Reproductive Performance of Camels (Camelus dromedarius) in Saudi Arabia

Adel Abdullah Al-Hozab
Department of Animal Science, College of Agricultural Sciences
King Faisal University
P.O. Box 420, Al-Hasa 31982
Saudi Arabia

Abstract

Reproductive performance of the camels in Saudi Arabia was assessed through the analysis of one hundred and ten records gathered by the author from meetings with owners of camel herds from various parts of the kingdom. Reproductive parameters included in this study were age at first mating for females and males, conception rate, calving rate, days open and calving interval. The mean values of age at first mating for females and males, and calving interval were 52.4, 65.0 and 23.5 months, respectively. Moreover, conception and calving rates were 89 and 57.5 percent, while days open were 30.8 days. The results of this study indicated that the major constraints to improving camel reproductive performance were: the practice of delayed first mating, the long calving interval and the high pre-and postnatal losses. However, a great potential to improve the productivity of camels in Saudi Arabia exists if new reproductive techniques are taken into consideration.

Key words: Camel, Reproductive Performance, Saudi Arabia.

Introduction

The ability of camel to survive and produce in the harsh environment of arid areas makes it the ideal agricultural animal for this region. In the past, camels played a critical socio-economic role in Saudi Arabia. They were used as draft animals and their milk and meat were a major source of animal protein for desert dwellers. The changes in the structure of the society and the improvement of living standards brought by oil discoveries, had reduced camel numbers to a minimum of 104 thousand in 1975 (MAGW 1975). However, camel population in Saudi Arabia has increased to more than 750 thousand during this decade (MAGW 1998). This increase could be due to the recognition of local consumers of the benefits of camel milk and meat over other animal by-products the use of camel in races. Camel farming could be a profit-making enterprize, if the production system is modernized under intensive systems (Bhattacharya, 1988). Knowedge of reproductive performance of camel under pastoral conditions is necessary prior to utilization of this animal in intensive management system. Very few studies have been conducted to evaluate reproductive performance in the female camel (Musa & Merkt, 1990; Hermas and Shareha, 1990; Djellouli and Saint-Martin, 1992; Aboul-Ela, 1994). The objective of this study was to assess the various parameters of reproductive performance of the camel raised under traditional system in Saudi Arabia.

Materials and Methods

Data sheets were designed to collect reproductive information from camel owners. The author interviewed one hundred and ten camel owners from different regions of Saudi Arabia over a period of three years. Data collected were used to assess age at first mating, conception rate, calving rate, calving intervals and some other reproductive parameters.

Results and Discussion

Data presented in Table (1) showed that the average numbers of females and males in the herds were 85 and 6, respectively. The ratio of male to female in the herds was 1:11, which is similar to the ratio indicated by Asad (1970) but higher than 1:70 reported by Singh (1963), Williamson and Payne (1978) and Wardeh (1989). This high male to female ratio reflects the desire of local breeders to ensure the highest fertility rate in their herds.

Age at first mating for female and male was 52.4 ± 12.3 And 65 ± 15 months, respectively. Female camel reaches puberty as early as 36 months of age (Williamson & Payne, 1978; Hermas & Shareha, 1990; Musa and Merkt, 1990; Farak, 1992; Aboul-Ela, 1994). In this study female first mating was delayed until four years of age. This practice is common among Bedouins in several countries (Khatami, 1970; Spencer, 1973; Musa and Merkt, 1990). Male camels show first sexual desire at two years of age (Singh, 1966; Arthur et al., 1985). However, their use as stud males start at five years (Khatami, 1970; Arthur et al., 1985; Gihad, 1995).

Table 1. Some reproductive performance parameters of camel under traditional system.

Parameter	Mean	± S.D.	Minimum	Maximum
Number of female per herd	85	106.8	14	800
Number of male per herd	6	7.2	1	50
Age at first mating, female (m)	52.4	12.3	36	96
Age at first mating, male (m)	65	15	36	96
Conception rate, first service (%)	57	21.5	6	100
Conception rate, more than one service	89	13.6	10	100
Calving rate (%)	57.5	23.5	8	100
Calving intervals (m)	23.5	1.8	17	30
Calf mortality rate (%)	24	16.3	0	80
Days open (d)	30.8	16.4	4	90
Weaning age (m)	10.6	2.3	5	18
Length of lactation (m)	11.5	1.9	7	18
Longivity (y)	21.7	3.5	12	30
Number of calves per life	10.8	2	6	15

Some authors claimed that fertility rate in camels was low (50%) when compared to other domestic animals (Gupta et al., 1968; Nova, 1970). According to Bedouins, fertility rate in camels was more than 90% and sterility occured in only 1% of camels observed (Arthur et al., 1985). Similarly, Bhattacharya (1988) reported that conception rate in camels under controlled conditions was 95.6% and calving rate was 88.6%. In this study, conception rate from first service was low (52.4%) and increased to 89% when female camels were exposed to more than one service. Calving rate, however, was 57.5% indicating high rate of embryonic death which was consistent with the findings of Tayeb (1953), Shalash (1965) and Al-Ani (1997).

Calving interval is another important indicator of reproductive performance. Table (1) showed that the interval between calvings was 23.5 ± 1.8 months. Magrebi camels have slightly shorter intervals 22.6 months (Hermas and Shareha, 1990) and 22.3 months (Farak, 1992). On the other hand, Musa and Merkt (1990) and Aboul-Ela (1994) indicated that interval between calvings was two years. The long calving interval in camel was attributed

to the common practice under traditional system of mating camels every alternate breeding season. Normally only one calf is born every two years, but occasionally a female breeds twice in two and a half years (Matharu, 1966). Richard (1985) observed intervals of 15 months when camel maintained under good sanitary conditions and were well nourished.

Days open in she-camel in this study was 30.8 ± 16.4 days. Nova (1970) indicated that the first estrus occurs 14-25 days after calving. However, in poorly nourished animals it may be delayed for one year. Estrus behavior resumed by 32.4 + 19 days postpartum and female camel can conceive during the first three weeks after parturition (Farak, 1992). Traditional camel owners usually delay mating to the next breeding season to allow new born calf to suckle at least for 10 months.

Mortality rate among newly born calves is very high, reaching 50% and levels of 30% are considered usual (Musa & Merkt, 1990). Mortality rate in this study was 24 ± 16.3%. Average postnatal losses was reported to be 16.8% (Farak, 1992). The high mortality rate could be attributed to many causes such as, under feeding, over feeding, early weaning diseases and poor management (Mukasa-Mugerwa, 1981; Wilson, 1984).

Length of lactation and age at weaning were found to be 11.5 + 1.9 and 10.6 + 2.3 months, respectively. Young calves are usually weaned between 3-18 months and the lactation period may last up to two years. Under traditional pastoral systems, the average weaning age is about 13 months (Musa and Merkt, 1990).

The length of reproductive life (longivity) was 21.7 + 3.5 years and the number of calves per life was 10.8 + 2 (Table 1). The length of camels reproductive life varies, but some female continue to breed until 30 years old (Yasin and Wahid, 1957; Cossins, 1971). The female camel can produce an average of 8-10 calves cinalifetime (Williamson and Payne, 1978; Arthur et al., 1985). However, Cossins (1971) has reported a 30 years-old camel that had 15 calves.

The results of this study indicate that advanced age at first mating, long calving interval and high prenatal and postnatal mortality constitute the major constraints to improving reproductive performance in camel. Several attempts have been made to manipulate the reproductive functions to improve camel performance. Yagil (1985) used follicle stimulating hormone (FSH) to accelerate onset of puberty. Successful fertile mating was achieved when 2-3 years camels were induced to ovulate (Rai et al., 1990). Shortening postpartum interval to conception is another important consideration to improve reproductive efficiency. Introducing artificial insemination (AI) on a large scale will improve fertility (Musa et al., 1993). Controlling diseases and improving herd management will minimize pre-and postnatal losses. The future prospective of camel as an agriculture animal is promising, however, further scientific collaboration is needed to provide applicable solutions to problems facing camel production.

References

1. Aboul-Ela, M.B. 1994. Reproductive performance of the one-humped camel under traditional Management in the United Arab Emirate. J. Arid Envir., 26: 47-51.
2. Al-Ani, F.K. 1997. Camel Encyclopaedia. Al-Bahja Press, Jordan, 400 pp.
3. Arthur, G.H., Rahim, A.T.A. and Al-Hindi, A.S. 1985. Reproduction and genital diseases of the camel. Br. Vet. J., 141: 650-659.
4. Asad, T. 1970. The Kababish Arabs X Power, authority and concent in a nomadic tribe. C. Hurst and Co., London, 263 pp.
5. Bhattacharya, A.N. 1988. Camel Reproduction Research in Northern Saudi Arabia: A monograph. Department of Agriculture Research, Ministry of Agriculture and Water, Golden Pages Printing Co. Ltd., Riyadh, 92 pp.
6. Cossins, N.J. 1971. Pastoralism under pressure: A study of the Somali clans in the Jijiga areas of Ethiopia. Mimeo Addis Ababa, L.M.B., 101 pp.

7. Djellouli, M.S. and Saint-Martin, G. 1992. Productivity and economy of camel breeding in Tunisia. Proc. First Int. Camel Conf., 2nd – 6th Feb., Dabai, pp. 209-212.
8. Farak, M. 1992. Study of reproductive performance of the female camel (camelus dromedarius): Postpartum and productivity. Doctorate Thesis, Institute Agronomique et Vitrinaire Hassan II, Rabat, Morocco.
9. Gihad, E.A. 1995. Arabian Camels: production and culture. Arab Pub. Dist. Co., Cairo, 373 pp.
10. Gupta, A.K., Choudhary, M.S. and Barhat, N.K. 1968. A note on optimum time for service in Camel (camelus dromedarius). Ind. J. Animal Sci., 48: 324-325.
11. Hermas, S.A. and Shareha, A.M. 1990. Reprodutice performance of the Magrebi camel (camelus dromedarius). Proc. Int. Conf. Camel Prod. Imp., Tobruk, 10-13 Dec. pp.1.
12. Khatami, K. 1970. Camel meat: A new promising approach to the solution of meat and protein in the arid and semi-arid countries of the world. Mimeo, Ministry of Agriculture, Tehran, 4 pp.
13. MAGW 1975. Bulletin of Agricultural current sample survey from 1970 to 1975. Ministry of Agriculture and Water, Riyadh, Saudi Arabia.
14. MAGW 1998. Indicators for Agriculture and Water. Ministry of Agriculture and Water, Riyadh, Saudi Arabia.
15. Matharu, B.S. 1966. Camel care. Ind. Farming, 16: 19-22.
16. Mukasa-Mugerwa, E. 1981. The camel (camelus dromedarius): A bibliographical review. ILCA Monograph, Int. Livestock Cent. For Africa, Addis Ababa, Ethiopea.
17. Musa, B.E. and Merkt, H. 1990. Reproductive performance in the female camel (camelus dromedarius). Proc. Int. Conf. Camel Prod. Imp., Tobruk, 10-13 Dec. pp. 87-92.
18. Musa, B., Sieme, H., Merkt, H., Hago BED, Cooper, M.J., Allen, W.R. and Jochle, W. 1993. Manipulation of reproductive functions in male and female camels. Animal Reprod. Sci., 33: 289-306.
19. Nova, C. 1970. Reproduction in camelidae, J. Reprod. Fertil., 22: 3-20.
20. Rai, A.K., Agarwal, S.P., Agarwal, V.K. and Khanna, N.D. 1990. Induction of early puberty in Female camels. Proc. Unite de Coordination pour I'Elevage Camelin. Workshop: Is it Possible to Improve the Reproductive Performance of the Camel, Paris, pp. 10-12.
21. Richard, D. 1985. Le Dromadaire et son elevage. Etudes et syntheses de L'I.E.M.V.T., 67-76.
22. Shalash, M.R. 1965. Some reproductive aspects in the female camel. World Rev. Anim. Prod.
23. Singh, H. 1963. Handbook of Animal Husbandry for Extension Workers. New Delhi. Ministry of Food and Agric., Directorate of Extension, 162 pp.
24. Singh, H. 1966. Camel care. Intensive Agric. J., 1966: 9-12.
25. Spencer, P. 1973. Nomads in alliance. Symbiosis and growth among the Rendille and Sombura of Kenya. London Oxford Univ. Press. 230 pp.
26. Tayeb, M.A.F. 1953. Les organses geniteux de la chamelle. Revue Elev. Med. Vet. Pays.
27. Trop., 6: 17-21.
28. Wardeh, M.F. 1989. Arabian Camels, Origin, Breeds and Husbandry. Al-Mullah Pub., Damascus, Syria. 500 pp.
29. Williamson, G. and Payne, W.J.A. 1978. An introduction to Animal Husbandry in the Tropics. 3rd ed., London Longman, 755 pp.
30. Wilson, R.T. 1984. The Camel. Longman, London. Pp. 83-101.
31. Yagil, R. 1985. The Desert Camel. Comparative physiology. Comparative Animal Nutrition, Vol.5, Karger, Basel.
32. Yasin, S.A. and Wahid, A. 1957. Pakistan Camels. A preliminary survey. Agric. Pakist., 8: 289-298.

الأداء التناسلي للإبل في المملكة العربية السعودية

عادل بن عبد الله الحزاب

قسم علوم الإنتاج الحيواني - كلية العلوم الزراعية والأغذية

جامعة الملك فيصل – الأحساء

المملكة العربية السعودية

الملخص

تم تقدير وتقييم الأداء التناسلي بعد تحليل اكثر من مائة سجل جمعها الباحث من مربي الإبل من مختلف مناطق المملكة العربية السعودية.

شملت الدراسة عدة مقاييس للأداء التناسلي وهي العمر عند التلقيح للذكر و الأنثى، معدل الخصوبة، الفترة بين ولادتين، معدل الولادة وعدد الأيام المفتوحة . بلغ متوسطات العمر عند التلقيح للأنثى، الذكر والفترة بين ولادتين ٤, ٥٢، ٠, ٦٥، ٥, ٢٣ شهر على التوالى. وقد كان معدل الخصوبة ومعدل الولادة ٨٩% و ٥٧،٥% أما بالنسبة لمقياس الأيام المفتوحة فقد بلغ ٣٠،٨ يوما.

تدل النتائج المستخلصة من هذه الدراسة أن أهم معوقات رفع الكفاءة التناسلية للإبل هي: تأخير التلقيح، طول فتره ما بين ولادتين وارتفاع معدلات الفقد خلال الحياة الجنينية وبعدها. ويمكن رفع الإنتاجية التناسلية للإبل في المملكة العربية السعودية عن طريق تطبيق بعض التقنيات التناسلية الحديثة.