GENETIC AND NON-GENETIC FACTORS AFFECTING MONTHLY AND CUMULATIVE MONTHLY MILK YIELD IN EGYPTIAN BUFFALOES

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ABSTRACT

Total of 893 lactation records collected during the period (1983-1993) on a herd of 281 buffaloes and 21 sires raised at Mehallet Mousa, Station, Animal Production Research Institute, Ministry of Agriculture, Egypt, were used to study some genetic and non-genetic factors affecting monthly and cumulative monthly milk yield. Effects of sire, generation number, year of calving and parity were highly significant for most of the traits studied except season of calving which was not significant. Heritability estimates of all traits were low and positive, they ranged between 0.06 to 0.19. Estimates of genetic correlation between each of monthly milk yield at the 3 rd and the 4 th month and cumulative monthly milk yield at 90 and 120 days and 300 days milk yield were positive and high about 1.02-1.09. Also, phenotypic and environmental correlation between the traits studied and 300 days milk yield were positive and either moderate or high, ranging between 0.35 and 0.99.

Keywords: Egyptian buffaloes, monthly milk yield, cumulative monthly milk yield, sire effect, non-genetic factors, heritability, genetic and phenotypic correlations .

INTRODUCTION

The part lactation yields i.e. monthly or cumulative monthly milk yield are of economic importance since it could be used in predicting production ability of the animal, so selection decisions could be made before the lactation records are completed, besides, it could serve as a useful indicator in the preliminary sire evaluation program to improve the annual genetic gain and thus, reduce generation interval.

Some genetic studies on buffaloes showed that selection based on part lactation yields would be expected to be as affective as selection on complete lactation milk yield (Jain *et al.;* 1986, Khan and Johar; 1988 and Verma *et al*.; 1989). The objectives of the present study were to investigate some non-genetic factors affecting monthly and cumulative monthly milk yields and to estimate heritability of them and its genetic relationships with the 300 days milk yield in the Egyptian buffaloes.

MATERIALS AND METHODS

Lactation records of buffaloes belonging to Mehallet Mousa Experimental Farm, Animal Production Research Institute, Ministry of Agriculture, Egypt, were used in the present study. Data of 893 Lactation records of 281 buffaloes and 21 sires were collected during a period of 10 years started in 1983. Feeding systems and management were as described by Mourad *et al*. (1986) and Khalil (1993).

The ten months milk yields of each buffalo cow were computed and the cumulative monthly milk yield was obtained by adding the milk yields of successive months. Forty buffalo dams were used as parents, and their progeny during the period studied were divided into three generations an the basis of generation interval which is defined as the period between the age of dam at calving and average ages of its offspring when coming to calve.

Data were analysed using the mixed model least squares and maximum likelihood computer program of Harvey (1990) as follows:

$Y_{ijklmn}= U+S_i+P_j+R_k+C_l+G_m+e_{ijklmn}$

Where:

Y_{ijklmn}= an observation related to the traits studied,

U= the population mean,

S_i= the randam effect of the i th sire, i= 1, 2, 3,………, 21;

P_j= the fixed effect of the j th parity, j= 1, 2, ………7;

R_k= the fixed effect of the k th year of calving,

k= 1, 2, ….5 (1=1983-, 2=1985-, …..5= 1991-1993);

C_l= the fixed effect of the l th season of calving, l=1, 2, …4 (1= winter, 2= spring, 3= summer and 4=Autuman);

G_m= the fixed effect of m th generation number, m= Parents, 1, 2 and 3;

e_{ijklmn}= the random error term (N.D.), (O, δ^2e).

The hertability estimates (h^2) for all traits were calculated by paternal half-sib method as: $h^2s= 46^2s/ 6^2s+6^2e$ where 6^2s and 6^2e are sire and error components corresponding. Also standard errors of hertiability and genetic (r_G), (with standard error) phenotypic (r_P) and environmental (r_E) correlations between monthly and cumulative monthly milk yields and 300 days milk yield were calculated using the formulas described by Harvey (1990).

RESULTS AND DISCUSSION

The overall mean of 300 days milk yield was 1427.3±474.5kg and maximum monthly milk yield was obtained in the second (214.2kg) and the third (206.2kg) month and then it decreased gradually till the tenth month (42.7kg) of lactation (Table 1). However, the cumulative monthly milk yield increased from the first 30 days to the 300 days of lactation but the rate of change decreased during the same period from 15% to 3% (Table 1). These results were nearly similar to those reported by Mourad *et al.* (1991) and Khalil (1993) while they were lower than those mentioned by Khan and Johar (1988) on first lactation in Murrah buffaloes and Kassab (1990) on Egyptian buffaloes.

Table (1): Actual means (X), standard deviation (±S.D) and Percentages of 300 days milk yield for part lactation milk yield in Egyptian buffaloes.

Months	Monthly M.Y (kg) (X±S.D)	% of 300 day M.Y.	Days	Cumulative M.M.Y (kg) (X±S.D)	% of 300 day M.Y.
1 st	180.2±14.1	12.6	30 Dy	180.2±41.1	12.6
2 nd	214.2±52.9	15.0	60 Dy	394.3±85.2	27.6
3 rd	206.2±53.2	14.4	90 Dy	600.5±128.4	42.1
4 th	192.2±56.2	13.5	120 Dy	792.7±169.9	55.5
5 th	171.3±69.8	12.0	150 Dy	964.0±219.2	67.5
6 th	145.5±78.0	10.2	180 Dy	1109.5±274.1	77.7
7 th	118.4±82.2	8.3	210 Dy	1227.9±330.2	86.0
8 th	91.6±83.3	6.4	240 Dy	1319.6±384.9	92.5
9 th	65.0±77.2	4.6	270 Dy	1384.6±435.2	97.0
10 th	42.7±65.7	3.0	300 Dy	1427.3±474.5	100.0
Overall mean (893)*	1427.3±474.5	%100			

*** = number of records**

Non-genetic factors affecting monthly and cumulative monthly milk yield:

1) Generation number:

There were significant (P<0.05, P<0.01 and P<0.001) effects due to generation number on monthly milk yield in the 1 st, the 2 nd, the 3 rd, the 9 th and the 10 th (Table 2), while it were not significant effect on the 4 th till the 8 th monthly yields of lactation. It is evident that there was a slight progress in monthly milk yield from 1 st to 5 th month of lactation in the favour of the 3 rd generation than parents. However, a depression occurred in the 6 th to 10 th monthly milk yield during the three generations studied than parents.

This may be a result of absence of selection and /or lack of genetic improving programes. Differences due to generation number were significant (P<0.05 or P<0.01) for cumulative monthly milk yield from 30 to 120 days of lactation and not significant from 150 till 300 days of lactation (Table 3).

2) Year of calving:

Differences due to year effects on both of monthly and cumulative monthly milk yield were significant (P<0.05, P<0.01 and P<0.001) as shown in tables 2 and 3. There were fluctuations in monthly and cumulative monthly milk yield with advancing of year of calving. These variations from year to year may be due to mangerial and feeding changes. These results were in agreement with Kassab, 1990, Mourad *et al.;* 1991, Khalil *et al.;* 1992 and Khalil; 1993, Who found that year of calving significantly affect the cumulative monthly milk yield at 60, 90, 180 and 305 day milk yield in Egyptian buffaloes, while Singh and Yadav (1987) found that year of calving showed no significant effect on monthly milk yield of the first lactation in Murrah and Nili Ravis buffaloes.

3) Season of calving:

However, monthly and cumulative monthly milk yield were in favour of spring and autumn calvers than those of winter and summer but the differences were not significant (Tables 2 and 3). These results may be due to that, in spring and autumn, green fodder and milder weather are available, indicating that temperature and feeding could be the main factors responsible for seasonal variation affecting the performance of Egyptian buffaloes.

These results were similar to that reported by Khalil *et al.* (1992) who they found that season had no significant effects on 90 and 180 days milk yield. Also, Singh and Yadav (1987) and Khan and Joher (1988) indicated that monthly or cumulative monthly milk yield were not significantly affected by season of calving, in first lactation in Murrah and Nili buffaloes. On the other hand, Kassab (1990), Mourad *et al.* (1991) and Khalil (1993) found that season showed significant effect on 60, 90, 180 and 305 days milk yield in Egyptian buffaloes.

Table 2: Least-squares and standard errors (X±S.E) of sire, generation number, year of calving, season of calving and parity affecting monthly milk yield in Egyptian buffaloes.

Factors	No.	Monthly milk yield (kg.)				
		1 st X±S.E.	2 nd X±S.E.	3 rd X±S.E.	4 th X±S.E.	5 th X±S.E.
Overall	893	180.4 ±3.1	216.1±.3.9	209.9±4.6	195.7±4.9	172.6±6.6
Sire		*	*	**	***	***
Generation number:		**	**	*	Ns	ns
Parents	40	168.4±6.9	214.9±8.9	210.2±9.2	195.0±9.8	171.2±12.6
1	130	180.5±4.3	210.8±5.5	204.3±6.1	195.0±6.4	170.6±8.4
2	218	183.9±3.6	213.5±4.6	207.8±5.2	193.1±5.6	172.7±7.3
3	505	188.6±3.2	225.4±4.0	217.3±4.7	199.6±5.0	175.7±6.7
Year of calving:		***	***	***	***	*
83-	126	193.6±5.9	231.1±7.7	225.6±8.0	203.9±8.6	164.3±11.0
85-	215	170.8±4.5	204.4±5.8	193.5±6.3	179.3±6.7	157.5±8.8
87-	217	172.7±3.9	213.4±5.1	209.8±5.6	201.2±5.9	182.3±7.8
89-	213	179.4±3.8	210.8±4.9	202.8±5.5	193.6±5.8	175.5±7.6
91-93	122	185.3±4.7	221.1±6.0	217.8±6.5	200.4±6.9	183.2±8.9
Season of calving:		ns	Ns	ns	Ns	ns
Winter	169	177.4±4.2	214.8±5.4	208.9±5.9	193.4±6.3	170.1±8.3
Spring	297	182.9±3.6	218.9±4.6	207.4±5.2	196.6±5.5	172.8±7.3
Summer	213	178.6±3.9	214.2±4.9	209.3±5.5	193.1±5.9	170.9±7.7
Autumn	214	182.5±3.9	216.6±4.9	213.9±5.5	199.7±5.9	176.4±7.7
Parity:		***	***	***	*	ns
1 st	200	158.5±4.6	192.4±5.9	188.9±6.4	175.7±6.8	158.9±8.9
2 nd	200	172.4±4.1	205.8±5.3	196.7±5.9	185.9±6.2	166.3±8.1
3 rd	172	179.0±4.2	215.9±5.4	213.4±5.9	197.4±6.4	176.3±8.3
4 th	126	192.9±4.6	232.1±5.9	224.1±6.5	204.2±6.9	174.6±8.9
5 th	82	188.8±5.4	222.1±6.9	208.5±7.4	194.8±7.8	169.3±10.1
6 th	52	185.6±6.4	219.7±8.4	221.4±8.7	203.0±9.3	175.5±11.9
7 th	61	185.2±6.5	224.9±8.5	216.2±8.8	208.5±9.4	187.2±12.0

ns= non-significant, *= P<0.05, **= P<0.01 ***= P<0.001

Table 2. Cont

Factors	No.	Monthly milk yield (kg.)				
		6 th X±S.E.	7 th X±S.E.	8 th X±S.E.	9 th X±S.E.	10 th X±S.E.
Overall	893	144.5±7.4	114.2±8.1	88.6±7.3	64.8±5.9	44.4±4.9
Sire		***	***	***	*	*
Generation number:		n.s	n.s	n.s	***	**
Parents	40	148.2±14.1	121.2±15.1	105.8±14.9	91.6±13.2	65.4±11.2
1	130	139.3±9.4	104.9±10.2	74.3±9.7	43.9±8.2	30.3±6.9
2	218	144.2±8.2	116.2±8.9	86.7±8.3	65.1±6.9	45.3±5.8
3	505	146.4±7.5	114.4±8.2	87.4±7.5	58.7±6.0	36.5±5.0
Year of calving:		*	***	***	***	***
83-	126	123.9±12.4	84.9±13.3	62.1±12.9	36.2±11.4	22.4±9.7
85-	215	136.6±9.9	110.7±10.6	86.2±10.1	66.9±8.7	46.5±7.3
87-	217	159.9±8.8	134.9±9.6	113.1±8.9	90.6±7.5	59.7±6.3
89-	213	150.9±8.6	120.4±9.4	93.4±8.7	65.4±7.3	43.9±6.1
91-93	122	151.2±10.1	120.0±10.9	87.9±10.4	64.9±8.9	49.5±7.6
Season of calving:		n.s	n.s	n.s	n.s	n.s
Winter	169	143.7+9.3	106.7+10.1	80.8±9.5	59.5±8.1	42.9±6.8
Spring	297	146.2+8.2	119.5+8.9	92.4±8.3	70.7±6.9	46.6±5.8
Summer	213	142.1+8.7	115.5+9.4	89.2±8.8	63.8±7.4	45.3±6.2
Autumn	214	146.1+8.7	115.1+9.4	91.9±8.8	65.3±7.4	42.7±6.2
Parity:		n.s	n.s	n.s	n.s	n.s
1 st	200	139.4±9.9	122.1±10.8	96.0±10.3	68.7±8.8	42.9±7.4
2 nd	200	138.4±9.1	112.7±9.9	90.7±9.3	66.3±7.9	46.9±6.7
3 rd	172	150.4±9.3	117.5±10.1	94.2±9.5	72.8±8.1	54.4±6.8
4 th	126	145.1±10.1	113.8±10.8	83.9±10.3	62.2±8.9	44.6±7.5
5 th	82	141.6±11.4	110.3±12.2	89.3±11.8	64.1±10.3	46.9±8.7
6 th	52	136.2±13.3	100.9±14.3	78.5±13.9	51.9±12.4	30.7±10.5
7 th	61	160.7±13.5	121.9±14.5	87.2±14.2	67.9±12.5	44.2±10.7

ns= non-significant, *= P<0.05, **= P<0.0 ***= P<0.001

4) Parity:

The monthly milk yields from the 1 st month to the 4 th month increased significantly (P<0.05 or P<0.01) as parity advanced till the 4 th parity and then decreased. However, differences due to parity in monthly milk yield from the 5 th month to the 10 th month were not significant (Table 2). On the opposite side, parity affects significantly (P<0.05 or P<0.001) cumulative monthly milk yield till the 210 days of lactation while it's effects on those of 240, 270 and 300 days were not significant.

The cumulative monthly milk yield from 30 to 150 days tend to increase till the 4 th parity and then decreased while cumultive monthly milk yield from 180 to 300 days had the highest mean for the 7 th parity. Highly significant effect of parity on 60, 90, 180 and 305 days milk yield was found by many workers (Kassab; 1990, Mourad *et al*.; 1991 and Khalil, 1993).

These variations, in monthly and cumulative monthly milk yield among parities are probably due to the managerial factors, mainly nutrition and climatological factors, in addition, advance of age in buffaloes, weight and the udder development may be also effective factors in such variation.

Genetic aspects:

1) Sire effect:

Sire differences in all monthly and cumulative monthly milk yield (Tables 2 and 3) were significant ((P<0.05, P<0.01 and P<0.001) which reflect the importance of sire selection in the genetic improvement of such traits. Mourad *et al.* (1991) and Khalil (1993) found that sire had significant effect on 90, 180 and 305 days milk yield in Egyptian buffaloes and the same result was observed by Jain *et al.* (1985) in first lactation on buffaloes.

2) Heritability:

The h^2 estimates for monthly and cumulative monthly milk yield were found to be low, and ranged between 0.06 and 0.19 (Table 4). It's estimates for monthly milk yield of the 4 th, 5 th and 6 th month showed the highest (0.14-0.16) and those of cumulative monthly milk yield of 210 and 240 days both gave an estimate of 0.19. These estimates were higher than those obtained by Mourad *et al* .(1991) and Khalil (1993) who gave estimates ranged from 0.034 to 0.116, but were less than that obtained by Jain *et al*. (1986) and Verma *et al* .(1989) on Indian buffaloes in 1 st lactation.

Table 3: Least-squares and standard errors (X±S.E) of sire, generation number, year of calving, season of calving and parity affecting cumulative monthly milk yield in Egyptian buffaloes..

Factors	No.	Cumulative Monthly milk yield (kg.)				
		30 day X±S.E.	60 day X±S.E.	90 day X±S.E.	120 day X±S.E.	150 day X±S.E.
Overall	893	180.4±3.1	396.5±6.4	606.4±9.9	802.1±14.2	974.6±20.3
Sire		*	*	**	***	***
Generation number:		**	**	**	*	ns
Parents	40	168.4±6.9	383.4±14.2	593.6±21.5	788.6±28.9	959.8±38.5
1	130	180.5±4.3	391.3±8.9	595.6±13.6	790.6±18.8	961.3±25.9
2	218	183.9±3.6	397.4±7.4	605.1±11.5	798.2±16.1	970.9±22.6
3	505	188.6±3.2	413.9±6.5	631.3±10.2	830.9±14.5	1006.6±20.7
Year of calving:		***	***	***	***	***
83-	126	193.6±5.9	424.7±12.2	650.3±18.6	854.2±25.2	1018.5±33.8
85-	215	170.8±4.5	375.2±9.4	568.6±14.3	747.9±19.7	905.4±26.9
87-	217	172.7±3.9	386.1±8.1	595.9±12.5	797.1±17.4	979.4±24.1
89-	213	179.4±3.8	390.2±7.9	593.0±12.2	786.7±16.9	962.2±23.6
91-93	122	185.3±4.7	406.3±9.7	624.2±14.8	824.5±20.2	1007.7±27.6
Season of calving:		ns	ns	ns	ns	ns
Winter	169	177.4±4.2	392.2±8.7	601.0±13.4	794.4±18.5	964.6±25.4
Spring	297	182.9±3.6	401.9±7.4	609.3±11.5	805.9±16.1	978.6±22.6
Summer	213	178.6±3.9	392.8±7.9	602.1±12.3	795.2±17.1	966.2±23.8
Autumn	214	182.5±3.9	399.2±7.9	613.1±12.3	812.9±17.1	989.2±23.8
Parity:		***	***	***	***	***
1 st	200	158.5±4.6	350.9±9.5	539.9±14.5	715.6±19.9	874.5±27.3
2 nd	200	172.4±4.1	378.2±8.5	574.9±13.1	760.9±18.1	927.2±25.0
3 rd	172	179.0±4.2	394.9±8.7	608.4±13.4	805.8±18.5	982.1±25.5
4 th	126	192.9±4.6	425.1±9.6	649.2±14.7	853.4±20.1	1027.9±27.5
5 th	82	188.8±5.4	410.9±11.1	619.3±16.9	814.2±22.9	983.4±31.0
6 th	52	185.6±6.4	405.3±13.3	626.7±20.2	829.7±27.2	1005.2±36.4
7 th	61	185.2±6.5	410.2±13.5	626.4±20.5	834.9±27.6	1022.1±36.8

ns= non-significant, *= P<0.05, **= P<0.01 ***= P<0.001

Table 3. Cont

Factors	No.	Cumulative Monthly milk yield (kg.)				
		180 day X±S.E.	210 day X±S.E.	240 day X±S.E.	270 day X±S.E.	300 day X±S.E.
Overall	893	1119.2±26.9	1233.4±34.3	1321.9±40.3	1386.7±44.5	1431.1±48.1
Sire		***	***	***	***	***
Generation number:		ns	ns	ns	ns	ns
Parents	40	1108.0±49.3	1229.2±60.8	1334.9±71.3	1426.6±80.0	1492.0±87.0
1	130	1100.6±33.6	1205.5±42.2	1279.9±49.5	1323.7±55.0	1354.0±59.7
2	218	1115.1±29.7	1231.3±37.6	1318.0±44.0	1383.1±48.8	1428.5±52.9
3	505	1152.9±27.3	1267.4±34.5	1354.8±40.9	1413.5±45.1	1450.1±48.8
Year of calving:		**	***	**	***	***
83-	126	1142.5±43.4	1227.4±53.7	1289.5±62.9	1325.7±70.6	1348.1±76.7
85-	215	1042.0±34.9	1152.7±43.8	1238.9±51.3	1305.8±57.2	1352.3±62.1
87-	217	1139.4±31.5	1274.3±39.7	1387.4±46.6	1478.1±51.8	1537.7±56.1
89-	213	1113.0±30.9	1233.5±38.9	1326.9±45.7	1392.3±50.7	1436.2±54.9
91-93	122	1158.9±35.8	1278.9±44.7	1366.9±52.5	1431.9±58.5	1481.3±63.5
Season of calving:		ns	ns	ns	ns	ns
Winter	169	1108.3±33.1	1214.9±41.6	1295.7±48.8	1355.1±54.3	1398.1±58.9
Spring	297	1124.8±29.6	1244.3±37.5	1336.7±43.9	1407.4±48.8	1454.1±52.8
Summer	213	1108.3±31.1	1223.8±39.2	1313.0±45.9	1376.8±51.0	1422.1±55.3
Autumn	214	1135.3±31.1	1250.4±39.3	1342.3±46.1	1407.7±51.2	1450.3±55.4
Parity:		***	*	ns	ns	ns
1 st	200	1013.8±35.3	1135.9±44.2	1231.9±51.9	1300.6±57.8	1343.6±62.7
2 nd	200	1065.6±32.6	1178.3±41.0	1269.0±48.1	1335.3±53.5	1382.2±58.0
3 rd	172	1132.5±33.2	1250.1±41.7	1344.2±48.9	1416.9±54.4	1471.4±59.0
4 th	126	1173.1±35.6	1286.8±44.5	1370.8±52.2	1432.9±58.2	1477.6±63.2
5 th	82	1124.9±39.9	1235.3±49.7	1324.6±58.31	1388.6±65.2	1435.6±70.8
6 th	52	1141.4±46.6	1242.3±57.6	1320.9±67.5	1372.7±75.7	140.3.4±82.3
7 th	61	1182.9±47.2	1304.8±58.3	1392.0±68.3	1459.9±76.7	1504.1±83.4

ns= non-significant, *= P<0.05, **= P<0.01 ***= P<0.001

The h^2 estimates of monthly and cumulative monthly milk yield in the present study revealed that the estimates of h^2 of cumulative monthly milk yields in first 210 days of lactation and monthly milk yield at the 5 th, 6 th and 7 th month were higher than those of first six months of lactation. This indicates that the genetic variation in the cumulative monthly milk yield in the first 210 days or monthly milk yield at the 7 th month was the highest as compared to those in the first six months of lactation. Evidenty the milk yield in the early months of lactation was more influenced by the temporary environment. Thus, selection on the basis of 210 days cumulative monthly milk yield could be expected to be as effective as selection on the basis of complete lactation yield.

3) Genetic, Phenotypic and environmental correlations:

Genetic correlation (r_G) between monthly milk yield and 300 day milk yield ranged from 0.43 to 1.09. Also, those between cumulative monthly milk yield and 300 day milk yield ranged from 0.43 to 1.05 (Table 4). It could be observed that estimates of r_G between each of monthly milk yield at the 3 rd and the 4 th month and cumulative monthly milk yield at 90 and 120 days and 300 days milk yield were positive and higher (1.02-1.09), while those between the 1 st month or 30 days milk yield and 300 days milk yield (Table 4) was slightly low (0.43), which indicate that selection based on cumulative monthly

Table (4): Estimates of hertability (h^2±S.E), genetic (r_G±S.E), phenotypic (r_P) and environmental (r_E) correlations between part lactation milk yield and 300 day milk yield in Egyptian buffaloes.

Traits	h^2±S.E	300 day M.Y.		
		r_G±S.E	r_P	r_E
Monthly milk yield:				
1 st	0.07±0.05	0.43±0.36	0.36	0.35
2 nd	0.06±0.05	0.99±0.19	0.51	0.46
3 rd	0.12±0.07	1.09±0.08	0.63	0.55
4 th	0.12±0.07	1.02±0.06	0.72	0.67
5 th	0.14±0.07	0.97±0.06	0.79	0.76
6 th	0.14±0.07	0.94±0.06	0.84	0.83
7 th	0.16±0.08	1.01±0.03	0.86	0.83
8 th	0.11±0.06	0.97±0.06	0.82	0.80
9 th	0.07±0.05	0.84±0.16	0.76	0.77
10 th	0.06±0.05	0.92±0.17	0.64	0.63
Cumulativemilk yield:				
30 Dy	0.07±0.05	0.43±0.36	0.36	0.35
60 Dy	0.07±0.05	0.81±0.23	0.49	0.46
90 Dy	0.08±0.06	1.05±0.12	0.59	0.54
120 Dy	0.11±0.06	1.04±0.07	0.69	0.64
150 Dy	0.15±0.07	0.99±0.05	0.79	0.75
180 Dy	0.17±0.08	0.98±0.03	0.87	0.85
210 Dy	0.19±0.09	0.98±0.02	0.93	0.92
240 Dy	0.19±0.09	0.99±0.01	0.97	0.97
270 Dy	0.18±0.08	0.99±0.00	0.99	0.99
300 Dy	0.18±0.08	-	-	-

milk yield at 90 and 120 days or on monthly milk yield at the 3 rd or the 4 th month of lactation is expected to be effective as selection based on 300 days milk yield. The estimates of r_G between cumulative monthly milk yield and 300 days milk yield in the present study are positive and are nearly similar to those observed by Mourad *et al.* (1991) and Khalil (1993) on Egyptian buffaloes and also, Jain *et al.* (1986), Verma *et al.* (1989) and Iype and Nagarcenkar (1992) on the 1 st lactation of Indian buffaloes. r_P and r_E between monthly or cumulative monthly milk yield and 300 days milk yield were positive and moderate or high ranging between 0.35 and 0.99 (Table 4) this give an indication that improving mangement and environment conditions could lead to an improve of total milk yield in Egyptian buffaloes. Khalil *et al* (1992) found that r_G, r_P and r_E between such traits were positive and high.

CONCLUSIONS

1-Significant effect due to sire on all traits studied confirmed that selection among sires may be effective in improving the milk yield of buffaloes. Besides, environmental factors as management and feeding….etc would be considered.

2-It is evident that selection on the basis of monthly milk yield at the 3 rd and 4 th month or cumulative monthly milk yield at 90 and 120 days could be expected to be as effective as selection on the basis of 300 days lactation yield.

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بعض العوامل الوراثية والغير وراثية المؤثرة على إدرار اللبن الشهرى والتجمعى الشهرى فى الجاموس المصرى

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أجريت الدراسة على 893 سجل لبن خلال الفترة ما بين 1983 وحتى 1993 وذلك على قطيع من 281 جاموسة واستخدم عدد 21 طلوقة فى محطة التربية بمحلة موسى التابعة لمعهد بحوث الإنتاج الحيوانى بوزارة الزراعة .

استخدمت هذه البيانات فى تقدير كمية إدرار اللبن الشهرى والتجمعى والعوامل المؤثرة عليها وكذلك تقدير المكافئ الوراثى لهذه الصفات والارتباط الوراثى والمظهرى والبيئى بينها وبين إدرار 300 يوم.

أوضحت الدراسة ما يلى :

1- أن أعلى إنتاج لكمية الإدرار الشهرى كان خلال الشهر الثالث من الإدرار ثم ينقص تدريجيا حتى الشهر العاشر.
2- كان تأثير عدد الأجيال معنويا على جميع الصفات الإنتاجية المدروسة .
3- ظهر لسنة الولادة تأثير معنوى على جميع الصفات الإنتاجية المدروسة .
4- موسم الولادة له تأثير غير معنوى ووجد أن ولادات الربيع كانت أعلى ادرارا عن باقى المواسم.
5- كان لترتيب موسم الحليب تأثيرا معنويا على الإدرار الشهرى والتجمعى بتقدم الموسم وذلك حتى الموسم الرابع.
6- كان تأثير الطلوقة على جميع الصفات الإنتاجية المدروسة تأثيرا معنويا.
7- وجد أن المكافئ الوراثى موجب ومنخفض لجميع الصفات ويتراوح قيمته ما بين 0.06 إلى 0.19 وكان أعلى مكافئ وراثى 0.19 فى 210 ،240 يوم إدرار.
8- كانت معظم قيم الارتباطات الوراثية موجبة وعالية بين الصفات الإنتاجية وبين 300 يوم إدرار وتراوحت ما بين 0.43 إلى 1.09 .
9- الارتباطات المظهرية والبيئية كانت موجبة وعالية القيمة بين الصفات الإنتاجية المختلفة.

وأوضحت الدراسة أنه يمكن الانتخاب المبكر لإنتاج اللبن خلال 300 يوم إدرار على أساس إنتاج اللبن خلال 90 يوم إدرار أو120 يوم إدرار أو على أساس إنتاج الشهر الثالث أو الرابع .