

Effect of Some Environmental Factors on Productive and Reproductive Performance of Egyptian Buffaloes

El -wakeel, EL.A¹; Eissa, M.M¹; Abdelsalam M.M²; Ahmed, M.H³; and El -Rewany, A.M¹

ABSTRACT

The study was carried out by the Department of Animal Production, Faculty of Agriculture, Alexandria University, Saba Bache, Alexandria, Egypt. Buffaloes were reared at Trust Farm. The farm is located in Km 40 Alexandria-Cairo desert road after Ameria City. A trial was conducted to raise buffaloes in open sheds under routine managerial practice. The mean body weights of heifers at birth, weaning and first service, together with the high pre-weaning daily gain showed that the desert conditions did not exert adverse effects on it. The mean calving interval (403.6±2.6 days) was near to the ideal calving interval which permits nearly a calf every year. Total milk yield per lactation averaged 1600 ±11 kg. Such results indicated that the Egyptian buffaloes responded well to good managerial procedures. Year of calving affected significantly (P<0.001) first service weight, daily gain from weaning to first service and from birth to first service, days open and lactation period. Season of calving and parity effects were significant (P<0.001, 0.01 or 0.05) on most of the traits studied. Also, Dry period affected days open (p< 0.001), lactation length (p<0.001) and total milk yield (p<0.001), however dry period didn't significantly affect calving interval. Days open was the highest in dry period (121-150 and >150 days) and the lowest in dry period (< 60, 60-90 and 91 -120 days). Lactation length was the highest in dry period (60 -90 days) and the lowest in dry period (121-150 and >150 days). Total milk yield was the highest in dry period (60-90 days) and the lowest in dry period (>150days).

Keywords: buffaloes, milk yield, reproductive performance

Abbreviation: THI = Temperature Humidity Index

INTRODUCTION

The buffalo is a milk producing species as well as an economically important source of meat in Egypt, buffaloes produce about 60% of the milk versus 40% for cattle, because buffaloes are the first choice of most Egyptian farmers. The buffalo milk is highly preferred by the public as well as by creameries due to its white color, sweet taste and high fat percentage. Buffalo milk production already corresponds to 12.1 % of the world production, with an increase of 70.6% in the last 10

years (Santos *et al.*, 2011). Productivities of buffalo are affected mainly by performance of reproductive female status. Reproduction efficiency is one of the most important factors for productivity and profitability of dairy animals and it's the primary factor affecting productivity in female buffalo, but is greatly hampered by late attainment of puberty, seasonality of calving, long postpartum anoestrus and subsequent calving interval.

Late or delayed estrus in buffalo heifers is one of the major factors limiting its overall productive and reproductive performance. Feeding and general management have been reported to improve reproduction efficiency of buffaloes (Jabalkandi *et al.*, 2010).

According to Bagnato and Oltenacu (1993), milk yield and fertility are the main factors that affect the profitability of milk herds. As the milk yield is related to the variations in the reproductive activity, then the shorter calving intervals can be associated to bigger milk production during the animal's productive life, besides the possible increase in the number of calves per year.

The buffalo should be dried off approximately 2 to 3 months before expected calving. The dry period is valuable to the buffalo, she may rest and the udder tissue is repaired. In a high yielding herd (above 10 kg per day) the buffalo should be dried off when the daily yield falls below 2.5 kg, even if it is still more than 3 months to expected calving. This goes especially for machine milked herds. The aim of the present investigation was to study the growth, some productive and reproductive traits of buffaloes as affected by some environmental factors

MATERIALS AND METHODS

The study was conducted on buffaloes herd that reared at trust Farm. The farm is located in Km 40 Alexandria-Cairo desert road after Ameria city.

Materials

The buffaloes were housed in open sheds similar to those used for cattle. Maximum and minimum ambient air temperatures in the sheds during the period of the

¹Agriculture research center, Animal Research Institute, El-Dokki, Egypt.

²Animal Production Department, Faculty of Agriculture (El-Shatby) Alexandria University.

³Faculty of Agriculture (Saba Basha) – Animal Production Department, Alexandria University.

study (three years) were 21.9 ± 1.1 and 9.8 ± 0.4 in winter, 33.1 ± 1.4 and 22.8 ± 0.4 in spring, 34.2 ± 5.9 and 23.8 ± 0.8 in summer and 28.2 ± 4.1 and 17.4 ± 3.0 C⁰ in autumn and relative humidity percentages were 65.1 ± 1.4 , 56.4 ± 2.4 , 66.3 ± 0.8 and 58.8 ± 5.0 , in the same seasons, respectively.

Animals were kept under a regular system of feeding recommended by Animal Production Institute, Ministry of Agriculture, Egypt. Feeds were offered according to the requirements of body weight, reproductive status and milk production. A concentrate mixture, green fodder [Egyptian clover (*Trifolium alexandrinum*) during winter and spring or Pioneer maize plants and corn silage during summer and autumn], in addition to Egyptian clover hay, rice or wheat straw, were provided.

Female were weaned at 4.5 months of age. Heifers being added to the breeding stock received first service when they reached a body weight of 330 kg. Calving in Egypt is preferred to be during September and October months, due to the availability of green fodder (Egyptian clover) in abundance and the mild weather that prevails during the following months. Pluriparous cows were mated two months after calving. Matings were performed naturally at random under group breeding (one bull with 50 buffalo cows). The animals were grouped according to parity number (1-5), Dry period (1 = < 60; 2 = 60-90; 3 = 91-120; 4 = 121-150 and 5 = > 150 days). Lactating animals were hand milked twice daily at 7.00 and 19.00 h.

All animals were healthy and clinically free of external and internal parasites and were kept, maintained and treated in adherence to accepted standards for the humane treatment of animals.

Methods

Data of body weight and growth were obtained on female calves born during two years and these of lactation records were collected on dams born during three years. Both procedures were begun at the same time. Body weights were studied on 71 buffalo female calves, from birth to first service.

Milk yield and related traits were studied on milking animals in the farm, during five consecutive parities. The number of lactations used in the study was 220 pertaining to 115 buffalo cows. Only records of lactations that continued for at least 150 days were considered normal and were used in the analysis of milk production traits, while those lasting for a period less than 150 days and/or those of cows were affected by mastitis or other udder disorders, as well as those of doubtful information, were excluded.

Statistical analysis:

Data were statistically analyzed using GLM procedure according to SAS (1999). The model concern body weight and gain was as follows:

$$Y_{ijkl} = \mu + G_i + W_j + M_k + e_{ijkl}$$

Where:

Y_{ijkl} = An observation on individual l

μ = overall mean

G_i = Fixed effect of the ith year of birth.

W_j = Fixed effect of the jth season of birth.

M_k = Fixed effect of the kth parity.

e_{ijkl} = random error normally distributed with mean = zero and variance = $\sigma^2 e$

The second models which describe milk traits and reproductive traits was as follows:

$$Y_{ijklm} = \mu + G_i + W_j + M_k + S_l + e_{ijklm}$$

Where:

Y_{ijklm} = An observation on individual m

μ = overall mean

G_i = Fixed effect of the ith year of calving.

W_j = Fixed effect of the jth season of calving.

M_k = Fixed effect of the kth parity.

S_l = Fixed effect of the lth dry period.

e_{ijklm} = random error normally distributed with mean = zero and variance = $\sigma^2 e$

Significance differences among means were detected using Duncan's Multiple Range Test.

RESULTS AND DISCUSSIONS

Performance of cow traits

Means of body weights of buffalo heifers were 43.0 ± 0.5 , 135.8 ± 0.4 and 372.2 ± 2.0 kg at birth, weaning and first service, respectively (Table 1). The averages of body weights at birth, weaning and first service were higher than that recorded in the Nile Valley (Tantawy, 1984) or under similar newly reclaimed desert conditions (Mohamed, 2000). The higher average weights, together with the higher pre-weaning daily gain than that reported by Mohamed (2000) and Marai *et al.*, (2009) indicated that the desert conditions did not exert adverse effects on the growth of calves. Averages of daily weight gain were 0.670 ± 0.01 , 0.590 ± 0.01 and 0.613 ± 0.01 kg between birth and weaning, weaning and first service and from birth to first service, respectively (Tables 1 and 3).

Effects of some environmental factors on body weight and gain

Temperature-humidity index (THI) calculated for maximum temperature during winter was 21.1, ranged between 21.6 and 30.6 during spring, 22.8 and 32.1 during summer and 17.0 and 26.4 during autumn, indicating absence of heat stress during winter and exposure to very severe heat stress during the other seasons, with the highest Temperature Humidity Index value during summer. Year effects were significant on weight at first service ($P < 0.001$), daily gain from weaning to 1st service ($P < 0.001$) and daily gain from birth to 1st service ($P < 0.001$) (Tables 2, 3)

Season of birth affected birth weight ($P < 0.001$), weight at first service ($P < 0.05$) and average daily gain from birth to weaning ($P < 0.05$) and from weaning to first service ($P < 0.001$) (Tables 2 and 3). Birth weight was the heaviest in winter, spring and autumn and the lightest in summer. Weight at first service was the heaviest in winter and the lightest in spring (Table 2).

Daily weight gain between birth and weaning was the highest in spring and the lowest in summer, and daily gain weight between weaning and first service was the highest in summer and autumn and the lowest in spring and winter births (Table 3).

Table 1. Means (\pm S.E) and coefficients of variation (CV%) of buffalo cow traits under study

Traits	No.	Mean \pm SE	C.V%
Birth weight, kg	71	43.0 \pm 0.5	14.1
Weaning weight, kg	71	135.8 \pm 0.4	3.3
Weight at first service, kg	71	372.2 \pm 2.0	8.0
Average daily gain, kg			
<i>Birth - weaning</i>	71	0.670 \pm 0.01	17.9
<i>Weaning - first service</i>	71	0.590 \pm 0.01	16.8
<i>Birth - first service</i>	71	0.613 \pm 0.01	11.9
Age at first calving, months	71	25.2 \pm 0.6	36.8
Days open, days	218	92.8 \pm 1.3	51.1
Lactation length, days	195	245.1 \pm 1.2	17.6
Calving interval, days	181	403.6 \pm 2.6	14.6
Total milk yield, kg	181	1600.0 \pm 11.0	25.5

Table 2. Least squares means (\pm S.E) of factors affecting birth, weaning and first service weights of Egyptian buffalo heifers

Factors	No.	Birth weight, kg	Weaning weight, Kg	Weight at first service, Kg
Overall means	71	43.0 \pm 0.5	135.8 \pm 0.4	372.2 \pm 2.0
<i>Year of birth</i>				
1 st year	31	43.9 \pm 1.2	136.0 \pm 1.1	349.0 ^b \pm 4. 8
2 nd year	40	43.7 \pm 0.7	135.4 \pm 0.6	373.3 ^a \pm 2.7
Significance		NS	NS	***
<i>Season of birth</i>				
Winter	17	46.6 ^a \pm 1.2	137.2 \pm 1.1	369.8 ^a \pm 4.8
Spring	14	44.4 ^a \pm 2.0	134.3 \pm 1.9	344.7 ^b \pm 8.2
Summer	14	40.0 ^b \pm 0.8	134.1 \pm 0.8	364.5 ^a \pm 3.3
Autumn	26	44.0 ^a \pm 0.9	135.9 \pm 0.8	368.4 ^a \pm 3.6
Significance		***	NS	*
<i>Parity</i>				
1 st	11	42.0 \pm 1.2	136.8 \pm 1.1	368.1 \pm 4.8
2 nd	14	44.1 \pm 1.3	136.2 \pm 1.3	364.4 \pm 5.5
3 rd	16	46.3 \pm 1.5	134.7 \pm 1.4	360.3 \pm 6.2
4 th	14	45.6 \pm 1.4	134.5 \pm 1.3	366.6 \pm 5.7
5 th	16	43.9 \pm 1.7	136.3 \pm 1.6	361.2 \pm 6.9
Significance		NS	NS	NS

Means bearing different superscripts within the same class differ significantly at $P < 0.05$,

* $P < 0.05$, *** $P < 0.001$, NS = Not significant. No . = number of observation

Table 3. Least squares means (\pm S.E.) of factors affecting daily gain weight of Egyptian buffalo heifers

Factors affecting	No of observations	Birth – weaning, kg	Weaning – 1 st service, kg	Birth – 1 st service, Kg
Overall means	71	0.670 \pm 0.01	0.590 \pm 0.01	0.613 \pm 0.01
Year of birth				
1 st year	31	0.709 \pm 0.02	0.432 ^b \pm 0.02	0.527 ^b \pm 0.01
2 nd year	40	0.677 \pm 0.01	0.606 ^a \pm 0.01	0.626 ^a \pm 0.01
Significance		NS	***	***
Season of birth				
Winter	17	0.674 ^b \pm 0.02	0.482 ^b \pm 0.02	0.567 \pm 0.01
Spring	14	0.775 ^a \pm 0.04	0.487 ^b \pm 0.03	0.588 \pm 0.02
Summer	14	0.647 ^c \pm 0.02	0.579 ^a \pm 0.01	0.594 \pm 0.01
Autumn	26	0.676 ^b \pm 0.02	0.563 ^a \pm 0.01	0.595 \pm 0.01
Significance		*	***	NS
Parity				
1 st	11	0.706 ^b \pm 0.02	0.525 \pm 0.02	0.582 ^a \pm 0.01
2 nd	14	0.724 ^a \pm 0.03	0.523 \pm 0.02	0.576 ^a \pm 0.02
3 rd	16	0.588 ^c \pm 0.03	0.517 \pm 0.02	0.554 ^b \pm 0.02
4 th	14	0.694 ^b \pm 0.03	0.531 \pm 0.02	0.586 ^a \pm 0.02
5 th	16	0.691 ^b \pm 0.03	0.509 \pm 0.02	0.565 ^{bc} \pm 0.02
Significance		*	NS	***

Means bearing different superscripts within the same class differ significantly at $P < 0.05$, * $P < 0.05$, *** $P < 0.001$, NS = Not significant. No. = number of observation .

The effect of season of birth on birth weight in the present study was similar to the results of Eid (1988), Zaki (1988) and Marai *et al* (2009) who reported that the heaviest calf weights at birth were produced by either spring or winter calvers. The lowest birth weight and average daily gain between birth and weaning of summer-born calves may be attributed to suffering of the foetus from the adverse effects resulting from exposure of their dams during late pregnancy to moderate to very severe heat stress (THI= 22.8 to 32.8 during summer). Parity effects were significant on growth traits. These traits were daily weight gain from birth to weaning ($P < 0.05$) and from birth to first service ($P < 0.01$). (Tables 2, 3)

Reproductive and productive traits:

Averages of days open, lactation length, and calving interval were 92.8 \pm 1.3, 245.1 \pm 1.2, and 403.6 \pm 2.6 days, respectively (Table 1). Length of days open (92.8 \pm 1.3 days) was much lower than that recorded by Roy Choudhury (1971) in Italian buffaloes (range 97-316 days), El-Wishy (1979) in Iraqi buffaloes, Govindaiah and Rai (1987) in Indian buffaloes, Eid (1988) and Marai *et al* (2009) in Egyptian buffaloes. Such

phenomenon may be attributed to serving the cows at the suitable time, in addition to the adequate plane of nutrition offered in the present study. Days open, calving interval and lactation length were affected ($P < 0.001$ or 0.01) by season of calving (Tables 4 and 5) The lowest length of each of day's open and calving interval was during summer and autumn and that of lactation length was in summer calves (Table 4). The significant effects of season of calving on days open, calving interval and lactation length were similar to that reported by Alim and Taher (1979) and Marai *et al* (2009). The lowest estimates shown in days open and calving interval during autumn and in lactation length during summer, were similar to that reported by El-Khaschab *et al* (1984) and Marai *et al* (2009).

Lactation length (245.1 \pm 1.2 days) was longer than the value recorded by Zaki (1988) (195 days) and Marai *et al* (2009) (244 days), but shorter than that reported by Zeidan (1990) (286 days) and by Mohamed (2000) (269.8 days), in Egyptian buffaloes. [This length fell within the range reported by Skalicki and Latinovic (1990) and Juneja *et al* (1991) who recorded almost similar results (344 days)]. However a shorter means (291.86 \pm 6.55 days) was stated by Sattar *et al* (2005) and

Alim (1986) in Libya. In this study LL is not significantly affected by year of calving, season of calving and parity number. The non significant effect of year of calving is agreed with Dhumal *et al* (1989) and Marai *et al* (2009) and disagreed with Karan and Joshi (1990). Njubi *et al* (1992) supported the non significant effect of parity on the trait . The results revealed that cows calved in winter lactated for longer period than those calved in other seasons. Whereas Nartey (1990) reported that cows calved in the rainy season had longer lactation length than those calved in dry season. The average length of calving interval (403.6±2.6 days) was very near to the ideal calving interval that permits nearly a calf each year. This indicated that Egyptian buffaloes responded well to good managerial procedures.

Mohamed (2000) reported the calving interval of 464.3 days, under newly reclaimed desert.

Total milk yield per lactation averaged 1600 ±11 kg. and being higher than that recorded by Mohamed (2000) under similar newly reclaimed desert conditions (1171 kg). The peak of milk production was reached in the fourth and fifth parities similar to that reported by El-Menshaway (1994) and Marai *et al* (2009). This amount was more than that reported by Morsy *et al.* (1990) while it is less than the findings of Gwaza *et al* (2007) in Cameroon, Ahmed *et al* (1997) in Libya and Petrovic (1992) in Yugoslavia. This shows that there are great variations in milk yield in different places. This could be attributed to variation in managerial practices such as nutrition, disease control in addition to the effect of climatic conditions.

Table 4. Least squares means (± S.E.) of factors affecting days open and calving interval, of Egyptian buffalo cows

Factors	No .	Days open, days	No .	Calving interval, days
Overall means	218	92.8±1.3	181	403.6±2.6
Year of calving				
1 st	60	96.9 ^a ±6.7	37	382.4±15.0
2 nd	70	101.0 ^a ±4.1	53	384.2±8.2
3 rd	88	61.4 ^b ±3.1	91	386.4±4.6
Significance		***		NS
Season of calving				
Winter	47	91.8 ^b ±5.2	38	395.7 ^b ±10.1
Spring	41	98.9 ^a ±6.5	26	401.7 ^a ±12.3
Summer	68	82.7 ^c ±4.6	58	383.7 ^c ±9.5
Autumn	62	80.0 ^c ±4.6	59	371.3 ^d ±9.3
Significance		***		**
Parity				
1 st	52	113.2 ^a ±3.1	33	480.1 ^a ±23.6
2 nd	42	101.6 ^{ab} ±3.4	35	429.3 ^b ±17.2
3 rd	44	90.0 ^b ±3.6	28	401.0 ^c ±11.2
4 th	49	83.1 ^b ±3.8	43	378.2 ^d ±6.7
5 th	31	86.1 ^b ±4.0	42	365.4 ^d ±7.0
Significance		***		**
Dry period (days)				
< 60	32	85.6 ^b ±4.1	31	366.4±3.9
60-90	50	83.2 ^b ±2.9	50	370.1±3.2
91-120	43	88.2 ^b ±3.9	42	377.4±3.7
121-150	42	104.2 ^{ab} ±3.7	28	387.6±4.6
> 150	51	112.3 ^a ±2.9	30	390.3±4.1
Significance		***		NS

Means bearing different superscripts within the same class, differ significantly (P < 0.05). ***P < 0.001, **P < 0.01, NS = Not Significant and No. = number of observations

Table 5. Least squares means (\pm S.E.) of factors affecting total milk yield and lactation length of Egyptian buffalo cows

Factors	No .	Total milk yield, kg	Lactation length, Days
Overall means	181	1600.0 \pm 11.0	245.1 \pm 1.2
Year of calving			
1 st	53	1562.3 ^b \pm 93.2	272.2 \pm 10.5
2 nd	57	1502.0 ^c \pm 50.3	269.4 \pm 5.5
3 rd	71	1596.3 ^a \pm 30.0	259.0 \pm 3.1
Significance		***	NS
Season of calving			
Winter	42	1550.3 ^b \pm 58.7	263.7 ^a \pm 6.6
Spring	31	1609.3 ^a \pm 65.3	262.7 ^a \pm 7.3
Summer	62	1641.3 ^a \pm 51.7	239.7 ^b \pm 5.7
Autumn	46	1501.7 ^c \pm 56.7	251.3 ^{ab} \pm 6.3
Significance		**	***
Parity			
1 st	29	1486.4 ^d \pm 167	227.3 ^b \pm 19.0
2 nd	36	1610.2 ^c \pm 123	242.3 ^{ab} \pm 14.0
3 rd	37	1597.0 ^c \pm 87.4	245.2 ^a \pm 9.9
4 th	39	1652.3 ^b \pm 55.5	246.4 ^a \pm 6.2
5 th	40	1685.0 ^a \pm 39.5	247.2 ^a \pm 4.3
Significance		***	***
Dry period (days)			
< 60	49	1603.7 ^{bc} \pm 65.3	234.6 ^{bc} \pm 11.4
60-90	36	1690.2 ^a \pm 122.6	245.5 ^a \pm 8.9
91-120	38	1655.6 ^b \pm 57.8	239.7 ^b \pm 7.9
121-150	30	1608.4 ^{bc} \pm 40.1	232.5 ^{bc} \pm 9.3
> 150	28	1481.3 ^c \pm 159.3	228.5 ^c \pm 18.4
Significance		***	***

Means bearing different superscripts within the same class, , differ significantly ($P < 0.05$). *** $P < 0.001$. ** $p < 0.01$ and NS = Not significant . No. = number of observation

Parity effects were significant on reproductive and productive traits. These traits were days open ($P < 0.001$), lactation length ($P < 0.001$), calving interval ($P < 0.001$) and total milk yield ($P < 0.001$) (Tables 4 and 5). In general, day's open, and calving interval decreased, while lactation length increased with advancement of parity (Tables 4 and 5). The significant effect of parity on days open was similar to the findings of Marai *et al* (2009) and different from those of Mohamed (1974). The tendency of the length of days open to decrease from the first parity onwards may be a result of culling buffaloes with lower fertility.

The decrease in calving interval with advancement of parity was similar to that reported by Mourad (1978)

and Marai *et al* (2009). Such a trend may be a reflection of the same practice of culling buffalo cows that show lower fertility in their early parities. The highly significant effect ($P < 0.001$) of parity on calving interval in buffaloes was similar to that reported by El-Menshawry (1994) and Marai *et al* (2009) in Egyptian buffaloes.

Dry period affected days open ($p < 0.001$), lactation length ($p < 0.001$) and total milk yield ($p < 0.001$), however dry period didn't significantly affect calving interval (table 4 and 5). Days open was the highest in dry period (121-150 and > 150 days) and the lowest in dry period (< 60, 60-90 and 91-120 days). Lactation length was the highest in dry period (60-90 days) and

the lowest in dry period (121-150 and > 150 days). Total milk yield was the highest in dry period (60-90days) and the lowest in dry period (> 150 days). The significant effects of dry period on days open, total milk yield and lactation length were similar to that reported by Alim and Taher (1979) and Marai *et al* (2009). The lowest estimates shown in days open and lactation length during dry period (< 60, 60-90 and 91-120 days) and dry period (121-150 and > 150 days) respectively were similar to that reported by El-Khaschab *et al* (1984).

CONCLUSIONS

Averages of female buffalo growth and reproductive performance traits obtained in the present study indicated that the desert conditions did not exert adverse effects on the traits, and buffaloes responded well to the good managerial procedures, without wallowing.

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الملخص العربي

تأثير بعض العوامل البيئية علي الأداء الانتاجي والتناسلي في الجاموس المصري

السعيد احمد الوكيل، مُجد عيسى مُجد، مجدي مُجد عبد السلام، مُجد حسن احمد، عبد العزيز مُجد الرويني

كان لموسم الولادة تأثير معنوي علي معظم الصفات المدروسة. تبين وجود تأثير معنوي لطول فترة الجفاف علي الفترة من الولادة وحتى الاخصاب (الفترة المفتوحة) وطول موسم الحليب ومحصول اللبن الكلي ولكن لم يكن هناك تأثير معنوي لطول فترة الجفاف علي الفترة بين الولادتين.

فقد وجد ان الفترة من الولادة حتي الاخصاب كانت اعلي في فترة الجفاف (121-150) وفي فترة فترة جفاف اكثر من 150 يوم وكانت اقل في فترات الجفاف (حتى 60 يوم ومن 60-90 يوم ومن 90 يوم حتي 120 يوم).

طول موسم الحليب كان اعلي في فترة الجفاف من 60-90 يوم وكان اقل في فترة جفاف من 121-150 يوم وفي فترة جفاف اعلي من 150 يوم.

كان محصول اللبن الكلي اعلي في فترة جفاف من 60-90 يوم والاقل في فترة الجفاف الاكثر من 150 يوم. نستخلص من هذه النتائج ان الموسمية لم يكن لها تأثير سلبي على الاداء التناسلي ومعدل النمو في الجاموس المصري المرئي في الصحراء وان الجاموس يستجيب للرعاية الجيدة بدرجة عالية.

اجريت هذه الدراسة في مزرعة خاصة (تراست فارم) علي الطريق الصحراوي الاسكندرية القاهرة بعد مدينة العامرية بالتعاون مع كلية الزراعة-سبا باشا-جامعة الاسكندرية وكانت مدة الدراسة 3 سنوات وكانت تربية الجاموس في احوال (تربية مفتوحة) عدد الجاموسات 115 وعدد العجلات الاناث 71 تم استخدامهم في الدراسة وكانت اهم النتائج المتحصل عليها كالتالي:

لم تؤثر التربية تحت الظروف الصحراوية علي اوزان العجلات عند الميلاد او عند الفطام او عند التلقيحة الاولي. كانت متوسط الفترة بين ولادتين 403.6 يوم وهذه قريبة جدا من الفترة القياسية والتي تكون ولادة كل سنة. وجد ان متوسط انتاج اللبن في الموسم 1600 كجم وهذه النتائج توضح ان الجاموس المصري يتاثر جيدا بالرعاية الجيدة. كان هناك تأثير معنوي لسنة الميلاد علي الوزن عند اول تلقيحة ومعدل النمو اليومي خلال الفترة من الفطام وحتى اول تلقيحة ومن الميلاد وحتى اول تلقيحة وايضا الفترة من الولادة حتي الاخصاب وطول موسم الحليب.