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Effect of Season of Calving and Mastitis on Reproductive Performance of Baladi and Crossbred Cows (Baladi X Friesian) under the Environmental Conditions of Aswan Governorate in South Egypt

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ABSTRACT

The current work was carried out on two hundred of Baladi and crossbred (Baladi x Friesian) cows to estimate effect of season of calving and mastitis on the reproductive performance under the environmental conditions of Aswan governorate in south Egypt. The cows follow up after one month post-partum and the California Mastitis Test was performed for all experimental cows by (California Mastitis Test). According to season of calving the cows were divided into two groups. The first group that calved during the cold season and the second group calved during the hot season. The cows Baladi and crossbred cows that calved during the cold and hot seasons were divided into two groups according to suffering of mastitis healthy cows and cows with mastitis (sub-clinical mastitis). The results demonstrated that the interval from calving to first service was longer (75.56± 12.3, 82.63±7.51 days) ($P < 0.05$) in cows that calved during the hot season than cows that calved during the cold season (65.71± 14.27 , 74.58± 8.94 days) in healthy Baladi and crossbred cows respectively. The interval from calving to the first service was longer in Baladi cows that suffer from mastitis (78.96± 15.08, 84.95±8.4 days) compared with healthy cows (65.71± 14.27, 75.56± 12.3 days) during the two seasons cold and hot respectively. The interval from calving to the first service was longer in crossbred cows that suffer from mastitis (85.89± 6.81, 87.09±7.11 days) compared with healthy cows (74.58± 8.94, 82.63±7.51 days) during the two season cold and hot respectively. The interval from calving to conception was greater in cows that calved in the hot season (96.93±10.66, 101.26±13.65 days) ($P < 0.05$) than cold season (90.38±11.44, 93.16±11.37 days) in healthy Baladi and crossbred cows respectively. The interval from calving to conception was higher in cows with mastitis than healthy cows in Baladi and crossbred cows in two seasons. Number of services pre conception were greater in Baladi and crossbred cows that suffer from mastitis (2.1±0.62, 2.05±0.22 and 2.08± 0.63, 2.13± 0.67 services) compared with healthy cows (1.95± 0.58, 1.89±0.42 and 2.0± 0.63 , 1.92± 0.67 services) during the two season cold and hot respectively. Conception rate in Baladi and crossbred cows that suffer from mastitis was lower (37.9, 15.0, 15.8 and 16.1 %) compared with healthy cows (66.7, 36.7, 66.7 and 42.1 %) during the two season cold and hot respectively. The percentage of mastitis cases were more frequent in cows during the cold season (58, 76%) compared to hot season (40, 62%) in Baladi and crossbred cows respectively. The rates of short estrous cycles were higher in cows with mastitis during the hot season (42.9, 38.5%) than cold season (33.3, 25%) in Baladi and crossbred cows respectively. The present study clarified that there is a negative effect of hot season and mastitis on the reproductive performance of Baladi and crossbred cows under the environmental conditions of south Egypt. Thus, the present study recommended must preparing effective defense programs in order to decreasing proportion of infection by mastitis for betterment the reproductive performance of Baladi and crossbred cows especially during the hot season of Aswan governorate.

Keywords: Season, mastitis, reproductive performance, cows.

INTRODUCTION

Many researchers concerned to the effect of season of calving on the reproductive performance Zahed *et al.* (2001), Barkawi *et al*. (2001) and Barkawi *et al.* (2006) in Baladi cows and Ray *et al.* (1992) Silva *et al.* (1992) and Farin *et al.* (1994) in dairy cows. Mastitis considered one of the most important diseases that infected the udder in the cows. Mastitis lead to decline in the economic impact of the farms by decreasing milk yield, spoiled milk, reduced reproductive performance, increasing in veterinary costs, culling and increased total costs of animals' husbandry Hagnestam *et al.* (2007), Ahmadzadeh *et al*. (2009) and Rehbein *et al*. (2013). Several authors reported that there was relationships between mastitis and impaired the reproductive performance in cows Schrick *et al*. (2001), Santos *et al*. (2004) and Hertl *et al*. (2010). Recently most of the authors concerned to the relationship between mastitis and impaired the reproductive performance in cows Chegin *et al*. (2016), Bouamra *et al*. (2017) and Kumar *et al.* (2017). Mastitis in cows was associated with reduction of normal estrous cycles Moore *et al*. (1991), Schick *et al*. (2001) and Santos *et al*. (2004), the ability to conception post-service Chebel *et al*. (2004), Santos *et al*. (2004) and Ahmadzadeh *et al*. (2009), increment of pregnancy loss (Chebel *et al*. (2004), Santos *et al*. (2004) and Hudson *et al*. (2012). Negative correlation between inflammation of the mammary gland (mastitis) and establish of pregnancy Moore *et al*. (2005), Chebel *et al*. (2004) and Hansen *et al*. (2004). Little investigations concerned to the effect of season of calving and mastitis on the reproductive performance of Baladi and crossbred cows under the environmental conditions of Aswan governorate on south Egypt for these the present study was designed, to achieve this objective of the study

MATERIALS AND METHODS

Climatic conditions and location:

This study was performed in Aswan governorate. The farm of animal was located in Nassr El-Nuba. Aswan governorate is famous for dry weather, higher ambient temperature and decline of relative humidity table (1). Season of calving divided into two seasons cold months (November to February) and hot months (May to August).

Animals and feeding:

Two hundred Baladi and crossbred cows (n=100 cows for each breed) in improving fertility of cattle project in Nassr El-Nuba village were used in the present work. The parities of cows ranged between 3rd and 7th . The live body weight at the service of Baladi cows was (250 - 400 kg) and (320 - 450 kg) for

crossbred cows. Animals were leaved in traditional farms as semi-shaded yards. Concentrate feed mixture, darawa (green fodder) and hay wheat offered during the hot season. Egyptian clover (*Trifolium alexandrinum*), hay wheat and concentrate feed mixture were offered during the cold season.

Table 1. The Ambient temperature (^{o} C) and relative humidity (%) during the two seasons cold and hot.

Season	Ambient Temperature (^{o} C)		Relative Humidity (%)
	Max.	Min.	
Hot months (May to August)	36.3 – 46.2	20.3 – 27.2	15 – 27
Cold months (November to February)	21.7 - 34.5	7.8 - 18.2	17 – 40

Experimental design:

Baladi and crossbred cows (n=200 cows) (n= 100 cows for each breed) after one month post-partum were divided into two groups (n= 50 cows for each breed). The first group (n= 50 cows for each breed) was calved during the cold season and the second group (n= 50 cows) was calved during the hot season. As routine work the cows checked by California Mastitis Test for detect that cows suffer from sub sub-clinical mastitis and recorded. 29/50 of cows had sub-clinical mastitis of Baladi cows that calved during the cold season compared to 20/50 of cows in the hot season; however 38/50 of cows had sub-clinical mastitis of crossbred cows that calved in cold season compared to 31/50 of cows in the hot one.

Detection cows with mastitis:

The cows with sub-clinical mastitis were detected by (California Mastitis Test) and follow up the manufacture steps.

According to the clinical symptoms:

Sub-clinical mastitis: The cows considered suffer from sub-clinical mastitis when the cows not observed it any signs of mastitis, in both milk and udder but the mastitis know by detector (California Mastitis Test) (Kathiriya *et al*., 2014).

Heat detection and pregnancy diagnosis:

Daily visual observation of cows was conformed. The cows were considered in heat when one of the symptoms manifest like vaginal mucus discharge or standing behavior. Pregnancy was diagnosed applying rectal palpation sixty days (without any heat sings) after service according to Arthur (1964).

Estimation of reproductive parameters:

Post-partum first service: is defining as the interval between the calving and the first service.

Days open: is defining as the interval from calving to conception.

Number of service per conception =

$$\frac{\text{Total number of services required to get pregnant}}{\text{Total number of cows}} \times 100$$

Conception rate: Was calculated as the percentage of cows which pregnant throughout 90 days post-partum

$$\textbf{Conception rate} = \frac{\text{Number of cows pregnant}}{\text{Number of cows mating}} \times 100$$

Blood samples and analysis:

Blood samples (10 ml) were collected from all of the experimental animals at day 5, 10 and 15 post-estrus in heparinized tubes from the jugular vein. The samples were centrifuged at 3000 rpm for 20 minutes for plasma harvesting. Plasma was separated and stored at -18 ºC until time of progesterone hormone determination using radioimmunoassay technique according to manufacturer instructions (Beckman Coulter, Prague, Czech Republic)

Statistical analysis:

The statistical design was including two factors (the effect of season and mastitis on the reproductive performance) the analysis confirmed by SAS (2002). The following model was used:

$$\mathbf{Yij = u + Si + Mj + eij}$$

Where:

Yij = the observation trait

μ = overall mean

Si = effect of season (cold=1 and hot=2)

Mj = effect of mastitis (Cows with mastitis =1, healthy cows=2)

eij= experimental error

Duncan's Multiple Range test (Duncan, 1955) was used to test the significance of difference between means. Chi Squire also was performed.

RESULTS AND DISCUSSION

Effect of season of calving and mastitis on post-partum reproductive performance of Baladi cows

Post-partum first service (days)

The means of the interval from calving to first service in healthy cows was (65.71± 14.27 and 75.56± 12.3 days) during the two season's cold and hot respectively table (2). The present means were closed to that reported by Barkawi *et al.* (2006) and Ali *et al.* (2015) (69- 71 days) in Baladi cows in Egypt. Observed from table (2) the interval from calving to first service in cows that calved in the hot season was late about 10 days from cows that calved in the cold season ($P < 0.05$). The results were agreement with that reported by Bagnato and Oltenacu (1994) in Italian Friesian cattle and Ali *et al.* (2015) who recorded lower interval from calving to first service in Friesian cows in Egypt that calved in the cold season. Cows with mastitis, demonstrate decline in the interval from calving to first service in cows that calved in the cold season (78.96± 15.08 days) compared to hot season (84.95±8.41 days) ($P < 0.05$) table (2). The results indicated that cows with mastitis had a significant ($P < 0.05$) longer interval from calving to first service than healthy cows during the two seasons. The current findings were agree with that reported in Holstein cows by Gunay and Gunay (2008), Boujenane *et al*. (2015) and Bouamra *et al*. (2017) who found that the interval from calving to first service in cows with mastitis was longer than healthy cows. Higher interval from calving to first service in cows with mastitis might be due to alteration hypothalamic–pituitary hormonal axis Hansen

et al. (2004) or delayed in recycle and ovarian activity Moore *et al.* (1991) and Huszenicza *et al.* (1998).

Days open

Days open that the interval from calving to conception. Indicated from table (2) the days open in healthy cows were (90.38±11.44 and 96.93±10.66 days) during the two season's cold and hot respectively. The obtained means were closed to that reported by Zahed *et al.* (2001) and Barkawi *et al.* (2006) who recoded the days open ranged between (79 – 93 day) in Baladi cows. Six days was longer ($P < 0.05$) of days open in healthy cows that calved during the hot season than cold season table (2). The present result agrees with that reported by Cavestany *et al*. (1985) and Ali *et al.* (2015) who found increment in days open of cows that calved in the hot season compared with that calved in the cold season. In cows with mastitis the days open were longer in cows that calved during the hot season (109.5±8.41 days) compared with the cold season (102.93±13.41 days) table (2). The obtained results showed that cows with mastitis had a significant ($P < 0.05$) longer day open throughout the two seasons than the healthy cows. The present result agrees with that recorded by Vacek *et al.* (2007), Chegin *et al*. (2016) and Bouamra *et al*.(2017) who reported that higher days open was found in cows that suffer from mastitis (135- 189 day) compared with healthy cows (116- 147 day).

Number of service per conception

The obtained average number of service per conception was (1.95± 0.58 and 1.89±0.42 service) table (2). The present means were closed to that reported in the previous study on Baladi cows by El-Wardani *et al*. (2000) (1.8 services). However, the present result was higher than that reported by Barkawi *et al*. (2001) and Barkawi *et al.* (2006) (1.3 – 1.4 service). The difference in number of service per conception may be due to the season or number of experimental animals. There was no significant effect of season on number of service per conception table (2). Similar trend, was observed by Zahed *et al.* (2001), Barkawi *et al*. (2001) and Barkawi *et al.* (2006) who found that no significant effect of season on number of service per conception in Baladi cows. Cows with mastitis had non-significant greater number of service per conception compared with healthy cows. This result agrees with that showed by Ahmadzadeh *et al*. (2009), Boujenane *et al*. (2015) and Chegin *et al*. (2016) who found that higher number of service per conception (2 – 2.6 service) in cows with mastitis compared to (1.6 – 2.4 service) healthy cows.

Conception rate

Conception rate of healthy cows that calved in the cold season was higher ($P < 0.05$) 66.7 % than cows that calved in the hot season 36.7% table (2). The obtained result was agrees with that found by Barkawi *et al*. (2001) and Barkawi *et al.* (2006) who reported that negative impact of the hot season on conception rate compared with the cold season in Baladi cows. Observed in cows with mastitis the conception rate was lower (37.9, 15%) compared with (66.7, 36.7%) in healthy cows during the cold and hot season respectively. The previous result was agrees with that reported by Schrick *et al.* (2001), Frago, *et. al*. (2004) and Bouamra *et al*. (2017) who found that decline in conception rate in cows that suffer from mastitis (38 - 48 %) adverse with healthy cows (61- 63%).

Table 2. Post–partum reproductive performance of healthy and cows with mastitis of Baladi cows during cold and hot season.

Items	Healthy cows (n=51)		Cows with mastitis (n=49)	
	Cold season n=21	Hot season n=30	Cold season n=29	Hot season n=20
Post-partum first service (days)	65.71± 14.27[a]	75.56± 12.3[b]	78.96± 15.08[c]	84.95± 8.41[d]
Days open (days)	90.38± 11.44[a]	96.93± 10.66[b]	102.93± 13.41[c]	109.5± 8.41[d]
Number of service per conception	1.95± 0.58	1.89± 0.42	2.1± 0.62	2.05± 0.22
Conception rate %[1]	14/21 66.7[a]	11/30 36.7[b]	11/29 37.9[c]	3/20 15.0[d]

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

1-Conception rate calculated throughout 90 days post-partum

Effect of season of the year and mastitis on post-partum reproductive performance of crossbred cows

Post-partum first service (days)

The interval from calving to the first service in healthy cows was ranged between 74 and 82 days table (3). The present mean was nearby the mean that recorded by previous studies El-Menoufy *et al*. (1984) and Bagnato and Oltenacu (1994) (86.6 and 87 days) in Friesian cows. In the present study the interval from calving to the first service in healthy crossbred cows was higher (74.58± 8.94 and 82.63±7.51 days) than of Baladi cows (65.71± 14.27 and 75.56± 12 days) table (2, 3). The differences maybe due to the difference of breed or milk production. In healthy cows that calved in the hot season recoded 8 days greater in the interval from calving to the first service than cows that calved in the cold season table (3). This result agrees with that reported by Cavestany *et al.* (1985) and Bagnato and Oltenacu (1994) who found that longer interval from calving to the first service was observed in the cows that calved in the hot season. Cows with mastitis show longer ($P < 0.05$) interval from calving to the first service than healthy cows table (3). The present result was agreement with that reported by Santos *et al*. (2004), Vacek *et al*. (2007) and Chegin *et al.* (2016) who found that increasing in the interval from calving to the first service in cows with mastitis (68 - 86 days) than healthy cows (64 - 81 days). Also, similar trend was reported by Kumar *et al.* (2017) who found that longer interval from calving to first service in crossbred cows had mastitis (99.9 days) compared to healthy cows (67.7 days).

2. Days open

The means of days open in healthy cows were (93.16±11.37 and 101.26±13.65 days) table (3). The present mean was nearby the mean that reported by Labib *et al.* (1988) (101.5 days), but Bagnato and Oltenacu (1994) reported higher days open (117.3 days)

in Friesian cows, this results may be due to breed differences. Days open of Baladi cows were lower (90.38±11.44 and 96.93±10.66 days) than crossbred cows (93.16±11.37 and 101.26±13.65 days) table (2, 3). Higher days open was recorded in cows that calved in the hot season compared with cold season table (3). This result was agrees with that reported by Folman *et al.* (1979), Silva *et al.* (1992) and Farin *et al.*(1994) who found that days open was longer in cows that calved in the hot season compared with cold season. Obviously from table (3) longer days open was recorded in cows with mastitis than healthy cows. The current result was agrees with that reported by Frago *et al.* (2004), Gunay and Gunay (2008) and Ahmadzadeh *et al*. (2009) who found that days open was longer in cows that suffer from mastitis (107 – 123 days) than healthy cows (88 - 94 days). Similar trend was reported by Kumar *et al.* (2017) who found that greater interval from calving to conception in crossbred cows that suffer from mastitis (164.9 days) compared to healthy cows (73.4 days).

3. Number of service per conception

From table (3) the mean of number of service per conception was closed to that reported by Basuney *et al*. (1990) (2.0 services) in Friesian cows. However, the obtained mean was greater than that reported by El-Menoufy *et al*. (1984) and Bagnato and Oltenacu (1994) (1.6 services) in Friesian cows, this result may be due to the differences of breed. Number of service per conception was nearby equal in Baladi cows (1.95± 0.58 and 1.89±0.42 service) and crossbred cows (2.0± 0.63 and 1.92± 0.67 services) table (2, 3). No significant effect of season on number of service per conception table (3). Opposite was observed by Cavestany *et al*. (1985) and Ray *et al.* (1992) who found that season of the year was affecting number of service per conception in Holstein cows. Cows with mastitis had higher number of service per conception than healthy cows but the difference was insignificant ($P < 0.05$) table (3). Similar trend, was showed by Gunay and Gunay (2008) and Boujenane *et al*. (2015) who found that number of service per conception was higher in cows with mastitis (2.1 - 2.5, service) than healthy cows (1.8 – 2.4 services). Addition, Kumar *et al.* (2017) found greater number of service per conception in crossbred cows with mastitis (2.2, service) compared to healthy cows (1.2, services).

4. Conception rate

Conception rate of crossbred cows during the cold and hot season 66.7 and 42.1 %, respectively table (3). Higher conception rate was recorded in cows that calved during the cold season compared with the hot season in healthy cows table (3). Similar trend was reported by Cavestany *et al.* (1985) Wolfenenson *et al.* (1988) and Eicker *et al*. (1996) who found that there was a relationship between the hot season and decline conception rate in Holstein cows. Conception rate of Baladi and crossbred cows during the cold season was equal in two breeds 66.7 but the conception rate was lower in the hot season 36.7 % in Baladi than crossbred cows 42.1 %, this may be due to the effect of season. Lower conception rate was observed in cows with mastitis (15.8, 16.1%) adverse (66.7, 42.1 %) of healthy cows in cold and hot season respectively. The present result was agrees with that reported by Kelton *et al*. (2001) and Santos *et al*. (2004) who found lower conception rate in cows with mastitis (22, 38 %) compared with (29, 46%) of healthy cows. Recently, Marques *et al*. (2015) found that cows that suffer from mastitis recoded lower conception rate (22%) than healthy cows (44%).

Table 3. Post–partum reproductive performance of healthy and with mastitis crossbred cows during cold and hot season.

Items	Healthy cows (n=31)		Cows with mastitis (n=69)	
	Cold season n=12 cows	Hot season n= 19 cows	Cold season n=38 cows	Hot season n= 31 cows
Post-partum first service (days)	74.58± 8.94[a]	82.63± 7.51[b]	85.89± 6.81[c]	87.09±7 .11[c]
Days open (days)	93.16± 11.37[a]	101.26 ±13.65[b]	114.92 ±15.25[c]	117.61± 17.94[c]
Number of service per conception	2.0± 0.63	1.92± 0.67	2.08± 0.63	2.13± 0.67
Conception rate %[1]	8/12 66.7[a]	8/19 42.1[a]	6/38 15.8[b]	5/31 16.1[b]

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

Conception rate calculated throughout 90 days post-partum Percentage (%) of incidence of mastitis cases in Baladi and crossbred cows throughout the hot and cold season

Higher percentage of mastitis cases were showed in Baladi and Crossbred cows during the cold season (58 and 76%) compared with hot season (40 and 62 %) respectively (Figure, 1). The present result agrees with that reported by Chegin *et al*. (2016) who found that the percentage of mastitis incidence in Holstein cows was more frequent during winter season compared with other seasons. Similar trend, was recorded by Steeneveld *et al*. (2008) and Nava- Trujill *et al*. (2010) found that both nilparous and multiparous had greatest mastitis rate during winter season compared with other seasons in dual-purpose cows.

Progesterone concentrations (ng/ml) on day 5th, 10th, 15th after mating of healthy and cows with mastitis Baladi and Crossbred

There is gradually increase in progesterone concentrations from 5th day to 15th day after mating of healthy and cows with mastitis in two breed Baladi and crossbred figure (2, 3). Concentrations of progesterone throughout the post-estrus were lower in cows with mastitis than healthy cows. The present result agrees with that reported by Isobe *et al*. (2014) who found that there is negative correlation between concentrations of progesterone and mastitis in cows. Malinowski and Gajewski (2010) showed that increase in prostsglndinsF2α concentrations in cows with mastitis were related to corpus leutium regression. Similar trend was recorded by Giri *et al*. (1990) and Herzog *et al*. (2012) found that intravenous infusion of *E. coli*

lipopolysaccharide lead to decrease in progesterone concentration in cows. Also, Moore and O'Connor (1993) found that increment in prostsglndinsF2α production of cows suffer from mastitis maybe causing to luteal regression. Addition, Huszenicza *et al*. (2005) found that mastitis can affect on ovarian activity in dairy cows during the post-partum period.

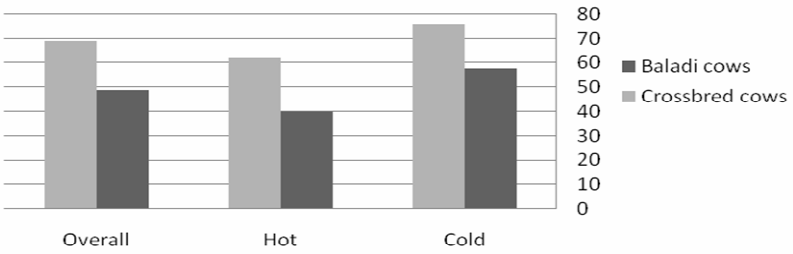

Figure 1. Percentage (%) of mastitis cases of Baladi and crossbred cows during the cold and hot season.

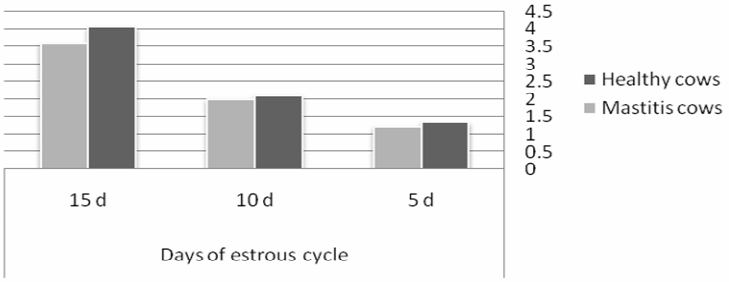

Figure 2. Concentrations (ng/ml) of progesterone in healthy and with mastitis Baladi cows during the estrous cycle.

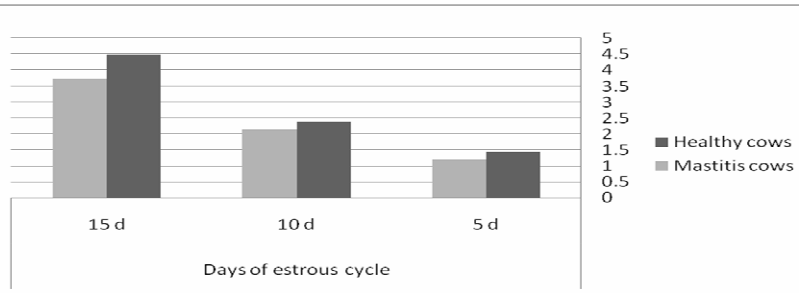

Figure 3. Concentrations (ng/ml) of progesterone in healthy and with mastitis crossbred cows during the estrous cycles.

V. Estrous cycles length (days) of healthy and cows with mastitis of Baladi and crossbred cows

The overall mean of normal cycle length of healthy and cows with mastitis was (21.2 ± 2.1 and 21.9 ± 2.1 days) in Baladi cows table (4). While the overall mean of normal cycle length of healthy and cows with mastitis was (20.8 ± 1.2, 21.1 ± 1.2 days) in crossbred cows table (4). The obtained mean of estrous cycle length is closed to that reported by El-Gaafrawy and Abdel-Khaber (2001) and El-Banna *et al.* (2005) 18.6 and 22.1 days in Baladi cows. Also El-Keraby (1970) and Barkawi *et al.* (1994) reported similar means in Friesian cows (19.7 and 20.1 days). There was no effect of season of calving on estrous cycle length in the two breeds (Baladi and Crossbred cows) table (4). The present result agrees with that reported by Zeitoun *et al.* (1996) and Barkawi *et al.* (2006) who found that no effect of season on the estrous cycle length in Brahman and Baladi cows. Percentage of odd cycles (long and short cycles) in healthy and cows with mastitis of Baladi cows during the cold season were (59.1 and 58.3%), however, higher percentage of odd cycles were recorded during the hot season was (70.6 and 85.8%) figure (4, 5). These results may be due to the effect of hot season and mastitis on the lifespan of corpus leutium. The obtained results were supported by Moore *et al*. (1991), Huszenicza *et al*. (2005) and Shaani *et al*. (2012) who found that there is altered inter-estrous intervals and

decline luteal phase length. Meanwhile, opposite trend was observed in crossbred cows that odd cycles were higher in healthy and cows with mastitis in the cold season (78.6 and 70.8%) compared with (50 and 69.3%) in the hot season figure (6, 7). The present result suggested due to higher percentage of mastitis in crossbred cows during the cold season. Similar trend was reported by Huszenicza *et al*. (2005) and Shaani *et al*. (2012) who found that cows suffer from mastitis demonstrated higher percentage of irregular estrous cycles. Similar observed was reported by Moore *et al*. (1991), Schick *et al*. (2001) and Santos *et al*. (2004) who found the incidence of mastitis in cows was associated with reduction of normal estrous cycles. Mastitis delay developmental potential of oocytes in ovary at the germinal vesicle phase in cows Wolfenson *et al*. (2015).

Table 4. Estrous cycles length (days) throughout the post-partum period of healthy and cows with mastitis of Baladi and Crossbred cows during the cold and hot season.

Breeds/ season	Healthy cows Estrous cycle length			Cows with mastitis Estrous cycle length		
	Normal 18-24 days	Long >24days	Short <18days	Normal 18-24 days	Long >24days	Short <18days
Baladi cows:						
Cold						
No.	9/22	6/22	7/22	5/12	3/12	4/12
%	40.9	27.3	31.8	41.7	25	33.3
X±SE	21.0±2.29	31.5±5.13	15.0±1.4	21.0±2.2	31.0±5.3	13.5±1.3
Hot						
No.	5/17	6/17	6/17	3/21	9/21	9/21
%	29.4	35.3	35.3	14.2	42.2	42.9
X±SE	21.6±1.82	35.2±2.99	11.8±1.33	23.3±0.58	31.4±2.6	12.9±1.96
Overall						
No.	14/39	12/39	13/39	8/33	12/33	13/33
%	35.9	30.8	33.3	24.2	36.4	39.4
X±SE	21.2±2.1	33.3±4.4	13.11±2.1	21.9±2.1	31.3±3.1	13.1±1.75
Crossbred cows:						
Cold						
No.	6/28	14/28	8/28	4/8	2/8	2/8
%	21.4	50	28.6	50	25	25
X±SE	21.5±0.8	29.7±4.1	15.0±1.5	20.5±0.58	27.0±0.0	15.0±2.8
Hot						
No.	7/24	11/24	6/24	4/13	4/13	5/13
%	29.2	45.8	25	30.7	30.7	38.5
X±SE	20.3±1.3	31.0±3.8	14.5±1.7	23.0±1.5	31.8±5.8	13.8±1.3
Overall						
No.	13/52	25/52	14/52	8/21	6/21	7/21
%	25	48.1	26.9	30.1	28.6	33.3
X±SE	20.8±1.2	30.3±3.9	14.8±1.6	21.1±1.2	30.2±5.2	14.1±1.7

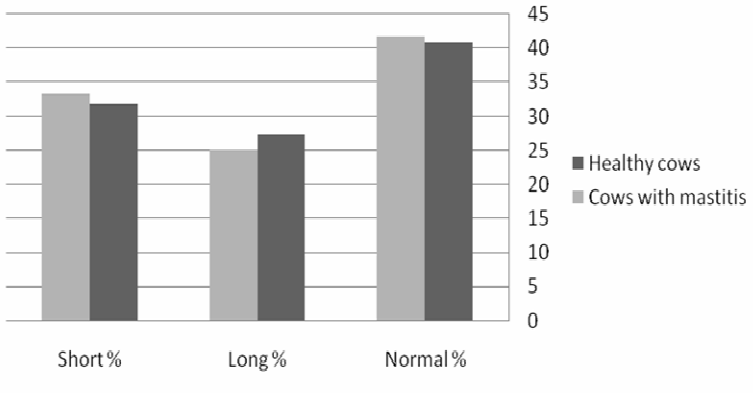

Figure 4. Percentage of estrous cycle lenght incidence of healthy and cows with mastitis of Baladi cows during the cold season

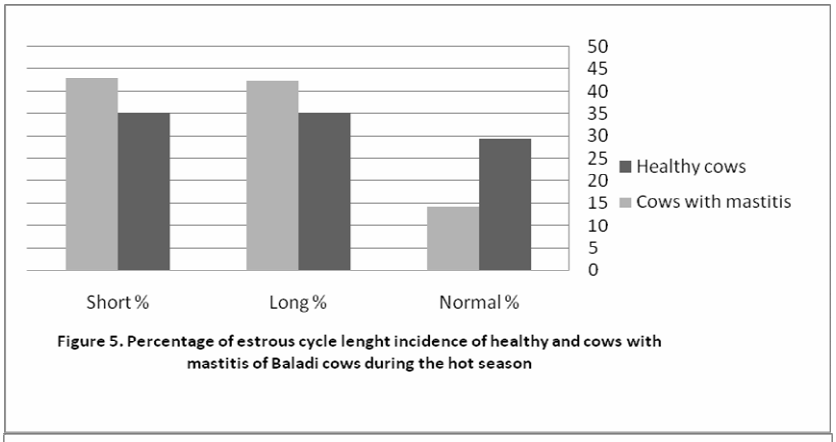

Figure 5. Percentage of estrous cycle lenght incidence of healthy and cows with mastitis of Baladi cows during the hot season

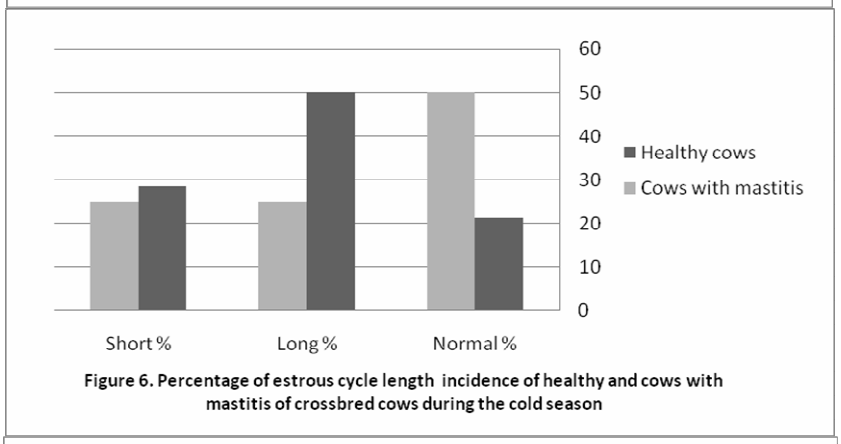

Figure 6. Percentage of estrous cycle length incidence of healthy and cows with mastitis of crossbred cows during the cold season

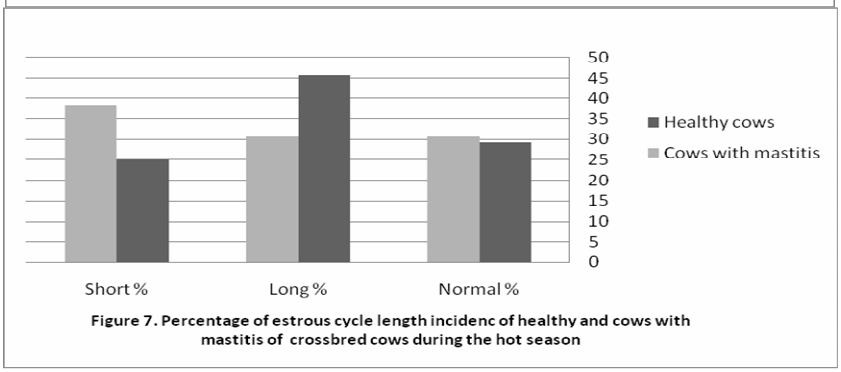

Figure 7. Percentage of estrous cycle length incidenc of healthy and cows with mastitis of crossbred cows during the hot season

CONCLUSION

The present study clarified that there is a negative effect of hot season and mastitis on the reproductive performance of Baladi and crossbred cows under the environmental conditions of Aswan governorate in south Egypt. Thus, the present study recommended must preparing effective defense programs in order to decreasing proportion of infection by mastitis for betterment the reproductive performance of Baladi and crossbred cows especially during the hot season of Aswan governorate.

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تأثير موسم الولادة والتهاب الضرع على الأداء التناسلي للأبقار البلدية والخليطة (البلدىx الفريزيان) تحت الظروف البيئية لمحافظة اسوان جنوب مصر

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تم إجراء هذه الدراسة على ٢٠٠ من الابقار البلدية والخليطة لتقييم تأثير موسم الولادة والتهاب الضرع على الخصائص التناسلية تحت الظروف البيئية لمحافظة اسوان جنوب مصر . تم متابعة الابقار بعد شهر من الولادة , تم عمل اختبار الكشف عن التهاب الضرع لكل الابقار تحت الدراسة (باستخدام اختبار كاليفورنيا) . تم تقسيم الأبقار بناء على موسم ولادتها إلى مجموعتين. المجموعة الأولى تشمل الأبقار التي ولدت خلال الموسم البارد والأخرى تشمل الأبقار التي ولدت خلال الموسم الحار. تم تقسيم مجموعة الابقار التى ولدت فى الموسم البارد والموسم الحار فى كل من الابقار البلدية والخليطة الى مجموعتين بعد فحص الضرع ابقار سليمة الضرع واخرى مصابة بالتهاب ضرع تحت سريري. أظهرت النتائج أن الفترة من الولادة حتى التلقيح الأول كانت أطول (٧٥.٥٦ ± ١٢.٣ و ٨٢.٦٣ ± ٧.٥١ يوم) (P <0.05) في الأبقار التي ولدت خلال الموسم الحار عنه في الأبقار التي ولدت خلال الموسم البارد (٦٥.٧١± ١٤.٢٧ و ٧٤.٥٨ ± ٨.٩٤ يوم) في الأبقار البلدية والخليطة السليمة على التوالي. كانت الفترة من الولادة حتى التلقيح الأول أطول في الأبقار البلدية المصابة بالتهاب الضرع (٧٨.٩٦± ١٥.٠٨ و ٨٤.٩٥± ٨.٤ يوم) بالمقارنة بالابقار السليمة (٦٥.٧١± ١٤.٢٧ و ٧٥.٥٦± ١٢.٣ يوم) خلال الموسمين البارد والحار على التوالى. كانت الفترة من الولادة حتى التلقيح الأول أطول في الأبقار الخليطة المصابة بالتهاب الضرع (٨٥.٨٩± ٨.٦ و ٨٧.٠٩± ٧.١١ يوم) بالمقارنة بالابقار السليمة (٧٤.٥٨± ٨.٩٤ و ٨٢.٦٣± ٧.٥ يوم) خلال الموسمين البارد والحار على التوالى. كانت الفترة من الولادة حتى التلقيح المخصب أطول في الأبقار التي ولدت في الموسم الحار (٩٦.٩٣ ± ١٠.٦٦ و ١٠١.٢٦ ± ١٣.٦٥ يوم) عنه في الأبقار التي ولدت خلال الموسم البارد (٩٠.٣٨± ١١.٤٤ و ٩٣.١٦± ١١.٣٧ يوم) (P<0.05) في الأبقار البلدية والخليطة السليمة على التوالي. كانت الفترة من الولادة حتى التلقيح المخصب أطول فى الأبقار المصابة بالتهاب الضرع عنه في الأبقار السليمة في كلا النوعين البلدية والخليطة. كان عدد التلقيحات اللازمة لحدوث الحمل اكبر في الأبقار البلدية والخليطة المصابة بالتهاب الضرع (٢.١± ٠.٦٢ , ٢.٠٥±٠.٢٢ و ٢.٠٨± ٠.٦٣ , ٢.١٣ ± ٠.٦٧ تلقيحة) بالمقارنة بالابقار السليمة (١.٩٥± ٠.٥٨ , ١.٨٩± ٠.٤٢ و ٢.٠ ±٠.٦٣ , ١.٩٢ ±٠.٦٧ تلقيحة) خلال الموسمين البارد والحار على التوالى. كان معدل الإخصاب فى الأبقار البلدية والخليطة المصابة بالتهاب الضرع اقل (٣٧.٩ , ١٥ , ١٥.٨ و ١٦.١ %) بالمقارنة بالابقار السليمة (٦٦.٧ , ٣٦.٧ , ٦٦.٧ و ٤٢.١ %) خلال الموسمين البارد والحار على التوالى. كانت نسبة حالات التهاب الضرع أعلى في الأبقار التي ولدت خلال الموسم البارد (٥٨ و ٧٦ %) بالمقارنة بالأبقار التي ولدت خلال الموسم الحار (٤٠ و ٦٢ %) في الأبقار البلدية والخليطة على التوالي. كان معدل دورات الشياع القصيرة أعلى في الأبقار المصابة بالتهاب الضرع خلال الموسم الحار (٤٢.٩ و ٣٨.٥ %) عنه في الموسم البارد (٣٣.٣ و ٢٥ %) في الأبقار البلدية والخليطة على التوالي. أظهرت الدراسة الحالية أن هناك تأثير سلبي للموسم الحار والتهاب الضرع على الأداء التناسلي للأبقار البلدية والخليطة تحت الظروف البيئية لمحافظة اسوان جنوب مصر. لذلك توصى الدراسة بوضع برامج وقاية فعالة من اجل تقليل نسبة الإصابة بالتهاب الضرع لتحسين الأداء التناسلي في الأبقار البلدية والخليطة وخصوصا خلال الموسم الحار لمحافظة اسوان.