

## Some Reproductive and Productive Traits of Camel (*Camelus dromedarius*) in Western Sudan

<sup>1,2</sup>H. H. Musa, <sup>2,3</sup>E. S. Shuiep, <sup>3</sup>Ibtisam, E. M. El Zubier and <sup>1</sup>G.H. Chen

<sup>1</sup>College of Animal Science and Technology, Yangzhou University, Yangzhou, 225009, China

<sup>2</sup>Department of Animal Production, Faculty of Veterinary Science, University of Nyala, Sudan

<sup>3</sup>Department of Dairy Production, Faculty of Animal Production, University of Khartoum, Sudan

**Abstract:** Some reproductive and productive traits of the One-humped Camel dromedary (*Camelus dromedarius*) in Western Sudan were studied. The results of reproductive traits presented in this study indicated that Camel was conceived and calved through out the year and a high incidence was observed in wet-summer season. Age at first oestrus (months), oestrus cycle (days) oestrus duration (hours) was 39.24±5.78, 12.29±4.09 and 18.56±8.01, respectively. Age at first calving (months), gestation length (days) and calving interval (month) was 52.41±7.74, 370.28±19.06 and 20.96±3.51, respectively. Calves were weaned at 275.09±24.18days; milk yield per day was 9.62±3.09 liter during 2.85±0.83 milking number per day. Similarly, lactation length was estimated 303.98±6.03day and the peak of milk yield was attended at 9.09±2.09 year of age. The number of calf per age was similar estimated 12.66±2.39 calf. Wet-summer was observed a high mortality rate among the other seasons.

**Key words:** Arabian camel, reproduction, production, Sudan

### INTRODUCTION

One humped Camels are a major resource in arid and semi-arid zones, especially in Arab countries where 63% of the world population of this species is found<sup>[1]</sup>. Recently, many scientific reports dealt with reproductive and productive aspects of Camels<sup>[2-6]</sup>.

Age at first service, age at first calving and calving intervals can be reduced by improved feeding and Veterinary care<sup>[7]</sup>. Milk production estimated in Ethiopian Camels per day, was 8-10 liter<sup>[2]</sup> and 4.5 liter<sup>[4]</sup>. They indicated that daily milk yield was varied according to number of milking per day. A number of studies on Camel reproduction and production traits have been carried out in Eastern Sudan<sup>[8,9]</sup> without considering the reproduction and production system in Western Sudan. Therefore, the purpose of this study was to evaluate some reproduction and production traits of Arabian camel in Western Sudan.

### MATERIALS AND METHODS

The study was conducted in 2003 in Southern Darfur State, Sudan. Data on one questionnaire was filling with group discussion (3-5 Camel breeders), visited Nyala livestock market a month interval to meet new Camel breeder and some breeders were also visited

in their campus out side Nyala City as described by Musa *et al.*<sup>[10]</sup>. Similarly, some records were filling at El-fashir, Kabkabi and Sarfomara. Include some reproductive traits like age at first service (month), Oestrus cycle (day) Oestrus duration (hours), age at first calving (month), gestation length (day) and calving interval (month). The effect season on Camel breeding and calving was determined. Whereas, production traits were include weaning age (days) milk yield per day (liter), number of milking per day, lactation length (day) peak of milk yield (year) and calving number per age. Similarly, mortality rate according to season and age of Camels were estimated. This data was analyzed used means, standard deviation, Ch-square and correlation coefficient.

### RESULTS AND DISCUSSION

**Reproduction traits:** The reproductive traits surveyed and presented in Fig. 1 indicated that camels were conceived through out the year, with significant different ( $p < 0.001$ ) a high incidence was observed in wet-summer season and low incidence in hot-summer season. Similarly, calving occurred through out the year with significant different ( $p < 0.001$ ) Fig. 2 it is clear that the role of reproduction traits as a whole are largely a function of management and nutrition. Selection was mainly practice

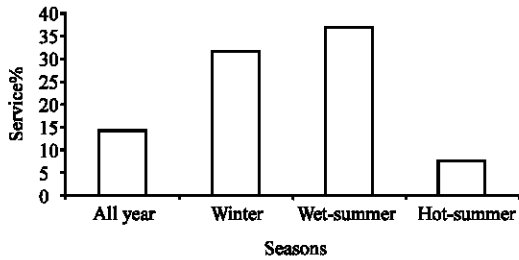


Fig. 1: The effect of seasons on camel service percentage

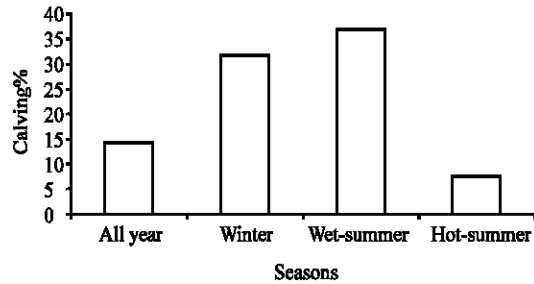


Fig. 2: The effect of seasons on camel calving percentage

for breeding purpose, when one bull rutting the other bulls was separated in the herds. Age at first service in the present study was 39.24±5.78 months. However, Arvana Camels are early maturing reach before the age of three years, Female mated at 3 years of age, males are used for service from 4-5 to 15-16 years<sup>[11]</sup>.

In the present study Table 1 Oestrus cycle and Oestrus duration was 12.29±4.01 day and 18.56±8.01 hours, respectively. Age at first calving was 52.41±7.74 months and that was less than 55.30±2.87 month for one humped Camel in United Arab Emirates estimated by Aboul-Ela<sup>[1]</sup>.

Gestation length was 370.28±19.06 day in the present study and it was shorter than that estimated for Bikaneri Camels in India 389±28 days<sup>[12]</sup> and 404.3±4.80 days<sup>[13]</sup>. However, shorter gestation periods of 345-360 days was also reported by Yagil and Etzion<sup>[14]</sup>, in this study calving interval was 20.96±3.51 month, long interval was 24.4±0.68 month reported by Simpkin<sup>[7]</sup>, while short interval 14.30 month was reported for improved management Camel in Saudi Arabia<sup>[15]</sup>. Camel was found arrive extreme production age at 21.29±6.24 year old. The positive correlation between the maximum productive age and number of calves was estimated 0.44.

**Production traits:** Some production traits of Camel in Western Sudan were surveyed and presented in Table 2. Calves were weaned at 275.09±24.18days and it was less than one year which was reported by Dmitriez and Ernst<sup>[11]</sup>

Table 1: Reproduction traits of camel in Western Sudan

Parameters	n	Average±SD
Age at first oestrus (months)	50	39.24±5.78
Oestrus cycle (days)	47	12.29±4.09
Oestrus duration (hours)	27	18.56±8.01
Age at first calving (months)	49	52.41±7.74
Gestation length (days)	54	370.28±19.06
Calving interval (months)	54	20.96±3.51
Maximum productive age (years)	37	21.29±6.24

n, number of records

Table 2: Production traits of camel in Western Sudan

Parameters	n	Average±SD
Weaning age (days)	53	275.09±24.18
Milk yield liter (days)	53	9.62±3.09
Number of milking (days)	54	2.85±0.83
Lactation length (days)	54	303.98±6.03
Peak of milk yield (years)	44	9.09±2.09
Calving number per (age)	28	12.66±2.39

n, number of records

for Arvana Camels. Number of milking per day was 2.85±0.83; yield 9.62±3.09 liter per day and this yield was higher than that estimated for Ethiopian Camel 4.5 liter by Tezera<sup>[4]</sup> and 3.6-6.5 liter by Baars<sup>[6]</sup>. The highest yield recorded by Bekele *et al.*,<sup>[16]</sup> was 13.75 kg. Daily milk yield varied according to number of milking per day. It may be due to difference in breed, management conditions and stage of lactation. Camels were hand milked twice daily in the morning and in the evening, some time breeder milked goats, while sheep was used for meat production.

In this study lactation period was 303.98±6.03days, is similar to that estimated by Aboul-Ela<sup>[1]</sup> and it was effected by year. Longer lactation period was also estimated 15-18 month<sup>[11]</sup> and 567 day<sup>[16]</sup>. They are indicated that Camels calved in long dry season had the longest lactation, while that calved in short rainy season showed shortest lactation length. Positive correlation between milk yield and number of milking per day was 0.40. However, the negative correlation was 0.22 between milk yield and lactation length. Camels attend a peak of milk yield at 9.09±2.09 year and the number of calf per one Camel was estimated 12.66±2.39 during their productive life. Generally in Western Sudan Camels were used for meat production at 7 years old.

**Mortality rate:** Season was non significantly ( $p>0.05$ ) effected Camel mortality as shown in Fig. 3 it was estimated 2.58, 1.86 and 1.48% for wet-summer, winter and hot-summer season, respectively. High death of adult was observed in winter season, whereas, for young was observed in rainy season, it was due to their feeding on milk and this was caused diarrhea ended to death. The other causes of mortality were found to be Trypanosomiasis, internal parasites, mange and toxic plant. Instead of drugs traditional treatments were also practice such as drenched of acacia trees for internal parasite treatment.

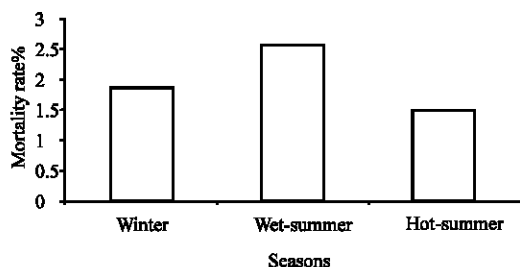


Fig. 3: The effect of seasons on camel mortality rate

### REFERENCES

1. Aboul-ela, M.B., 1994. Reproductive performance of one-humped Camel under traditional management in the United Arab Emirates. *J. Arab Environ.*, 26: 47-51.
2. Abebe, W., 1991. Traditional husbandry practice and major health problems of Camels in the Ogaden. *Nomadic People*. 29: 21-31.
3. Arthur, G.H., 1992. 1st international Camel conference Dubai, UAG. pp: 109-113.
4. Tezera, G., 1998. Characteristics of camel husbandry practices and Camel milk and meat utilization in Shinille and Jijiga zones of Somali National Regional State. M.Sc. Thesis, Alemaya University of Agriculture, Ethiopia.
5. Kebebew, T. and R.M.T. Baars, 1998. Milk production performance of pastorally managed Camels in Eastern Ethiopia. *Proceedings of 6th Annual conferences. Ethiopian Society of Animal production, Ethiopia*, pp: 184-193.
6. Baars, R.M.T., 2000. Costs and returns of Camels, Cattle and Small ruminants in pastoral herds in Eastern Ethiopia. *Tropical Animal Health and Production*, 32: 113-126.
7. Simpkin, S.P., 1987. A summary of the increased productivity in camels as a result of the application of a Veterinary package. Paper Presented at the Workshop on Camel Management and Ecology, Landskrona, Sweden.
8. Young, W.C., 1987. The effect of labor migration on relations of exchange and subordination among the Rashaayda Bedouin of Sudan. *Res. Eco. Anthropol.*, 9: 191-220.
9. Werner, L., 1994. *Real lives 2: Sudan people planet*, 3: 20-25.
10. Musa, H.H., E.S. Shuiep, E.M. Ibtisam and El Zubier, 2006. Camel husbandry Among Pastoralists in Darfur in Western Sudan. *Nomadic peoples*. In Press.
11. Dmitrez, N.G. and L.K. Ernst, 1989. Animal genetic resources of the USSR. *Animal Production and Health Paper Published by FAO, Rome*, pp: 517.
12. Mehta, V.S., A. Prakash and M. Singh, 1962. Gestation period in Camels. *Indian Vet. J.* 39:387-389.
13. Ram, S., B. Singh and O.P. Dhanda, 1977. A note on genetic studies on gestation length, birth weight and intra-uterine development index in Indian Camels (*Camelus dromedarius*) and factors affecting them, *Indian Vet. J.* 54: 953-955.
14. Yagil, R. and Z. Etzion, 1980. Milk yield of Camels (*Camelus dromedarius*) in draught areas. *Comp. Biochem. Physiol.*, 67: 207-209.
15. Bakkar, M.N. and S. Basmaeil, 1988. Reproduction performance in najdi camels. *Proceedings of the 11th International Congress on Animal Reproduction and Artificial Insemination*, 1: 529.
16. Bekele, T., M. Zeleke and R.M.T. Baars, 2002. Milk production performance of the one humped Camel (*Camelus dromedarius*) under pastoral management in semi-arid Eastern Ethiopia. *Livestock Production Sci.*, 76: 37-44.