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SHORT ESTROUS CYCLES DETECTED BY MILK PROGESTERONE TEST DURING POST-PARTUM PERIOD IN WATER BUFFALOES IN UPPER EGYPT.

(With One Table & One Fig.)

By

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إكتشاف دورات الشبق القصيره بقياس مستوى البروجستيرون فى اللبن فى فترة مابعد الولاده فى الجاموس فى صعيد مصر

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تم إجراء هذا البحث على عدد ٥٩ جاموسه فى فترة ما بعد الولاده . تم أخذ عينات لبن اسبوعياً ابتداءاً من الاسبوع الثانى بعد الولاده واستمر أخذ العينات حتى ثبوت حمل هذه الحيوانات . تم تقدير هرمون البروجسترون فى هذه الحيوانات وذلك لتحديد ميعاد دورات الشبق وذلك عندما يكون مستوى الهرمون أعلى من ٥ ر٢ نانومول لكل لتر تعتبر هذه الحيوانات فى فترة ما بعد الشبق (فترة الجسم الأصفر) من الدوره .

وقد لوحظ ان نسبة ٧ ر٤٠٪ من الحيوانات يرتفع معدل البروجسترون أكثر من ٥ ر٢ نانومول لكل لتر فى الاسبوع الأول ثم ينخفض الى أقل من المستوى السابق ذكره فى الاسبوع الثانى مشيراً الى حدوث دورة شبق قصيره فى الجاموس وبالفحص الاكلينيكى تبين أن الجسم الاصفر فى مثل هذه الحالات لا يستمر الا لفتره أقل من ١٠ أيام ، أما فى الحيوانات التى أعطت دورات طبيعيه طولها ٢ ر٣ أسبوع فقد كان مستوى البروجسترون مرتفعاً لمدة أكثر من اسبوعين .

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SUMMARY

An incidence of 40.7% of buffaloes showed a short estrous cycle within 9.9 weeks during the post-partum period. These cycles were detected when milk progesterone levels increased over 2.5 nml/l. The duration of short cycles were two weeks with short luteal phase less than 10 days. The duration of normal cycles were 3.2 ± 1.5 weeks. Non significant differences were recorded between milk progesterone levels during the first week of the cycle for both short and normal length cycle. Moreover, a significant increase (P> 0.001) in milk progesterone were recorded during the third week of normal length cycle. The group of buffaloes diagnosed as non return was proved latter as pregnant by rectal palpation.

Keywords: Estrous cycle, milk progesterone test, postpartum period, water buffaloes, Upper Egypt.

INTRODUCTION

Estrous cycles of shorter duration (8-12 days) are usually found when either dairy or beef cows resume cyclicity post partum *(EDQVIST, et al. 1984)*. The probability that the first postpartum estrous cycle is short, seems to be about 50% or more for both dairy and beef cattle *(LAMMING, et al., 1981; KINDAHL, et al., 1982; RAMIREZ-GODINEZ 1982)*. In buffaloes, and average of oestrous interval is mostly given around 20-24 days for river and for swamp buffaloes *(COCKRILL, 1977; WELTHORUTTOPEMON and MONGKONPANGA, 1978 and WANGE PEI-CHIEN, 1979)*. Only *CAMOENS (1976)* recoded an estrous interval of 28 days for the Malaysisan swamp buffalo. In contrast to estrous interval, the estrous period shows a wide range between 12-72 hours *(BHANSIRI, 1976 and CHANTALAKHANA, 1979)* for Thailand swamp Buffaloes. Concerning progesterone hormone in either milk or blood, it can provide an effective way for monitoring post-partum ovarian activity in cattle *(LAMMING and BULMAN, 1976)*. Moreover, milk progesterone was a clear indicator of lutal function and reflect the stages of estrous cycle as assessed by ovarian palpation per rectum *(LAYING and HEAP 1971)*. *WILLIAMS and RAY (1980)* found that in a short life span corpus lutum (<12 days) the time of progesterone secretion was short and refered it as a short luteal phase. Moreover, *MANNS et al., (1983)* recorded a rapid decline in milk progesterone just in case of short live corpus luteum. The occurance of short

estrous cycles is incompatible with the establishment of pregnancy, so that calving interval will be increased in such cases. In Egyptian buffaloes the calving interval during the last three decades were, 541.7, 488 and 585 days *(RAGAB et al., 1954). OSMAN (1985)* recorded that calving intervals in buffaloes varied between 472 to 582 days, and this variation depends upon the gynaecological health care of buffaloes. Moreover, *ISMAIL, et al., (1989)* recorded an average of 470 days for calving interval in Assiut Province. The object of this work is to record the incidence of the first post-partum ovarian activity in buffaloes with special attention to the length of the cycle using milk progesterone.

MATERIALS AND METHODS

Animals and milk samples:

This work was carried out at El-Hawatka Governmental buffalo dairy farm that belongs to Assiut province. A total number of 59 buffalo cows were included in this study. The age of these animals varied between 5-17 years old. They were tied in open sheds and milked manually, twice daily. The fore milk were taken as milk samples for milk progesterone assay. In clean dry test tubes, containing 30 mg potassium dichromate 5-10 ml milk were taken. Milk sampling and gynaecological examination started at the second week after parturition regularly with one week interval till proving of pregnancy by rectal palpation. Milk samples were kept in refregerator some days, then skin milk was aspirated by long needle syring, transfered into vials and stored at - 20 °C till analysis.

Determination of milk progesterone level:

The progesterone level in skim milk was determined by the solid phase Radioimmunoassay technique. The RIA kit was supplied by the joint FAO/IAEA division from agriculture laboratory seibersdorf-Austria. These test kits were supported as a part from the project RC. 4823 NL joint FAO/IAEA. The procedures were followed as the Agency method supplied with the kit using I^{135} progesterone and the coated tubes. Progesterone concentration of unknown samples were determined from standard curve by using Logit-log fraph paper. The standard curve started with 2.5 n. mol/I conl-80 n.mol/I. The activity is measured by Gamma counter supplied by the A gency/Minia Assay 2 Model 6-90 Scaler/ Retemcter). The beginning of the cycle will be detected when milk progesterone value reached over 2.5 n ml/L *(ISMAIL et al., 1989).*

RESULTS

Our results recorded an incidence of 40.7% (24/59) of buffaloes showed a short estrous cycles as a first post-partum ovarian activity within 9.9 ± 2.02 weeks postparum (Table 1.). The duration of this cycle was two weeks with short luteal phase less than 10 days. This short luteal phase was detected by sharp decline in milk progesterone less than 2.5 n mol/I after one week from the peak of milk progesterone. Out of these buffaloes eighteen (75%) showed another subsequent normal fertile cycle, while six (25%) showed normal non fertile cycle within four weeks after the end of the short cycle (Table 1). A significance difference ($P<0.05$) was recorded between the time taken to the occurance of short and normal cycles. In short estrous cycle, milk progesterne levels were 6.9 ± 0.6 and <2.5 nml/l during the first and second weeks of the cycle respectively. In normal duration cycles, milk progesterne leveles were 7.8 ± 1.7, 14.4 ± 2.0 and 3.8 ± 1.3 nml/l during the first, second and third weeks of the cycle respectively. Moreover in non return group the progesterone leveles were 7.9 ± 0.5, 12.6 ± 1.2, 11.7 ± 0.9 and 12.6 ± 1.2 nml/l during the first, second, third and fourth weeks of the cycle respectively (Fig. 1). Non significant differences were recorded in milk progestrone level during the first week of luteal phase. However, in short cycles, milk progesterone recorded a sharp decline by the end of the second week to indicate the end of the luteal phase (Fig. 1). In normal cycles milk progesterone decreased by the end of the 3rd week, indicating a duration of 3.2 weeks for normal cycles.

In normal fertile cycle milk progesterone increased significantly ($P<0.001$) during the 3rd week when compared with normal non fertile cycles to indicate that this group is non return. Rectal examination at this time revealed the presence of corpus luteum and these buffaloes confirmed to be pregnant there after.

DISCUSSION

The present study reveals that 40.7% of buffaloes showed a short estrous cycles within 9.9 weeks as a first post-partum ovarian activity. These cycles were non fertile due to a short luteal phase less than 10 days and two weeks cycle intervals. Similarly, *LAMMING* et al. *(1981)* recorded an incidence of 50% for the first short post-partum estrous cycles in both dairy and beef cattle. In dairy breeds the first ovulation is usually not accompanied by signs of estrus, while in beef cows, especially following calf removal, a high proportion of the

cows will show signs of estrus (*RAMIREZ, 1982*). Concerning milk progesterone during the first six days either in short cycle or normal length cycle the levels are simillar to the findings of *ODDE et al. (1980)*. Since the corpus luteum is a transient emdocrine gland secrets progesterone, so it has an important regulatory role. The length of estrous and menstrual cycles are determined by the duration of progesterone secretion (*MICHAEL et al., 1986*). Moreover, progesterone synthesis and secretion are regulated by luteotropic and luteolytic mechanisms. Thus, the stimulation or inhibition of progesterone synthesis and secretion may be dependent upon a balance of these stimuli (*ROTHCHILD, 1981*). Lutenzing hormone stimulates progesterone synthesis and considered as an important luteotropic in numerous species (*HANSEL et al., 1973 and ROTHCHILD, 1981*). Therefore, there is some suggestions that the short luteal phase following first ovulation in dairy and beef cows is due to insufficent luteotropic support (*WALTERS et al., 1984*). On the contrary, *WEBB et al. (1990)* found that in dairy cows the peak LH level preior to a short luteal phase that similar to those accompanying ovulation. The same finding was reported by *RAMIREZ, et al. (1982)*, that the LH curve did not differ between the first and second post-weening estrous but where the first estrous cycle was 8-10 days long.

On the other side, there is a suggestion that a premature release of prostaglandin is responsible for the short luteal phase (*EDQVISTT et al., 1984*). The causes for premature release of prostaglandin during short estrous cycle are not known. It seems that a priming with progesterone is required in order to induce prostaglandin release at the proper time (Days 15-18) of the normal length estrous cycle (*EDQUIST et al., 1984*). This short luteal phase may represent such a priming effect since the occurance of two consecutive short cycles is extremely rare, and treatment with synthetic gestagen in conjunction with weaning in beef cattle reduced the incidence of short cycles considerably (*RAMIREZ et al., 1981*).

So any atempt to bread cattle early post partum, the high incidence of short estrous cycles should be taken in consideration. Fertilization may occur very well, and the conception rate will be low since the presece of a fertilized ovum is not able to rescue the corpus luteum function at their early stage (*EDQVIST et al., 1984*). However, foetal control to influence maternal corpus luteum function via altreation of the prostaglandin realease pattern does not seem to occur until about days 15-19 following a successful mating (*KINDAHL et al., 1984*). This evidence support our results, that, milk progesterone did not decline in normal length fertile cycle

after 3 week of fertile mating. Morevor, the normal length estrous cycles detected by milk progesterone in the present work (3.2 ± 0.15 week), are in agreement with *COCKRILL, (1977), WELTHORUTTOPEMON and MONGKONPANGA (1978) and WANG PIE-CHEIM (1979)* in buffaloes.

Conclusivelly, in buffaloes the occurance of short estrous cycles following weaning should be considered. Moreover, the breeding strategies of animals subsequently corrected.

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Table (1): Incidence and duration of short and normal estrous cycles in buffaloes.

Type of cycles	Cycle No. (%)	Weeks post partum	Cycle duration "weeks"	age	Parity
Short cycles	24 (40.7%)	9.9 ± 2.02	2	9.6 ± 0.75	7.3 ± 0.73
Normal cycle "non return"	18 (75 %)	12.8 ± 1.27	non return	10.1 ± 0.90	7.8 ± 0.80
Normal cycle	6 (25 %)	15.5 ± 1.70	3.2 ± 0.15	8.8 ± 1.02	6.7 ± 0.98