

HERD COMPOSITION, PRODUCTION LEVEL AND PHYSICAL APPEARANCE OF SHEEP KEPT UNDER NEW VALLEY OASES FARMING SYSTEMS.

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ABSTRACT

The study was aimed to recognize the herd composition, sheep productivity and physical appearance in two oases (Dakhla and Farafra) located in the Egyptian western desert, New Valley. A set of semi-structured questionnaire was used to collect information from 245 sheep owners based on single-visit-interviews. The study revealed that farmers keep mixed livestock species. Sheep production is the major livestock activity in Farafra oasis. On the other hand, households in Dakhla oasis own higher number of cattle per herd; this may be due to relatively larger land holdings that can be cultivated, as well as, more land allocation for green fodder in this area. About three quarter of sheep in the two oases have a white body, legs and tail colors. The prevailing sheep breeds raised in the studied areas are fat tail sheep in Dakhla flocks and thin tail sheep in Farafra flocks. The average litter size and weaning weight of fat tail sheep were significantly lower (1.22 and 12.2 kg, respectively) than that in thin tail sheep (1.37 and 17.4 kg, respectively). Higher lamb mortality rates (17%) were recorded for Dakhla flocks comparing to Farafra flocks (9%). Meanwhile, no significant differences were detected among sheep of the two oases for other traits such as age at first lambing, lambing interval and age at marketing. In average, females in the studied areas gave first birth at age 1.3 years and lambed every 8.6 months. It is concluded that the level of production of sheep in the studied areas is generally low. The relatively better performance of Farafra sheep may due to genetic superiority of the breed and /or better-feed situation of the area. Reasons of high lamb mortality rates, especially in Dakhla flocks, should be identified and reduced in order to make sheep production profitable and sustainable.

Keywords: *flock composition, sheep, productivity*

INTRODUCTION

The New Valley (Al Wady Al Jadid oasis) extends in the north as far as Marsa Matrouh, in the south as far as Sudan and in the west as far as Libya. It is the biggest governorate in Egypt, covering an area of 458,000 square kilometers and represents about one fifth of the total surface area of Egypt (Fig 1). It is considered the least populated governorate in Egypt, while 99% of all Egyptians live in the Nile valley. Therefore, the quickly growing development in Egypt has required big movements of people from the Nile valley towards the New Valley. In that case, enhancing the livelihood of farmers in this governorate through appropriate management of their farm resources is an essential and feasible option. Small ruminant's production is an important activity for low –input small holder's production systems (Kosgey and Okeyo, 2007). Designing and implementation of genetic improvement program based on indigenous

breeds, which are appropriate to existing conditions, can contribute substantially to improving the livelihood of farmers. More knowledge about production system, environment, management of the breed, morphological characters and productivity level of the breeds in their habitat are the first step to develop sustainable improvement and conservation program of small ruminant's genetic resources (Duguma et al., 2010; FAO, 2010; Gizaw et al., 2011). So, the objectives of this study is to recognize sheep flock composition, level of productivity, and to describe the physical appearance of New Valley sheep in Egypt for designing possible breeding strategies.

MATERIALS AND METHODS

Description of the study areas

Dakhla and Farafra oases were selected to address sheep production in two different farming systems and sheep breeds. Farafra

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oasis is located 320 km northeast of Dakhla (Fig 1). Historically, the oasis of Farafra was known as Ta Aht meaning the "land of the Cow, while Dakhla was known as Khemet, meaning the black land.

Data were collected during implementation of the Sustainable Utilization of Agriculture Biodiversity research project. This project was implemented from January till December 2013 to develop the Local Communities in the New Valley governorate. The climate in this governorate is characterized by dry desert climate. Temperature ranged from a minimum of 0°C to a maximum of 50°C. Rainfall is almost not exceeding 4 mm/year (EEAA/EMU, 2008). Ground water is the only available water source for both irrigation and drinking.

Sampling and data collection

A total of 245 households were interviewed individually using semi-structured questionnaires. The questionnaire was prepared to obtain information on sheep flock composition, reproductive and productive parameters and physical appearance. The reproductive parameters assessed included age at first lambing, lambing intervals, pre-weaning mortality and litter size while productive parameters were mainly weaning weight and age at marketing.

Data analysis

Data from the questionnaire were entered into program Microsoft excel for generating mean ± SD and frequencies. The sheep reproductive and productive data were analyzed using Statistical Analysis Software (SAS 2009) package. A one-way analysis of variance was applied for dependent variables using production system as independent variable.



Figure 1: Location of Dakhla and Farafra

RESULTS AND DISCUSSION

The average land holding of Dakhla households was lower (11.73±29.34 acres) than that in Farafra (13.55 ± 25.83 acres). However, due to scarcity of water, about 37.9% of the total land size in Farafra left fallow for almost six month a year. The studied oases have different cropping patterns (Table 1). Dakhla has the highest proportion of animal green fodder and fruit lands (date palms, figs and citrus fruits). On the other side, the proportion of land cultivated field crops was the highest in Farafra.

Average number of ownership per household of cattle, buffalo, camel, sheep and goats in Dakhla and Farafra oasis are represented in table (2). Results revealed that farmers keep mixed livestock species. Households in Dakhla oasis own higher number of cattle per herd, which may be due to relatively larger land holdings that can be cultivated and more land

allocation for green fodder in this area (ranged from 57.6 to 67.3% of the total farm size around the year). On the other hand, sheep flock is the major livestock activity within Farafra oasis. Green fodders is the main source of feeding small ruminants while concentrates are not common. From December to May, Berseem (*Trifolium alexandrinum*) is dominant, while green maize or Sordan grass fodders, as available, are important source of feed from the start of June to the end of August. Depending on Alfalfa for feeding extended during summer and autumn while declines during winter and spring. Crop residues and farm by-products have basic contribution in feeding animals especially in autumn months. From the interviewed households, 65% of them have small ruminants only and in most cases they graze after cattle and buffalo. However, small ruminants are tethered by day and penned in open or roofed enclosures, or inside houses.

Table 1: Mean ±SD values of land holding (acres) and its distribution for different crops.

Items	Dakhla		Farafra	
	Summer	Winter	Summer	Winter
Green fodder	57.6	67.3	48.1	43.8
Field crops	19.1	2.7	40.6	9.6
Vegetable	1.5	0.0	2.6	0.0
Fruit	21.8	21.8	8.7	8.7
Fallow land	0.0	8.2	0.0	37.9
Average farm size	11.73± 29.34		13.55 ± 25.83	

Table 2: Household ownership of different livestock species.

Items	Dakhla (N= 108)			Farafra (N= 137)		
	No.	Mean±SD	%	No.	Mean±SD	%
Cattle	102	11.17±11.32	77.9	125	7.23±7.91	34.6
Buffalo	1	0.11±0.29	0.8	12	0.25±0.59	1.2
Sheep	46	2.17±20.90	15.1	67	8.6±10.48	41.2
Goat	40	0.89±4.62	6.2	76	4.66±13.99	22.3
Camel	0	0.0	0.0	6	0.11±1.40	0.5
Average herd size	14.34±28.05			20.90±34.6		

N= number of households; SD= standard deviation

Qualitative characters observed for female sheep in the two oases are presented in Table 3. Most of (71-75%) sheep in the two oases have a white body, legs and tail colors. On the other hand, the study revealed that the sheep breeds in both oases have a wide range of head and neck colors and about 65-76% of females without horns. The prevailing sheep breeds

raised in the studied areas are fat tail sheep in Dakhla flocks and thin tail sheep in Farafra flocks.

The reproductive and productive performance of sheep as reported by the respondents is given in table 4. There was a significant difference between the two breeds for litter size, lamb mortality rate and weaning weight traits. The average litter size and

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weaning weight of fat tail sheep were found to be 1.22 and 12.2 kg, respectively. The corresponding values for thin tail sheep were 1.37 and 17.4 kg, respectively. Higher lamb mortality rates (17%) were estimated for Dakhla flocks but the figures were lower (9%) in Farafra flocks. For other traits such as age at first lambing, lambing interval and age at marketing, no significant differences in performance were observed among sheep of the two Oases. In average, females in the study areas give first birth at age 1.3 years and lambed every 8.6 months

CONCLUSION

It is concluded that the level of production of sheep in the studied areas is generally low. Sheep flock is the major livestock activity within Farafra oasis. The relatively better performance of Farafra sheep may be because of the genetic superiority of the breed and /or better feed situation of the area. Lamb mortality rates, especially in Dakhla flocks, should be reduced in order to make sheep production profitable and sustainable.

REFERENCES

- Duguma, G., Mirkena, T., Haili, AIniguez, I., Okeyo, A.M., Tibbo, M., 2010. Participatory approach to investigate breeding objectives of livestock keepers. *Livestock Research for Rural Development*, 22, Article No. 64.
- FAO.2010.Breeding strategies for sustainable management of animal genetic resource. *FAO Animal Production and Health Guidelines*. No.3.Rome.Italy, FAO.
- Gizaw, S., Komen, H., Hanotte, O., Van Arendonk, J.A.M., Kemp, S., Haile, A., 2011. Characterization and conservation of indigenous sheep genetic resources. *Research Report No. 27*. Nairobi, Kenya.
- Kegey, I.S. and Okey, A.M. 2007. Genetic improvement of small ruminants in low-input, smallholder production systems: technical and infrastructural issue. *Small Ruminant Research*, 70:76-88.
- SAS (Statistical Analysis System) Institute Inc. 2009. *SAS procedure guide, Version 9.2*. Cary, NC, USA.

Table 3: Physical appearance (%) of sheep prevailing in the studied area.

Physical appearance	Dakhla	Farafra
Color:		
Body		
White	75	71.4
Brown	15	9.5
Black	0	14.3
Brown and white	0	4.8
Black and white	10	0
Head and neck:		
White	20	19.1
Brown	55	28.6
Black	20	38.1
Brown and white	0	5.6
Black and white	0	8.6
Others	5	0
Legs		
White	70	66.7
Brown	15	4.8
Black	10	19.1
Brown and white	0	9.4
Others	5	0
Tail		
White	75	81
Brown	15	4.8
Black	10	14.3
Horns:		
Present	35	32.8
Absent	65	76.2
Tail Type:		
Fat tail	85	21
Thin tail	15	79

Table 4:- Reproductive and productive performance of sheep raised under New Valley conditions.

Parameter	Dakhla (n=108)	Farafra (n=137)	P-value
Lambing interval (months)	8.64	8.55	Ns
Litter size	1.22	1.37	*
Lamb mortality (%)	17	9	**
Weaning weight (kg)	12.2	17.4	**
Age at first lambing (month)	14,1	13.6	Ns
Age at marketing, month	6.5	5.8	Ns

n=number of respondents ,** significant at (P<0.01), *significant at (P<0.05), Ns=non significant

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