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INFLUENCE OF SOME FACTORS AFFECTING THE BREEDING EFFICIENCY IN THE EGYPTIAN BUFFALOES

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A B S T R A C T

The present study aimed at displaying effects of farm, age at first services, age at first calving, days in milk, days in milk to first breeding, calving interval, days open, number of services per conception, days dry, season and year of calving, lactation order and level of production on the breeding efficiency of a total 1342 buffalo cow records measured by different methods. The highest breeding efficiency measured by Wilcox and Wilcox modification methods was 85.59 and 91.92 % at over 25 month and by Tomar and Sharma methods was 75.37 and 91.31% at less than 20 month of age at first services, respectively. Highest values of Wilcox, Tomar and Sharma methods were 85.34 %, 81.82 % and 99.66 %, respectively at less 30 month of ages at first calving and highest breeding efficiency measured by Wilcox modification method was 92.86 % at about over than 35 month age at first calving. Lowest the breeding efficiency measured by Wilcox, Tomar and Sharma methods recorded at more than 300 days in milk (81.53, 89.83 and 90.21 %, respectively). The breeding efficiency tended to decrease by increasing the calving interval, highest values of breeding efficiency were 91.87, 94.53, 76.44 and 94.05 % for Wilcox, Wilcox modification, Tomar and Sharma methods, respectively at 11-13 months of calving interval. Days open had significant effect ($P \leq 0.05$) on Wilcox and Wilcox modification methods, while it had non significant effect ($P \geq 0.05$) on Tomar and Sharma methods. Days dry and season of calving had non significant effect ($P \geq 0.05$) on breeding efficiency measures by all methods. The highest breeding efficiency measures by Tomar and Sharma methods obtained in first lactation (76.57 and 95.67 %, respectively), while the highest breeding efficiency measured by Wilcox and Wilcox modification methods recorded in second lactation (88.08 and 94.40 %, respectively). High levels of production are usually associated with high breeding efficiency. It can be concluded that buffalo cows can maintain high breeding efficiency with high levels of milk production if accompanied by good management that maintain BCS and avoid negative energy balance; all can be obtained with the adjustment of ration to the corresponding stage of production.

KEY WORDS: Breeding efficiency, Egyptian Buffaloes.

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1. INTRODUCTION

The reproductive efficiency is one of the primary factors which affect productivity in female buffaloes. Amin [1] concluded that the primary goal of dairy reproductive management program is to maximize the number of pregnancies per lifetime of the cow efficiently and profitably. Sources of financial loss due to poor reproductive efficiency are less milk sold as a result of longer days open, fewer neonate due to longer calving interval, more numbers of breeding per conception as a result of poor heat detection, greater veterinary costs treat reproductive disorder and relatively higher rate of culling on base of lower productive and reproductive efficiency. Barile [4] mentioned that fertility can be expressed by the calving interval, calving rate, service per conception and age at first calving. Calving interval is the period between consecutive calvings. Among the reproduction traits calving interval is the most important criterion of fertility. Poor breeding efficiency can be attributed to late onset of puberty, seasonality, poor estrus expression, and long calving intervals in buffaloes [7]

High Reproductive efficiency is very important for achieving the maximum economic benefit. Buffaloes expressing breeding efficiency below 70% were not economical and maximum profit can be obtained if they calve regularly at an interval of 365 days [18]. Consequently, improvements in reproductive efficiency lead to increased profit per cow and improved overall efficiency in dairy operations [20].

2. MATERIALS AND METHODS

The present study was conducted on records of a total 1342 buffalo cows distributed in Kaliobia, Gharbia, Behera and Kafr El-Sheikh governorates during the period from 1992 – 2010. In private farms, buffaloes fed Egyptian clover (barseem), silage, rice straw, hay and concentrate mixture. In governmental farm, during winter and spring (December to May), buffaloes were grazed on Egyptian clover (barseem). During summer and autumn (June to November), buffaloes were kept under open sheds and fed concentrate mixture, wheat or rice straw, and a limited amount of clover hay when available. In both types of farms animal had free access to clean water. The buffaloes were milked by hand twice daily with 12 hours interval between milking. Heifers were served for the first time when they reach 300 to 380 kg of body weight and / or 18-24 month of age. The cows should were dried off two months before the calving date, and they served not before two months after calving. Private farms depend on artificial insemination; while in governmental farm depended on natural services.

Traits to be studied were farm, age at first service, age at first calving, days in milk, days in milk to first bred after calving, calving interval, days open, number of services/conception, days dry, season of calving, year of calving, lactation order, level of production (305ME).

Estimation of Breeding Efficiency:

1. *Wilcox et al.* (1957*)* [21]:

$$\mathbf{WBE} = \frac{\mathbf{365\ (N-1)}}{\boldsymbol{D}}\ \boldsymbol{X100}$$

Where: N: Total number of parturitions and D: Days from first to last parturition.

2. Modification of Wilcox et al. (1957) formula:

Jain et al (1996) [10] calculated breeding efficiency using modified formula:

$$\mathbf{BE\ \%(modified)} = \frac{\mathbf{n(365) + AFC}}{\boldsymbol{TCD}}\ \boldsymbol{X100}$$

Where: n: is the number of calving intervals, 365: is the desired calving interval in days, AFC: is the actual age at first calving and TCD: Total calving days (i.e) from date of birth to the date of last calving. But this method proved to be invalid and biased for the first calf heifers as where the AFC give 100% BE.

3. Tomar (1965):

In order to be able to characterize reproductive performance in dairy cattle also attempts have been made using the term breeding efficiency developed by Tomar [19]. Breeding efficiency was defined by the formula:

$$\mathbf{BE\ \%} = \frac{\mathbf{(\mathit{NX}365) + 1020}}{\mathbf{(AFC\ +\ HL)}}\ \boldsymbol{X100}$$

Where: N: is the number of lactation completed by a buffalo, 365: is the desired calving interval in days, 1020: is the desired age at first calving in days, AFC: is the actual age at first calving in days and HL: is actual herd life in days.

4. *Sharma et al.* [15]:

Where: 900: standard age in days at first calving, n: is number of the calvings, 400: is standard calving interval in days, AFC: is actual age at first calving in days and CI:

is total number of days of calving intervals.

Data Handling and Statistical Analysis:

The data were analyzed using GLM model of Statistical Analysis System Package (SAS, 2001) [14].

The Mathematical Model:

1. *First model:*

$Y_{ijklmnopqrst} = \mu + F_i + AFS_j + AFC_k + DIM_l + DFB_m + CI_n + DO_o + S/C_p + D.D_q + S_r + Y_s + b_1 (Age) + b_2 (Age)^2 + e_{ijklmnopqrst.}$

$Y_{ijklmnopqrs}$: is the observation of the buffalo cow; (i.e. Breeding efficiency of each buffalo cow), μ: is an effect common to all buffaloes cows in the population, F_i : is an effect due to farm; (1= private and 2= governarate), AFS_j : is an effect due to age at first service; (i.e. 1=less than 20 months, 2=20 to 25 months, and 3=more than 25 months), AFC_k: is an effect due to age at first calving; (i.e. 1=less than 30 months, 2=30 to 35 months, and 3=more than 35 months), DIM_l : is an effect due to days in milk; (i.e. 1=less than 200 days, 2=200 to 300 days, 3=more than 300 days), DFB_m: is an effect due to days in milk to first breeding; (i.e. 1=less than 50 days, 2=50 to 80 days and 3= more than 80), CI_n : is an effect due to calving interval; (i.e. 1=11 to 13 months, 2=14 to 17 months, and 3=more than 17 months), DO_o : is an effect due to days open; (i.e. 1=less than 60 days, 2=60 to 109 days, 3=110 to 160 days, and 4=more than 160 days), S/C_p : is an effect due to number of services/conception; (i.e. 1=one service, 2= two services, 3=three services, 4=four and more services), $D.D_q$: is an effect due to days dry; (i.e. 1=less than 120 days, 2=120 to 180 days, and 3=more than 180), S_r : is an effect due to season of calving; (i.e. 1= summer season (21 January to 21 March), and 2=winter season (21 September to 21 December), Y_s : is an effect due to year of calving; (i.e.1=1992-2000, 2=2001-2005, and 3=2006-2010), b_1 and b_2: partial linear and quadratic regression coefficients of $Y_{ijklmnopqrs}$ on age at calving and $e_{ijklmnopqrs}$: is a random element associated with the individual observation.

2. *Second model:*

To analyze the effect of order of lactation and level of production on the traits studied in the present investigation, the following model was used:

$$Y_{ijk} = \mu + LACT_i + 305ME_j + e_{ijk.}$$

Symbols in the model are defined as following:-

Y_{ijk} : is the observation of the buffalo cow; (i.e Breeding efficiency of each buffalo cow), μ : is an effect common to all buffalo cows in the population, $LACT_i$: is an effect due to lactation order; (i.e. 1=the first lactation, 2= the second lactation, 3= the third lactation, 4= the fourth lactation, 5= the fifth lactation and more), $305ME_j$: is an effect due to level of production; (i.e. 1=less than 2000 kg, 2=2000 to 3000 kg, and 3=more than 3000 kg) and e_{ijk} : is a random element associated with the individual observation.

3. RESULTS AND DISCUSSION

Table (1, 2) showed the Least Squares Means, Standard Errors and test of significance of differences among means for different factors affecting breeding efficiency by different methods (WBE %, WBE-M %, TBE % and SBE %). Farm had a highly significant effect ($P \leq 0.01$) on breeding efficiency measured by all different methods. The highest breeding efficiency came with the private farms for WBE (87.76 %), WBE-M (92.80 %), TBE (75.62 %) and SBE (93.04 %). These findings are in line with Daney [6] who reported that reproductive efficiency was significantly affected by herd in buffaloes bred in Bulgaria. Also, Bashir *et al*. [5] reported that herd had a highly significant effect on the reproductive efficiency. Age at first services had highly significant effect ($P \leq 0.01$) on breeding efficiency measured by WBE-M and TBE while it had a significant effect ($P \leq 0.05$) on breeding efficiency by measured by WBE and SBE methods. WBE and WBE-M methods revealed that maximum breeding efficiency was 85.59 % and 91.92 %, respectively at more than 25 month of ages at first services range. However, other methods revealed that the highest breeding efficiency measures was obtained at less than 20 month's age at first services for TBE (75.37 %) and SBE (91.31 %). Generally breeding efficiency measured by TBE and SBE decreased by increase age at first service. In agreement with the present study, Sohail [17] stated that breeding efficiency measured by SBE decreased by increasing age at puberty. Khan [11] reported that the decline in milk yield with the onset of pregnancy was prevented by an increase in maturity of dairy buffaloes.

Age at first calving had a highly significant effect ($P \leq 0.01$) on breeding efficiency measured by all different methods. WBE, TBE and SBE methods showed that maximum breeding efficiency of 85.34 %, 81.82 % and 99.66 %, respectively at less of 30 month of ages at first calving. However, WBE-M method revealed that the highest breeding efficiency (92.86 %) was obtained at about more than 35 month's age at first calving.

Table 1 Least Squares Means, Standard Errors of Various Factors Affecting on Wilcox breeding efficiency (WBE) and Wilcox breeding efficiency modification (WBE-M).

Factors	Classification	WBE		WBE-M	
		n	L.S.M ± S.E	n	L.S.M ± S.E
Farm	Private	255	87.76 ^{a}±1.20	261	92.80^{a}±0.69
	Governorate.	409	80.77 ^{b}±0.99	454	88.39^{b}±0.56
Age at First Service (months).	Less than 20	210	82.08 ^{b}±1.12	277	88.90^{b}±0.62
	20-25	315	85.12^{a}±1.05	342	90.96^{a}±0.59
	More than 25.	139	85.59^{a} ±1.34	164	91.92^{a}±0.76
Age at First Calving (months).	Less than 30	128	85.34^{a}±1.49	133	89.68^{b}±0.82
	30-35	260	82.37^{b}±1.03	282	89.42^{b} ±0.59
	More than 35.	276	85.08^{a}±1.08	300	92.68^{a}±0.60
Days in Milk (DIM)	Less than 200	224	85.47^{a}±1.17	243	90.98^{a}±0.66
	200-300	323	85.78^{a}±0.95	349	90.97^{a}±0.53
	More than300.	117	81.53^{b}±1.17	123	89.83^{a}±0.67
Days in Milk First Breeding (days).	Less than 50	258	84.83^{a}±0.97	276	90.56^{a}±0.55
	50-80	260	83.36^{a}±0.93	281	90.35^{a}±0.53
	More than 80.	146	84.59^{a}±1.39	158	90.86^{a}±0.79
Calving Intervals (months)	11-13	343	91.87^{a}±0.89	349	94.53^{a}±0.51
	14-17	229	80.86^{b}±0.89	232	90.52^{b}±0.51
	More than17.	63	74.58^{c}±1.23	103	83.98^{c}±0.60
Days Open (days).	Less than 60	248	85.52^{a} ±1.68	255	91.67^{a} ±0.96
	60-109	187	83.73^{ab} ±1.30	203	90.13^{bc}±0.74
	110-160	92	81.87^{b}±1.30	101	89.35^{c}±0.73
	More than 160.	137	85.92^{a}±1.08	156	91.22^{ab}±0.60
Number of Services/Conception (S/C).	One Service	414	86.48^{a}±0.89	436	91.94^{a}±0.51
	Two Services	146	83.97^{b}±0.99	158	91.11^{a} ±0.57
	Three Services	60	81.77^{b}±1.71	71	89.13^{b}±0.97
	≥ Four Services	44	84.83^{ab}±2.02	50	90.18^{ab}±1.13
Days Dry (days).	Less than120	155	82.93^{a}±1.26	163	89.57^{a}±0.69
	120-180	223	82.94^{a}±0.95	240	89.66^{a}±0.52
	More than180.	257	81.43^{a}±0.89	281	89.81^{a}±0.50
Season of Calving.	Summer	326	84.40^{a}±0.95	353	90.66^{a}±0.54
	Winter.	338	84.12^{a}±0.94	362	90.53^{a}±0.54
Year of Calving.	1992-2000	110	84.18^{a}±1.39	126	90.32^{a}±0.54
	2001-2005	208	84.95^{a}±1.01	228	90.96^{a}±0.40
	2006-2010.	346	83.65^{a}±0.90	361	90.51^{a}±0.51

Values within the same category with different letters are significantly different ($p \leq 0.05$).

The present result came in associated with the previous study of [9] reported that age at first calving had highly significant effect (P ≤ 0.01) on breeding efficiency by increasing age at first calving the breeding efficiency decreased when measured by Wilcox et al. [21]. On the contrary, [17] stated that breeding efficiency increased with the increase in age at first calving up to 1400 days, remained high up to day 1500 & then decreased. Days in milk had a highly significant effect (P≤ 0.01) on breeding efficiency measure by WBE (high level was 85.78% at range of 200-300 days of milk) and non significant effect on breeding efficiency measures by WBE-M (high level was 90.98% at less than 200 days of milk), TBE (high level was 74.14 % at 200-300 day of milk) and SBE (high level was 90.82 % at 200-300 day of milk).

Days in milk to first breeding had a non significant effect (P ≥ 0.05) on breeding efficiency by all measured methods. Maximum breeding efficiency obtained at less than 50 days by WBE, TBE and SBE (84.83, 73.99 and 90.53 %, respectively), while by WBE-M, it was 90.86 % at more than 80 days.

Calving interval had great influences (P ≤ 0.01) on all different breeding efficiency measures.

Table 2 Least Squares Means, Standard Errors of Various Factors Affecting on Tomar breeding efficiency (TBE) and Sharma breeding efficiency (SBE).

Factors	Classification	WBE		WBE-M	
		n	L.S.M ± S.E	n	L.S.M ± S.E
Farm	Private	447	75.62^{a}±0.46	455	93.04^{a}±0.66
	Governorate.	440	72.07^{b}±0.42	552	87.58^{b}±0.59
Age at First Service (months).	Less than 20	352	75.37^{a}±0.43	363	91.31^{a}±0.60
	20-25	421	73.52^{b}±0.39	455	90.64^{a}±0.56
	More than 25.	114	72.65^{b}±0.60	189	88.97^{b}±0.78
Age at First Calving (months).	Less than 30	218	81.82^{a}±0.54	218	99.66^{a}±0.79
	30-35	405	72.83^{b}±0.41	407	89.30^{b}±0.59
	More than 35.	264	66.88^{c}±0.43	382	81.97^{c}±0.58
Days in Milk (DIM)	Less than 200	280	73.58^{a}±0.46	333	89.89^{a}±0.62
	200-300	424	74.14^{a}±0.37	474	90.82^{a}±0.51
	More than300.	183	73.81^{a}±0.46	200	90.21^{a}±0.65
Days in Milk First Breeding (days).	Less than 50	331	73.99^{a}±0.37	372	90.53^{a}±0.52
	50-80	350	73.61^{a}±0.37	390	90.05^{a}±0.51
	More than 80.	206	73.93^{a}±0.55	245	90.35^{a}±0.77
Calving Intervals (months)	11-13	331	76.44^{a}±0.49	348	94.27^{a}±0.69
	14-17	207	74.05^{b}±0.49	231	90.05^{b}±0.69
	More than17.	78	70.28^{c}±0.63	101	83.41^{c}±0.82
Days Open (days).	Less than 60	93	74.33^{a}±0.68	317	91.32^{a}±0.96
	60-109	268	73.55^{a}±0.51	297	90.02^{a}±0.71
	110-160	133	73.40^{a}±0.50	152	89.50^{a}±0.70
	More than 160.	193	74.09^{a}±0.42	41	90.41^{a}±0.57
Number of Services/Conception (S/C).	One Service	540	74.97^{a}±0.34	594	92.09^{a}±0.48
	Two Services	191	74.31^{a}±0.39	228	90.75^{ab}±0.55
	Three Services	84	73.48^{ab}±0.68	102	89.58^{b}±0.94
	≥ Four Services	72	72.62^{b}±0.77	83	88.82^{b}±1.07
Days Dry (days).	Less than120	154	73.05^{a}±0.67	161	89.35^{a}±0.94
	120-180	221	73.81^{a}±0.51	239	89.26^{a}±0.71
	More than180.	241	73.91^{a}±0.50	280	89.10^{a}±0.68
Season of Calving.	Summer	455	73.85^{a}±0.37	520	90.26^{a}±0.52
	Winter.	432	73.84^{a}±0.37	487	90.36^{a}±0.52
Year of Calving.	1992-2000	126	73.98^{a}±0.57	193	89.25^{b}±0.76
	2001-2005	286	73.92^{a}±0.39	321	91.21^{a}±0.55
	2006-2010.	475	73.63^{a}±0.38	493	90.46^{ab}±0.53

Values within the same category with different letters are significantly different (p ≤ 0.05).

In general, all values of breeding efficiency tend to decrease by increasing the calving interval from around 11-13 months to more than 17 months (for WBE was 91.87 vs 74.58 %, for WBE-M was 94.53 vs 83.98 %, for TBE was 76.44 vs 70.28 % and for SBE was 94.27 vs 83.41 %, respectively). In support of the present study, [2] reported that for enhancing calf crop during life time span of dairy animals, reduction in the length of calving interval is important. Also, [17] stated the necessity of decreasing calving interval to improve low reproduction efficiency. Prolonged calving interval being a negative indicator of reproductive efficiency results in delayed breeding which is commonly practiced in urban and the peri-urban dairy farming system in the country, in order to avoid loss in milk yield due to pregnancy [12].

Days open significantly affected ($P \leq 0.05$) the breeding efficiency measured by WBE and WBE-M methods, while by TBE and SBE were non-significant effects. The highest breeding efficiency recorded by WBE (85.92%) at more than 160 day of days open and by WBE-M, TBE and SBE were 91.67, 74.33 and 91.32 %, respectively at less than 60 day of days open.

Number of inseminations per conception had significant effect ($P \geq 0.05$) on all different breeding efficiency measures. The highest measures were 86.48, 91.94, 74.97 and 92.09 % for WBE, WBE-M, TBE and SBE, respectively recorded in buffalo cows attained conception with only one insemination. Days dry had a non significant effect ($P \geq 0.05$) on all different breeding efficiency measures. High value of breeding efficiency by WBE (82.94 %) was close to 120 to 180 days dry, by WBE-M and TBE (89.81 and 73.91 %, respectively) were obtained after more than 180 day of dry period and by SBE (89.35 %) recorded when days dry less than 120 days. No significant effect for season of calving was observed on breeding efficiency by different methods. In summer season was recorded the highest value by WBE, WBE-M and TBE (84.40, 90.66 and 73.85%, respectively), while by SBE high value was 90.36 % in winter season. The non significant effect of season of calving on breeding efficiency came in agreement with the findings of [8, 3 and 17] and in disagreement with those findings obtained by [16, 13, 5 and 9]. Non-significant effect for year of calving on breeding efficiency by all methods except those measured by SBE method in which maximum breeding efficiency was 91.21% in period of 2001- 2005. In agreement with present study, Baghdasar and Juma [3] reported that year of calving had no significant effect on breeding efficiency in Iraqi buffaloes. In contrast to the previous findings, [13, 5 and 17] stated that year of calving significantly affected breeding efficiency.

Table (3) showed Least Square Means and Standard Errors of breeding efficiency by different methods (WBE %, WBE-M %, TBE % and SBE %) in Relation to Order of Lactation and Level of Production (305-Day ME). Lactation order had highly significant effect ($P \leq 0.01$) on all different breeding efficiency measures except TBE %. The highest breeding efficiency measures were 76.57 and 95.67 %, respectively in the first lactation for TBE% and SBE, and were 88.08 and 94.40% in second lactation for WBE and WBE-M, respectively. lowest values were83.80 and 89.05% in fifth lactation order and more for WBE and WBE-M, and were75.53 and 89.34% in forth lactation order for TBE% and SBE-M%, respectively. The results obtained were not in consistence with the findings of [9] noted that breeding efficiency increased with increasing the parity. Level of production had a high significant effect ($P \leq 0.01$) on breeding efficiency measures including TBE and SBE %, while it had non-significant effects on WBE and WBE-M %. In general, high levels of production are usually associated with high breeding efficiency. Highest breeding efficiency measured by WBE, WBE-M, TBE and SBE were 87.02, 92.23, 77.92 and 94.20%, respectively obtained at high level of production (more than 3000 kg). This indicated that the buffalo cows can maintain high breeding efficiency with high levels of milk production if accompanied by good management that maintain BCS and avoid negative energy balance; all can be obtained with the adjustment of ration to the corresponding stage of production.

Table 3 Least Square Means and Standard Errors of breeding efficiency by different methods (WBE %, WBE-M %, TBE % and SBE %) in Relation to Order of Lactation and Level of Production (305-Day ME).

Parameter	Classification	WBE %		WBE-M %		TBE %		SBE%	
		N	L.S.M±S.E	N	L.S.M±S.E	N	L.S.M±S.E	N	L.S.M±S.E
Order of lactation	1st lactation.	-	-	-	-	316	$76.57^{a}\pm0.54$	369	$95.67^{a}\pm0.70$
	2nd lactation.	289	$88.08^{a}\pm0.72$	322	$94.40^{a}\pm0.42$	280	$75.19^{a}\pm0.57$	320	$90.80^{b}\pm0.74$
	3rd lactation.	214	$87.00^{a}\pm0.82$	229	$92.50^{b}\pm0.49$	210	$75.69^{a}\pm0.65$	229	$90.57^{b}\pm0.86$
	4th lactation.	150	$83.95^{b}\pm0.96$	153	$90.22^{c}\pm0.59$	144	$75.53^{a}\pm0.77$	154	$89.34^{b}\pm1.04$
	≥5th lactation	215	$83.80^{b}\pm0.82$	215	$89.05^{c}\pm0.51$	210	$75.53^{a}\pm0.64$	217	$88.94^{b}\pm0.89$
Level of Production (kg) (305-Day ME)	> 2000.	101	$84.54^{a}\pm1.13$	110	$91.04^{a}\pm0.67$	182	$72.18^{b}\pm0.69$	227	$85.72^{b}\pm0.88$
	2000-3000.	508	$85.57^{a}\pm0.51$	540	$91.36^{a}\pm0.31$	705	$77.00^{a}\pm0.35$	765	$93.28^{a}\pm0.48$
	> 3000.	259	$87.02^{a}\pm0.70$	269	$92.23^{a}\pm0.43$	273	$77.92^{a}\pm0.55$	297	$94.20^{ab}\pm0.74$

Within the same classification, the appearances of least square means with the different letters are significantly different ($p \leq 0.05$). Otherwise, they don't.

4. REFERENCES

1. Amin, A. 1998**.** Reproductive performance and efficiency. Animal and veterinary Science Department, University of Idaho. *J. Dairy sci*. **76**.
2. Ashfaq, M., Mason, I.L. 1954. Environmental and genetical effects on milk yield in Pakistani buffalo. *Empire J. Exper. Agric.* **22**: 161-175.
3. Baghdasar, G.A., Juma, K.H. 1998. Some aspects of life performance of Iraqi buffalo (Bubalus bubalis) cows. Proceedings of the 6th World Congress on Genetics Applied to Livestock Production, Armidale, NSW, Australia, 11-16 January, 1998. Vol. 24: Sheep and goats (fibre); sheep and goats (meat and milk); poultry; horses; buffaloes. 474-475.
4. Barile, V.L. 2005. Improving reproductive efficiency in female buffaloes. *Livestock Prod. Sci*. **92**: 183.
5. Bashir, M. K., Khan, M. S., Bhatti S. A., Iqbal, A. 2007. Lifetime Performance of Nili-ravi Buffaloes in Pakistan. *Asian-Aust. J. Anim. Sci.* **20**: 661 – 668.
6. Danev, A.D. 1994. Influence of some factors on reproductive efficiency of buffaloes bred in Bulgaria. Proceedings, 4th World Buffalo Congress, Sao Paulo, Brazil, **3**. 655-657.
7. Drost, M. 2007. Bubaline versus bovine reproduction. *Theriogenology* **68**: 447-449.
8. El-Barbary, A.S.A., Badran, A. E.1987. Studies on breeding efficiency of Egyptian buffaloes.*alex.j.agric.res*.**32**:75.
9. Hammoud, M.H.; Khalifa, Z.A., Nour El-Din, A.N.M., El-Shafie, O.M. 2009. Factors affecting some reproductive traits of Egyptian buffaloes. *Alex J. Agric.Res*. **54**: 1-7.
10. Jain, J.K., Khan, F.H., Saha, D.N. 1996. Studies on breeding efficiency in Jersey cows. *Indian, Vet. J.* **73**: 1150-1153.

11. Khan, S. 2007. Lactation-reproduction interaction in dairy buffaloes. Ph.D. thesis, NWFP, Agricultural University Peshawar, Pakistan. Publisher.
12. Qureshi, M.S., Khan, S., Ahmad, N. 2007. Pregnancy depresses milk yield in dairy buffaloes. *Ital. J. Anim. Sci*. **6**: 1290-1293.
13. Sahana, G., Sadana, D.K. 1999. Genetic study on breeding efficiency in Murrah buffaloes. *Indian J. Anim.Sci*. **69**: 842-844.
14. SAS 2001. statistical analysis system, User's Guide Computers by SAS Institute Inc., Cary, NC, USA.
15. Sharma, O. P., Nielsen, E., Niemann-Sorensen, A. 1980. Views on computing breeding efficiency of buffaloes. Ninth. Intl. Congr. Anim. Rep. and A. I. June 16-20, 1981.
16. Singh, B., Yadav, M.C. 1989. Inheritance of milk production and breeding efficiency in Nili Ravi buffaloes. *Indian J. Anim. Sci*.**59**: 872.
17. Sohail, M.S. 2010. Genetic Evaluation of Dairy Buffaloes. PhD thesis. Faculty of Animal Husbandry and Veterinary Sciences, University of Agriculture, Faisalabad.
18. Sunil, Kumar., Yadav, M.C., Prasad, R.B., Prasad, R.B. 2006. Relative importance of reproductive traits on herd life milk production and profit in buffaloes. *Bulgarian Journal of Agricultural Science* **13**: 119-126.
19. Tomar, N. S. 1965. A note on the method of working out breeding efficiency in Zebu cows and buffaloes. *Indian Dairy Man*. **17:** 389-390**.**
20. Watters, R. D., Wiltbank, M. C., Guenther, J. N., Brickner, A. E., Rastani, R. R., Fricke, P. M., Grummer, R. R. 2009. Effect of dry period length on reproduction during the subsequent lactation. *J. Dairy Sci*. **92**: 3081–3090.
21. Wilcox, C. J.; Pfau, K. O. and Bartlett, J. W. 1957. An investigation of the inheritance of female reproductive performance and longevity, and their interrelationships within a Holstein-Friesian herd. *J. Dairy Sci.* **40**: 942-947.

مجلة بنها للعلوم الطبية البيطرية
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تاثير بعض العوامل على الكفاءة التناسلية فى الجاموس المصرى

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الملخص العربي

الهدف من البحث دراسة تاثير المزرعة ، العمر عند أول تلقيح، العمر عند أول ولادة، فترة الحليب،الفترة من الولادة حتي أول تلقيحة، الفترة بين ولادتين، الفترة المفتوحة، عدد التلقيحات اللازمة للإخصاب، فترة الجفاف، موسم الولادة، سنة الولادة، موسم الحليب و مستوي الإنتاج على الكفاءة التناسلية المحسوبة بكل الطرق. أعلى الكفاءة التناسلية المحسوبة بطرق Wilcox و المعدلة كانت 85.59 و 91.92% على التوالى عند أكثر من خمسة و عشرين شهر من العمر عند اول تلقيح و أعلى الكفاءة التناسلية المحسوبة بطرق Tomar و Sharma كانت75.37 و91.31% على التوالى عند أقل من عشرين شهر من العمر عند اول تلقيح. أعلى الكفاءة التناسلية المحسوبة بطرق Wilcox, ، المعدلة وTomar كانت 85.34 81.82و 99.66 % على التوالى عند أقل من ثلاثين شهر من العمر عند اول ولادة و أعلى الكفاءة التناسلية المحسوبة Wilcox المعدلة كانت92.86% عند أكثر من خمسة وثلاثين شهر من العمر عند اول ولادة. أدنى مستوى للكفاءة التناسلية المحسوبة بطرق Wilcox, Tomar، و Sharma عند فترة حليب أكثر من ثلاثة مائة يوما (81.53،89.83 و 90.21 % على التوالى). الكفاءة التناسلية تميل إلى الإنخفاض بزيادة الفترة بين ولادتين،أعلى الكفاءة التناسلية المحسوبة بطرق Wilcox ، المعدلة، Tomar و Sharma كانت 91.87، 76.44،94.53 و 94.05 % على التوالى. الفترة المفتوحة (من الولادة حتي حدوث أول تلقيحة مخصبة) لها تأثير معنوي على الكفاءة التناسلية ما عدا تلك المحسوبة باستخدام طريقة Tomar و Sharma كان التأثير غير معنوي. ، فترة الجفاف و موسم الولادة لها تأثير غير معنوي على الكفاءة التناسلية المحسوبة بكل الطرق. أعلى الكفاءة التناسلية المحسوبة بطرق Tomar و Sharma تم الحصول عليها فى أول موسم للحلابة (76.57 و95.67% على التوالى) وبطريقة Wilcox و المعدلة كانت 88.08 و 94.40% على التوالى فى الموسم الثانى للحلابة. الكفاءة التناسلية العالية مصحوبة بمستويات عالية من انتاج الحليب. ". يمكن لأبقار الجاموس الحفاظ على الكفاءة التناسلية عالية مصحوبة بمستويات عالية من انتاج الحليب إذا كان مصحوبا" بالرعاية الجيدة التى تحافظ على حالة الجسم وتجنب سلبية توازن الطاقة، ويمكن الحصول على كل شى مع تعديل العليقة التى تقابل مرحلة الإنتاج.

(مجلة بنها للعلوم الطبية البيطرية: عدد 23 (1)، يونيو2012: 72-80)