STUDY ON OESTROUS ACTIVITY AND REPRODUCTIVE EFFICIENCY OF LACTATING BALADI AND CROSSBRED COWS IN EGYPT

A. E., Abdel-Khalek*; M. M., El-Moghazy, SH. M. Shamiah*** and E. S., Dandoush****

*Anim. Prod. Dept., Fac. Agric., Mansoura University, Mansoura, Egypt.

**Anim. Prod. Dept., Fac. Agric., Minufiya University, Shebin El-Kom, Egypt.

***Anim. Prod. Res. Institute, Agric. Res. Center, Dokl, Egypt.

****Ministry of Agriculture, Egypt.

ABSTRACT

This study was conducted to compare the oestrous activity and postpartum reproductive efficiency of Baladi and crossbred (Friesian x Baladi) cows kept under the traditional conditions of small holdings in Desok village, Kafr El-Shiekh governorate, Egypt. Total of 26 lactating Baladi and crossbred cows, aged 5-9 years and between 3-6 parities were targeted in this study. The obtained results indicated that frequent sniffing to other female, restlessness and stiffed teat (95.0, 80.0 and 70.0%, respectively) were the main signs used in Baladi versus mucus discharge, frequent urination and sniffing to other female (85.0, 80.0 and 70.0%, respectively) in crossbred cows. About 90% of crossbred cows did not increase their activity peak more than 6 h versus 70% of Baladi cows. Peak of oestrous activity in 65-70% of Baladi and crossbred cows occurred at early morning between 06:00 and 09:00 h versus 20% in crossbred and 15% in Baladi cows showing oestrous activity at early evening (>18:00 h). All Baladi cows versus 90% of crossbred cows exhibited oestrous activity throughout 90 days postpartum. Average number of oestrus cases per animal was greater in crossbred than in Baladi cows (1.2 vs.1.4/animal). All cows showed oestrous activity during hot versus 90% in cold season. Average number of oestrus cases per animal was greater in cold than in hot season (1.2 vs. 1.4/animal). Oestrous cycle length was similar in both cow groups, being 22.0 days. All oestrous cycles observed during cold season in crossbred and during hot season in Baladi cows. Average postpartum 1st service (PPFSI) interval was shorter (P<0.05) in Baladi than in crossbred cows (47.8 vs. 58.2 d). Baladi cows showed longer PPFSI in cold than in hot (49.3 vs. 46.3 d), while crossbred cows showed an opposite trend (48.3 vs. 68.0 d). Length of service period (SP) was shorter

and number of services/conception (NSC) was less in Baladi cows (3.8 days and 1.14 S/C) than in crossbred cows (13.4 days and 1.42 S/C), but the differences were not significant. Average SP was shorter and NSC was less in hot (3.8 days and 1.14 S/C) than in cold (13.4 days and 1.42 S/C), but this difference was not significant. Average number of days open (DO) was shorter (P<0.05) in Baladi than in crossbred cows (51.6 vs. 71.6 d). DO tended to be insignificantly shorter in hot than in cold season (60.9 vs. 62.3 d). DO of crossbred cows tended to be shorter in hot than in cold (68.0 vs. 75.2 d), while an opposite trend was observed in Baladi cows (49.3 vs. 53.7 d). Baladi cows showed shorter calving interval (CI) than in crossbred cows (336.6 vs. 346.6 d, P<0.05). Average CI of Baladi cows was longer in hot than in cold (328.7 vs. 324.3 d), however, it was 343.0 and 350.2 days in hot and cold for crossbred cows, respectively. Average herd pregnancy rate of cows within 90 days postpartum was higher (P<0.05) for Baladi (100%) than crossbred cows (92.3%). All Baladi cows were conceived during 60 days postpartum in cold and during 90 days postpartum in hot season. However, all crossbreds were conceived during 90 days postpartum in hot versus only 85.7% in cold season.

In conclusion, local Egyptian cows (Baladi) showed better postpartum reproductive performance than crossbred cows (Baladi x Friesian), in particular in hot season. On the other hand, most reproductive measures of crossbred cows improved in hot season as compared to Friesian cows raised under summer conditions in Egypt.

Keywords: Baladi cows, crossbred cows, oestrous activity, days open, pregnancy rate.

INTRODUCTION

Local "Baladi" cattle constitute about 37% of the total large ruminant population, which represented a major part of the animal wealth in Egypt **(CAPMAS, 1995)**. Baladi cows had no great attention due to their low milk production as compared to Friesian cows. In the earlier reports, Baladi cows was found to have low milk production potentially (640-1175 kg) compared to standard dairy breeds **(Ragab and Asker, 1951; Ahmed and Tantawy, 1956; Ragab et al., 1956; Oloufa, 1960; Morsy et al., 1984 and Nigm et al., 1986)**.

It is of high priority to keep the local breeds as pure genotype for crossing plans. Hence, characterizing reproductive and productive performance of Baladi cattle becomes of significant value. However, with the fact that they thrive under the prevailing environmental conditions, particularly at small farmer level, they should not be precluded from national development plans of ani-

mal production.

Little information is available concerning the characteristics of reproductive performance of Baladi cows under field (**Nigm et al., 1986**) or experimental conditions (**Barkawi et al., 2001 and El-Gaafrawy et al., 2000**), and some aspects of reproductive performance of crossbred cattle in Egypt (**Morsy et al., 1986**).

Season of calving was reported to have great bearing on the reproduction of some extent in exotic dairy breeds (**El-Keraby and Aboul-Ela, 1982 and Swiefy, 1997**) and Baladi cows (**Barkawi et al., 2001**) under climatic conditions of Egypt. Therefore, the objective of this study are to evaluate the postpartum reproductive performance of Baladi cows as compared to their crossbreed with Friesian cows during hot and cold seasons in Egypt, under the traditional conditions of small size holdings.

MATERIALS AND METHODS

This work was conducted on reproductive performance of Baladi and crossbreed (Friesian x Baladi) cows under the field conditions of small size holdings in a small village belonging to Desok city, Kafr El-Shiekh governorate, during the period from June 2004 to February 2006.

Animals and management:

A total of 26 lactating cows, 13 Baladi and 13 crossbreed (Friesian x Baladi) cows were normally calved and diagnosed as free of reproductive diseases at the beginning of this study. All animals had 5-9 years of age and ranged between 3 to 6 parities. Animals were tied under an open-shed during day time from 7:00 to 18:00 h and housed tied in hovel during the night. The animals were mostly fed on berseem and little amount of concentrate feed mixture (CFM) during winter-spring period and on crop residues, CFM and variable amounts of darawa during summer-autumn period. Animals were kept under the regular system of feeding and management adopted by the Egyptian farmers.

Cows in heat after about 2 months from calving were bred by natural mating using a bull in the same village, no interference was made in the timing of mating, or any other managerial practices followed at the studied holdings. Mating was repeated for cows returned to heat post-mating. Non-return cows that did not show heat signs within 4-5 weeks of mating were left to be examined by rectal palpated at about 45 days post mating.

Cows were hand milked twice daily at about 6:00 h and 17:00 h, and all cows were used essentially for milk production.

Data recorded:

The basal information concerning age, parity, managerial system (housing and feeding), date of the last parturition, oestrus signs used for heat detection, date of service and parturition were recorded. To investigate seasonal effects on the studied traits, the year was divided into two main seasons, cold season extends from November to April and the hot season from May to October.

Milk samples:

Whole milk samples (about 15 ml for each) were collected from 20 cows, 10 animals in each group. Milk samples were taken from the milking bucket of each cow at the end of milking. Samples were collected starting 9-11 days after calving twice weekly (at 3-4 days interval) until 10 days from the last service which was assumed to be conception service. Milk samples were transported in icebox (4-5C°) to Animal Biotechnology Laboratory, Animal Production Department, Faculty of Agriculture, Mansoura University, and stored at -20C° till progesterone assay was performed.

Determination of the onset of ovulation:

Progesterone profile in whole milk samples of each cow were evaluated for postpartum 1st ovulation interval and detection of silent ovulation incidence. A female was considered to be in ovulatory oestrus on the basis of showing oestrous behavior signs, as determined by the herds man himself (confirmed later by standing to bull and actual natural mating if service took place), coinciding with low milk P4 concentration of ≤5.0 ng/ml followed by an increase in P4 concentration to more than 5.0 ng/ml that was sustained for at least two consecutive samples (about one week duration). This threshold level of 5.0 ng/ml was determined after **Heap et al. (1974) and Lamming and Darwash (1998)**.

Throughout progesterone profile of each animal, postpartum first ovulation interval (PPFVI) and incidence of ovulatory anoestrus cases (Silent ovulation) were recorded.

Progesterone assay:

Direct radioimmunoassay technique (RIA) was performed for determination of progesterone concentration in whole milk using ready antibody coated tubes kit (Diagnosis Systems Laboratories Texas, USA) according to the procedure outlined by the manufacturer.

Statistical analysis:

Data were statistically analyzed using the least squares method of analysis of variance by **SAS (2005)**. Conception rate was subjected to statistical analysis of χ^2, according to **Steel and Torrie (1980)**. The differences among the treatment mean were preformed using Duncan Range Test **(Duncan, 1955)**.

RESULTS AND DISCUSSION

Oestrous activity:

Oestrus signs:

In this study one or more of oestrus signs were recorded as indicators for onset of oestrus in different groups, with distinct differences in the frequency of using the various symptoms (Table 1). The recorded signs were different between both cow groups in intensity and frequency of various symptoms, although there was consistency among the same group in intensity and frequency of oestrus signs.

The observations on oestrus signs of Baladi was different than that in the crossbred cows, frequent sniffing to other female, restlessness and stiffed teat were the main signs used in Baladi (95.0, 80 and 70%, respectively), accompanied by one or more other signs. However, mucus discharge, frequent urination and sniffing to other female (85.0, 80 and 70%, respectively) were the major signs in crossbred cows (Table 1).

It is of interest to note that oestrus signs including tail-raising, response to puting hand on rump, frequent urination, mucus discharge, stiffed teat, drop in milk yield and increased body temperature were nearly frequent in both groups. While, oestrus signs involving bellowing and response to slight vulva message were more detected and sniffing to other female and sniffing by other female did not observed in Baladi as compared to crossbred cows (Table 1). In accordance with the recorded oestrus signs on cow groups, **Foote (1974)** found that restlessness, sniffing the vulva of cows on that, mounting others, raising tail when contacted by others, vulva swollen and secretion of clear mucus from the vulva were mainly observed for animals in heat.

In contrast, **Baker and Seidel (1985)** found that the most important sign during heat period is the standing of the cow to the bull or other females those attempt to mount it. **Darchir et al. (1984)** found that the percentage of cows showing standing oestrus in the first, second and third ovulations was 23, 27 and 42%, respectively.

Duration and time of oestrous behaviour:

It was observed that peak of one or more signs as indicators for onset of oestrus in both groups occurred for different durations (Table 2). The highest distribution of cows in both groups was observed to show the highest intensity of oestrous activity for 6 h. Oestrous duration was lower in crossbred cows than in Baladi cows, since about 90% of crossbred cows did not increase their activity peak more than 6 h versus 70% of Baladi cows. Also, 20% of crossbred cows showed short oestrous activity for only 3 h and 5% for long duration (>9 h) (Table 2).

The average heat duration was reported to range from 10.6 to 16.0 h in Friesian and Holstein cows **(Pennington et al., 1986; Abdel-Bary et al., 1992 and Swiefy, 1997)** and from 8.6 to 10.7 h in local African cow breeds **(Zakari, 1981 and Chicoteau et al., 1989)**. In Baladi cows, **Hanafy (2000)** reported that mean of oestrous duration was 9.0 h, ranging from 8 to 16 h, but the modal length (58%) of oestrous duration (8 h) was slightly longer than that reported in the present study (35.0% for 6 h, Table 2).

Based on the statement of farmers, peak of oestrus signs in 65-70% of cows in both groups occurred at early morning between 06:00 and 09:00 h versus 20% in crossbred and 15 in Baladi showing oestrous activity at early evening (>18:00 h). The rest of animals showed their oestrus at noon or afternoon between 9:00 and 18:00 h (Table 2).

In agreement with the present results, **Zakari (1981)** found a very high proportion of the mounting and standing activities associated with heat occurred in the late evening or early morning. However, **Pennington et al. (1986)** observed two mounting activity peaks, the first between 01:00 and 03:00 h and the second between 18:00 and 24:00 h.

Number of oestrus cases and oestrous cycle length:

Oestrous activity in term of number of animals came in oestrus and average number of oestrus cases throughout 90 days postpartum period is shown in Table (3). Results revealed that all Baladi cows versus 90% of crossbred cows exhibited oestrous activity throughout 90 days postpartum (except one crossbred cow did not exhibit oestrous activity). However, average number of oestrus cases/animal was greater in crossbred (1.4/animal) than in Baladi cows (1.2/animal). The present number of oestrus cases/animal for Baladi cows was lower than 1.4/animal as reported by **Hanafy (2000)**.

The present results also revealed that all cows showed oestrus activity during hot (100%) versus 90% in cold season. This means that the observed anoestrous crossbred cow was in cold season. However, average number of oestrus cases/animal was greater (1.4/animal) in cold than

1.2/animal in hot season (Table 3).

It is worthy noting that all Baladi cows exhibited oestrous activity during both seasons. However, 85.7% of crossbred cows showed oestrous behaviour in cold versus 100% of those in hot (Table 3). However, pronounced differences were observed in average number of oestrus cases/animal during both season, being greater in cold than in hot for crossbred cows (1.6 and 1.0/animal, respectively). While, an opposite trend was obtained for Baladi cows, being 1.0/animal in cold and 1.29/animal in hot (Table 3).

The trend of increase in number of oestrus cases of Baladi cows in hot than in cold contrasted that reported by **Hanafy (2000)**, who found that heat cases/cow during the days open was 1.3 in hot and 1.5 in cold season. However, the trend observed in crossbred cows is similar to that obtained on Friesian cows (**El-Keraby and Aboul-Ela, 1982**).

Results in Table (3) showed that oestrous cycle length was similar in both group cows, although Baladi cows gave only one oestrous cycle in normal type versus three cycles in crossbred cows (the 1st was short, 2nd was normal and 3rd was long, Table 3). Most of the previous reports indicated that oestrous cycles ranged between 19 and 24 days (**El-Keraby, 1970; Zakari, 1981; Fonseca et al., 1983; Rajamahendran and Taylor, 1990 and Keeling et al., 1992**).

It is worthy noting that, all oestrous cycles of crossbred cows were observed during cold season, while occurred in Baladi cows during hot season. The effect of season on oestrous cycles was more pronounced on its duration. **Stott and Williams (1962) and Gangwar et al., (1965)** reported that the occurrence of long oestrous cycles (more than 24 days) was more frequent during hot than cold seasons. However, **Zakari (1981)** reported that oestrous cycle length was longer during the period from January to May (26 days) than from June to December (21 days) in Nigeria.

On the other hand, different trends was reported on the effect of season on oestrous cycle length of Friesian cows in Egypt. In this respect, **Abdel-Bary et al. (1992)** found that oestrous cycle length was longer (29.8 days) in cold than in hot season (25.9 days), while **Swiefy (1997)** found an opposite trend.

Progesterone concentration during oestrous cycle:

Concentrations of P_4 in whole milk throughout 7 and 3 pre-oestrus, 0 and 3 days post-oestrus were higher in Baladi than in crossbred cows, however, the differences were not significantly (Figure 1).

The effect of calving season on concentration of P_4 in whole milk at different sampling days

was significantly (P<0.05) higher in hot than in cold season only on day 3 pre-oestrus incidence (24.8 vs. 16.4 ng/ml). However, there was a tendency of increasing P_4 concentration on days 7 pre-oestrus, day of oestrous and day 3 post-oestrus in hot than cold season, but the differences were not significant (Figure 2).

As affected by the insignificant interaction between cow group and season of calving, P_4 concentration was higher in hot than in cold season throughout 7 and 3 pre-oestrus, 0 and 3 days post-oestrus in Baladi cows, while the differences were only significant on day of oestrous. Reversible situation was observed in crossbred cows, except on day 7 pre-oestrus (Figure 3).

These results agreed with those reported by **El-Gaafrawy et al. (2000)**, who found that P_4 concentration was at its minimum level on the day of oestrus, then increased to maximum value around day 15 of the oestrous cycle in Friesian and Baladi cows and decreased again. Also, **Wetteman et al. (1972) and Ramirez-Godinez et al. (1982)** observed marked decrease in P_4 concentration to its minimum level on the day of oestrus, then increased to the maximum on day 14 of the oestrous cycle and decreased again.

Reproductive efficiency measurements:

Postpartum first oestrus/service interval:

The differences in average interval from calving to first oestrus/service (PPFE/SI) between both groups were not significant, but it tended to be longer in crossbred (58.2 d) than in Baladi cows (47.8 d, Table 4). This difference reached about 11 days, indicating early postpartum oestrous activity in Baladi than in crossbred cows.

Wide variation in the reported PPFEI for different cattle breeds, being 28.3-69.0 days in Holstein cows **(Rajamahendran and Taylor, 1990; Lu et al., 1992; Ramirez-Iglesia et al., 1993 and Esteban et al., 1994)**, 51.5-65.7 d in Friesian cows **(Kadoom, 1991 and Swiefy, 1997)**; 73.0 d in Finnish cows **(Miettinen, 1990)** and 95.0 d in Zebo cattle **(Soto-Belloso et al., 1997)**. However, longer PPFEI than that presented herein was reported on Baladi cows, being 55.3 d **(Barkawi et al., 2001)**, 68.7 d **(Damarany, 2007)** and was 71.5 d **(El-Wardani et al., 2000)**. Also, longer PPFSI was reported on Baladi cattle, ranging between 57.6 and 87.3 days **(Oloufa, 1988; Morsy et al., 1984 & 1986; Hanafy, 2000 and Zahed et al., 2001)**.

Also, the obtained PPFSI of crossbred cows was shorter 122 and 125 days after the first and second calving as reported by **Morsy et al. (1986)** for crossbred cattle in Egypt. While, **El-Gaafrawy et al. (2000)** reported that length of PPFOI was shorter in Baladi compared with Friesian cows in Egypt (35.5 and 41.0 days, respectively). However, **El-Wardani et al., (2000)**

reported that length of PPFSI was shorter in Baladi cows in Egypt (68.5 days).

The shorter length of PPFEI in Baladi cows was almost associated with significantly (P<0.05) higher frequency distribution of animals displaying their postpartum first oestrus within two months from calving than those of in crossbred cows (100 and 66.7%, respectively). On the other hand, all animals of crossbred cows showed their first oestrous activity within three months postpartum (Table 4).

Meanwhile, the obtained all Baladi cows displaying PPFEI with 2 months postpartum (100%) was higher than that reported by **Hanafy (2000)**, who reported that about 62% of the Baladi cows showed their first oestrus during the first two months postpartum increased to be 82% at the end of third month.

Although the effect of calving season on PPFO/SI not significant (Table 4), there was a tendency of longer PPFO/SI in hot than in cold season (57.1 and 48.8 days, respectively). This tendency was attributed to that frequency distribution of animals showing oestrous activity within 2 months postpartum was significantly (P<0.05) higher in hot than in cold (84.6 and 58.3%, respectively, Table 4).

The interaction between cow group and season was not significant. For both groups in both seasons, it was found that Baladi cows showed longer PPFO/SI in cold than in hot season, while crossbred cows showed an opposite trend (Table 4).

In accordance with the results of Baladi cows, **Barkawi et al. (2001)** found that cold season calved of Baladi cows had relatively longer PPFSI than in those calved in hot season. The shorter PPFSI of hot season calvers was attributed to their ability to express sexual behaviour. However, **Morsy et al. (1984)** reported that animals that give birth for their calves during late winter scored the shortest PPFSI (35 days), while those calved during autumn recorded the longest period (105.6 days).

Also, in agreement with the obtained results, **Swiefy (1997)** reported no significant effect of season of calving on PPFOI of Friesian cows. However, in Jersey cows, PPFSI was shorter for cows that calved during winter than summer or autumn seasons by about 11 days **(Fonseca et al., 1983)**. Also, **Cavestany et al. (1985)** found that Holstein cows which calved during the hot season had longer PPFSI (71-79 days) than those calved during the cold season (62-69 days). In Italy, **Bagnato and Oltenacu (1994)** found that PPFSI of Friesian cows was longer in hot than cold season. These findings may indicate the trend of change in PPFOI of crossbred cows in hot and cold seasons.

Service period and number of services per conception:

Results presented in Table (5) show that length of service period (SP) was shorter and number of services per conception (NS/C) was less in Baladi cows (3.8 days and 1.14 S/C) than in crossbred cows (13.4 days and 1.42 S/C), but the differences were not significant. Length of SP was longer by about 10 in crossbred as compared to Baladi cows.

The shortest SP in Baladi cows was associated with the highest distribution (84.6%) of animals required one service to conceive and all animals required 1-2 services per conception. However, crossbred cows inspite of lower percentage required one service per conception (66.7%), was related to that about 18% of crossbred cows required three services to conceive.

Wide variation was recorded for number of services required for conception of cattle, ranging from 1.8 to 3.4 in Friesian and Holstein cows **(Butler et al., 1981; Cavestany et al., 1985; Faust et al., 1988; Basuney, 1990; Farin et al., 1994; Sprecher et al., 1997 and Swiefy, 1997)** and 1.8-2.6 in Baladi cows **(Morsy et al., 1984 & 1986)**. On the other hand, **Hanafy (2000)** found that NSC of Baladi cows ranged from 1 to 3 with an average of 1.3 and percentage of animals that conceived from first service, being 76.5%. **El-Wardani et al., (2000)** reported that of NSC of Baladi cows ranged from 1 to 4 services/conception with an average of 1.8 and length of SP between 0 to 233 days with an average of 43.8 days. Recently, **Damarany, (2007)** reported that NSC of Baladi cows ranged from 1 to 3 services/conception with an average of 1.4 and length of SP between 0 to 195 days with an average of 23.8 days and percentage of animals that conceived from first service, being 67.5%.

Such trend between both groups in SP and NSC, beside the earliest resumption of postpartum ovarian and intensity of oestrous activities indicated higher reproductive performance of Baladi cows than crossbred cows.

The present results in Table (5) show that average SP was shorter and NS/C was less in hot (3.8 days and 1.14 S/C) than in cold season (13.4 days and 1.42 S/C), but this difference was not significant.

This tendency come in line with significant ($P<0.05$) increase in percentage of animals conceived after the first service in hot than in cold (84.6 and 66.7%, respectively). However, frequency distribution of cows required 2 services per conception was insignificantly higher in cold than in hot (Table 5).

It is of interest to note that all animals required 1-2 services to conceive in hot and 1-3 services in cold season (Table 5). Also, the interaction between cow group and calving season on each of SP and NS/C was not significant (Table 5). Average SP was longer and NS/C was higher in

crossbred cows on cold season, while an opposite trend was recorded for Baladi cows (Table 5).

The trend of differences between both seasons in crossbred cows came in line with the results on Friesian cows raised in Egypt. **El-Keraby and Abou-Ela (1982) and Faust et al. (1988)** found that NS/C was greater in summer (2.2-2.6 ser./conception) than in other seasons (1.7-2.1 ser./conception). Also in USA, **Cavestany et al. (1985)** showed that the average NSC of Holstein cows was greater (4.5-5.3 ser./conception) in hot months (May to August) than 2.3-3.6 services/ conception in cold months (September to April).

On the contrast, **Ray et al. (1992) and Swiefy (1997)** reported that winter calvers required more services (2.1--4.1) than summer one (1.9-2.4). However, no significant difference in NS/C between winter and summer calvers **(Kumar et al., 1988)**, however, winter calvers required more services (2.1-4.1) than summer one (1.9-2.4) as reported by **Ray et al. (1992) and Swiefy (1997)**.

On the contrary, **Hanafy (2000)** found that in Baladi cows, the average of NS/C in cold and hot season was equal in the two seasons (1.3 services). However, conception rate from the first service in cold season was higher than in the hot season (87.5 and 66.7%, respectively).

Days open (DO) :

Average number of DO was significantly (P<0.05) shorter in Baladi cows than in crossbred cows (51.6 vs. 71.6 d, Table 6). Such difference (20 days) was mainly in relation to shorter PPFE/SI (47.4 d) and SP (3.8 d) in Baladi than in crossbred (59.9 and 11.7 d, respectively, Table 6).

The obtained DO of Baladi cows (51.6 days) was shorter than that reported on Egyptian Baladi cows, ranging between 70.8 days **(Barkawi et al., 2001)** and 153 days **(Morsy et al., 1984)** under experimental conditions. However, **El-Wardani et al. (2000)** reported that length DO of Baladi cows under field condition ranged between 45 to 285 days with an average of 103.4 days. These differences are mainly related to differences in managerial factors between experimental stations and field conditions and even within each of them.

However, the obtained mean of DO of crossbred cows was shorter than those reported by **El-Keraby and Aboul-Ela (1982); Kadoom (1991); Eicker et al. (1996) and Pursley et al. (1997)** on Friesian cows.

The shortest DO in Baladi cows was associated with significantly (P<0.05) higher distribution (92.3%) of Baladi cows conceiving within 2 months postpartum than 33.3% of animals in cross-

bred. The opposite was observed within the 3rd month postpartum (7.7 and 66.7%, respectively, Table 6).

As compared to DO of Baladi cows within two months postpartum (92.3%) reported in this study, **Hanafy (2000)** found lower frequency distribution of the experimental cows having DO less than 60 days, being 53%, while 41% and 6% of cows had DO between 60 and 120 days, and >120 days, respectively.

However, in comparing the results of crossbred cows with Friesian cows, several authors fond that only 51.4% of animals had DO less than 90 days, while 28.6% and 22.8% had DO of 90, 180 and >180 days, respectively **(Butler and Smith, 1989; El-Ashram, 1993; Risco et al., 1994; Eicker et al., 1996; Pursley et al., 1997 and Swiefy, 1997)**.

The large variation among estimated DO can most probably be attributed to the difference in physiological, managerial, and climatic conditions. This emphasized that the length of DO is apparently not specific to the group, but could be shortened by improving managerial practices particularly oestrous detection.

The short DO reported in this study for all groups was found to be affected by heat detection regimen. **Barkawi et al. (1999)** suggested that increasing frequency of heat detection would have a positive impact on the farm profitability and productive life of animals.

The effect of calving season on DO was not significant, although DO tended to be shorter in hot than in cold season (60.9 and 62.3 days, respectively, Table 6). This was attributed to shorter PPFE/SI (57.1 and 48.8 days, respectively) and SP (3.8 and 13.4 days, respectively) in hot than in cold season (Tables 4 and 5).

It is of interest to note that the observed shorter DO in hot than in cold was associated with higher percentages of animals having DO of ≤60 and >60-90 days in hot than in cold. Also, animals in hot season had only 90 days postpartum as DO versus >90 day postpartum in cold season (Table 6).

The effect of interaction between calving season and cow group on DO was not statistically significant (Table 6). In crossbred cows, DO tended was shorter in hot than in cold (68.0 vs. 75.2 d), but the opposite was for Baladi cows, being shorter in cold than in hot (49.3 vs. 53.7 d). This trend disagreed that reported by Hanafy (2000), who found that DO was longer in cold than in hot season, but the difference was not significant. In accordance with the results of crossbred cows, Swiefy (1997) reported that DO was longer for cold season calvers than hot season ones (182.7 and 85.0 days respectively, $P<0.05$).

Calving interval (CI):

Average length of CI was significantly (P<0.05) longer (346.6 d) in crossbred than in Baladi cows (336.5 days, Table 7). Such difference was mainly in relation with shorter DO in Baladi (51.6 days) than in crossbred cows (71.6 days, Tables 7).

The obtained CI of Baladi cows (336.5 days) was shorter than those reported on Egyptian Baladi cows, being 359.0 days **(Hanafy, 2000)**, 381.6 days **(Oloufa, 1968)**, 386.7 days **(El-Wardani et al., 2000)**, 401.3 days **(Morsy et al., 1984)**, 419.0 days **(Asker et al., 1958)** and 421.0 days **(Nigm et al., 2006)**. However, the recorded CI of crossbred cows was shorter than those reported on crossbred cows in Egypt by **Nigm et al. (2006)** being 402 days. Also, its was shorter than those reported on Friesian cows by **El-Sheikh (1995) and Thalkari et al. (1995)**, being 472 and 429 days, respectively. These differences were mainly associated with the differences in DO. This means that CI of crossbred cows had almost moderate values between Baladi and Friesian cows, which may indicate some beneficial effects of crossing Baladi cows with Friesian on reproductive performance of crossbred cows under the Egyptian conditions.

The shortest CI in Baladi cows was associated with significantly (P<0.05) higher distribution (76.9%) of animals having CI of <330 days, and significantly (P<0.05) lower percentage (23.1%) of animals having CI between 331 and 360 days as compared to 15.4 and 61.5% in crossbred cows, respectively (Tables 7).

It is of interest to note that all Baladi cows (100%) had CI up to 360 days (12 mo) as compared to >390 days (>13 mo) in crossbred cows (Table 7). In Baladi cows, **Hanafy (2000)** indicated that 47% of the experimental cows had CI <340 days, while 23.5, 6.0 and 23.5% of cows had CI between 341-370, 371-400 and >400 days, respectively.

The effect of calving season or its interaction with cow group on CI length was statistically not significant, and CI was nearly similar in hot and cold seasons (Table 7). In Baladi cows, nearly similar CI was obtained in cold and hot seasons (324.3 and 328.7 days, respectively). However, CI of crossbred cows contrasted Baladi cows, being longer in cold than in hot (350.2 vs. 348.0 days, respectively). In similarity with the present results, **Slama et al. (1978) and Mohamed (1987)** reported that calving season had no significant effect on CI of cattle.

In accordance with the present results of crossbred cows, **El-Menoufy et al. (1984) and Thalkari et al. (1995)** found the longest calving interval (410-423 d, respectively) was recorded in cold months, while the shortest CI (359- 408 d, respectively) was obtained in hot months for dairy cows. However, several investigations indicated the shortest (405 days) CI in autumn calvers (September-November) and the longest (458 days) in spring calvers (March-May) as reported

by **Mohamed (1987)**. In Baladi cows, **Hanafy (2000)** found that cold season calvers had longer CI compared to the hot season one, however, but the difference was not significant.

Herd pregnancy rate (%):

Results shown in Table (8) cleared that average herd pregnancy rate of cows within 60 days postpartum was affected significantly (P<0.05) by cow group, being higher for Baladi (92.3%) than crossbred cows (30.8%). These rates increased to be 100% in Baladi and 92.3% in crossbred cows (P<0.05) within three months postpartum. It is of interest to note that 7.7% of crossbred cows did not conceive during 90 days postpartum.

The reported conception rate of Baladi in this study is pronouncedly higher than that found by **Hanafy (2000)**, being 64.7% within 90 days postpartum, under experimental condition. Also, the general conception rate following the first insemination of Baladi cows reported by **Oloufa (1968)**, being 43.2% or by **Morsy et al. (1984)**, being 54.3% was lower than that reported in the present study, being 100% within 90 days postpartum. The present pregnancy rate within two months postpartum of crossbred cows are higher by 20% than that reported by **Swiefy (1997)** on Friesian cows raised in Egypt.

Pregnancy rate of cows within 60 and 90 days postpartum was affected significantly (P<0.05) by calving season, being higher during hot than cold season (Table 8). As affected by the interaction between cow group and calving season, it is of interest to note that calving season had reversible effect on each group. All Baladi cows were conceived during 2 months postpartum in cold and during 3 months postpartum in hot season. However, all crossbred were conceived during 3 months postpartum in hot versus only 85.7% in cold season (Table 8).

In accordance with results of Baladi cows, **Hanafy (2000)** found no significant effect of calving season on conception rate, being higher after the 1st service in cold than hot season. However within the first 90 days postpartum, it was higher in hot than in cold season (62.5 vs. 66.7%).

In conclusion, local Egyptian cows (Baladi) showed better postpartum reproductive performance than crossbred cows (Baladi x Friesian), in particular in hot season. On the other hand, most reproductive measures of crossbred cows improved in hot season as compared to Friesian cows raised under summer conditions in Egypt.

Table (1): Percentages of oestrus incidence in Baladi and crossbred cows.

Item	Cow group	
	Baladi	Crossbred
Incidence of oestrus signs (%):		
Bellowing	20.0	5.0
Restlessness	80.0	60.0
Tail raising	35.0	30.0
Response to putting hand on rump	30.0	35.0
Frequent urination	65.0	80.0
Isolation	20.0	0.0
Response to slight vulva message	10.0	5.0
Mucus discharge	65.0	85.0
Reduction of appetite	50.0	50.0
Stiffed teat	70.0	60.0
Drop in milk yield	45.0	50.0
Increased body temperature	20.0	10.0
Sniffing to other female	95.0	70.0
Sniffing by other female	10.0	40.0

Table (2): Frequency distribution (%) of duration and time of oestrus in Baladi and crossbred cows.

Item	Cow group	
	Baladi	Crossbred
Frequency distribution (%) of oestrous duration (h):		
3	5.00	20.0
4	10.0	15.0
5	20.0	20.0
6	35.0	35.0
7	10.0	5.00
9	20.0	0.00
≤10	0.00	5.00
Frequency distribution (%) for times of oestrus onset:		
Morning (6:00-9.00 h)	70.0	65.0
Noon (after 9:00-12:00 h)	5.00	10.0
Afternoon (after 12:00-18:00 h)	10.0	5.00
Evening (after 18:00 h)	15.0	20.0

Table (3): Oestrous activity throughout 90 days postpartum as affected by cow group and calving season.

Item		n	Oestrous animals		Oestrus cases		Oestrus cycle length (day)	
			n	%	n	Average/ animal	n	Average
Cow group:								
Baladi		10	10	100	12	1.2	1	22.0±0.00
Crossbred		10	9	90.0	14	1.4	3	22.0±4.16
Calving season:								
Cold		10	9	90.0	14	1.4	3	22.0±4.16
Hot		10	10	100	12	1.2	1	22.0±0.00
Cow groups in both seasons:								
Baladi	Cold	3	3	100	3	1.0	-	-
	Hot	7	7	100	9	1.3	1	22.0±0.00
Crossbred	Cold	7	6	85.7	11	1.6	3	22.0±4.16
	Hot	3	3	100	3	1.0	-	-

Table (4): Average length (day) and frequency distribution (%) of postpartum first oestrus/service interval (PPFE/SI) as affected by cow group and calving season.

Item		n	Postpartum first oestrus/service interval			
			Mean (day)	Frequency distribution (%)		
				≤30 d	31-60 d	61-90 d
Cow group:						
Baladi		13	47.8	0.0[b]	100[a]	-
Crossbred		12	58.2	25.0[a]	41.7[b]	33.3
±SEM		25	6.42	-	-	-
Calving season:						
Cold		12	48.8	25.0[a]	58.3[b]	16.7
Hot		13	57.1	0.00[b]	84.6[a]	15.4
±SEM		25	6.42	-	-	-
Cow groups in both seasons:						
Baladi	Cold	6	49.3	0.0	100	-
	Hot	7	46.3	0.0	100	-
Crossbred	Cold	6	48.3	50.0	16.7	33.3
	Hot	6	68.0	0.0	66.7	33.3
±SEM		25	8.93	-	-	-

a and b: Means having different superscripts within the same column for each classification are significantly different at P<0.05.

Table (5): Average length (day) of service period (SP) and number of services/conception (NS/C), and frequency distribution (%) of NS/C as affected by cow group and calving season.

Item		n	Mean SP (d)	Mean NS/C	Frequency distribution (%) of NS/C		
					1 service	2 services	3 services
Cow group:							
Baladi		13	3.8	1.14	84.6[a]	15.4	-
Crossbred		12	13.4	1.42	66.7[b]	25.0	8.3
±SEM		25	5.40	0.18	-	-	-
Calving season:							
Cold		12	13.4	1.42	66.7[b]	25.0	8.3
Hot		13	3.8	1.14	84.6[a]	15.4	-
±SEM		25	5.40	0.18	-	-	-
Cow groups in both seasons:							
Baladi	Cold	6	0.0	1.00	100	-	-
	Hot	7	7.6	1.26	71.4	28.6	-
Crossbred	Cold	6	26.8	1.83	33.3	50.0	16.7
	Hot	6	0.0	1.00	100	-	-
±SEM		25	7.51	0.26	-	-	-

a and b: Means having different superscripts within the same column for each classification are significantly different at P<0.05.

Table (6): Average (day) and frequency distribution (%) of days open (DO) of cows in different groups as affected by season of calving.

Item		n	Number of days open			
			Mean (day)	Frequency distribution (%)		
				≤30 d	31-60 d	61-90 d
Compared with two groups:						
Baladi		13	51.6[b]	0.0	92.3[a]	7.7[b]
Crossbred		12	71.6[a]	0.0	33.3[b]	66.7[a]
±SEM		25	3.38	-	-	-
Effect calving season:						
Cold		12	62.3	0.0	50.0[b]	50.0[a]
Hot		13	60.9	0.0	76.9[a]	23.1[b]
±SEM		25	3.38	-	-	-
Cow groups at both seasons:						
Baladi	Cold	6	49.3	0.0	100	-
	Hot	7	53.9	0.0	85.7	14.3
Crossbred	Cold	6	75.2	0.0	0.0	100
	Hot	6	68.0	0.0	66.7	33.3
±SEM		25	4.71	-	-	-

a and b: Means having different superscripts within the same column for each classification are significantly different at P<0.05.

Table (7): Average (day) and frequency distribution (%) of calving interval (CI) in different cow groups as affected by season of calving.

Item		n	Calving interval			
			Mean (day)	Frequency distribution (%)		
				≤330 d	331-360 d	361-390 d
Cow group:						
Baladi		13	336.5 [b]	76.9 [a]	23.1 [b]	-
Crossbred		12	346.6 [a]	16.7 [b]	58.3 [a]	25.0
±SEM		25	3.37	-	-	-
Calving season:						
Cold		12	337.3	50.0	41.7	8.3
Hot		13	335.9	46.1	38.5	15.4
±SEM		25	3.37	-	-	-
Cow groups in both seasons:						
Baladi	Cold	6	324.3	100	-	-
	Hot	7	328.7	57.1	42.9	-
Crossbred	Cold	6	350.2	0.0	83.3	16.7
	Hot	6	343.0	33.4	33.3	33.3
±SEM		25	4.69	-	-	-

a and b: Means having different superscripts within the same column for each classification are significantly different at P<0.05.

Table (8): Herd pregnancy rate within different days postpartum of cows in different groups as affected by season of calving.

Item		N	n	Cumulative herd pregnancy rate (%)		NP%
				Within 60 d	Within 90 d	
Cow group:						
Baladi		13	13	92.3 [a]	100 [a]	0.0
Crossbred		13	12	30.8 [b]	92.3 [b]	7.7
Calving season:						
Cold		13	12	46.2 [b]	92.3 [b]	7.7
Hot		13	13	76.9 [a]	100 [a]	0.0
Cow groups in both seasons:						
Baladi	Cold	6	6	100	-	0.0
	Hot	7	7	85.7	100	0.0
Crossbred	Cold	7	6	0.0	85.7	14.3
	Hot	6	6	66.7	100	0.0

a and b: Means having different superscripts within the same column for each classification are significantly different at P<0.05.

N: Total number of cows n: Number of conceived cows NP: non-pregnant cows

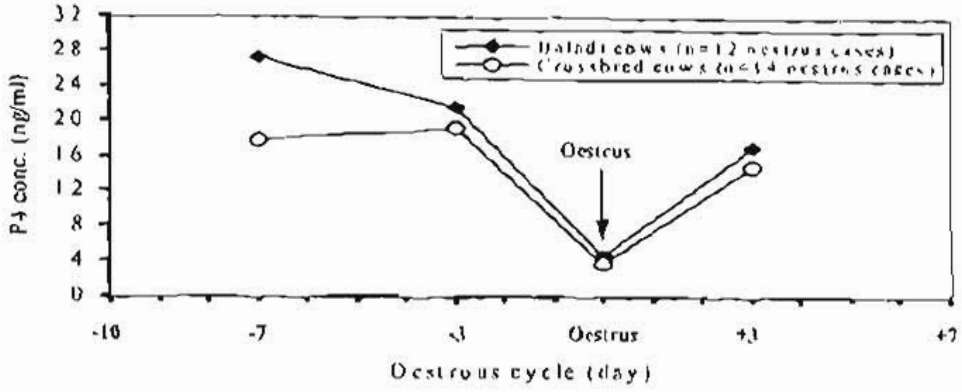

Figure (1): Concentration of P_4 (ng/ml) in whole milk of Baladi and crossbred cows on different days of oestrus.

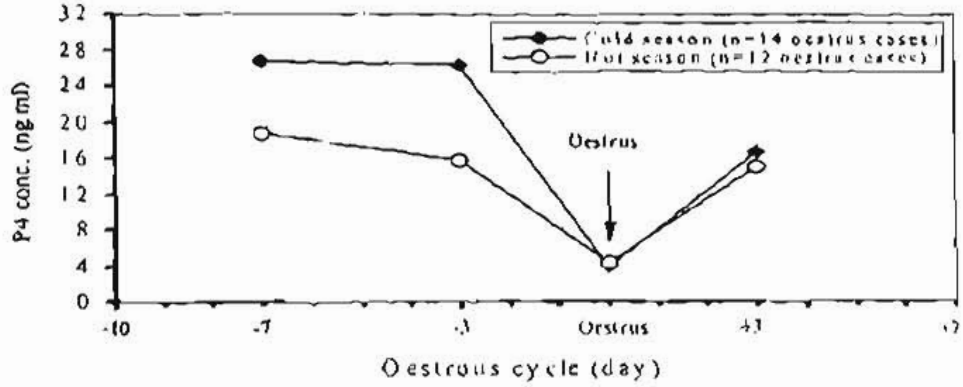

Figure (2): Concentration of P_4 (ng/ml) in whole milk of cows on different days of oestrus as affected by calving season.

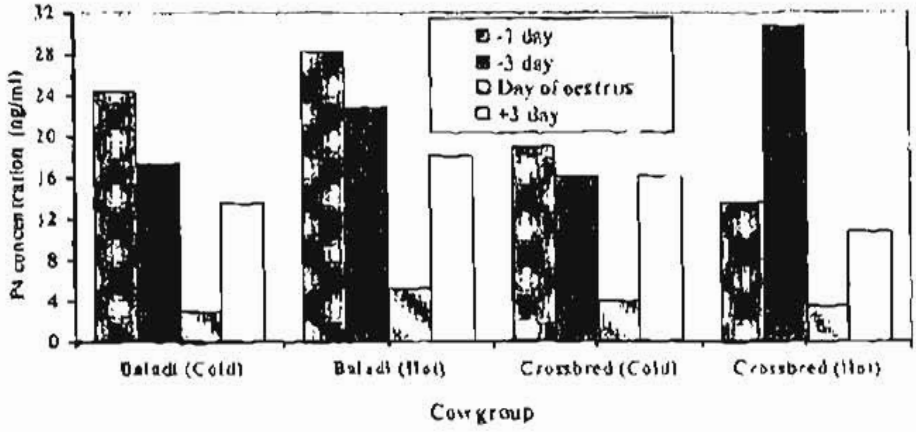

Figure (3): Concentration of P_4 (ng/ml) in whole milk of cows in different cow groups and calving seasons.

REFERENCES

Abdel-Bary, H. T.; Mahmoud, M. M.; Zaky, H. I. and Mohamed, A. A. (1992) : Effect of season and month of calving on estrous performance, services conception and milk yield of Friesian cows in Egypt. Egyptian J. Anim. Prod., 29: 229.

Ahmed, I. A. and A.O. Tantawy (1956) : Causes of variation in the gestation period of Egyptian cows and buffaloes. Euro. J. Exp. Agric., 23: 213.

Asker, A. A., El-Itriby, A. A. and Bedeir, L. H. (1958) : Environmental factors affecting milk production in Egyptian cows. Indian J. Dairy Sci., 2: 113.

Bagnato, A. and Oltenacu, P.A. (1994) : Phenotypic evaluation of fertility traits and their association with milk production of Italian Friesian cattle. J. Dairy Sci., 77: 874-882.

Baker, A. E. and Seidel, G. E. (1985) : Why do cows mount other cows App. Anim. Behav., 13: 236.

Barkawi, A. H.; Ahmed, A. M.; El-Wardani, M. A.; El-Asheeri, A. K. and Hamed, M. K. (1999) : Effect of heat detection regime on the cost of days open and longevity of buffaloes. Egyptian J. Anim. Prod., 36: 83-91.

Barkawi, A. H.; Ashour, G.; Zenat B. Hassan and Damarany, A. I. (2001) : Postpartum reproductive performance of suckling Egyptian native (Baladi) cattle. Egyptian J. Anim. Prod., 38 (2): 79-86.

Basuney, Z. M. (1990) : Relation between milk production and the reproductive efficiency in Friesian cows. M. Sc. Thesis, Fac. Agric., Tanta Univ., Egypt.

Butler, W. R. and Smith, R. D. (1989) : Inter relationships between energy balance and postpartum reproductive function in dairy cattle. J. Dairy Sci., 72: 767.

Butler, W. R.; Everett, R. W. and Coppock, C. E. (1981) : The relationships between energy balance, milk production and ovulation in postpartum Holstein cows. J. Anim. Sci., 53 : 742.

CAPMAS (1995) : Animal Wealth Statistics. Central Agency for Public Mobilization and Statistics. Cairo, Egypt.

Cavestany, D.; El-Wishy, A. B. and Foot, R. H. (1985) : Effect of season and high environmental temperature on fertility of Holstein cattle. J. Dairy Sci., 68: 1471.

Chicoteau, P.; Mambou, E.; Cloe, C. and Bassinga, A. (1989) : Estrous behaviour of Baoule cows (Bos;taurus) in Burkina Faso. Anim. Reprod. Sci., 21: 153.

Damarany, A. I. (2007) : Reproductive aspects of Egyptian Baladi cattle. Ph.D. Thesis, Fac. Agric., Cairo Univ., Egypt.

Darchir, S.; Blake, R. W. and Harms, P. G. (1984) : Ovarian activity of Holstein and Jersey cows of diverse transmitting abilities for milk. J. Dairy Sci., 67: 1776.

Duncan, D. B. (1955) : Multiple Range and Multiple F. test. Biometrices, 11:10.

Eicker, S. W.; Gorhon, Y. T. and Hertl, J. A. (1996) : The association between cumulative milk yield, days open, and days to first breeding in New York Holstein cows. J. Dairy Sci., 79: 235-241.

El-Ashram, A. M. A. (1993) : Studies on reproductive performance in cows. M.Sc. Thesis, Fac. Vet. Med. Zagazig, Univ., Egypt.

El-Gaafrawy, A. M.; El-Banna, M. K.; Sweify; S. A.; Zenat B. Rabie and Aboul-Ela, M. B. (2000) : A study on some physiological parameters in Baladi and Friesian cows. Proc. Conf. Anim. Prod. In The 21th Century, Sakha, 18-20 April 2000, 277-286.

El-Keraby, F. E. and Aboul-Ela, M. B. (1982) : A study of some non genetic factors affecting postpartum reproductive performance in Friesian cows. Tropical Anim. Prod., 7: 307.

El-Keraby, F. E. (1970) : Studies on the sexual behaviour of the purebred Friesian cows. M.Sc. Thesis, Fac. Agric. Alex. Univ., Egypt.

El-Menoufy, A. A.; El-Tayeb; Ayoub, M. M.; Yousef, H. I. and Abdou, M. S. S. (1984) : Breeding performance in buffaloes and Friesian cows in Egypt. Egyptian J. Anim. Prod., 24: 193-206.

El-Sheikh, S. M. (1995) : Some productive and reproductive traits of dairy Friesian cows under Sakha condition. Ph.D.Thesis, Fac. Agric., Cairo Univ., Egypt.

El-Wardani, M. A.; Almahdy, H.; Tabana, A. S. and Hathout, M. K. (2000) : Reproductive performance of the Baladi cows and buffaloes under traditional management system in Egyptian holdings. Proc. Conf. Anim. Prod. in the 21th century, Sakha, 18;20 April, pp. 325-333.

Esteban, E.; Philip, H.; Leon, D.; Weaver, D. and Fred, H. (1994) : Reproductive performance in high producing dairy cows treated with recombinant bovine somatotropin. J. Dairy Sci., 77: 3371.

Farin, P. W.; Slenning, B. D.; Correa, M. T. and Britt, J. H. (1994) : Effect of calving season and milk yield on pregnancy risk and income in North Carolina Holstein cows. J. Dairy Sci., 77: 1848.

Faust, M. A.; McDaniel, B. T.; Robison, O. W. and Britt, J. H. (1988) : Environmental and yield effects on reproduction in primiparous Holsteins. J. Dairy Sci., 71: 3092.

Fonseca, F. A.; Britt, J. A.; Mc Daniel, B. T.; Wilk, J. E. and Rakes, A. H. (1983) : Reproductive traits of Holstein and Jersey. Effects of age, milk yield and clinical abnormalities on involution of cervix and uterus, ovulation, estrous cycles, detection of estrous, conception rate and days open. J. Dairy Sci., 66: 1128.

Foote, R. H. (1974) : Estrous detection and estroue detection aids. J. Dairy Sci. 58: 248.

Gangwar, P. C.; Branton, C. and Evons, D. L. (1965) : Reproductive and physiological response of Holstein heifers to controlled and natural climatic conditions. J. Dairy Sci.; 48: 222.

Hanafy, A. I. D. (2000) : Post-partum reproductive performance of Baladi cows. M. Sc. Thesis, Fac. Agric., Cairo Univ., Egypt

Heap, R. B.; Holdworth, R. J.; Gadsby, J. E.; Laing, J. A. and Walter, D. E. (1974) : Pregnancy diagnosis in cow from milk progesterone concentrations. British Vet. J., 132: 445.

Kadoom, A. K. A. (1991) : Hematological and biochemical studies in Friesian cows during calving:conception interval. M. Sc. Thesis, Fac. Agric. Alexandria Univ., Egypt.

Keeling, B.; Rajamahendran, R. and Ravindran, V. (1992) : Detection of postpartum ovarian activity in cows using on; farm progesterone ELISAS. Vet. Record., 131: 291.

Kumar, S.; Pusbey, L. N. and Agawal, S. K. (1988) : Effect of season on conception rate in non;descript cattle. Indian Anim. Reprod., 9: 64.

Lamming, G. E. and Darwash, A. O. (1998) : The use of milk progesterone profile to characterize components of subfertility in milked dairy cows. Anim. Reprod. Sci., 52: 175-190.

Lu, G.; Hwang, S. Y.; Yang, S. P.; Chang, G. M. and Hsu, T. T. (1992) : Studies on housing of lactating Holstein cows after calving in air conditioned barns during the hot season in Taiwan. J. Taiwan; Livestock; Research, 25: 1.

Miettinen, P. V. H. (1990) : Uterine involution in Finnish dairy cows. Acta, Vet. Scand. 31: 181.

Mohamed, S. S. (1987) : Milk and production as affected by calving interval and service period in purebred and crossbred Friesian cows in Egypt. M. Sc. Thesis, Fac. Agric. Ain Shams Univ., Egypt.

Morsy, M. A.; Nigm, A. A.; Mostageer, A. and Hid Pirchner, F. (1984) : Some economic characteristics of the Egyptian Baladi cattle. Egyptian, J. Anim. Prod., 24: 273.

Morsy, M. A.; Nigm, A. A.; Sadek, R. R. and Rashed, N. S. (1986) : Some aspects of reproductive performance of crossbred cattle in Egypt. Egyptian J. Anim. Prod, 26: 1.

Nigm, A. A.; Mohamed, Y. M.; Swiefy, S. A.; Ahmed, A. M.; Tabana, A.S. and Sadek, R.R. (2006). Some salient features of dairy farming under the crop/livestock production system in the Nile delta region in Egypt. J. Agric. Sci. Mansoura Univ., 31 (5): 2733-2741.

Nigm, A. A.; Soliman, I.; Hamed, M. K. and Abdel-Aziz, A. S. (1988) : Milk production and reproductive performance of Egyptian cows and buffaloes in small livestock holdings. 7th Conference of Animal Production, Cairo, Egypt, Sept. 16-18, pp: 290-304.

Oloufa, M. M. (1960) : Reproductive efficiency in Egyptian buffaloes and cattles. Bull. Fac. Agric., Cairo Univ., 14: 3-12.

Oloufa, M. M. (1968) : Some aspects of reproductive efficiency in Egyptian cattle and buffaloes. Vet. Med. J., Cairo Univ. 15: 173-177.

Pennington, J. A.; Albright, J. L. and Callahan, C. J. (1986) : Relationships of sexual activities in estrous cows to different frequency of observation and pedometer measurements. J. Dairy Sci., 69: 2925.

Pursley, J. R.; Kosorok, M. R. and Wiltbank, M. C. (1997) : Reproductive management of lactating dairy cows using synchronization of ovulation. J. Dairy, Sci., 80: 301-306.

Ragab, M. T. and Asker, A. A. (1951) : Factors influencing length of gestation period in Egyptian cattle and buffaloes. Ind. J. Dairy Sci., 4: 159.

Ragab, M.T.; Asker, A.A. and Hilmy, S.A. (1956) : The relation between some fertility aspects and the milk yield in Egyptian cattle and buffaloes. Indian J. Dairy sci., 9: 53-60.

Rajamahendran, R. and Taylor, C. (1990) : Characterization of ovarian activity in postpartum dairy cows using ultrasound imaging and progesterone profiles. Anim. Reprod Sci.; 22: 171.

Ramirez-Godinez, G. A.; Kiracofe, G. H. and Schalles, R. R. (1982) : Endocrine patterns in the postpartum beef cows associated with weaning: Comparison of the short and subsequent normal cycles. J. Anim. Sci., 55: 153-158.

Ramirez-Iglesia, L.; Soto-Belloso, E.; Gonzalez-Stagnaro, C.; Soto-Castillo, G.; Rincon-Urdaneta, E.; Iflesia, L.; Ramirez-Belloso, E.; Soto-Stangnaro-, C.; Gonzolez-Castillo, G.; Soto and Ijrdanetae; Rincan (1993) : Factors affecting postpartum ovarian activity in crossbred primiparous tropical heifers. Theriogenology, 38: 449.

Ray, D. E.; Halbach, T. J. and Armstrong, D. V. (1992) : Season and lactation number effects

on milk production and reproduction of dairy cattle in Arizona. J. Dairy Sci., 75: 2976.

Risco, C. A.; Archbald, L. F.; Elliott, J.; Tran, T. and Chavatte, P. (1994) : Effect of hormonal treatment on fertility in dairy cows with dystocia or retained fetal membranes at parturition. J. Dairy Sci., 77: 2562.

SAS (2005) : SAS User's Guide: Statistics. SAS Institute, Cary, NC.

Slama, H.; Wells, M. E.; Adams, G. D. and Morrison, R. D. (1976) : Factors affecting calving interval in dairy herds. J. Dairy Sci., 59: 1334.

Soto-Belloso, E.; Ramirez-Iglesia, L.; Guevara, L. and Soto-Castillo, G. (1997) : Bull effect on the reproductive performance of mature and first calf.

Sprecher, D. J.; Hostetler, D. E. and Kaneene, J. B. (1997) : A lameness scoring system that uses posture and gait to predict dairy cattle reproductive performance. Theriogenology. 47 : 1179.

Steel, R. G. D. and Torrie, J. H. (1980) : Principles and procedures of statistics. McGraw-Hill co., NY.

Stott, G. H. and Williams, R. J. (1962) : Causes of low breeding efficiency in dairy cattle associated with seasonal high temperatures. J. Dairy Sci., 46: 1963.

Swiefy, S. A. (1997) : Postpartum reproductive performance of Friesian cows in relation to season of calving and level of milk production. Ph.D. Thesis, Fac. Agric. Cairo Univ., Egypt.

Thalkari, B. T.; Birodor, U. S. and Rotte, S. G. (1995) : Performance of Holstein Friesian x Dean and Jersey x Dean half bred cattle. Indian J. Dairy Sci.; 48: 309.

Wetteman, R. P.; Hafs, H. D.; Edgerton, L. A. and Swanson, L. V. (1972) : Estradiol and progesterone in blood serum during the bovine estrous cycle. Patterns in the postpartum beef cows associated with weaning comparison. J. Anim. Sci., 34: 1020-1024.

Zahed, S. M.; El-Gasfrawy, A. A. and Aboul-Ela, M. B. (2001) : Reproductive performance of a herd of Egyptian Baladi cattle. J. Agric. Sci. Mansoura Univ., 26: 5361.

Zakari, A. Y. (1981) : Effect of season on the estrous cycle of cows (Bos indicus) indigenous to Northern Nigeria. Vet. Record, 12: 213.

الملخص العربى

دراسة مقارنة على نشاط الشياع والكفاءة التناسلية فى الأبقار البلدى والخليط فى مصر

عبدالخالق السيد عبدالخالق* مصطفى ماهر محمد المغازى**

شريف مغاورى شاميه*** السعيد سليمان دندوش****

قسم إنتاج الحيوان - كلية الزراعة - جامعة المنصورة - مصر*

قسم الإنتاج الحيوانى - كلية الزراعة - شبين الكوم - جامعة المنوفية - مصر**

معهد بحوث الإنتاج الحيوانى - مركز البحوث الزراعية - وزارة الزراعة - مصر***

وزارة الزراعة - مصر****

أجريت هذه الدراسة بهدف مقارنة نشاط الشياع والكفاءة التناسلية فى مرحلة مابعد الولادة فى الأبقار البلدى والخليط (بلدى × فريزيان) تحت الظروف الحقلية لصغار المربين فى دسوق - محافظة كفر الشيخ - مصر، وقد اشتملت هذه الدراسة على ٢٦ بقرة بلدى وخليط، كانت أعمارها تتراوح بين ٥-٩ سنوات، وأعطت مابين ٣-٦ مواسم حليب، وقد أظهرت نتائج هذه الدراسة أن العلامات الرئيسية المستخدمة لاكتشاف الشياع فى الأبقار البلدى كانت تكرار شم الإناث الأخرى والتلق وتصلب الحلمات (٩٥ و ٨٠ و ٧٠٪ على التوالى) مقابل نزول المخاط من فتحة المهبل وتكرار التبول وتكرار شم الإناث الأخرى (٨٥ و ٨٠ و ٧٠٪ على التوالى) فى الأبقار الخليط، لم يستمر نشاط الشياع فى ٩٠٪ من الأبقار الخليط أكثر من ٦ ساعات مقابل ٧٠٪ من الأبقار البلدى، وصل نشاط الشياع قمته فى ٦٥-٧٠٪ من الأبقار البلدى والخليط فى الصباح الباكر بين الساعة ٦:٠٠ و ٩:٠٠ مقابل ٢٠٪ فى الأبقار الخليط و١٥٪ فى البلدى ظهر عليهم نشاط الشياع فى وقت مبكر مساءً (الساعة ١٨:٠٠) ظهر نشاط الشياع فى كل الأبقار البلدى مقابل ٩٠٪ من الأبقار الخليط خلال ٩٠ يوم بعد الولادة كان متوسط عدد مرات الشياع لكل حيوان أعلى فى الأبقار الخليط عن الأبقار البلدى (٢ر١ مقابل ١ر٤/بقرة). أظهرت كل الأبقار التى وضعت خلال الموسم الحار نشاط الشياع مقابل ٩٠٪ فى الأبقار التى وضعت خلال الموسم البارد، كان متوسط عدد مرات الشياع لكل حيوان أعلى فى الأبقار التى وضعت خلال الموسم البارد عنه فى الأبقار التى رضعت خلال الموسم الحار (٢ر١ مقابل ١ر٤/بقرة). تشابه طول دورة الشياع فى كلاً من مجموعتى الأبقار، حيث كانت ٢٢ يوم، حدثت كل دورات الشياع فى الأبقار الخليط التى وضعت خلال الموسم البارد وفى الأبقار البلدى التى وضعت خلال الموسم الحار، كان متوسط طول الفترة بعد الولادة حتى أول تلقيح أقصر معنوياً ($P<0.05$) فى الأبقار البلدى عن الخليط (٨ر٤٧ مقابل ٢ر٥٨ يوم)، وكانت الفترة بعد الولادة حتى أول تلقيح أطول فى الأبقار البلدى التى وضعت خلال الموسم البارد عن التى وضعت خلال الموسم الحار (٣ر٤٩ مقابل ٣ر٤٦ يوم)، بينما أظهرت الأبقار الخليط إتجاهاً عكس ذلك (٣ر٤٨ مقابل ٠ر٦٨ يوم)، وكان طول فترة التلقيح أقصر وعدد التلقيحات اللازمة للإخصاب أقل فى الأبقار البلدى (٨ر٣ يوم و١ر١٤ تلقيحة/بقرة) عن الأبقار الخليط (٤ر١٣ يوم و١ر٤٢ تلقيحة/بقرة)، وكان طول فترة التلقيح أقصر وعدد التلقيحات اللازمة للإخصاب أقل فى الأبقار التى وضعت خلال الموسم الحار (٨ر٣ يوم و١ر١٤ تلقيحة/بقرة) عن الأبقار التى رضعت خلال الموسم البارد (٤ر١٣ يوم و١ر٤٢ تلقيحة/بقرة) كان متوسط طول الفترة من الولادة حتى الإخصاب أقصر معنوياً ($P<0.05$) فى الأبقار البلدى عن الخليط (٦ر٥١ مقابل ٦ر٧١ يوم)، وكان طول الفترة من الولادة حتى الإخصاب أقصر فى الأبقار التى وضعت خلال الموسم الحار عن الأبقار التى وضعت خلال الموسم البارد

(٩ر٦٠ مقابل ٣ر٦٢ يوم)، وكان طول الفترة من الولادة حتى الإخصاب أقصر فى الأبقار الخليط التى وضعت خلال الموسم الحار عن التى وضعت خلال الموسم البارد (٠ر٦٨ مقابل ٢ر٧٥ يوم)، بينما حدث العكس فى الأبقار البلدى (٣ر٤٩ مقابل ٧ر٥٣ يوم) كانت الفترة بين ولادتين أقصر معنوياً (P<0.05) فى الأبقار البلدى (٥ر٣٣٦ مقابل ٦ر٣٤٦ يوم)، وكانت الفترة بين ولادتين أطول فى الأبقار البلدى التى وضعت خلال الموسم البارد (٧ر٣٢٨ مقابل ٧ر٣٢٨ يوم)، بينما كانت فى الأبقار الخليط التى وضعت خلال الموسم الحار والبارد ٠ر٣٤٣ و ٢ر٣٥٠ يوم، على التوالى، وكان متوسط نسبة الحمل فى القطيع خلال ٩٠ يوم بعد الولادة أعلى معنوياً (P<0.05) فى الأبقار البلدى (١٠٠٪) عنها فى الخليط (٣ر٩٢٪)، كل الأبقار البلدى التى وضعت فى الموسم البارد حملت خلال ٦٠ يوم بعد الولادة وخلال ٩٠ يوم بعد الولادة فى الأبقار التى وضعت خلال الموسم الحار، فى حين أن كل الأبقار الخليط التى وضعت فى الموسم الحار حملت خلال ٩٠ يوم بعد الولادة مقابل ٧ر٨٥٪ فقط فى الأبقار التى وضعت خلال الموسم البارد.

الخلاصة : يتضح من النتائج السابقة أن الأبقار المحلية المصرية (البلدى) أظهرت أداءاً تناسلياً بعد الولادة أفضل عن الأبقار الخليط (بلدى × فريزيان)، خصوصاً فى الموسم الحار، من ناحية أخرى، تحسنت أكثر القياسات التناسلية للأبقار الخليط فى الموسم الحار مقارنة بالأبقار الفريزيان تحت الظروف الصيفية فى مصر.