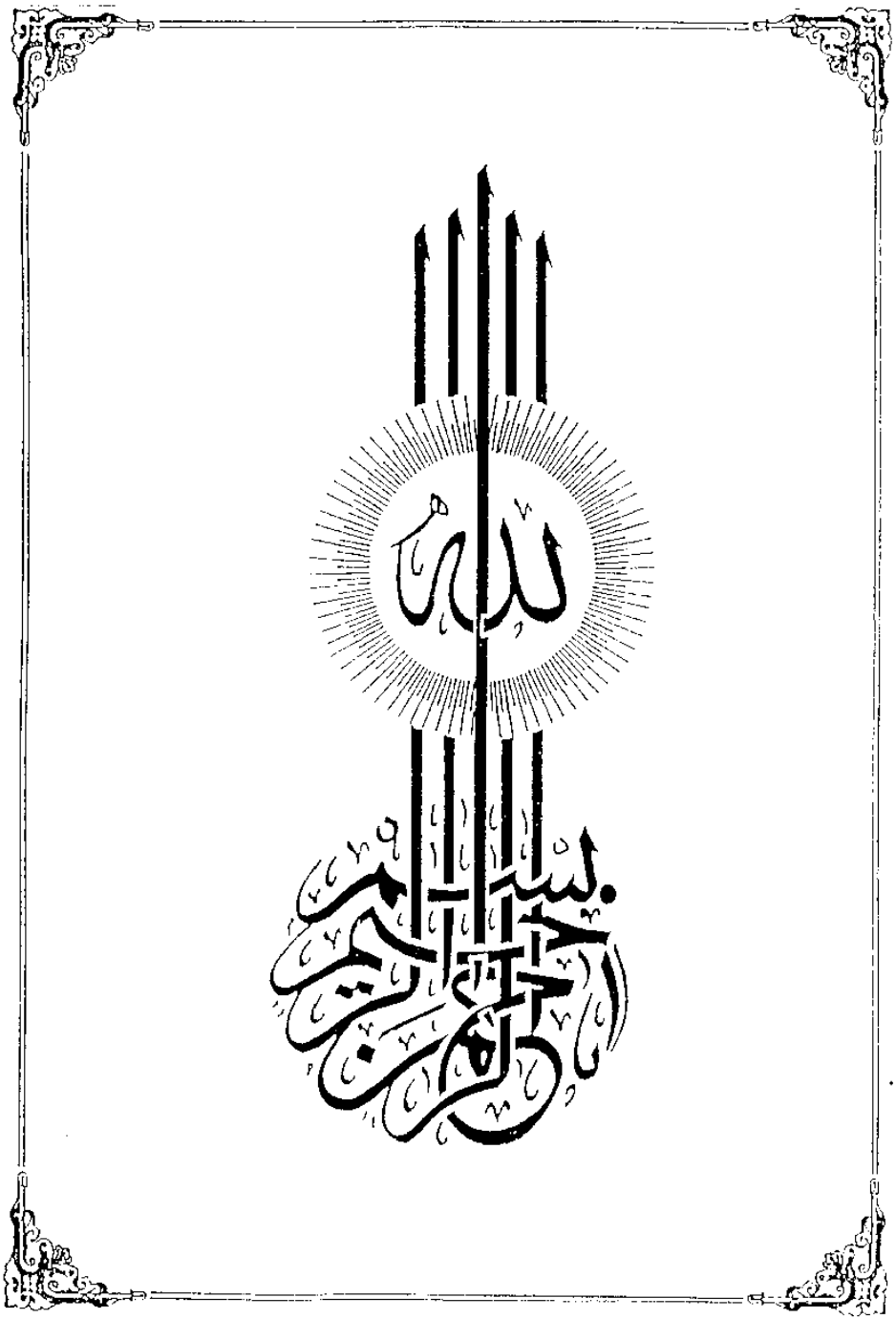

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ABSTRACT

HAZEM MOHAMMAD MOHAMMAD ALMAHDY. A Study of Production Systems In Local Sheep. Unpublished doctor of philosophy, University of Ain Shams, Faculty of Agriculture, Department of Animal Production, 1996.

Simulation computer model was developed to simulate performance of two Egyptian sheep breeds, Rahmani (R) and Ossimi (O), and their crosses with Finnish Landrace (F) breed. The crosses used in the simulation were 1/2F 1/2R (FR), 1/2F 1/2O (FO), the interse mating of 1/4F 3/4R $(RFR)^2$ and of 1/4F 3/4O $(OFO)^2$. Two breeding systems were simulated, one mating a year (1M) and three mating every two years (3M). Reproduction performance and mortality were stochastically simulated while performance traits were deterministically simulated. The objectives of this study were to: 1) Determine the profitability of crossing the Finnish Landrace sheep breed with Rahmani and Ossimi sheep breeds; 2) Estimate the relative economic weights of objective traits; 3) Develop criteria for genetic selection within breeds. The model was used to simulate effects on life-cycle efficiency from genetic changes in conception rate (CR), lambing rate (LR), mortality rate (MR), mature weight (MW) and milk production (MK). Two biological (life-cycle feed conversion) measures of efficiency, kg TDN cost per kg empty body weight (TDN/EBW) and kg TDN cost per kg carcass lean (TDN/CLN), and one measure of profit, gross margin per ewe per year (GM/EWE), were used for evaluation.

A significant ($P<.01$) reduction in both TDN/EBW and TDN/CLN costs in all crossbred over the local sheep are shown.

The target breeds $(OFO)^2$ and $(RFR)^2$ were biologically better than the local O and R breeds by an average of 11% and 16% respectively, for both breeding systems. The 3M system has significantly reduced TDN/EBW for all breed groups except for FR. When using the measure of profit (GM) the results indicated that FR and $(RFR)^2$ performed well under the 1M system while other breed group perform better under the 3M system. The results indicated that breed profitability may differ with the various environments created by alternate management strategies.

The ranks of the traits will differ according to the definition of efficiency. Conception rate ranks first followed by LR, MR. MK and MW when TDN/EBW was the efficiency while using TDN/CLN the rank was LR, CR, MR, MW and MK. Moreover, the rank was CR, LR, MW, MR then MK when GM is targeted. When these relative efficiency and economic weight account for differences in variation among component traits. The relative importance of CR and LR were greatly reduced by their low heritability. When considering selection index for R and O breeds under the two systems, the results indicated that MW were the most important traits followed by LR for both breeds under the two systems. Relative weights for MK were ranking third for O breed under both system, while it ranks fourth for R breed under the two systems. Conception rate ranks third for R breed and fourth for O breed while, MR ranks fifth for the two breed group under both breeding systems.

Key words: Sheep, Rahmani, Ossimi, Simulation, System analysis, Bioeconomic model, Flock modeling

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