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BREEDING EFFICIENCY IN COWS AND EGYPTIAN BUFFALOES: NUMBER OF SERVICES PER CONCEPTION

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ABSTRACT

Data were collected from 1552 reproductive records of 318 Friesian crossbred cows and 230 Egyptian buffaloes belonging to Faculty of Agriculture, University of Alexandria, Egypt over a period of 15 years started in 1970. The effects of year of breeding, month and season of breeding, post partum first service, days open, parity, age of parents and sire effect on the number of services required for conception (NS/C) were studied. The results obtained could be summarized in the following:

1-Year of breeding had significant (P<0.01) effect on NS/C for cows and buffaloes and it ranged from 1.0 to 3.2.

2-The lowest NS/C appeared in spring and autumn seasons of breeding and the highest values were in summer and winter. Both month and season of breeding had significant effect in cows but non significant for buffaloes in this respect.

3-Buffalo and cow females having post partum period less than 3 months required more NS/C and then it decreased for those having a period (3-<6months). The effect of post partum period on NS/C was significant (P<0.01) in buffaloes but non significant in cows.

4-The average NS/C tended to increase significantly (P<0.01) as days open increased in both species.

5-Differences in breeding efficiency described by NS/C due to sire or bull effect were significant (P<0.01) for both cows and buffaloes.

6-The average NS/C was high at 1st parity and it decreased thereafter up to 5th parity and over. The differences due to parity in this respect were significant (P<0.05) for buffaloes while non significant for cows.

7-Buffalo heifers required more NS/C than buffalo cows and also those giving birth to males needed more NS/C than those giving birth to females whereas cows showed a reverse trend.

8-The average NS/C showed an increase trend with the progress of sire's age until <6 years old indicating that young bulls were more efficient than older ones and age of sire had significant (P<0.01) effect on NS/C for cows but non significant for buffaloes.

9-The average NS/C decreased as age of dam increased in buffaloes and it showed contrary trend in cows. Age of dam significantly (P<0.01) affect NS/C for both species.

10-The highest conception percentages were obtained at the 2nd service being 48.9 and 41.7% for buffaloes and cows, respectively.

INTRODUCTION

Profitable milk production and faster genetic improvement of dairy cattle can be brought about by high degree of breeding efficiency and economic loss occurs from failure to keep it at the highest level. The number of services are among the most important measures for breeding efficiency of dams and sires. Therefore, it is of interest to study the genetic and environmental factors influencing number of services per conception to select highly fertile females aiming to obtain successful dairy herd.

The low estimates of heritability for reproductive traits such as calving interval, service period and number of services per conception indicate that a major part of variation is due to environmental factors. Selection would not be effective by genetic improvement but through better management and reproductive practices. So, the main targets of the present investigation are to study the effects of some environmental factors such as year of breeding, month and season of breeding, post partum first service, days open, parity and age of parents besides, sire effect on the number of services required for conception in cows and Egyptian buffaloes.

MATERIALS AND METHODS

A total of 1552 reproductive records of 318 Friesian crossbred (>50%) cows and 230 Egyptian buffaloes, maintained at Experimental Station, Faculty of Agriculture, University of Alexandria over a period of 15 years (1970-1984) were utilized. The number of sires used in the present study were 19 and 24 for buffaloes and cows, respectively, and that sires having less than 5 females in buffaloes and 10 females in cows were excluded. Also abortion and other pathological causes which affect the reproductive performance were considered to be abnormal and hence were excluded. The two herds were kept under the feeding and managerial regime organized by the Department of Animal Production.

The present work was planed to study and evaluate the factors affecting the number of services per conception such as year of breeding, month and season of breeding, post partum first service, days open, parity, age of parents and sire effect. Therefore, records were classified to groups within each factor. The data were analysed according to SAS (1990) and L.S.D method was used to compare between each two means.

RESULTS AND DISCUSSION

The number of services required for conception ranged from 1.0 to 3.2 in both cows and buffaloes and the average was 1.8 in Egyptian buffaloes compared to that in Friesian crossbred cows which being 2.2, the difference between both species in this respect was significant ($P<0.01$) as shown in table (1). Such results indicate that better care and management could be introduced to buffalo herd than cows one besides, the absence of an effective selection program (Khalil *et al.*, 1991) may be allowed to cow females which having somewhat reproductive problems to stay inside the herd and did not dispose at early time lead to raising NS/C. Nasr *et al.* (1997) found that the average NS/C was 2.31 for pure Friesian cows and it ranged from 2.3 to 3.0 for crossbred ones. The average NS/C was 2.24 for Murrah buffaloes as indicated by Parkash *et al.* (1989). Whereas Mahdy *et al.* (2001) found that the average NS/C for another herd of Egyptian buffaloes was 4.8±2.4.

Factors affecting number of services per conception (NS/C):

1.Year of breeding:

There were variations in the number of services per conception from year to year in both cows and buffaloes. It ranged from 1.4 to 3.1 and from 1.5 to 2.8 for buffaloes and cows, respectively (Table 1). Year of breeding had significant ($P<0.01$) effect on the NS/C for the two species. These results

are in agreement with those reported by Afifi *et al.* (1992), Khalil (1993), Ibrahim (1998) and Mahdy *et al.* (2001) who found that year of calving had significant effect on NS/C. Badinga *et al.* (1985) reported that the effect of year of service on NS/C was significant (P<0.01) for dairy cattle while year of calving showed non significant effect for Murrah buffaloes (Parkash *et al.*, 1989).

It could be seen that the average NS/C was higher during the periods (1973-1977) in buffaloes and (1975-1980) in cows (Table 1). Such results recorded that the low breeding efficiency may be due to poor or undesirable changes in management or using old sires during these periods.

Table (1): **Effect of year of breeding on number of services per conception (NS/C) in Egyptian buffaloes and Friesian crossbred cows.**

Year of breeding (1970-1984)	Buffaloes			Cows		
	Total no. of services	Total no. of conceptions	NS/C (X±S.D)	Total no. of services	Total no. of conceptions	NS/C (X±S.D)
1	44	27	1.6^{ab}±1.0*	120	52	2.3^{bcd}±1.1*
2	18	11	1.6^{ab}±1.0	115	60	1.9^{def}±1.0
3	55	34	1.6^{ab}±0.5	65	33	2.0^{cde}±1.2
4	74	24	3.1^{d}±1.6	48	31	1.5f±0.8
5	12	6	2.0^{c}±1.6	91	48	1.9^{def}±0.8
6	55	26	2.1^{c}±1.1	138	52	2.7^{ab}±1.8
7	99	48	2.1^{c}±0.9	102	51	2.0^{cde}±1.4
8	113	57	2.0^{c}±1.1	181	76	2.4^{abc}±1.2
9	133	69	1.9^{bc}±1.2	163	60	2.7^{ab}±1.4
10	100	65	1.5^{a}±0.6	175	67	2.6^{ab}±1.6
11	95	61	1.6^{ab}±0.8	235	84	2.8^{a}±1.6
12	114	79	1.4^{a}±0.6	164	84	2.0^{cde}±0.8
13	87	43	2.0^{c}±0.7	147	76	1.9^{def}±0.9
14	157	82	1.9^{bc}±0.7	129	70	1.8^{ef}±1.1
15	79	42	1.9^{bc}±0.3	69	34	2.0^{cde}±0.7
Total or mean	1235	674	1.8±0.8	1942	878	2.2±1.3
F ratio			6.83**	42.90**		5.57**
(L.S.D $_{0.05}$)			(0.4)			(0.5)

**(P<0.01)

+Means having the same letter vertically are not significant at 5% level.

2.Month and Season of breeding:

Both month and season of breeding had significant (P<0.01&0.05) effects on breeding efficiency, i.e. NS/C for cows, whereas, they had non significant effects for Egyptian buffaloes (Table 2). The least NS/C appeared in spring and autumn seasons of breeding especially, during the months of March (1.6) in buffaloes and September (1.9) in cows, while the highest values were in summer or winter especially, during June and January months (2.0) in buffaloes and January (2.8) in cows.

Such results indicate that the lowest fertility may be attributed to some physiological disturbances resulting from higher temperature, scarcity of green fodder and lower quality of bull semen during summer months (Bhat and Taneja, 1986) while the highest NS/C appeared in winter may be due to

other causes concerning to managerial and reproductive practices such as mineral deficiency, metritis, timing of service and delayed heat detection.

The present results are in agreement with Badinga et al. (1985) who reported that month of service had significant (P<0.01) effect on NS/C in dairy cattle and Parkash *et al.* (1989) who stated that the NS/C were the maximum in winter (Dec-March) as 2.68 for Murrah buffaloes and were affected significantly by season of calving.

Table (2): Effect of both month and season of breeding on number of services per conception (NS/C) in Egyptian buffaloes and Friesian crossbred cows.

Month & Season of breeding	Buffaloes			Cows		
	Total no. of services	Total no. of conceptions	NS/C (X±S.D)	Total no. of services	Total no. of conceptions	NS/C (X±S.D)
Dec.	130	69	1.9^{bc}±1.1+	123	51	2.4^{cd}±1.3+
Jan.	176	89	2.0^{c}±0.9	163	58	2.8^{e}±1.6
Feb.	112	60	1.9^{bc}±0.8	208	104	2.0^{ab}±1.4
Winter	418	218	1.9^{a}±0.9	494	213	2.3^{a}±1.5
March	108	66	1.6^{a}±0.8	198	101	2.0^{ab}±1.2
April	124	75	1.7^{ab}±0.9	257	127	2.0^{ab}±1.0
May.	113	59	1.9^{bc}±0.8	212	91	2.3^{bcd}±1.4
Spring	345	200	1.7^{b}±0.9	667	319	2.1^{b}±1.2
June	91	45	2.0^{c}±1.3	161	63	2.6^{de}±1.4
July	57	31	1.8^{ac}±0.7	121	51	2.4^{cd}±1.2
Aug.	60	36	1.7^{ab}±1.1	123	55	2.2^{abc}±1.0
Summer	208	112	1.9^{a}±1.1	405	169	2.4^{a}±1.2
Sep.	69	44	1.6^{a}±0.7	85	45	1.9^{a}±1.0
Oct.	123	61	2.0^{c}±1.1	125	62	2.0^{ab}±1.2
Nov.	72	39	1.8^{ac}±1.0	166	70	2.4^{cd}±1.5
Autumn	264	144	1.8^{ab}±0.9	376	177	2.1^{b}±1.3
Total or mean	1235	674	1.8±0.8	1942	878	2.2±1.3
F ratio (Month):			$1.65^{n.s}$			3.32**
$L.S.D_{0.05}$			(0.3)			(0.4)
F ratio (Season):			$1.63^{n.s}$			2.94*
$L.S.D_{0.05}$			(0.2)			(0.2)

* (P<0.05) ** (P<0.01) n.s= not significant at 5% level.

+Means having the same letter vertically are not significant at 5% level.

3.Post partum first service (PPFS):

It is evident from table (3) that buffalo and cow females having PPFS <3 months and also 6 months and over required NS/C more than those having PPFS from 3 months to <6 months. The effect of PPFS on NS/C was significant (P<0.01) in buffaloes but non significant in cows (Table 3).

The present results could be explained on the basis of reverse effect of lactogenic hormones (prolactin) on reproductive performance for females which were in peak of lactation during the first three months after parturition and also reproductive system did not completely return to normal condition (Hafez, 1993).

Table (3): Effect of post partum first service (PPFS) on number of services per conception (NS/C) in Egyptian buffaloes and Friesian crossbred cows.

PPFS (month)	Buffaloes			Cows		
	Total no. of services	Total no. of conceptions	NS/C (X±S.D)	Total no. of services	Total no. of conceptions	NS/C (X±S.D)
1-	89	48	$1.9^{a}\pm0.7^{+}$	368	144	$2.6^{a}\pm1.5^{+}$
2-	152	79	$1.9^{a}\pm0.8$	371	160	$2.3^{ab}\pm1.3$
3-	96	61	$1.6^{b}\pm0.6$	182	86	$2.1^{bc}\pm1.2$
4-	54	35	$1.5^{b}\pm0.7$	126	58	$2.2^{bc}\pm1.1$
5-	42	25	$1.7^{ab}\pm0.8$	48	25	$1.9^{c}\pm0.9$
6 and over	159	83	$1.9^{a}\pm0.7$	207	81	$2.6^{a}\pm1.7$
Total or mean	592	331	1.8±0.7	1302	554	2.4±1.4
F ratio ($L.S.D_{0.05}$)			3.13** (0.3)			$2.16^{n.s}$ (0.4)

**(P<0.01) n.s= not significant at 5% level.

+Means having the same letter vertically are not significant at 5% level.

4.Days open:

Days open had significant (P<0.01) effect on NS/C for both species (Table 4). From this table, it was observed that the average NS/C showed an increase tendency as days open increased until 180 days and over being 2.3 and 3.2 for buffaloes and cows, respectively. The lowest breeding efficiency may be caused by several factors i.e., delayed onset of ovarian activity, silent heat, missed oestrus due to weak symptoms, poor heat detection, timing of service and poor nutrition which lead to lengthening of days open (Kotby *et al.*, 1987 and Khalil *et al.*, 1991) and hence increasing the number of services required to conception.

Table (4): Effect of days open on number of services per conception (NS/C) in Egyptian buffaloes and Friesian crossbred cows.

Days Open (day)	Buffaloes			Cows		
	Total no. of services	Total no. of conceptions	NS/C (X±S.D)	Total no. of services	Total no. of conceptions	NS/C (X±S.D)
30-	49	33	$1.5^{a}\pm0.5^{+}$	61	47	$1.3^{d}\pm0.8^{+}$
60-	80	56	$1.4^{a}\pm0.6$	118	80	$1.5^{cd}\pm0.6$
90-	71	50	$1.4^{a}\pm0.5$	127	72	$1.8^{bc}\pm0.7$
120-	46	32	$1.4^{a}\pm0.6$	107	57	$1.9^{b}\pm0.8$
150-	37	23	$1.6^{a}\pm0.8$	90	45	$2.0^{b}\pm0.7$
180 and over	309	137	$2.3^{b}\pm0.7$	802	253	$3.2^{a}\pm1.5$
Total or mean	592	331	1.8±0.7	1305	554	2.4±1.4
F ratio ($L.S.D_{0.05}$)			25.8** (0.3)			47.9** (0.4)

** (P<0.01)

+Means having the same letter vertically are not significant at 5% level.

5.Parity:

The average NS/C was higher at the first calving and then it decreased as parity progressed up to the 5th calving and over for both buffaloes and Friesian crossbred cows. Parity had significant (P<0.05) effect on NS/C for buffaloes while it had non significant effect for cows (Table 5). Parkash *et al.*, (1989) working on Murrah buffaloes showed a reduction in the

NS/C with the advance of parity being the minimum in the 5th parity and non significant effect of parity order in this respect. However Mahdy *et al.*, (2001) had done their studies on an Egyptian buffaloes herd and found that differences in NS/C due to parity were highly significant .

Recent results showed that buffalo heifers required significantly ($P<0.05$) more NS/C (2.0) than buffalo cows (1.8). However the requirement of NS/C for cow heifers and the old cows was found to be the reverse as 2 vs. 2.4 (Table 5) and that was similar to those obtained by Badinga *et al.*, (1985) who reported that age group (heifers vs. cows) highly significantly affect NS/C and being 1.9 and 2.3 for heifers and cows, respectively.

Results given in table (5) showed that buffalo cows which giving birth to males needed more NS/C (1.8) than those giving birth to females (1.7). Similarly, the corresponding numbers for buffalo heifers were 2.1 and 1.9. On the contrary, cows giving birth to males needed less NS/C (2.3) than those giving birth to females (2.4) and the corresponding numbers for cow heifers were 2.0 and 2.1 but the difference was so small. Sex of calf did not affect NS/C and being 2.40 and 2.08 for female and male Murrah buffalo calves (Parkash *et al.*, 1989) while Tomar and Arneja (1972) reported significantly more NS/C following birth of male than female buffalo calves.

The present results suggest that with the advance of parity, infertile cows and those having somewhat reproductive problems have to cull outside the herd in early parities, while regular cows which calving without any problems were remained inside the herd reflecting the least NS/C and this is obvious from number of conceived females over different parities (table 5) though this did not completely apply in cow herd. On the other hand, heifers may require more NS/C because their reproductive problems have not yet appeared besides, reproductive system and responsible hormones did not reach to the optimum function at this early age.

Table (5): Effect of Parity on breeding efficiency as no. of services per conception (NS/C) in Egyptian buffaloes and Friesian crossbred cows.

Parity	Buffaloes					Cows				
	Total no. of services	Total no. of conce-ptions	NS/C ($\bar{X}$ ±S.D)			Total no. of services	Total no.of conce-ptions	NS/C ($\bar{X}$ ±S.D)		
			Male	Female	Both sexes			Male	Female	Both sexes
Heifers	411	205	2.1	1.9	2.0±1.3^{a}	455	222	2.0	2.1	2.0±1.3^{a}
1st	227	116	1.9	2.0	2.0^{a}±1.3	520	210	2.5	2.5	2.5^{b}±1.4
2nd	116	67	1.8	1.7	1.7^{ab}±1.1	281	117	2.2	2.6	2.4^{b}±1.5
3rd	34	27	1.4	1.1	1.3^{b}±0.4	172	77	2.3	2.2	2.2^{b}±1.5
4th	12	10	1.2	1.2	1.2^{b}±0.4	85	36	1.5	2.6	2.4^{b}±1.7
5th and over	12	8	1.4	1.7	1.5^{ab}±0.7	131	56	2.4	2.3	2.3^{b}±1.6
Cows	401	228	1.8	1.7	1.8±1.1	1189	496	2.3	2.4	2.4±1.5
Total or mean	812	433	1.9	1.8	1.9±1.2	1644	718	2.3	2.3	2.3±1.4
F ratio (Parity)					2.9*					0.4 n.s
(L.S.D 0.05)					(0.6)					(0.4)
F ratio (heifers vs. cows)					4.7*					9.2**

*(P<0.05) ** (P<0.01)

n.s: not significant at 5% level

+ Means having the same letter vertically are not significant at 5% level.

6.Age of parents:

The average NS/C showed an increase tendency with the advance of sire's age until 6 years old and over in buffaloes, but in cows until <6 years old and it decreased thereafter. Age of sire had significant (P<0.01) effect on NS/C in cows whereas it had non significant effect in buffaloes in this concern (Table 6). Such results indicate that young bulls were more efficient than older ones.

The average NS/C declined as age of dam increased up to <7 years old in buffaloes except the first group (<2 years). A contrary trend was found in cows which it tended to increase with the progress of dam's age up to <5 years old and then decreased thereafter up to <8 years (Table 7). The highest conception percentages occurred from the first and second services. They were accounted for 20.8% and 48.9% in buffaloes and 30.6% and 41.7% in cows, respectively (Table 7).

It is of interest to show that females in different parities which bred to young bulls (<6 years old) needed NS/C as 1.7, while those bred to older bulls gave higher value being 2.0 in buffaloes, whereas, contrary results were observed in cows being 2.4 or 2.6 and 1.9 (Table 8).

Table (6): Effect of age of sire on breeding efficiency as no. of services per conception (NS/C) in Egyptian buffaloes and Friesian crossbred cows.

Age of sire (year)	Buffaloes			Cows		
	Total no. of services	Total no. of conceptions	NS/C (X±S.D)	Total no. of services	Total no. of conceptions	NS/C (X±S.D)
2-	252	140	1.8^{a}±1.2	1141	498	2.3^{a}±1.4
4-	461	243	1.9^{a}±1.2	345	137	2.5^{a}±1.5
6 and over	99	50	2.0^{a}±1.2	158	83	1.9^{b}±1.1
Total or mean	812	433	1.9±1.2	1644	718	2.3±1.4
F ratio ($L.S.D_{0.05}$)			$0.5^{n.s}$ (0.3)			4.9** (0.4)

n.s= not. Significant at 5% level.
**= (P<0.01).

7.Sire effect:

Differences in breeding efficiency determined by the NS/C due to service sire or bull were significant (P<0.01) for both buffaloes and cows (Table 9) and ranging from 1.2 to 3.1 and from 1.5 to 3.2, respectively. The present results indicate that mostly, buffalo sires having the highest percentage of progeny in the herd appeared the least average NS/C, but this trend was not obvious for cow sires. Moreover, 20 buffalo and cow sires out of the total 43 sires under the study showed the average NS/C as 1 to 2, others 20 sires appeared the average NS/C being 2 to 3 and the last three sires showed the average NS/C accounting for more than 3 (Table 9).

Such results disagree with those reported on Murrah buffaloes by Parkash *et al.*, (1989) who found non significant effect of sire on NS/C. However, Mahdy *et al.*, (2001) showed significant (P<0.01) effect in this concern for Egyptian buffalo herd.

Table (7): Effect of age of dam on breeding efficiency as no. of services per conception (NS/C) in Egyptian buffaloes and Friesian crossbred cows.

Dam's age (year)	Buffaloes							Cows						
	Total no. of services	Total no. of Conceptions	Conceptions as % of no. of services				NS/C (X±S.D)	Total no. of services	Total no. of Conceptions	Conceptions as % of no. of services				NS/C (X±S.D)
			1	2	3	4 and over				1	2	3	4 and over	
Less than 2	317	185	23.3	59.9	10.4	6.4	1.7^{cd}±0.7+	428	231	36.4	50.2	9.5	3.9	1.9^{d}±0.9+
2-	340	155	12.9	45.3	15.9	25.9	2.2^{a}±0.4	449	210	31.0	43.8	13.3	11.9	2.1^{cd}±1.2
3-	207	107	40.8	42.5	14.5	2.2	1.9^{b}±0.8	340	135	20.7	39.3	19.3	20.7	2.5^{ab}±1.3
4-	140	79	27.1	38.6	25.7	8.6	1.8^{bc}±0.7	290	118	26.3	39.0	16.1	18.6	2.5^{ab}±1.5
5-	91	53	31.9	39.6	3.3	25.2	1.7^{cd}±0.8	156	64	28.1	39.1	7.8	25.0	2.4^{ac}±1.4
6-	65	38	24.6	61.5	-	13.9	1.7^{cd}±0.7	102	45	44.4	20.0	15.6	20.0	2.3^{bc}1.5
7-	38	18	13.2	47.4	15.8	23.6	2.1^{a}±0.8	99	41	36.6	31.7	14.6	17.1	2.4^{ac}±1.3
8 and over	21	13	23.8	76.2	-	-	1.6^{d}±0.5	109	41	24.4	36.6	17.1	21.9	2.7^{a}±1.7
Total or mean	1219	648	20.8	48.9	13.3	17.0	1.9±0.7	1973	885	30.6	41.7	13.6	14.1	2.2±1.3
F ratio							8.2**							5.7**
(L.S.D $_{0.05}$)							(0.2)							(0.4)

** (P<0.01)

+ Means having the same letter vertically are not significant at 5% level.

Table (8): Effect of age of dam as parity by sire age on breeding efficiency as no. of services per conception (NS/C) in Egyptian buffaloes and Friesian crossbred cows.

Species	Parity	Sire age (Year)									Total or mean		
		(2-)			(4-)			(6 and over)					
		Total no. of services	Total no. of conceptions	NS/C (X±S.D)	Total no. of services	Total no. of conceptions	NS/C (X±S.D)	Total no. of services	Total no. of conceptions	NS/C (X±S.D)	Total no. of services	Total no. of conceptions	NS/C (X±S.D)
Buffaloes	(Heifers)	(159)	(84)	(1.9±1.3)	(234)	(112)	(2.1±1.3)	(18)	(9)	(2.0±1.3)	(411)	(205)	(2.0±1.3)
	1st	48	30	1.6±0.9	131	63	2.1±1.5	48	23	2.1±1.3	227	116	2.0±1.3
	2nd	33	15	2.2±1.5	58	40	1.5±0.7	25	12	2.1±1.3	116	67	1.7±1.1
	3rd	10	9	1.1±0.3	19	14	1.4±0.5	5	4	1.3±0.5	34	27	1.3±0.4
	4th	2	2	1.0±0.0	8	7	1.1±0.4	2	1	2.0±0.0	12	10	1.2±0.4
	5th and over	-	-	-	11	7	1.6±0.8	1	1	1.0±0.0	12	8	1.5±0.7
	Total or mean	93	56	1.7±0.9	227	131	1.7±1.1	81	41	2.0±1.2	401	228	1.8±1.1
Cows	(Heifers)	(355)	(174)	(2.0±1.4)	(55)	(24)	(2.3±1.2)	(45)	(24)	(1.9±0.9)	(455)	(222)	(2.0±1.3)
	1st	371	151	2.5±1.4	110	42	2.6±1.3	39	17	2.3±1.4	520	210	2.5±1.4
	2nd	203	82	2.5±1.5	53	22	2.4±1.4	25	13	1.9±1.2	281	117	2.4±1.5
	3rd	79	36	2.2±1.5	67	28	2.4±1.6	26	13	2.0±1.2	172	77	2.2±1.5
	4th	59	23	2.6±1.5	17	6	2.8±2.6	9	7	1.3±0.8	85	36	2.4±1.7
	5th and over	74	32	2.3±1.5	43	15	2.9±1.8	14	9	1.6±1.0	131	56	2.3±1.6
	Total or mean	786	324	2.4±1.4	290	113	2.6±1.6	113	59	1.9±1.2	1189	496	2.4±1.5

Table (9): Effect of sire or bull on number of services per conception (NS/C) in Egyptian buffaloes and Friesian crossbred cows.

Sire no.[1]	Buffaloes: % of progeny [2] in the herd	Buffaloes: Total no. of services	Buffaloes: Total no. of conceptions	Buffaloes: NS/C (X±S.D)	Sire no.[1]	Cows: % of progeny [2] in the herd	Cows: Total no. of services	Cows: Total no. of conceptions	Cows: NS/C (X ±S.D)
1	11.4	138	77	1.8^{bcd}±1.2*	1	1.8	37	16	2.3^{cde}±1.2*
2	6.2	61	42	1.5^{ab}±0.8	2	3.0	56	26	2.2^{bcde}±0.9
3	5.6	58	38	1.5^{ab}±0.6	3	1.9	32	17	1.9^{abc}±1.3
4	3.7	40	25	1.6^{abc}±0.9	4	3.6	70	32	2.2^{bcde}±1.6
5	1.5	17	10	1.7^{abc}±0.5	5	1.5	20	13	1.5^{a}±0.7
6	2.1	35	14	2.5^{ef}±1.1	6	1.6	27	14	1.9^{abc}±1.3
7	1.9	23	13	1.8^{bcd}±0.8	7	5.4	92	47	2.0^{abcd}±1.1
8	1.9	26	13	2.0^{bcde}±1.1	8	3.6	68	32	2.1^{abcd}±1.4
9	1.3	25	9	2.8^{fg}±2.3	9	4.8	110	42	2.6^{defgh}±1.4
10	1.2	16	8	2.0^{bcde}±0.9	10	2.4	65	21	3.1^{gh}±2.1
11	1.8	25	12	2.1^{cde}±1.5	11	2.6	42	23	1.8^{abc}±1.2
12	2.7	38	18	2.1^{cde}±1.3	12	5.2	108	46	2.3^{cde}±1.4
13	2.4	49	16	3.1^{g}±1.5	13	2.3	60	20	3.0^{fgh}±1.7
14	4.5	60	30	2.0^{bcde}±1.2	14	3.0	74	26	2.8^{efgh}±1.6
15	1.0	17	7	2.4^{ef}±1.6	15	3.6	102	32	3.2^{h}±1.9
16	0.7	8	5	1.6^{abc}±0.5	16	7.5	144	66	2.2^{bcde}±1.4
17	3.7	52	25	2.1^{cde}±1.3	17	2.8	71	25	2.8^{efgh}±1.6
18	4.7	74	32	2.3^{def}±1.6	18	2.1	46	18	2.6^{defgh}±1.4
19	2.5	21	17	1.2^{a}±0.4	19	1.8	42	16	2.6^{defgh}±1.3
					20	5.5	104	48	2.2^{bcde}±1.4
					21	3.3	46	29	1.6^{ab}±1.1
					22	2.2	38	19	2.0^{abcd}±1.0
					23	1.8	27	16	1.7^{abc}±0.7
					24	1.3	21	11	1.9^{abc}±1.1
F. ratio (L.S.D 0.05)				2.9** (0.6)					2.8** (0.7)

1.Sires having less than 5 females in buffaloes, less than 10 females in cows and unknown sires were excluded.

2.Total no. of progeny = 674 (buffaloes) and 878 (cows).

** (P<0.01)

*Means having the same letter vertically are not significant at 5% level.

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الكفاءة التناسلية فى الأبقار والجاموس المصرى عدد التلقيحات اللازمة للاخصاب

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تم جمع وتحليل عدد ١٥٥٢ سجل تناسلى خاص بعدد ٣١٨ من إناث الأبقار الفريزيان الخليطة وعدد ٢٣٠ من إناث الجاموس المصرى التابعة لكلية الزراعة جامعة الإسكندرية (مصر) خلال فترة ١٥ عاما (١٩٧٠-١٩٨٤) وذلك لدراسة تأثير بعض العوامل مثل سنة التلقيح، شهر وموسم التلقيح، فترة ما بعد الولادة حتى أول شياع، الفترة المفتوحة، عدد مرات الولادة، عمر الأباء (الأب والأم)، كذلك تأثير الطلوقة على الكفاءة التناسلية مقدرة بعدد التلقيحات اللازمة للإخصاب وتم الحصول على النتائج التى يمكن تلخيصها فيما يلى:

١- كان لسنة التلقيح تأثير عالى المعنوية على عدد التلقيحات اللازمة للإخصاب فى كلا النوعين وكانت تتراوح خلالها بين ١,٤ إلى ٣.١.
٢- اتضح أن اقل عدد من التلقيحات اللازمة للاخصاب حدث فى فصلى التربية الربيع والخريف وان اعلى عدد من التلقيحات حدث فى فصلى الصيف او الشتاء وكان لكل من شهر وموسم التربية تأثير معنوى فى الأبقار وغير معنوى فى الجاموس فى هذا الشان.
٣- تحتاج إناث الأبقار والجاموس التى لها فترة مابعد الولادة حتى اول شياع قصيرة اقل من ٣شهور لعدد اكبر من التلقيحات اللازمة للاخصاب ثم يقل العدد بعد ذلك كلما زادت الفترة من ٣شهور إلى اقل من ٦شهور. ولهذه الفترة تأثير معنوى فى حالة الجاموس وغير معنوى فى حالة الأبقار على عدد التلقيحات اللازمة للإخصاب.
٤- يميل عدد التلقيحات اللازمة للإخصاب إلى الزيادة معنويا (٠.٠١) كلما زادت الفترة المفتوحة فى كلا النوعين.
٥- كانت الفروق فى الكفاءة التناسلية والمقدرة بعدد التلقيحات اللازمة للإخصاب والراجعة إلى تأثير الطلوقة عالية المعنوية لكل من الأبقار والجاموس.
٦- أظهر عدد التلقيحات اللازمة للإخصاب ارتفاعا عند الولادة الأولى ثم ينخفض بعد ذلك حتى الولادة الخامسة وكانت الفروق الراجعة لعدد مرات الولادة فى هذا الشان معنوية فى حالة الجاموس وغير معنوية فى حالة الأبقار.
٧- عجلات الجاموس تحتاج لعدد من التلقيحات اللازمة للإخصاب أكبر من إناث الجاموس وكذلك الإناث التى تعطى ولادات ذكور تحتاج عدد من التلقيحات اللازمة للاخصاب أكبر من التى تعطى ولادات إناث بينما فى حالة أبقار الفريزيان فقد ظهر عكس ذلك.
٨- يميل متوسط عدد التلقيحات اللازمة للاخصاب للزيادة مع زيادة عمر الطلوقة حتى أقل من ٦ سنوات موضحة أن الطلائق الصغيرة فى السن اكثر كفاءة من الأكبر سنا ومع ان عمر الطلوقة كان ذا تأثير عالى المعنوية فى الأبقار فقد كان غير معنوى فى حالة الجاموس فى هذا الشان.
٩- يؤثر عمر الأم معنويا جدا على عدد التلقيحات اللازمة للإخصاب فى كلا النوعين الا انه يميل للنقصان فى حالة الجاموس وتميل للزيادة فى حالة الأبقار كلما زاد عمر الام.
١٠- تم الحصول على أعلى نسبة اخصاب من التلقيحة الثانية بنسبة ٤٨,٩%، ٤١,٧% فى الجاموس والأبقار على الترتيب.