

Investigations on Reproductive Performance of the Female Camel (AL-NAGA) '*Camelus dromedarius*' I. Characterization of the Reproductive Cycle

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SUMMARY

Twenty complete Estrous cycles were followed in 9 female dromedary camels. The female camel (AL-NAGA) appears to be a seasonally polyestrous. The breeding season starts from November and ends in April with a range of 4-5 months. The length of estrous cycle and estrus ranges from 25-30 days ($\bar{X}=28.20 \pm 1.7$ days) and 5-7 days ($\bar{X}=5 \pm 1.2$ days) respectively. The estrus behavior characterized by restlessness, swelling of the vulva, frequent urination and mucus discharges.

INTRODUCTION

The camel is characterized by its ability to survive under the most adversable environmental conditions. Observations that camel dromedary is a seasonal polyestrous with long calving intervals (3 years)(9) may be a genetical and physiological adaptive mechanisms. These characteristics may enable the female camel to minimize the efforts of frequent gestations and to allow calving to occur during pasture vegetations. Factors which determine the seasonal reproductive activity in the female camel are not very well established, although few attempts with conflicting results have been made to describe the estrous behaviour (7, 8, 9), detailed investigation on reproductive cycling activity are required to improve its reproductive and productive efficiency. This study was undertaken to follow and determine the breeding activity in the female camel under Libyan environmental conditions.

MATERIALS AND METHODS

Nine female camels ranging from 5-8 years old were used to investigate the breeding sexual activity. All camels were kept under proper health and management conditions. Hay straw and water provided *ad. lib.* in addition to a daily supplement of 2 kg concentrate was given to each animal. Observational data regarding length of estrous cycle, estrus and breeding season were recorded. Ovarian palpation has not been

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practiced in this study since a detailed *Vivo* investigation of the ovarian activity is presented in a following report (12).

RESULTS AND DISCUSSION

• Estrus and estrous cycle

Accumulative data from 20 complete estrous cycles showed that the estrous cycle ranges from 25 to 30 days ($\bar{X} = 28.2 \pm 1.7$ days) and estrus period ranges from 4 to 7 days ($\bar{X} = 5 \pm 1.20$ days). These values are higher than those reported by (7) who stated that the length of estrous cycle in dromedary ranges from 2–3 weeks and heat period lasts 3–4 days. In addition to Yassin and Wahid (11) reported that estrous cycle lasted 21 days in *Camelus dromedarius*, while, in camelus Bacterianus, Bosaev (3) found that intervals between heat periods, varied from 10 to 20 days and sometimes reached 30 to 40 days. On the other hand, Barmince (1) has reported that the estrous cycle averages 14 days in Bacterian camel. This contraversion is probably has to do with genetic environmental interaction since different breed respond differently under different environment. The beginning of estrous cycle was determined at the time sings of estrus starts, they include state of restlessness swelling of vulva, cervical and vaginal mucus discharges mounting each other, frequent urination, receptively to vulva stimulation and general reduction in feed and water intake. The cervical mucus usually starts to discharge on day 2 and disappears on day 3 and 4 of the estrus. Estrus signs in AL-NAGA are distinct, except they are less evident than those observed in cows and ewes. It was not possible at this time to determine the patterns of follicular maturation nor to specify the proper time of follicular regression.

The breeding season

In different regions of the world the camelus dromedarius is classified as a seasonally polyestrous animal. However, there are conflicting reports about the time of the year when the camel can exhibit full reproductive activity. In Pakistan, Yassin and Wahid (11) reported that the period at which the female camel comes into heat starts in December and ends in March. In India Hira (6), Singh and Prakash (10) reported that the sexual activity in dromedary occurs between November and February. In Morocco Charnot (4, 5) stated that the rutting season in the same breed occurs in winter and spring. In Egypt, Shalash (9) reported that the highest ovarian activity occurred from December to May. In Sudan, Musa and Abusineina (8) stated that the ovarian activity in camelus dromedary starts in March and ends in August.

In Libya, the results of the current study showed that the breeding season at which the female camel (AL-NAGA) comes into full ovarian activity starts in November and ends in April. The variations in the breeding season characteristics can undoubtedly be explained to differences in location and probably to differences in management and nutritional conditions. There is no experimental evidence to show the effect of different environmental conditions in estrous behavior in camels. Although in sheep with a breeding season characteristic as the camel the reproductive cycle is known to be controlled by external environmental factors such as day length, temperature, humidity, nutritional and genetical factors.

Therefore, much more attention should be given to improve the camel's productive and reproductive capacities. This can be done by planning and conducting a series of research to study all the aspects dealing with this area.

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دراسات عن النشاط الجنسي في الإبل

١ — التصرف الجنسي ودورة الشبق في الإبل (الناقة)

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المستخلص

عشرون دورة شبق درست في ٩ نياق من الإبل الليبية خلال موسم التزاوج (التلقيح) وقد وجد أن مدة التلقيح في الناقة محددة بفترة زمنية معينة لا تتعدى ٥ أشهر (من أكتوبر إلى أبريل) من السنة وخلال هذه الفترة تنتاب الناقة دورات شبق تتراوح طول كل منها من ٢٥ إلى ٣٠ يوماً (متوسط ٢٨,٢ ١,٧) وتبدأ كل دورة شبق بفترة شياح تستمر من ٥ — ٧ أيام ويكون الحيوان في هذه الفترة قلقاً مع انخفاض فس نسبة الأكل وانتفاخ فتحة المهبل (الحيا) ورفع الذيل مع استمرارية التبول وغالباً ما يلاحظ أيضاً ظهور السائل المخاطي اللزج في منتصف مدة الشياح.