PERFORMANCE OF FINN-CROSS LAMBS IN EGYPT

BY

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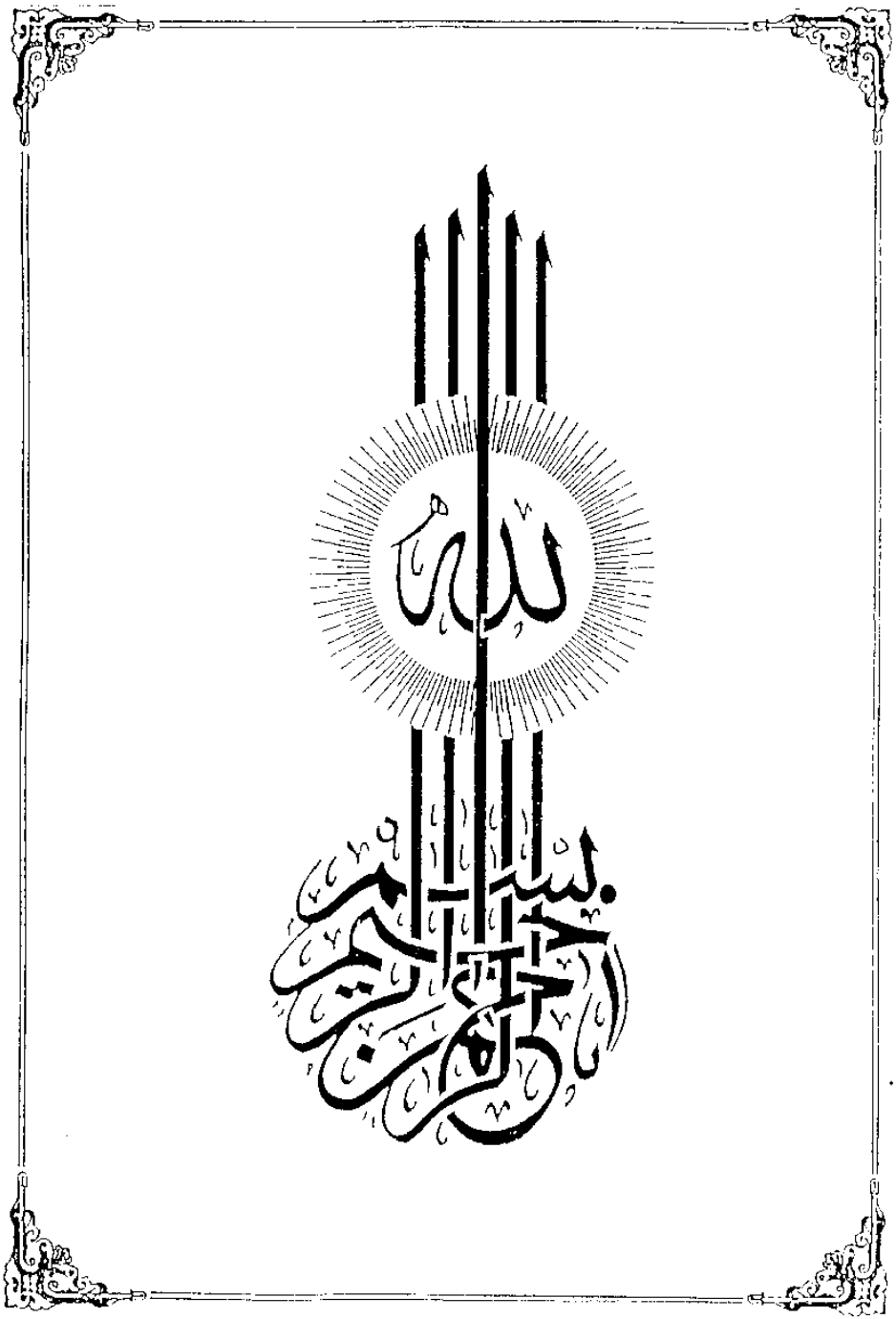

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Key words : Lamb, Crosses, Body weight, Growth rate, Growth function, Mature weight, Individual heteroses, Maternal heteroses, Recombination

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ABSTRACT

A total of 4861 Rahmani (R) lambs and its crosses with Finnish Landrace (F) and 2384 Ossimi (O) lambs and its crosses with F records were used for the study. Data were collected during the years 1974-1989 from Sakha and Mahallet Mousa stations of Ministry of Agriculture under accelerated lambing system of 3 lambings per 2 years.

The objectives of this study were to estimate the genetic and non-genetic factors affecting crossbred lambs body weight, growth and maturing patterns and the estimation of individual heterosis, maternal heterosis and individual recombination loss for body weights at various ages and growth parameters.

Lamb's weights (BW, WW, W_4, W_6, W_{12} and W_{18}), growth parameters (A, B and K), coefficient of determination (R^2), amount of maturity (AM_4, AM_4, AM_6, AM_8, AM_{10} and AM_{12}) and instantaneous growth rate (IGR_4, IGR_4, IGR_6, IGR_8, IGR_{10} and IGR_{12}) were analyzed using a fixed model to estimate the effect of breed group, location, sex, age of dam, season and block of years and some interactions between those fixed effects.

In general, all main effects were significant in explaining the variation of lamb body weights and other studied traits.

Means of lamb body weights obtained for R and its crosses indicate that, R breed group was the heaviest for BW, W_6 and W_{18}, while F.R was the heaviest for WW and W_4, but $(R.FR)^3$ showed the heaviest at W_{12}. Means of O and its crosses, showed that, FO.O breed group had the heaviest weight at different ages except at birth, where O breed group was the heaviest.

Estimates of growth parameters for R and its crosses ranged from 46.99 to 51.31 kg for A; from .956 to .979 for B and from .0035 to .0043 for K. Moreover, R^2 ranged from .9866 to .9918. Estimates of growth parameters for O and its crosses ranged from 42.84 to 48.76 kg for A; from .971 to .975 for B, from .0043 to .0050 for K and for R^2 it ranged from .9882 to .9912.

Estimates of amount of maturity indicated that, O breed and its crosses were generally early maturing than R and its crosses.

Estimates of instantaneous growth rate at 6, 10 and 12 months, indicate that, for R and its crosses, IGR ranged from 75 to 102 g for IGR_6; from 48 to 54 g for IGR_{10} and from 10 to 43 g for IGR_{12}. Meanwhile for O and its crosses, IGR ranged from 78 to 136 g for IGR_6; from 42 to 49 g for IGR_{10} and from 34 to 53 for IGR_{12}.

Estimates of heterotic component for R and F crosses, indicate that individual heterosis was significantly positive for W_6 and IGR_8; significantly negative for B. Maternal heterosis was significantly positive for BW and IGR_4 and individual recombination loss was significantly positive for WW, W_6, W_{12} and IGR_8. While estimates of heterotic component for O and F crosses, indicate that, individual heterosis was significant and positive for AM_W and AM_{10} IGR_{12}; significantly negative for WW. Maternal heterosis was significant positive for WW and W_6; significantly negative for B, AM_W and IGR_6, while individual recombination loss was significantly positive for BW, WW, W_4, W_6, W_{12}, W_{18}, A, AM_W, IGR_6, IGR_{10} and IGR_{18}.

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LIST OF ABBREVIATIONS

R	Rahmani
O	Ossimi
F	Finnish Landrace
F.R	1/2 Finn . 1/2 Rahmani
$(F.R)^3$	3rd inter se mating of (F.R).(F.R)
R.F	1/2 Rahmani . 1/2 Finn
R.FR	3/4 Rahmani . 1/4 Finn
FR.R	1/4 Finn . 3/4 Rahmani
$(R.FR)^1$	1st inter se mating of (R.FR).(R.FR)
$(R.FR)^2$	2nd inter se mating of (R.FR).(R.FR)
$(R.FR)^3$	3rd inter se mating of (R.FR).(R.FR)
F.FR	3/4 Finn . 1/4 Rahmani
$(F.FR)^3$	3rd inter se mating of (F.FR).(F.FR)
F.O	1/2 Finn . 1/2 Ossimi
$(F.O)^3$	3rd inter se mating of (F.O).(F.O)
O.F	1/2 Ossimi . 1/2 Finn
O.FO	3/4 Ossimi . 1/4 Finn
FO.O	1/4 Finn . 3/4 Ossimi
$(O.FO)^1$	1st inter se mating of (O.FO).(O.FO)
$(O.FO)^2$	2nd inter se mating of (O.FO).(O.FO)
$(O.FO)^3$	3rd inter se mating of (O.FO).(O.FO)
F.FO	3/4 Finn . 1/4 Ossimi
$(F.FO)^3$	3rd inter se mating of (F.FO).(F.FO)
A	Asymptotic weight
B	Parameter related to early changes in body weight
K	Parameter related to earliness of maturing
d	day(s)
wk	Week(s)
mo	Month(s)
BW	Body weight at birth
WW	Body weight at Weaning
W_2	Body weight at 2 months

W_4	Body weight at 4 months
W_6	Body weight at 6 months
W_{12}	Body weight at 12 months
W_{18}	Body weight at 18 months
AM	Amount of maturity
AM_w	Amount of maturity at weaning
AM_4	Amount of maturity at 4 months
AM_6	Amount of maturity at 6 months
AM_8	Amount of maturity at 8 months
AM_{10}	Amount of maturity at 10 months
AM_{12}	Amount of maturity at 12 months
IGR	Instantaneous growth rate
IGR_w	Instantaneous growth rate at weaning
IGR_4	Instantaneous growth rate at 4 months
IGR_6	Instantaneous growth rate at 6 months
IGR_8	Instantaneous growth rate at 8 months
IGR_{10}	Instantaneous growth rate at 10 months
IGR_{12}	Instantaneous growth rate at 12 months
MM	Mahallet Mousa

1. INTRODUCTION

Egyptian sheep breeds are characterized by low prolificacy which limits the annual lamb offtake.

Finn sheep have been extensively utilized for cross breeding with a wide range of sheep breeds in several countries to improve their prolificacy (e.g., Aboul-Naga et al., 1989).

Egyptian Ministry of Agriculture started a cross breeding programme with Finn sheep, about 20 years ago, to improve prolificacy in two local breeds (Rahmani and Ossimi) and to establish a synthetic breed of higher fecundity suitable for the prevailing subtropical conditions.

This thesis reports on the phenotypic performance of crossbred lambs i.e. body weights and growth patterns.

Evaluating the genetic and non-genetic factors affecting the phynotypic crossbred lambs was the first goal of this study. Estimation of growth and maturing patterns by appropriate technique formed the second goal of this study. The last goal was estimating the individual and maternal heterosis and individual recombination loss for body weight at various ages and growth parameters.

2. REVIEW OF LITERATURE

The literature review in the present study was conducted to cover : The non-genetic factors affecting lamb weights and daily gain in different stages of life; describing growth curves and finally estimating the heterotic components of weights and growth parameters.

2.1. Genetic and Non-genetic Factors Affecting Growth Traits. Genetic and non-genetic factors contributing to the phenotypic variation of lamb growth performance, can be classified into three classes: (1) factors affecting the whole flock such as location, year and season, (2) factors that may influence a group of animals but not the whole flock e.g., breed group, age of dam, sex and type of birth and (3) factors peculiar to an individual (may be regarded as a random error).

2.1.1. Breed group. Many investigators working on different breeds of sheep under varying environmental conditions found that breeds differ significantly in their body weights recorded at different ages.

Arora et al. (1979); Boaz and Jones (1980); Large (1980); Arora and Batta (1983); El-Oksh et al. (1983); Charyulu and Munirathnam (1984) working on different breeds of sheep and their crosses indicated that breed group had a