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INFLUENCE OF CAMEL BREEDS AND AGES ON THE REPROD PERFORMANCE OF DROMEDARY CAMELS IN SAUDI ARABIA

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ABSTRACT

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To evaluate the reproductive performance of the camel herd at the Camel Research Center, records over 20 years were collected and analyzed. The effects of camel breeds and ages on the reproductive performance were included in the study. The results revealed that, the overall mean values of ages at first mating, conception and calving were 39.75±0.61; 41.82±0.64 and 54.39±0.64 months, respectively. The overall means of the corresponding body weights were 437.17±6.75, 450.16±7.57 and 519.03±6.86 kg, respectively. Camel breeds have a significant effect (P<0.05) on the body weight at first calving. The overall mean of the interval between services was 19.32±0.26 days, with no significant effects of camel breeds and ages. The overall period of post-partum heat was 45.39±2.57 days and was influenced significantly by camel breeds. The overall means of the service period and open days were 74.58±3.62 and 317.61±4.54 days, respectively, and both of camel breeds and ages had a significant effect on these criteria. Camel ages had significant effect on the number of services/conception and this indicated by medium ages (5-11 years) needs less service for conception than other ages. Service period and number of services/conception were significantly less during November to January mating months than that during February to April. The overall mean of calving interval was 19.70±0.34 months. Camel breeds and successive calving seasons had no significant effect on the calving interval. In conclusion, reproductive performance of Dromedary camels depends essentially on the camel breeds and ages.

***Key words**: Dromedary camels, -reproductive performance, camel bree*

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INTRODUCTION

The one-humped camel is a unique producer of food in the arid and semi-arid zones of the world. It is the only animal that can exist for several weeks without water and still able to provide its offspring and humans with milk (Yagil, 1982). The total population of camels in the world was estimated to be about 19 million, 14 million (73%) of which are in Africa and the Near East and 5 million (27%) in Asia (FAO 1992). The total population of dromedary is estimated to be around 1.6 million camels within the Arabian Peninsula, about 53% found in Saudi Arabia (FAO statistics, 2011). However, there is an important gap between the official number of camel heads according to FAO statistics (280,000 in 2009) and the national estimation published by the Ministry of Agriculture in Saudi Arabia (830,000 heads). Based on this last estimation, the camel population is 51% of the total tropical livestock in the country (Abdallah1 and Bernard Faye, 2012). The importance of camel in Saudi Arabia is clearly underlined by these data. ~~The total population of dromedary in the Arabian Peninsula was estimated at approximately 1.6 million camels, about 53% in Saudi Arabia (Al-Eknah, 2008).~~ Camels in Saudi Arabia play a major role in supplying the desert indwellers with milk and meat under extremely hostile conditions of temperature, drought and lack of pasture (Yagil and Etzion, 1980). Camel breeds derive their names from the areas of their habitats in dry and hot zones (North Africa, the North East and West Central Asia) as well as according to the tribe name (Wilson, 1984). A recent classification of camel breeds based on their economical traits was suggested by Wardeh (1989). Accordingly, Camels are assigned to four main classes: beef, dairy, dual purpose and racing camels. However, Saoud *et al*. (1988) and Basmaeil, *et al*~~.~~, (2012) identified native camel breeds in the Saudi Arabia according to coat colors and production into Magahiem (black color, best milking breed); Maghatier (white color, moderate in milk production) Safrah (color mixture between the white and red) and Hamrah (color overlap between red and blond, more suitable for meat production than milk)~~.~~. The breeding of camels is at high risk because of the slow reproduction rate (Dahl and Hjort, 1979). Full reproductive capacity of the female camel ~~is~~ reached at 6 years (Singh, 1966; Khetami, 1970), but it can be bred at 3-5 years of age (Matharu, 1966; Williamson and Payne, 1978). Yasin and Wahid (1957) reported that the female camel would breed until 30 years of age.

The production and reproduction in camels are affected by many factors such as late puberty, restricted breeding season, induced ovulation, long gestation period and long calving interval. These factors may constitute a major reason for the long generation interval in camels. The investigation aimed to study the re performance of Saudi Arabian camels unde management system will shed more lig influence of —age and camel breeds reproductive performance traits.

MATERIALS and METH

The used records ~~used~~ were collected fron of the camel station at the Camel Research Sakaka, Al Jouf in the N~~n~~ortheastern par Arabia. These records were used to ev reproductive performance through measu the fertility parameters of Arabian car intensive controlled management. The ~~observations of~~ reproductive parameters wl in~~included in~~ this study included, data of a female camel which~~ere~~ collected from sexually mature camels during consecutiv seasons over a period of 20 years (1985 to 2 animals were fed the available hay *ad-libidu* kg concentrate pellets (containing 16% cru 2.5-3.0% crude fat, 4.9-8.5% crude fibe 0.69-0.7%, phosphorus 0.4% and salt 1% breeding season variable amounts of alf offered to the animals. Supplementary feed form of whole dates and bran were als irregularly.

The studied reproductive performance in following traits which described by EL-A (1997): (1) Ages (months) and weights (k mating, first conception and first calving, (between services (days) within the same season which annually starts at early Novem April and may extended to early May, (3) P period (days); period between calving to on first heat, (4) Service period (days); perio from calving to successful conception withi breeding season, (5) Open days period (day from calving to last successful service which to forthcoming breeding season, (6) N services/conception, (7) Calving interva period between two consecutive calving's~~.~~.

The influence of camel breeds and ages on r were studied. ~~Data~~ Oobtained data acc available observations of reproductive t tabulated into 2 fixed factors (camel breeds and statistically analyzed using the SPSS ve Windows statistical software package. The also subjected to analysis of variance usin Linear Model (GLM) procedure and multiple comparisons for observed r Duncan's test for performances in relati suggested factors.

RESULTS

As shown in Tables 1 and 2, the overall mean values of ages at first mating, conception and calving were 39.75±0.61; 41.82±0.64 and 54.39±0.64 months, respectively. The overall means of the corresponding body weights were 437.17±6.75, 450.16±7.57 and 519.03±6.86 kg, respectively. The results indicated that, the differences between the camels' breeds (Magahiem, Maghatier, Hamrah and Safrah) were not significant for the studied ages and body weights at first services and conception. However, Safrah camel breed had lesser (P<0.05) body weight (499.00±14.04 Kg) at first calving than other camel breeds.

The overall mean values of the interval between services were 19.72±0.51, 19.13±0.42, 19.56±0.78 and 19.50±0.50 days for Magahiem, Maghatier, Safah and Hamrah camel breeds, respectively, whereas, the mean values of the same criteria for camel ages ≤5, 5-7, 7-9, 9-11 and ≥11 years were 19.28±0.32, 18.78±0.63, 20.41±0.84, 19.34±0.84 and 18.93±0.90 days, respectively (Table 3). Camel breeds and ages didn't have a non-significant effect on this trait.

The effect of camel breeds and ages on post-partum period are illustrated in Table (4). Results indicated that, Hamrah camel breed had significant (P<0.05) shorter period (36.83±3.73 days) than other breeds. However, no significant effect to camel ages on the post-partum period, and the overall period was 45.39±2.57 days.

The influences of camel breeds and ages on the service periods are illustrated in Table (5). Results indicated that, Hamrah camel breed had significant (P<0.05) longer period (93.21±7.42 days) than other breeds, at the same time, female camel ages ≥11 years old had significant (P<0.05) long (90.88±10.85 days) than other studied ages.

The effects of camel breeds and ages on the period are showed in Table (6). The open d were affected by camel breeds and age Maghatier camel breed recorded longer period (329.51±7.50 days) than other breed camel ages 5-7 years reported longer (P<0.0 (342.46±7.59 days) than other studied influences of camel breeds and ages on t service/conception are illustrated in Table overall mean value of number of services/ was 2.57±0.02 services. Results indicated th camels ages had significant effect (P<0.0 number of service/conception and this in medium ages (7 to 9 years) needs less se conception (2.05±0.20), on the other han (≤5 years) and older ages (≥11 years) n services for conception (2.88±0.17 and respectively) (Table 7). However, the car had no significant effect on this trait.

Measurement of calving interval is an impo herd performance monitoring tool. As d Table (8), the overall mean of calving in 19.70±0.34 months; and no significant diff the calving interval between camel br successive calving seasons. However, ca show substantial difference in the calving i she-camels age advanced the interval incr this phenomenon was denoted up to the season (Table 8). Calving interval distribut she-camel population is shown in Fig. calving interval classes were <15, 15-17, 18 and >24 months and the corresponding p were 7.27%, 17.27%, 35.46%, 31.82% and the she-camels, respectively.

Table 1: Influence of camel breeds on the ages at first service, conception and calving (Mean±SE)

Camel Breeds	No. of observations	Ages (Months)		
		1st Service	1st Conception	1st Calving
Magahiem	38	41.21±1.34	42.90±1.41	55.53±1.41
Maghatier	60	39.33±1.07	40.77±1.13	53.36±1.12
Safrah	46	40.09±1.22	42.65±1.28	55.21±1.28
Hamrah	44	38.36±1.25	40.96±1.31	53.48±1.31
Overall	188	39.75±0.61	41.82±0.64	54.39±0.64

Table 2: Influence of camel breeds on the body weight at first service, conception and calving (Mean±

Camel Breeds	No. of observations	Body weights (kg)		
		1st Service	1st Conception	1st Calving
Magahiem	14	442.57±15.66	456.29±17.58	504.57±15.92 ab

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Maghatier	44	444.77±8.84	460.41±9.91	530.05±8.98 [ab]
Safrah	18	439.44±13.81	445.56±15.50	499.00±14.04 [b]
Hamrah	16	421.88±14.65	438.38±16.44	542.50±14.89 [a]
Overall	92	437.17±6.75	450.16±7.57	519.03±6.86

Means in the same column with different superscripts differ significantly (P<0.05).

Table 3: Influence of camel breeds and ages on the interval between services (Mean±SE)

Ages	No. of observations	Camel Breeds (Number of observations)				Overall (n=687)
		Magahiem (n=186)	Maghatier (n=238)	Safrah (n=90)	Hamrah (n=173)	
≤ 5	339	18.55±0.82	19.37±0.63	19.46±0.92	19.57±0.66	19.28±0.32
5-7	105	17.93±1.65	19.22±0.89	19.58±1.84	17.65±1.55	18.78±0.63
7-9	90	21.86±1.20	18.88±1.11	18.00±4.51	21.29±1.55	20.41±0.84
9-11	72	20.09±1.13	18.92±1.84	21.00±2.02	16.62±1.77	19.34±0.84
≥ 11	81	20.61±1.20	18.17±1.50	18.20±2.85	17.45±1.43	18.93±0.90
Overall	687	19.72±0.51	19.13±0.42	19.56±0.78	19.50±0.50	19.32±0.26

Table 4: Influence of camel breeds and ages on the post-partum period (Mean±SE)

Ages	No. of observations	Camel Breeds (Number of observations)				Overall (n=108)
		Magahiem (n=25)	Maghatier (n=32)	Safrah (n=26)	Hamrah (n=25)	
≤ 5	23	34.67±12.11	38.67±8.57	42.00±12.11	29.00±12.11	36.29±5.05
5-7	20	70.00±12.11	51.00±12.12	51.00±12.11	33.33±12.00	51.33±6.34
7-9	22	45.00±12.11	40.67±12.00	32.00±14.84	35.40±9.39	38.31±4.54
9-11	21	58.00±12.11	58.00±12.17	69.00±12.11	31.00±12.00	54.00±6.61
≥ 11	22	51.67±12.00	40.00±12.12	58.00±9.39	48.50±14.84	50.92±5.21
Overall	108	48.67±4.51[a]	46.64±5.44[ab]	52.74±4.38[a]	36.83±3.73[b]	45.39±2.57

Means in the same row with different superscripts differ significantly (P<0.05).

Table 5: Influence of camel breeds and ages on the service periods/days (Mean±SE)

Ages	No. of observations	Camel Breeds (Number of observations)				Overall (n=197)
		Magahiem (n=39)	Maghatier (n=44)	Safrah (n=56)	Hamrah (n=58)	
≤ 5	52	45.00±15.35	48.14±12.97	70.00±15.35	87.44±11.44	65.35±6.38 [b]
5-7	50	75.00±17.16	44.00±15.35	82.88±12.14	100.88±12.14	79.60±8.05 [ab]
7-9	40	73.50±17.20	86.00±17.18	51.75±17.16	95.25±12.10	80.35±8.17 [ab]

9-11	30	82.75±17.16	56.67±19.82	43.00±15.35	66.00±19.82	60.93±7.20 [b]
≥ 11	25	82.40±21.71	113.67±19.82	73.33±14.01	149.00±34.33	90.88±10.85 [a]
Overall	197	69.54±7.41 [b]	64.18±7.62 [b]	66.96±5.80 [b]	93.21±7.42 [a]	74.58±3.62

Means in the same column with different superscripts differ significantly (P<0.05).
Means in the same row with different superscripts differ significantly (P<0.05).

Table 6: Influence of camel breeds and ages on the open days period (Mean±SE)

Ages	No. of observations	Camel Breeds (Number of observations)				Overall (n=272)
		Magahiem (n=46)	Maghatier (n=81)	Safrah (n=63)	Hamrah (n=82)	
≤ 5	78	300.71±17.32	345.88±12.96	343.54±13.23	282.60±16.73	324.89±7.28 [bc]
5-7	55	365.40±28.97	356.40±14.49	336.29±17.32	323.25±16.20	342.46±7.59 [c]
7-9	45	305.40±28.97	262.75±22.91	275.80±28.97	327.00±22.91	293.23±17.59 [ab]
9-11	44	297.50±32.39	301.40±28.97	315.86±24.49	227.67±21.60	278.28±16.62 [a]
≥ 11	50	282.80±28.97	317.65±13.51	299.92±17.97	327.22±21.59	311.28±8.43 [ab]
Overall	272	308.12±12.20 [ab]	329.51±7.50 [b]	324.48±7.30 [ab]	297.82±8.63 [a]	317.61±4.54

Means in the same column with different superscripts differ significantly (P<0.05).
Means in the same row with different superscripts differ significantly (P<0.05).

Table 7: Influence of camel breeds and ages on the number of services/conception (Mean±SE)

Ages	No. of observations	Camel Breeds (no. of observations)				Overall (n=319)
		Magahiem (n=62)	Maghatier (n=87)	Safrah (n=82)	Hamrah (n=88)	
≤ 5	121	2.92±0.48	2.76±0.26	2.37±0.33	3.39±0.29	2.88±0.17 [b]
5-7	74	2.53±0.45	2.42±0.35	2.19±0.43	2.21±0.40	2.34±0.18 [ab]
7-9	43	2.44±0.58	2.36±0.46	1.13±0.61	2.00±0.50	2.05±0.20 [a]
9-11	34	2.78±0.58	2.18±0.53	2.43±0.66	1.86±0.66	2.32±0.29 [ab]
≥ 11	47	3.14±0.66	3.27±0.45	2.33±0.45	2.60±0.55	2.81±0.27 [b]
Overall	319	2.57±0.22	2.61±0.15	2.16±0.18	2.72±0.20	2.57±0.02

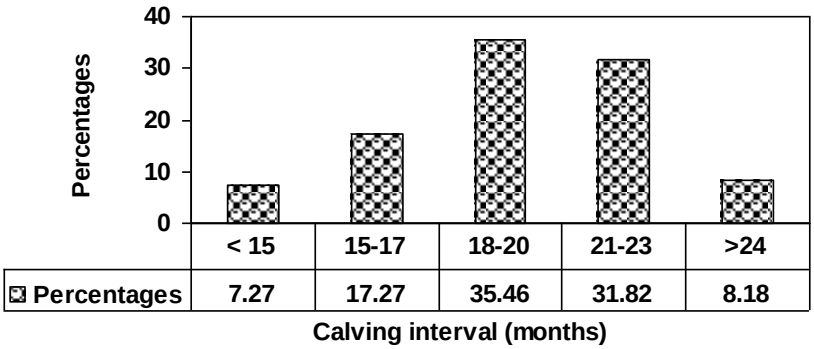
Means in the same column with different superscripts differ significantly (P<0.05).

Table 8: Influence of camel breeds and calving seasons on the calving interval/months (Mean±SE)

Successive Calving Seasons	No. of Animals	Camel Breeds				overall mean (n=110)
		Magahiem (n=19)	Maghatier (n=38)	Safrah (n=27)	Hamrah (n=26)	
2nd	25	18.29±1.31	21.06±1.15	19.40±1.55	18.38±1.73	19.52 ±1.04

3rd	22	18.33±1.73	19.74±1.15	18.19±1.31	20.17±2.45	19.03 ±0.51
4th	29	18.50±3.46	18.80±1.10	19.03±3.14	19.50±1.10	19.09 ±0.46
5th	12	22.80±1.73	21.87±2.00	20.40±2.45	16.73±2.00	20.55±1.03
6th	13	17.89±2.00	22.83±1.41	19.92±2.45	25.67±2.45	21.68±0.95
≥7th	9	No Data	20.86±2.00	20.28±2.00	19.09±1.55	19.69 ±0.70
Total	110	19.19±1.00	20.49±0.56	19.19±0.67	19.46±0.56	19.70±0.34

Fig.(1): Distribution of calving percentages



DISCUSSION

The reproductive function beginning by onset of puberty is affected remarkably by change in body weight. Attainment of puberty is influenced by the overall growth and weight of the animal which in turn is affected by nutrition (Marai *et al*., 2007). Ages at first service, conception and calving may constitute major reasons for the long generation interval in camels. In the present study, the overall mean values of ages and weights at first mating, conception and calving were 39.75, 41.82, 54.39 months; 437.17, 450.16 and 519.03 kg, respectively. These results were in agreement with those reported in countries as Magrebi Arabia, where the a conception and first calving were reported and 49.4 months, respectively (Sghir Moreover, Mounir and Borni (2012) recor first successful mating of Maghreby Ne varied between 33 to 48 months with an ave months and the age at first parturition varie 68 months. In Turkmenistan, Arvana can for the first time at 3 years of age and 350 live weight (Dmitriez and Ernst, 1989). In 66.7% of the female camels were bred at age (Abbas and Musa, 1989). In the Ur

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Emirates, ages at first service and calving were 43.1±0.58 and 55.3±2.87 months, respectively (Aboul-Ela 1991). In Libya, ages at first service and first calving were 36.9±1.10 and 50.3±1.28 months, respectively (Hermas and Shareha, 1991). In contrast, the current findings were less than 61-62 months which were reported for Bikaneri camels as age at first calving (Beniwal and Chaudhry, 1984 and Khanna *et al*., 1990). Moreover, in Pakistan (Yasin and Wahid, 1957); Indian (Khanna *et al*., 1990); Sudan (Köhler ~~Kohler~~-Rollefson *et al*., 1990); Horn of Africa (Hartley, (1984) and Kenya (Karimi and Kimenye, 1990) the she-camels were reported to reach puberty at 4-5 years of age. The variation in these observations may be related to feeding and management and/or breed differences. However, the onset of puberty is remarkably independent on body weight. Therefore, dromedary camels reproductive performance in terms of age at puberty, at first conception and at first birth can be improved by ensuring adequate nutrition in early life and improvement of managerial and environmental conditions as well as by using hormonal treatment that can assist early sexual development and breeding maturity (Arthur and Al-Rahim, 1982; Simpkin, 1987; Zaied, 1991; Formigoni *et al*., 1996; ~~and~~ Mounir and Borni, 2012).

The overall mean of the interval between services within the same breeding season which starts at early November to late April was 19.32±0.26 days. The present findings agree with those recorded by EL-Azab *et al*., (1997) where the mean interval between services within the same breeding season was 15.83±0.39 days.

~~The estrous cycle in the she camel is incomplete when compared to that of the ungulates (Marai *et al*, 2007). Al Eknah *et al* (1992) divided the follicular cycle into a growth phase (10.5 ± 0.5 days), a mature phase (7.6 ± 0.8 days) and a regression phase (11.9 ± 0.8 days). Nawito *et al* (1967) hypothesized the interval between two services is expressed as the interval between two estrus or follicular cycle. Duration of estrous cycle averaged 24.2 days in Egypt (Nawito *et al*, 1967), 23.4 days in India (Joshi *et al*, 1978) and 28 days in Sudan (Musa and Abusineina, 1978). Camels estrous cycle duration have been ranged 11-35 days in Egypt (Nawito *et al*, 1967); 16-30 days in Saudi Arabia (Al-Eknah *et al*, 1993) and 10-28 days in Magarabi camels (EL-Azab *et al*, 1997). In the present study such interval ranged 10-40 days and the camel breeds and ages didn't have a significant effect on this trait. However, EL-Azab *et al* (1997), attributed the differences between camel follicular cycle and subsequently interval between service to hereditary factor.~~

The overall period from calving to first onset heat (postpartum period) was 45.39±2.57 days. Similarly, other studies indicating that the postpartum heat occurs 14-30 days after calving (Novoa, 1970; Evans and Powys, 1979; Abdel-Rahim and El-Nazier, 1992) and between 10-72 days with mean 26.34±1.89 days for Magarabi female camels (EL-Azab *et al*., 1997). In this study, it has been observed that the majority of female camels calved at the beginning of a breeding season came into the first postpartum heat after 13-103 days after calving within the same breeding season. It is importance to notice that in camels even with the early induction of heat after calving, the majority of females fail to conceive within the same breeding season, and this might be due to the effects of lactation, feeding status of the animals, body weight and conformation and feed availability (Shalash 1965; Shareha *et al*., 1982; Artl ~~and~~ Mounir and Borni, 2012).

~~However, Hermas et al (1990) noticed the p heat in Magarabi camels to occur 233.97±: after calving and authors attributed this lon to the delay in estrus detection for the females till the forthcoming breeding seasor~~ The overall mean of service periods ~~was~~ 7 days, came relative to value 51.9±12.1 d recorded by Hermas and Shareha (1991) i camel. In the present study, The overall me days herein was 317.61±4.54 days, in accor EL-Azab *et al*., (1997) and Hermas ~~et~~ whereas open days period elapsed from conception for Magarabi female car 308.02±6.95 days and 286.80±12.70 days. I recent study recorded shorter interval (147± between calving to successful mating of Negga camel (Mounir and Borni, 2012).

The overall mean value of the nu services/conception was 2.57±0.02 Similarly, in Libya, Hermas and Shareh reported that services/conception was while in United Arab Emirates, Aboul-E showed that the services/conception were and the conception percentage occurred service was 58% and only 20% of she came ≥3 services before pregnancy. In this study the available observations it has been obser Saudi Arabia, camels' breeding season is st early November to late April and it may early May. During this period both males ar are fertile. On the other hand, summer mont September) are considered as a non-breedi for local camel breeds (male and female reproductive activities of camels were adversely by the heat stress and the funct high ambient temperature ~~–~~(Habeeb *et* Marai and Habeeb, 1998 and Marai *et al*., 2

~~Generally, in this study, the traits of serv (days) and number of services/concep significantly affected by months of mati been observed that, service period and n services/conception were significantly less during November to January (43.74±2.39- 2.22±0.12 services) than for that during F April (77.68±3.27 days and 3.75±0.16 (untabulated data). Thus, the pattern of t reproductive cycle appears to relate environment in which they live (Novoa, 1 breeding season differs in the various co Pakistan (Yasin and Wahid, 1957), China (1985), Egypt (Shalash, 1965) and Israel (Etzion, 1980), the breeding season of camel from December to April. In Somalia, Ma~~

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~~observed that the male camel ruts in the spring months (April and May) . In India, the breeding period is from November to February (Singh and Prakash, 1964). Contrariwise, in the Sudan, Musa and Abusinea (1978) reported the breeding season to be from March to August. Similarly, in Eritrea the breeding of camels starts at the beginning of the rainy season in July and continues throughout, but if camels are in good condition and the plenty of forage is available, the breeding males become sexually active and females are fertile and receptive at any season (Gebrehiwet, 1997). It was also noted that the majority of the females in the herd were mated in the summer (rainy season, commencing in July) and the rest in the winter (short rainy season, commencing in January) when forage was plentiful (Marai and Habeeb, 1998).~~ Long calving intervals are the most major factor contributing to poor reproductive performance of camels. Under extensive management system calving interval lasts for more than 24 months (Evans and Powys, 1979). However, the calving interval of camels may reach eighteen months, similar to that of cows (Knoess, 1976). The overall mean of calving interval was 19.70±0.34 months; and no significant difference in the calving interval between camel breeds and successive calving seasons. These results are in agreement with that reported by Basmaeil *et al.,* (1994) in Saudi Arabia where the calving interval for five successive breeding seasons was 20.58±0.82 months. Similarly, Mounir and Borni, (2012) cited that, the intervals between calving of Maghreby Negga camel was 526±145 days. Moreover, Dmitriez and Ernst (1989) in Turkmenistan obtained in their~~ir~~ study 2 calves/3years. As well as, in Kenya, Evans and Powys (1979) observed an average calving interval of 22 months if young survives. In the same purport, the present findings were longer than those reported by Richard *et al.,* (1985) in Niger (15.0 months); Mosleh (1991) in Tunisia (13.45±0.27 months) and Köhler-Rollefson (1991) in Sudan (14-15 months). In contrast, the present calving interval was shorter than those recorded by Aboul-Ela (1991) in United Arab Emirates (24.4±0.68 months); Khanna *et al.,* (1990) in Indian (25.73±0.27 months); Hermas and Shareha (1991) in Magrebi Arabia countries (22.62±0.40 to 24.0±8.2 months); Dioli (1991) in East Africa (24.0 months); Aslam *et al.* (2002) in Pakistan (23.5±1.33 months); Schwartz *et al.* (1983) in Kenya (28 months) and Herren (1993) in Somalia (29 months). The disagreement of these observations was attributed to differences in she camels' gestation length and seasonality of breeding (Wilson, 1984 and Arthur *et al.,* 1985); late post-partum estrus (Mukasa-Mugerwa, 1981) and individual variation in open days period (Aboul-Ela, 1991).

Among the studied camel herd, the calvir distribution classes were <15, 15-17, 18-20, >24 months with corresponding percent 7.27%, 17.27%, 35.46%, 31.82% and 8.1 she-camels, respectively. Similarly, in M (1979) reported that, 20.9%, 27.9%, 44.2% of a herd of she-camels showed calving ir ranges 12-15, 16-23, 24-25 and >25 respectively. Also, in United Arab Emirat Ela (1991) indicated that the intervals calving is <20 months for 14.4% of s Moreover, in Kenya, Bremaud (1969) den 11.5%, 3.9%, 53.5% and 30.8% of she-ca with calving intervals 12-15, 16-23, 24-25 months, respectively. Herren (1993) repor Somalia a period of 28 months was estir calving interval in 35-40% of a herd of Generally, the current calving interval show of calving intervals. Short calving interv average 14 months that was observed to cor breeding female camels aborted at late pregnancy and in cases of calf death after d this case, the dam was submitted to a bull conception within one month. The mediu interval (between 16 and 18 months) was the female camels delivered at the beginn breeding season, and calves were weaned a 75 days of age, and their dams were r became pregnant at the end of the same sea calving interval (≥23 months) was observec female camels were kept milking to satisf demand of the calves.

CONCLUSION

Reproductive traits, in terms of post-partu service period and open days are depend camel breeds, and this indicates the imp heritability as a value that express anc average additive gene effect. Howeve research is needed to determine the between genetic merits of camel breeds productivity including reproductive pe which may be better in some camel br others.

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Table 1: Influence of camel breeds on the ages at first service, conception and calving (Mean

Camel Breeds	No. of observations	Ages (Months)		
		1st Service	1st Conception	1st Calving
Magahiem	38	41.21±1.34	42.90±1.41	55.53±1.41
Maghatier	60	39.33±1.07	40.77±1.13	53.36±1.12
Safrah	46	40.09±1.22	42.65±1.28	55.21±1.28
Hamrah	44	38.36±1.25	40.96±1.31	53.48±1.31
Overall	188	39.75±0.61	41.82±0.64	54.39±0.64

Table 2: Influence of camel breeds on the body weight at first service, conception a (Mean±SE)

Camel Breeds	No. of observations	Body weights (kg)		
		1st Service	1st Conception	1st Calving
Magahiem	14	442.57±15.66	456.29±17.58	504.57±15.92 ab
Maghatier	44	444.77±8.84	460.41±9.91	530.05±8.98 ab
Safrah	18	439.44±13.81	445.56±15.50	499.00±14.04 b
Hamrah	16	421.88±14.65	438.38±16.44	542.50±14.89 a
Overall	92	437.17±6.75	450.16±7.57	519.03±6.86

Means in the same column with different superscripts differ significantly (P<0.05).

Table 3: Influence of camel breeds and ages on the interval between services (Mean±SE)

Ages	No. of observations	Camel Breeds (Number of observations)				Overall (no.=687)
		Magahiem (no.=186)	Maghatier (no.=238)	Safrah (no.=90)	Hamrah (no.=173)	
≤ 5	339	18.55±0.82	19.37±0.63	19.46±0.92	19.57±0.66	19.28±0.32

5-7	105	17.93±1.65	19.22±0.89	19.58±1.84	17.65±1.55	18.78±0.63
7-9	90	21.86±1.20	18.88±1.11	18.00±4.51	21.29±1.55	20.41±0.84
9-11	72	20.09±1.13	18.92±1.84	21.00±2.02	16.62±1.77	19.34±0.84
≥ 11	81	20.61±1.20	18.17±1.50	18.20±2.85	17.45±1.43	18.93±0.90
Overall	687	19.72±0.51	19.13±0.42	19.56±0.78	19.50±0.50	19.32±0.26

Table 4: Influence of camel breeds and ages on the post-partum period (Mean±SE)

Ages	No. of observations	Camel Breeds (Number of observations)				Overall (no.=108)
		Magahiem (no.=25)	Maghatier (no.=32)	Safrah (no.=26)	Hamrah (no.=25)	
≤ 5	23	34.67±12.11	38.67±8.57	42.00±12.11	29.00±12.11	36.29±5.05
5-7	20	70.00±12.11	51.00±12.12	51.00±12.11	33.33±12.00	51.33±6.34
7-9	22	45.00±12.11	40.67±12.00	32.00±14.84	35.40±9.39	38.31±4.54
9-11	21	58.00±12.11	58.00±12.17	69.00±12.11	31.00±12.00	54.00±6.61
≥ 11	22	51.67±12.00	40.00±12.12	58.00±9.39	48.50±14.84	50.92±5.21
Overall	108	48.67±4.51[a]	46.64±5.44[ab]	52.74±4.38[a]	36.83±3.73[b]	45.39±2.57

Means in the same row with different superscripts differ significantly (P<0.05).

Table 5: Influence of camel breeds and ages on the service periods/days (Mean±SE)

Ages	No. of observations	Camel Breeds (Number of observations)				Overall (no.=197)
		Magahiem (no.=39)	Maghatier (no.=44)	Safrah (no.=56)	Hamrah (no.=58)	
≤ 5	52	45.00±15.35	48.14±12.97	70.00±15.35	87.44±11.44	65.35±6.38[b]
5-7	50	75.00±17.16	44.00±15.35	82.88±12.14	100.88±12.14	79.60±8.05[ab]
7-9	40	73.50±17.20	86.00±17.18	51.75±17.16	95.25±12.10	80.35±8.17[ab]
9-11	30	82.75±17.16	56.67±19.82	43.00±15.35	66.00±19.82	60.93±7.20[b]
≥ 11	25	82.40±21.71	113.67±19.82	73.33±14.01	149.00±34.33	90.88±10.85[a]
Overall	197	69.54±7.41[b]	64.18±7.62[b]	66.96±5.80[b]	93.21±7.42[a]	74.58±3.62

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Table 6: Influence of camel breeds and ages on the open days period (Mean±SE)

Ages	No. of observations	Camel Breeds (Number of observations)				Overall (no.=272)
		Magahiem (no.=46)	Maghatier (no.=81)	Safrah (no.=63)	Hamrah (no.=82)	
≤5	78	300.71±17.32	345.88±12.96	343.54±13.23	282.60±16.73	324.89±7.28[bc]
5-7	55	365.40±28.97	356.40±14.49	336.29±17.32	323.25±16.20	342.46±7.59[c]
7-9	45	305.40±28.97	262.75±22.91	275.80±28.97	327.00±22.91	293.23±17.59[ab]

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9-11	44	297.50±32.39	301.40±28.97	315.86±24.49	227.67±21.60	278.28±16.62[a]
≥11	50	282.80±28.97	317.65±13.51	299.92±17.97	327.22±21.59	311.28±8.43[ab]
Overall	272	308.12±12.20[ab]	329.51±7.50[b]	324.48±7.30[ab]	297.82±8.63[a]	317.61±4.54

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Table 7: Influence of camel breeds and ages on the number of services/conception (Mean±SE)

Ages	No. of observations	Camel Breeds (no. of observations)				Overall (no.=319)
		Magahiem (no.=62)	Maghatier (no.=87)	Safrah (no.=82)	Hamrah (no.=88)	
≤5	121	2.92±0.48	2.76±0.26	2.37±0.33	3.39±0.29	2.88±0.17[b]
5-7	74	2.53±0.45	2.42±0.35	2.19±0.43	2.21±0.40	2.34±0.18[ab]
7-9	43	2.44±0.58	2.36±0.46	1.13±0.61	2.00±0.50	2.05±0.20[a]
9-11	34	2.78±0.58	2.18±0.53	2.43±0.66	1.86±0.66	2.32±0.29[ab]
≥11	47	3.14±0.66	3.27±0.45	2.33±0.45	2.60±0.55	2.81±0.27[b]
Overall	319	2.57±0.22	2.61±0.15	2.16±0.18	2.72±0.20	2.57±0.02

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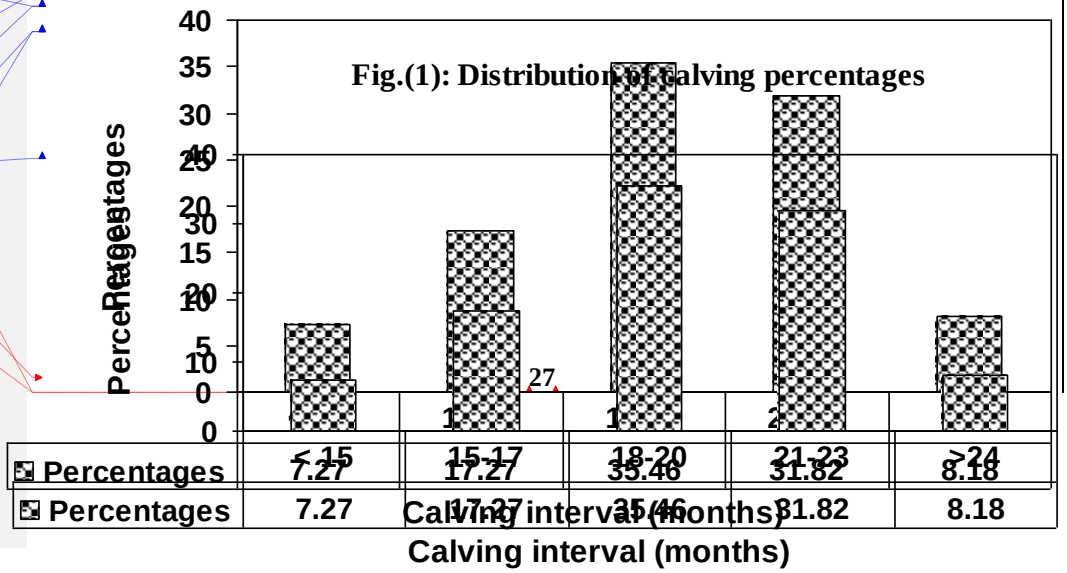
Table 8: Influence of camel breeds and calving seasons on the calving interval/months (Mean±SE)

Successive Calving Seasons	No. of Animals	Camel Breeds				overall mean (no.=110)
		Magahiem (no.=19)	Maghatier (no.=38)	Safrah (no.=27)	Hamrah (no.=26)	
2nd	25	18.29±1.31	21.06±1.15	19.40±1.55	18.38±1.73	19.52±1.04
3rd	22	18.33±1.73	19.74±1.15	18.19±1.31	20.17±2.45	19.03±0.51
4th	29	18.50±3.46	18.80±1.10	19.03±3.14	19.50±1.10	19.09±0.46
5th	12	22.80±1.73	21.87±2.00	20.40±2.45	16.73±2.00	20.55±1.03
6th	13	17.89±2.00	22.83±1.41	19.92±2.45	25.67±2.45	21.68±0.95
≥7th	9	No Data	20.86±2.00	20.28±2.00	19.09±1.55	19.69±0.70
Total	110	19.19±1.00	20.49±0.56	19.19±0.67	19.46±0.56	19.70±0.34



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تأثير سلالة الابل والعمر على الأداء التناسلي للابل وحيدة السنام في السعودية

كامل مصطفى السيد محمد و صلال عيسى المطيري

عربية وحيدة السنام هى المصدر الوحيد للحليب واللحوم فى المناطق الصحراوية الحارة القاحلة، حيث أن الابل تتحمل الجوع والعطش
وفى نفس الوقت ترضع مولدها وتمد مربيها بالحليب المطلوب لحياتهم مما جعل لها أهمية خاصة لدى المربين والبدو فى هذه
جد فى المنطقة العربية سلالات مختلفة من الابل تتفاوت فيما بينها فى الانتاج والكفاءة التناسلية، ونظرا لأن طبيعة تواجد الابل
د الى حد كبير على وجود المراعى الطبيعية والتى تنتشر بكثافات متنوعة وتختلف من مكان لأخر مما جعل مربى الابل ينتقلون
شون مسافات واسعة بحثا عن المراعى، أدى ذلك الى قلة الدراسات وندرة الأبحاث التى تعطى صورة واضحة للكفاءة التناسلية للابل
تتواجد فى تجمعات محدودة المكان تمكن مربيها الاهتمام بها وتمكن الباحثين من مراقبتها ومتابعتها وتسجيل بياناتها مثل باقى الماشية،
ك موسمية التناسل وتأخر سن البلوغ والنضوج الجنسى وطول مدة الحمل والفترة بين ولادتين، لذلك استهدفت هذه الدراسة القاء
ـوء والمعرفة على الكفاءة التناسلية للابل وحيدة السنام تحت نظام التربية المكثفة ومعرفة مدى تأثير السلالة والعمر على الأداء
، تم حصر أربعة سلالات (مجاهيم ، مغاتير ، صفراء ، حمراء) وخمسة مراحل عمرية (أصغر من 5 سنوات ، 5-7 ، 7-9 ، 9-11
سنة) من خلال سجلات التناسل لقطيع الابل المرباة فى مركز أبحاث الابل والمراعى لأكثر من 20 سنة. ولتحقيق أهداف الدراسة تم
لاص البيانات الخاصة بالتناسل بداية من عمر ووزن الحيوان عند أول تلقيح وأول اخصاب وأول ولادة ومتابعة الفترة الزمنية بين
شياع بعد الولادة واخر تلقيحة مخصبة بعد الولادة، كذلك الفترة الزمنية بين الولادات ثم اجريت تنقية للبيانات من القراءات الشاذة
ها تحليل لها احصائيا باستخدام برنامج SPSS الاحصائى. اسفرت النتائج أن المتوسط العام لعمر النوق والوزن عند أول تلقيح وأول
ولادة كان 39,75 ، 437,17 و 41,82 ، 450,16 و 54,39 شهرا ، 519,03 كجم على التوالي، ولم توجد فروق معنوية لتأثير
هذه الخصائص. بلغ المتوسط العام للفترة الفاصلة بين التلقيحات 19,32 يوما ولم يوجد تأثيرا معنويا للعمر ولا للسلالة على هذه
حين أن المتوسط العام للفترة بين الولادة وأول شياع كان 45,39 يوما وفى الوقت الذى لم يكون للعمر تأثير على هذه الخاصية كان
تأثيرا معنويا عليها. بلغت الفترة الزمنية بين الولادة وحتى حدوث اخصاب فى نفس موسم الولادة أو الموسم الذى يليه 74,58 و
ا على التوالي، وقد كان لأعمار النوق وسلالتها تأثيرا معنويا على هذه الخصائص. بالنسبة للمتوسط العام لعدد التلقيحات اللازمة
، فقد بلغ 2,57 تلقيحة وفى الوقت الذى لم يكون لسلالة النوق تأثير على هذه الخاصية كان لأعمارها تأثير واضحا، وقد ظهر هذا جليا
، النوق ذات الأعمار المتوسطة (7-9 سنوات) أقل عدد من التلقيحات (2,05) مقارنة بالأعمار الصغيرة (أقل من 5 سنوات) والكبيرة
سنة) والتى احتاجت 2,88 و 2,81 تلقيحة على التوالى. وبشكل عام فان عدد التلقيحات اللازمة لحدوث حمل كانت أقل فى الشهور
حتى يناير من التي تمت فى فبراير وحتى ابريل. بلغ المتوسط العام للفترة البينية بين الولادات 19,70 شهرا ولم تكون للسلالة أو لعدد
ا معنويا عليها، وقد وجد أن أكثر من 65% من النوق التي خضعت للدراسة كانت الفترة البينية للولادات تتراوح ما بين 18 الى 23

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ة الدراسة أثبتت ان سلالات النوق وأعمارها تؤثر على الأداء التناسلي للابل العربية وحيدة السنام مما يلفت النظر الى أهمية السلالة
يبية والتلقيح والتي يمكن أن تتناولها دراسات مستقبلية كنقطة انطلاق للتحسين الوراثي للكفاءة التناسلية فى الابل.

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