



### Camel Herd Composition and Milk Yield in Central Libya

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#### ABSTRACT

The survey was conducted through a questionnaire and guided interviews with camel owners in selected regions around the five main towns of the Elgufra (Waddan, Hun, Soukana, Zalla and Fougaha) in central Libya. In this study, a questionnaire was designed to investigate camel herd composition and estimation of milk yield of she-camels in different age groups and in different seasons under traditional production system. The collected data were analyzed by using descriptive statistics. The result of the study showed that, the percentages of the herd structure decreased as the camels age group increased, they were 13.1%, 13.4%, 11.6%, 10.2%, 9.6%, 8.5%, 7.2%, 7.2%, 6.3%, 6.3% and 6.7 % for age groups less than year, 2years, 3 years, 4 years, 5years, 6years, 7 years, 8 years, 9 years, 10 years and more than 11 years respectively. The study showed that Waddan area was recorded higher percentages than the other areas in herd structure for first age and second group. In the third group (3 years ) there were variations in the herd structures, Soukana was the least percentage in herd structure and Hun was the highest. In the age groups between 7 to 11 years there were variations in the structure in Algufra.

**Keywords:** camel, herd structure, Libya.

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#### INTRODUCTION

According to the Food and Agriculture Organization (FAO) statistics, the total population of camels in the world is estimated to be about 20 million, with Somalia having the largest herd worldwide (FAO, 2008).

In Libya, the camel population estimated to be around 250000 head (Chapman, 1991, Wardeh, 2004.), there has been a considerable reduction

in the camel population of Libya reported by FAO (Bourzat, and Wilson 1987). Here, camels are important source of meat and milk in central Libya. Camels live in the vast pastoral areas in Africa and Asia and divided into two different species belonging to the genus *Camelus*. Dromedary camels (*Camelus dromedaries*, one humped) that mainly live in the desert areas

(arid), and Bactrian camel (*Camelus bactrianus*, two-humped) which prefer living in the cooler areas.

The importance of the dromedary arises primarily, however, from its provision of milk, meat within a subsistence economy and its use as animal of burden. Besides its economic importance, the camel has social and cultural importance to the pastoral herders of the region. Apart from its value as milk, meat, transport and riding animal, camels are prized according to their role in the traditional social relations for payment of bride wealth and compensation of injured parties in tribal feuds. Camels can also be seen as a sort of banking system or security against drought, diseases and other natural calamities that affect smaller stock more severely. Camels are the most capable animals in utilizing marginal areas because they can survive under harsh environmental conditions. For the people residing in the arid and semiarid areas, camels provide important sources of subsistence and income.

Milk yield and composition of camels affected with different factors including breeds, individuality, nutritional, stage of lactation, milking practices, calf suckling, and availability of drinking water and frequency of milking (Ramet, 2001). Therefore, the objectives of this research were to characterize the herd composition of camels in their natural management systems in Algoufra region and to estimation of milk yield of she-camels.

## MATERIALS AND METHODS

### *Sampling and questionnaire methodology:*

The survey was conducted through a questionnaire and guided interviews with camel herd owners in selected regions of the camel habitat in central Libya. The study was carried around the four main towns of the Elgufra (Waddan, Hun, Soukana, Zalla and Fougaha).

A set of detailed structured questionnaires were prepared and used to collect information from a total of 103 camel owners in different regions in interview conducted over single visit. Some of the information collected during interviews was supported by observation. The questionnaires were designed to obtain information on estimation of milk yield, herd structure, herd management, and breeding practices, production objectives, feeding management and production constraints.

**Data analysis:** The SPSS statistical computer software (SPSS for windows, release 15.0, 2006) was used to analyze the data. Results are represented mainly in the form of descriptive tabular summaries.

## RESULTS AND DISCUSSION

The results of the study showed that camel herd composition was differ according to the age groups, The highest camel herd size was recorded in Waddan in the first age group (less than year) while the smallest size recorded was in Fougaha, they were 18.9% and 10.7 respectively (Table 1). Also the study showed that, the herd structure of camels was varied according to the age group and the

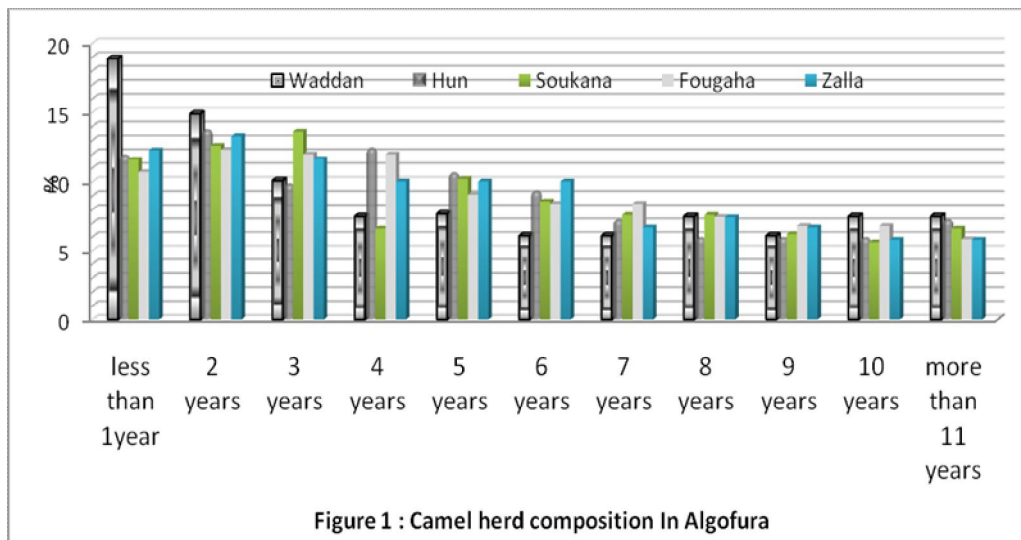
region, camels their age more than 11 years recorded the lowest percentages in Fougaha and Zalla (5.8%).

**Table 1:** Camel herd composition in different regions

Age groups	Waddan	Hun	Soukana	Fougaha	Zalla	Overall
≥ year	18.9	11.9	11.62	10.71	12.29	13.1
2 years	14.9	13.7	12.62	12.33	13.3	13.4
3 years	10.1	9.8	13.62	12.01	11.65	11.6
4 years	7.5	12.4	6.61	12.01	10.03	10.2
5 years	7.7	10.6	10.22	9.09	10.03	9.6
6 years	6.1	9.3	8.61	8.44	10.03	8.5
7 years	6.1	7.2	7.61	8.44	6.7	7.2
8 years	7.5	5.9	7.61	7.46	7.44	7.2
9 years	6.1	5.9	6.21	6.81	6.7	6.3
10 years	7.5	5.9	5.61	6.81	5.8	6.3
≤11 years	7.5	7.2	6.61	5.84	5.8	6.7

Figure (1) shows that, the herd composition was decreased as the age group increased, the percentages of

young groups were highest than old groups.



**Figure 1 :** Camel herd composition In Algofura

The average camel flock size was found to be 375.6 heads. The largest flock size was recorded in Waddan, followed by Soukana, Hun, and Zalla. However, Fougaha was recorded the lowest camel flock size. The highest herd composition in Hun was recorded in the second age group (13.7%) then the percentage decreased in the other groups and animals their age more than 8 years recorded the lowers (5.9%)

Table (2). The results revealed that the highest average flock size in Soukana was 68 heads in the third age group and the lowest 28 heads in the animals their age 10 years (Table 3), the percentage of the animals increased in the young animals (less than 3 years) and decreased sharply in the fourth group, then began to decrease slowly in the other old groups.

**Table 2:** Camel herd composition in Hun

Age group	Mean $\pm$ SE No. herds	Range No. herds	%
$\geq$ year	46	48-43	11.9
2 years	53	55-50	13.7
3 years	38	55-50	9.8
4 years	48	50-45	12.4
5 years	41	43-38	10.6
6 years	36	38-33	9.3
7 years	28	33-23	7.2
8 years	23	25-20	5.9
9 years	23	25-20	5.9
10 years	23	25-20	5.9
$\leq$ 11 years	28	33-23	7.2

**Table 3** Camel herd composition in Soukana

Age group	Mean $\pm$ SE No. herds	Range No. herds	%
$\geq$ year	58	60-55	11.6
2 years	63	65-60	12.6
3 years	68	70-65	13.6
4 years	48	50-45	6.6
5 years	51	53-48	10.2
6 years	43	43-43	8.6
7 years	38	40-35	7.6
8 years	38	40-35	7.6
9 years	31	33-28	6.2
10 years	28	30-25	5.6
$\leq$ 11 years	33	35-30	6.6

Most the animals rearing around Fougaha were recoded less percentages and low averages (Table 4), similar

percentages for the young animals (less than 5 years) and decreased slowly for the other groups.

**Table 4** Camel herd compositions in Fougaha

Age group	Mean $\pm$ SE No. herds	Range No. herds	%
$\geq$ year	33	35-30	10.7
2 years	38	40-35	12.3
3 years	37	40-33	12.0
4 years	37	40-33	12.0
5 years	28	30-25	9.1
6 years	26	28-23	8.4
7 years	26	28-23	8.4
8 years	23	20-20	7.5
9 years	21	23-18	6.8
10 years	21	23-18	6.8
$\leq$ 11 years	18	20-15	5.8

The percentage of camels in Zalla was 41% of young animals while the percentage of mature males 18 %, the herd composition were highest for

young and mature animals (less than 7 years) and lowest for the old animals (Table 5).

**Table: 5** Camel herd composition in Zula

Age group	Mean ± SE No. herds	Range No. herds	%
≥ year	38	40-35	12.3
2 years	41	43-38	13.3
3 years	36	38-33	11.7
4 years	31	33-28	10.0
5 years	31	33-28	10.0
6 years	31	33-28	10.0
7 years	21	23-18	6.7
8 years	23	25-20	7.4
9 years	21	23-18	6.7
10 years	18	20-15	5.8
≤11 years	18	20-15	5.8

The herd composition in Waddan was differing from the other areas; animals their age 1 year recorded higher average 71 heads (Table 6). The

percentage of growing animals (< 4 years) was greater than the percentage of mature and old.

**Table 6:** Camel herd compositions in Waddan

Age group	Mean ± SE No. herds	Range No. herds	%
≥ year	71	73-68	18.9
2 years	56	58-53	14.9
3 years	38	40-35	10.1
4 years	28	30-25	7.5
5 years	29	33-25	7.7
6 years	23	25-20	6.1
7 years	23	25-20	6.1
8 years	28	30-25	7.5
9 years	23	25-20	6.1
10 years	28	30-25	7.5
≤11 years	28	30-25	7.5

The majority of camel owners in this study adopted a sedentary management system, and most of them were grazing around the cities and kept in pens during night, this agrees with that found by Al-Khoury and Majid (2000). These three management systems were also reported in Pakistan (Aujla et al 1998). The results of this study revealed that the majority of respondents settled with their herds during the past years in response to availability of grazing and water supplies which found in the low valleys of Elgoufara. Similar findings were also reported by Al-Khoury and Majid (2000); Wardeh (1989); Abbas

et al (1992) and Agab and Abbas (1993).

The statement that camel raising was a way of life was the manner in which most owners explained the purpose of camel keeping in this study, The low cost of camel keeping and the fact that camels are drought tolerant animals able to survive in severe conditions compared to other livestock were also offered as reasons for keeping camels. None of the respondents stated the sale of camel milk as an objective of camel keeping, but camel milk was used for home-consumption.

Generally, feed and water supply were considered as constraints in different

regions, but were considered to be most serious in central Libya. This is probably due to the decrease in available range land as a result of the desert in camel rearing region. Most of the income of camel owners was spent on the purchase of crop residues in the study area. The camel owners in other regions of Libya solve the shortage of feed and water by adopting a long migration route to other regions

Camels are playing very important roles in the life of nomadic tribes rearing them. Socially, herd size is a very important indicator for the standing of the man in nomadic community. Economically, camel milk however, has less importance as direct source of income for nomads as it is

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mainly consumed by the household. During the last few years, the awareness about nutritional and medicinal benefits of camel milk in the urban communities in Libya has ravidly increased. Consequently, the market demand on the product has also increased. Nowadays, camel milk is available through different marketing shops in Algofra , these agree with Shuiep et.al (2014) who reported the same results with Sudanese camels also Ishag and Ahmed (2011) observed the same results . Camel rearing system in Algofra not mobile for long distance as in Sudan their movement for short distance practiced mainly around the valleys.

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