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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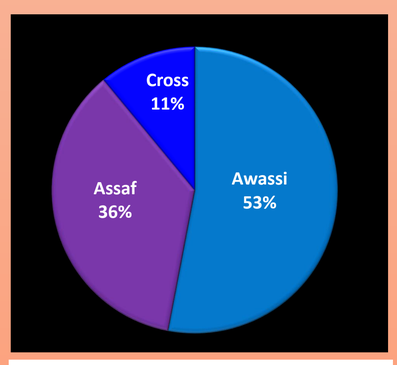
Background

Sheep is the major small ruminant in Palestine and contributes a larger source of meat and milk compared to goats.

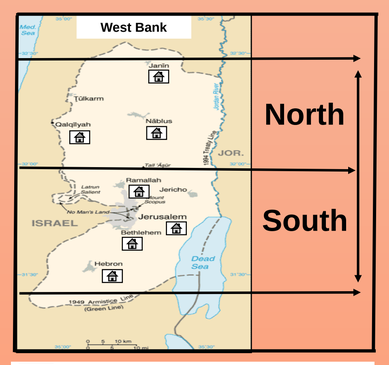
Awassi represents the major sheep breed. The second breed is Assaf(Graph1).

Data were collected from the demonstration farms belong to the Small Ruminant Middle East Regional Program in the West Bank (2003 to 2010Under this project, all records were validated and stored by technicians of the Ministry of Agriculture using 'Ewe and Me' software.

Location of Demonstration farms covers West Bank from north to south graph 2.



Graph 1. Distribution of Sheep Breeds In Palestine



Graph 2. Geographic Map of the Locations demo farms.

Methods

Total milk yield through the lactation was calculated by using the Fleischmann method (Ruiz et al., 2000):

$$TMY = y1t1 + \sum((yi + yi+1)/2)(ti+1 - ti))$$

For breed evaluation, the following fixed-effects model was used and the following model:

$$Y = Xb + e$$

A mixed-model (fixed and random effects) for Estimation of genetic parameters and the following model was used.

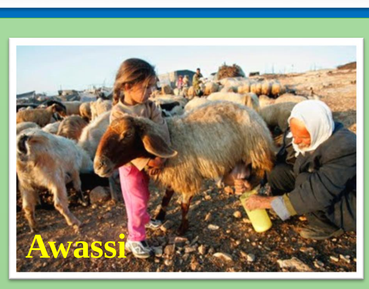
$$Y = Xb + Za + Wp + e$$

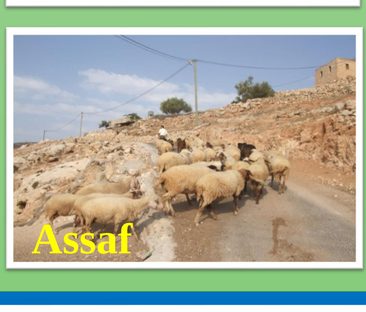
variance components was carried out using derivative-free REML (Restricted Maximum Likelihood) procedure implemented in the MTDFREML programs Boldman et al. (1993).

Objectives

- To evaluate sheep productivity and compare sheep milk and prolificacy between breeds under farm conditions in the West Bank.
- To estimate genetic parameters (heritability and repeatability) for milk production and prolificacy traits of ewes, in the West Bank.

Sheep breeds of Palestine





Results

AA= Afec Awassi**; IA=** Improved Awassi; AF= Assaf; LA= Local Awassi; XB= Awassi xAssaf cross.
BEQ= Betqad; **HEB**= Hebron; **JEN**= Jenin; **QAL**= Qalqeelia; **RAM**= Ramallah **JER**= Jerusalem; **BET**= Bethlehem; **DOR**= Dora; **NAB**= Nablus;
TMY= total milk yield; **TMY120**= total milk yield to 120 days of lactation; **TMY150** = total milk yield to 150 days of lactation.
NLB= Number of lambs born per ewe lambing; **NLBA**= number of lambs born alive per ewe; **NLBA\year=** number of lambs born alive per ewe per year.

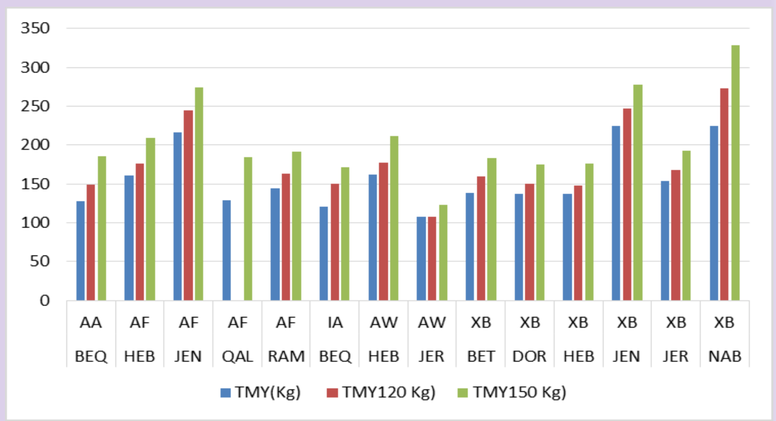


Figure 1: Least squares means of milk traits (kg) by location-breed.

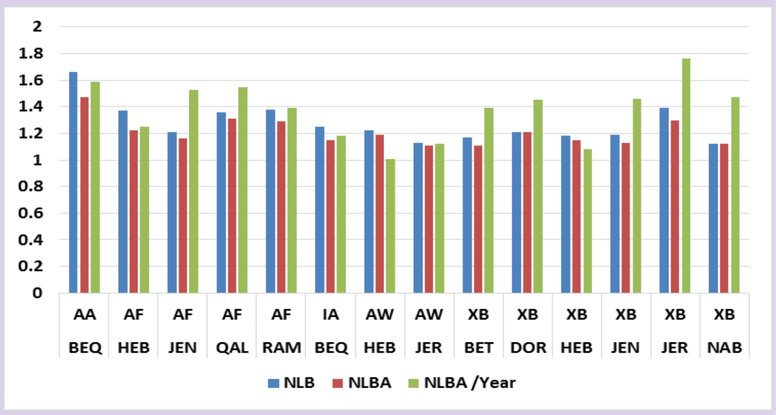


Figure 2: Least squares means of prolificacy by location breed.

Results

Table 1: Estimates of genetic parameters of milk traits

Breed	Genetic parameters	Total milk Yield	Total milk yield 120 days	Total milk yield 150 days
Improved Awassi	Heritability (h^2)	0.10	0.06	0.15
	Repeatability (r)	0.31	0.36	0.30
Awassi	Heritability (h^2)	0.02	0.16	0.16
	Repeatability (r)	0.11	0.16	0.16
Assaf	Heritability (h^2)	0.01	0.02	0.02
	Repeatability (r)	0.09	0.1	0.08
Crossbred	Heritability (h^2)	0.00	0.00	0.00
	Repeatability (r)	0.00	0.02	0.03

Table 2: Estimates of genetic parameters of prolificacy traits

Trait	Genetic parameters	Breed			
		Improved Awassi	Awassi	Assaf	Crossbred
Number of lambs born	Heritability (h^2)	0.08	0.09	0.02	0.00
	Repeatability (r)	0.16	0.09	0.04	0.04
Lambing Interval	Heritability (h^2)	0.00	0.03	0.00	0.00
	Repeatability (r)	0.06	0.03	0.00	0.25

Conclusions

- Milk production increased for Awassi and a decreased in Assaf.
- Prolificacy of Assaf also decreased over time while lambing interval increased for Assaf and Awassi x Assaf crosses.
- Estimates genetic parameters had large standard errors due to the small numbers used and the lack of recording of sire and dam identities

References

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