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COMPARISON BETWEEN SOME PRODUCTIVE AND REPRODUCTIVE TRAITS AND GENETIC PARAMETERS IN THE FIRST THREE LACTATIONS IN EGYPTIAN BUFFALOES.

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ABSTRACT

The objectives of the present study were to estimate mean, heritability, genetic and phenotypic correlations and genetic trend. Data of 1776 records of Egyptian buffaloes, kept at Mehallet Mousa farm, Ministry of Agriculture, during the period from 1972 to 2002 were used to estimate the genetic parameters for productive traits, total milk yield (TMY), 305-day milk yield (305-DMY), lactation period (LP) and dry period (DP) and the reproductive traits were calving interval (CI) and days open (DO). Data were analysed using the software package VCE-6 Groeneveld et al (2010). Averages of TMY, 305-DMY, LP, DP, CI and DO were recorded to be 1057, 1000 kg, 226, 372, 538 and 224 days, respectively. In the first lactation and the corresponding numbers in the second lactation were 1446, 1364 kg, 253, 288, 503 and 188 days but in the third lactation were 1586, 1523 kg, 253, 241, 477 and 160 days. The heritability values estimated for the productive traits in the first three parities were generally low and ranged between 0.03 to 0.19 and the values for reproductive traits were usually close to zero in the second lactation 0.001 and 0.0001, respectively. Genetic and phenotypic correlations in the first parity among all traits studied were positive except the genetic and phenotypic correlation between DP and (TMY, 305- DMY, LP) was negative. Genetic correlation between LP and, (TMY, 305-MY, CI and DO) and between DP and (TMY, 305-MY, CI) were negative in the second parity, also genetic correlation between DP and (TMY, 305-MY, LP) and between 305-MY and (CI, DO), and between TMY and CI were negative in the third parity. Annual genetic trend for milk traits in the first three lactations were negative for TMY, LP, 305-MY, CI and DO and ranged between -3.681 to -22.57 but it was positive for DP and ranged between 1.04 to 1.738.

INTRODUCTION

Buffalo (*Bubalus bubalis*) population in the world is estimated by 172 million head: 168 million are in Asia (97%) and 4 million heads (3%) are in Africa, mainly (2.3%) in Egypt (Borghese, 2011). According to Livestock development sector, Ministry of agriculture (2014) the buffalo population in Egypt about 4,949,262 heads. Buffaloes are an important species from a socioeconomic viewpoint, especially in developing countries, for their meat, milk and working ability. Buffalo milk is characterized by high fat content (7%), protein and total solids contents, thus reaching high yields in dairy products manufacturing and high revenues for the producers. However, selection for increasing milk production causes decline in milk quality and livestock reproductive efficiency. Heritability, as well as genetic and phenotypic correlations of productive traits are necessary for planning and choosing the proper techniques for genetic improvement of buffaloes. The aim of the present study was to obtain the estimation of mean, heritability, genetic, phenotypic correlations coefficients and genetic trend between the above-mentioned traits in the first three lactations in dairy buffaloes.

MATERIALS AND METHODS

A total of 1776 normal lactation records of Egyptian buffaloes kept at Mehaleet Mousa farm, Animal Production Research Institute, Ministry of Agriculture, Egypt, during the period from 1972 to 2002. Animals were kept in open sheds all the year. They were grazed on Egyptian clover berseem (*Trifolium Alexandrinum*), during December to May. During the rest of the year, the animals were fed limited amounts of berseem hay. Buffaloes are hand milked twice daily and they dried off two months before the calving date and they served not before two months after calving. Heifers were served for the first time when they reach 330 kg / or 24 months. Traits studied are total milk yield (TMY), 305-day milk yield (305-d MY), lactation period (LP) and dry period (DP) where as the reproductive traits are calving interval (CI) and days open (DO).

Statistical Analysis

Data for each parity were analyzed using the software package VCE-6 (Groeneveld et al , 2010), using multiple analysis animal model. The model of statistical analysis for productive trait were used to determine variance and (Co)variance components, which included month and year of calving as a fixed effects and age at calving and days open was represented as a fixed covariate, and the additive direct genetic effect of animal and error as random effects. The same model was used to analyze the reproductive traits except days open which was replaced by total milk yield as covariate. The basic multiple model was as follows:

$$Y = X\beta + Za + e$$

Where:

Y = a vector of observations, β = is a vector of fixed effect, a = vector of direct genetic effects, and e = vector of residual effects. X and Z are incidence matrices relating records to fixed genetic effects, respectively.

The estimated breeding values (EBVs) for all animals using (co)variances obtained by multi trait animal model for each separate parities. The genetic trend was obtained by regression of the breeding value for animal on the year of calving.

RESULTS AND DISCUSSION

Unadjusted number of records, means, standard deviations (SD) and coefficient of variation (CV%) for productive and reproductive traits in the first three parities are presented in Table1. The present means of TMY and 305-DMY in the first parity were 1057 kg and 1000 kg produced in an average lactation period of 226 days and they were 1446 kg and 1364 kg at an average lactation period of 253 days in the second parity, while they were in the third parity 1586 kg and 1523 kg in an average lactation period of 253 days. In the present study milk yield was lower in the first lactation than the yield in the 2nd and 3rd lactation. The lactation milk yield increased with increasing lactation length.

Table 1: Means, standard deviations (SD) and coefficient of variations (CV%) for productive and reproductive traits in the first three parities of Egyptian buffaloes.

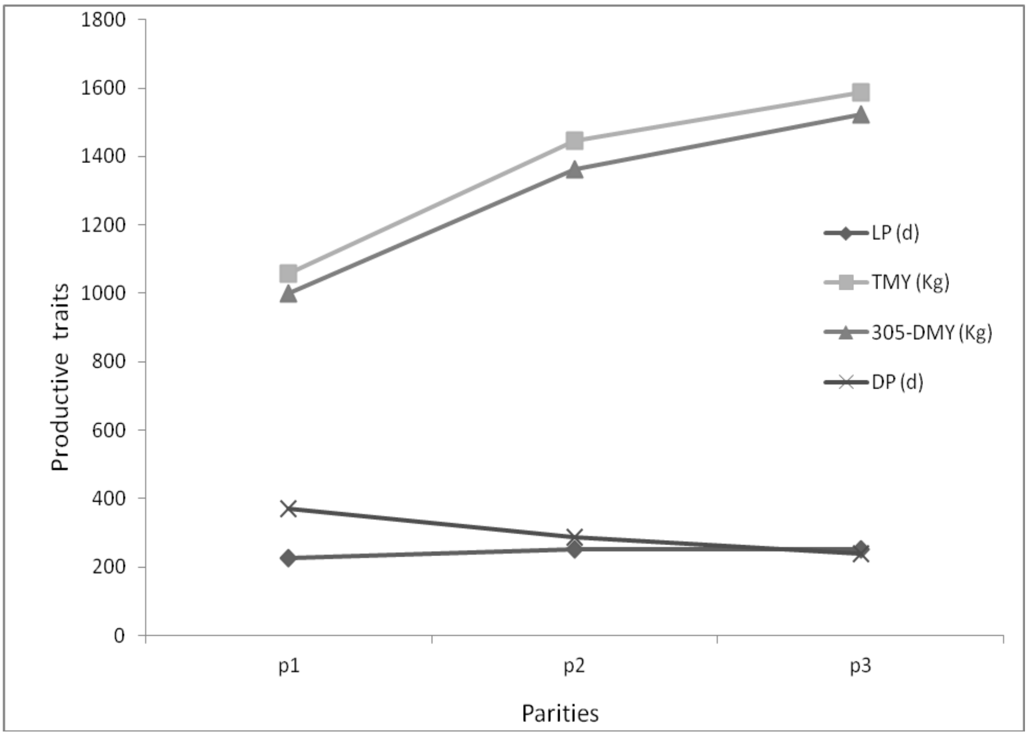
Trait	Parity 1			Parity 2			Parity 3		
	No.	Mean ± SD	CV%	No.	Mean ± SD	CV%	No.	Mean ± SD	CV%
Productive									
TMY (kg)	1259	1057 ± 594	56.2	1123	1446 ± 678	46.9	907	1586 ± 667	42.1
305-DMY(kg)	1259	1000 ± 514	51.4	1123	1364 ± 571	41.9	907	1523 ± 593	38.9
LP (d)	1259	226 ± 113	50.5	1123	253 ± 105	41.5	908	253 ± 98.2	38.9
DP (d)	1593	372 ± 166	44.8	1237	288 ± 143	49.9	894	241 ± 120	49.9
Reproductive									
CI (d)	1593	538 ± 138	25.7	1237	502 ± 128	25.5	892	477 ± 113	23.8
DO (d)	1593	224 ± 141	63.2	1237	188 ± 127	68.2	892	160 ± 115	72.1

TMY= Total milk yield (kg) **305-DMY= 305- day milk yield (kg)** **LP= Lactation period (d)**
CI= Calving interval (d) **DO= Days open (d)** **DP= Dry period (d)**
SD= standard deviations **CV= coefficient of variation**

The present mean of TMY in the second and third lactation was higher than that of Mourad and Khattab (2009) 1427 kg in an average 305-DMY in Egyptian buffaloes. While the present means of TMY and 305-DMY were lower than those estimates reported by Hitesh *et al* (2012) with Nili-Ravi buffaloes who found that the average of total milk yield and 305-DMY were 2231 kg 2148 kg, respectively. Higher yield than that noted in the present study has been reported by Afzal et al (2007). They found that the value of TMY 1832 kg in lactation period of 273 days were rewarded in Nili-Ravi buffaloes. Better feeding and longer lactation might be possible reasons for these differences. The mean values for DP, CI and DO were 372, 538 and 224days respectively in the first lactation and the corresponding values in the second lactation were 288, 502 and 188 days, respectively but in the third lactation those values were 241, 477 and 160 days, respectively. The results of Thiruvenkadan *et al* (2010) were in agreement with these results, where these authors reported that the means of service period, calving interval and dry period in Murrah buffaloes were 254, 560 and 251 days, respectively. However, the present means of DO and CI were higher than that of results of Marai et al (2009) who reported that the values of DO and CI were, 92 days and 403 days, respectively. Figure1 showed that the mean values for the productive traits in the first three parties and where as Figure 2 showed the mean values for the reproductive traits in the first three parties. The TMY, 305-day and LP increased up to third parity however, DP, CI and DO decreased with the advancement of parity.

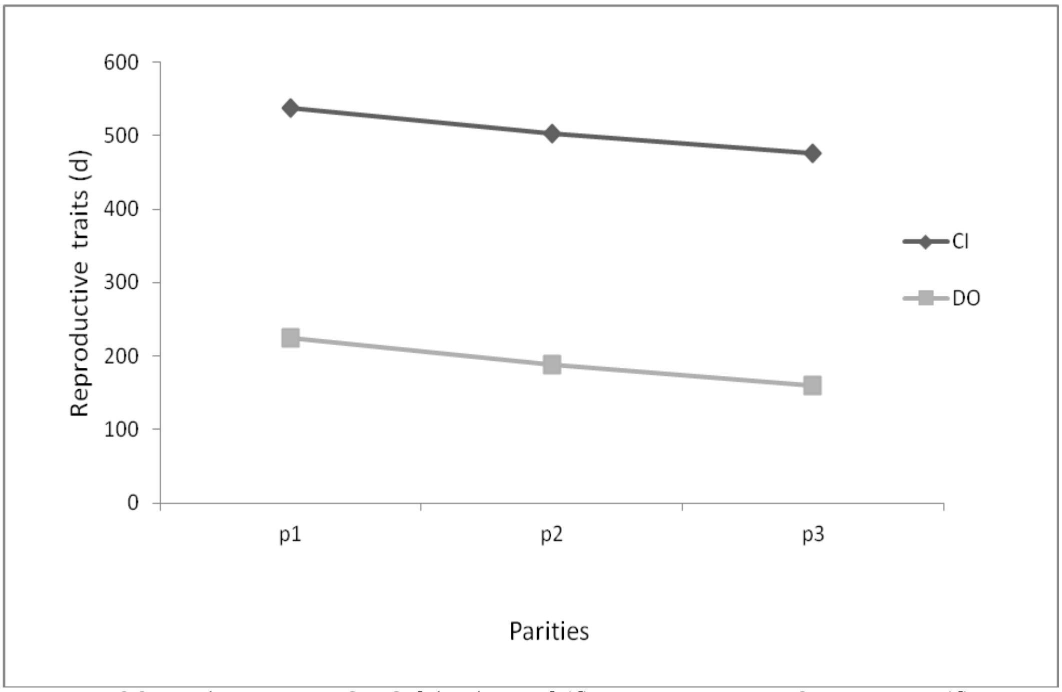
Table 2 shows heritability estimates for productive traits across all lactations were low and ranged between 0.03 to 0.19. These results indicate that the variation of these traits is due to environmental differences among individuals and, therefore, improving management and feeding could also improve the traits. Heritability estimate for TMY trait in all three lactation were lower than the estimate obtained by Tonhati et al (2000), Badran *et al* (2005), Seno *et al* (2010), Malhado et al (2013) and Barros *et al* (2014) which were 0.38, 0.58, 0.20, 0.28 and 0.31, respectively.

The value of TMY in the first lactation (Table 2) has the same magnitude that those estimated by Rosati and Van Vleck (2002) and higher than that verified by Zinvand *et al* (2010) which was 0.07. The lactation period displayed a moderate estimate of heritability in the first and second lactation (0.17and 0.19) suggesting that this trait responds reasonably well to selection. The value for LP in the third lactation obtained 0.08 was similar to value reported by Barros *et al* (2014). Heritability values for DP trait in the first and 3rd lactation were almost the same as reported by Thevamanoharan *et al* (2002) which was 0.07 but it was lower than estimate obtained (0.13) by Aziz et al (2001). The heritability values estimated for reproductive traits calving interval and days open are usually close to zero in the second lactation 0.001 and 0.0001, respectively which indicated that much of the variation of these traits is due to environmental differences among individuals, therefore improving management and feeding could also improve the trait indices. Heritability estimates were generally low for the all traits studied in the different parities. The heritability estimates obtained in this study are in agreement with those reported by Aziz *et al* (2001), Thevamanoharan *et al* (2002), Ramos et al (2006) and Morammazi *et a*l (2007) for different breeds of buffaloes. They also reported low heritability estimates for calving interval the values were 0.07, 0.04, 0.02 and 0.085, respectively.



P1,2,3 = parity TMY= Total milk yield (kg) 305-DMY= 305- day milk yield (kg) LP= Lactation period (d) DP= Dry period (d)

Figure 1: Means for productive traits in the first three parities.



P1,2,3 = parity CI= Calving interval (d) DO= Days open (d)

Figure 2: Means for reproductive traits in the first three parities.

Table 2: Heritability estimates and standard errors for productive and reproductive traits in first three parities of Egyptian buffaloes.

Trait	Parity 1	Parity 2	Parity 3
TMY (kg)	0.14±0.04	0.14±0.06	0.16±0.1
305-DMY(kg)	0.10±0.04	0.15±0.06	0.18±0.1
LP(d)	0.17±0.04	0.19±0.07	0.08±0.1
DP(d)	0.08±0.03	0.03±0.02	0.07±0.1
CI(d)	0.08±0.03	0.001±0.8	0.06±0.06
DO(d)	0.07±0.03	0.0001±0.3	0.07±0.06

Table 3 shows the genetic and phenotypic correlations among studied traits. The estimates of genetic correlations for various production and reproductive traits in the first parity in the present study ranged from 0.20 to 0.99. The genetic correlation between the traits 305-MY and TMY was high and positive 0.99. Similar results were obtained by Badran *et al* (2005) they found high and positive genetic correlation between the traits 305-MY and TMY 0.96. Therefore, direct selection suggested that increase 305-MY would also increase TMY. The same results between the traits days open and calving interval 0.99. The genetic correlation between the traits MY and lactation length (LP) was high and positive 0.81. Malhado *et al* (2009) reported a similar result, 0.89. Genetic correlation between DP and TMY, LP and 305-MY were negative -0.58, -0.58 and -0.55, respectively. These results show that the selection process of any of these traits is independent which indicated that selection for TMY, LP and 305-MY has no impact on dry period.

Phenotypic correlation among all traits studied are positive except the phenotypic correlation between DP and TMY, 305- DMY, LP which were negative -0.491, -0.479 and -0.518, respectively. These results are in agreement with Badran *et al* (2005) they found negative phenotypic correlation between DP and LMY, 305- DMY, LL which were -0.07, -0.04 and -0.07, respectively. Also, Aziz *et al* (2001) reported a similar result between DP and LP which was -0.37.

Table 3: Genetic correlations (above diagonal), phenotypic correlations (below diagonal) for productive and reproductive traits in the first parity of Egyptian buffaloes.

Trait	LP	TMY	305-DMY	CI	DO	DP
LP (d)		0.81±0.06	0.71±0.09	0.55±0.13	0.53±0.14	-0.58±0.17
TMY(kg)	0.883		0.99±0.01	0.32±0.13	0.31±0.14	-0.58±0.17
305-DMY(kg)	0.813	0.965		0.23±0.13	0.20±0.14	-0.55±0.16
CI (d)	0.239	0.166	0.114		0.99±0.01	0.35±0.19
DO (d)	0.257	0.185	0.135	0.931		0.36±0.19
DP (d)	-0.518	-0.491	-0.479	0.624	0.655	

Table 4 shows the genetic and phenotypic correlations among studied traits in the second parity. The genetic correlation between the traits 305-MY and TMY was high and positive (0.43). Therefore, direct selection to increase 305-MY would also increase TMY. Genetic correlation between LP and, TMY, 305-MY, CI and DO were negative -0.98, -0.59, -0.63, and -0.22 respectively. Also genetic correlation between DP and TMY, 305-MY, CI were negative -0.23, -0.40 and -0.76, respectively. This result shows that the selection process for any of these traits is independent that which indicated that selection for TMY, 305-MY, and CI has no impact on dry period. Phenotypic correlation among all traits studied is positive except the phenotypic correlation between LP and (TMY, 305- DMY, CI, DO). The phenotypic correlation between DP and (TMY, 305-MY, CI) and phenotypic correlation between DO and CI were negative.

Table 4: Genetic correlations (above diagonal), phenotypic correlations (below diagonal) for productive and reproductive traits in the second parity of Egyptian buffaloes.

Trait	LP	TMY	305-DMY	CI	DO	DP
LP (d)		-0.98±0.002	-0.59±0.007	-0.63±0.02	-0.22±0.01	0.29±0.01
TMY(kg)	-0.968		0.43±0.01	0.55±0.02	0.19±0.01	-0.23±0.01
305-DMY(kg)	-0.578	0.531		0.68±0.02	0.24±0.01	-0.40±0.01
CI (d)	-0.697	0.673	0.793		-0.34±0.03	-0.76±0.01
DO (d)	-0.209	0.203	0.237	-0.074		.29±0.01
DP(d)	0.284	-0.268	-0.414	-0.654	0.376	

The genetic and phenotypic correlations among studied traits in the third parity are presented in Table 5. The estimates of genetic correlations for various production traits in the third parity in the present study ranged between -0.03 to 0.99. The genetic correlation between the traits 305-MY and total milk yield (TMY) was high and positive 0.98. Therefore, direct selection to increase 305-MY would also increase TMY. Also, genetic correlation between the traits DO and CI was high and positive 0.99. On the other hand, genetic correlation between DP and (TMY, 305-MY, LP) were negative being -0.60, -0.63 and -0.48, respectively. Also, genetic correlation between 305-MY and both CI and DO and genetic correlation between TMY and CI were negative. These results showed that the selection process for any of these traits is independent, that is, selection for TMY, LP, 305-MY has no impact on dry period.

Phenotypic correlation among all traits studied is positive except the phenotypic correlation between DP and TMY, 305- DMY, LP were negative.

Table 5: Genetic correlations (above diagonal), phenotypic correlations (below diagonal) for productive and reproductive traits in the third parity of Egyptian buffaloes.

Trait	LP	TMY	305-DMY	CI	DO	DP
LP (d)		0.66±0.11	0.61±0.13	0.36±0.27	0.45±0.25	-0.48±0.23
TMY(kg)	0.832		0.98±0.01	-0.03±0.26	0.01±0.23	-0.60±0.18
305-DMY(kg)	0.766	0.970		-0.12±0.24	-0.08±0.23	-0.63±0.17
CI (d)	0.378	0.237	0.165		0.99±0.01	0.64±0.21
DO (d)	0.376	0.236	0.166	0.986		0.57±0.22
DP(d)	-0.540	-0.518	-0.524	0.555	0.565	

Estimated of annual genetic trend for milk traits studied are presented in Table 6 Annual genetic trend for milk traits in the first three lactations were negative for TMY, LP, 305-MY, CI and DO and ranged between -3.681 to -22.57 but it was positive for DP and ranged between 1.04 to 1.738. Similar results were obtained by Khattab and Mourad (1992). They reported that the genetic trend for TMY and LP in all Mehallet Mousa farms from 1966 to 1987 were -1.60 kg and -0.40 days respectively. Similarly, Khan (1998) also reported a negative genetic trend for a different data set on Nili-Ravi buffaloes in Pakistan. Also, Fooda *et al* (2010) arrived the same results on another set of Egyptian buffaloes. Due to negative genetic trend the genetic improvement in milk yield as expected could not be attained through selection.

Table 6: Estimates of genetic trends for studied traits in the first three lactations of Egyptian Buffaloes.

Trait	Parity 1	Parity 2	Parity 3
LP (d)	-6.55	-6.072	-5.456
TMY (kg)	-15.80	-22.57	-18.83
305-DMY (kg)	-8.76	-12.01	-11.99
CI (d)	-5.801	-4.523	-3.777
DO (d)	-5.658	-4.409	-3.681
DP (d)	+1.04	+1.738	+1.673

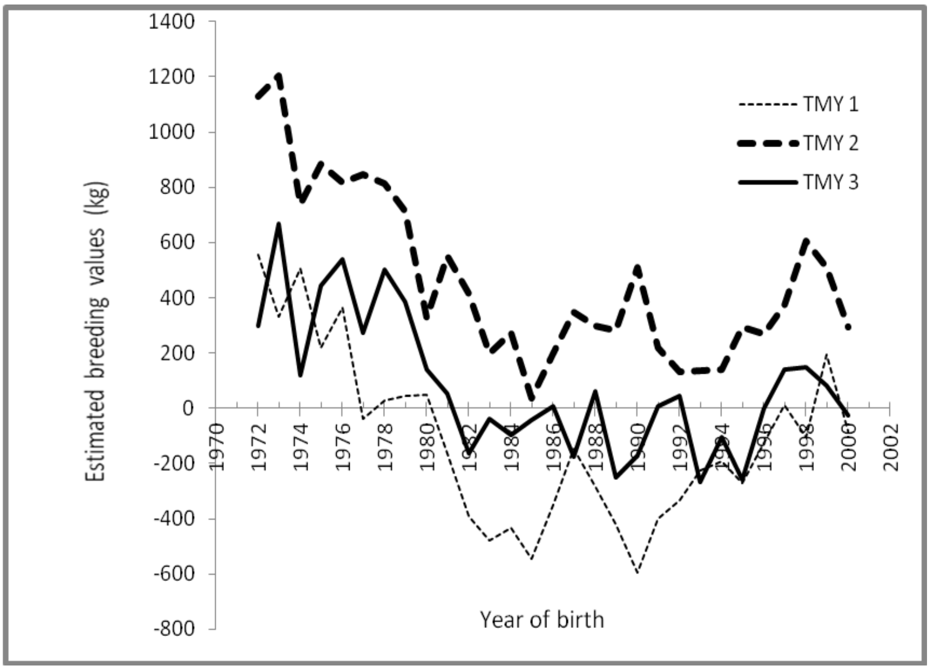


Figure 3: Genetic trend for milk yield in the first three parities.

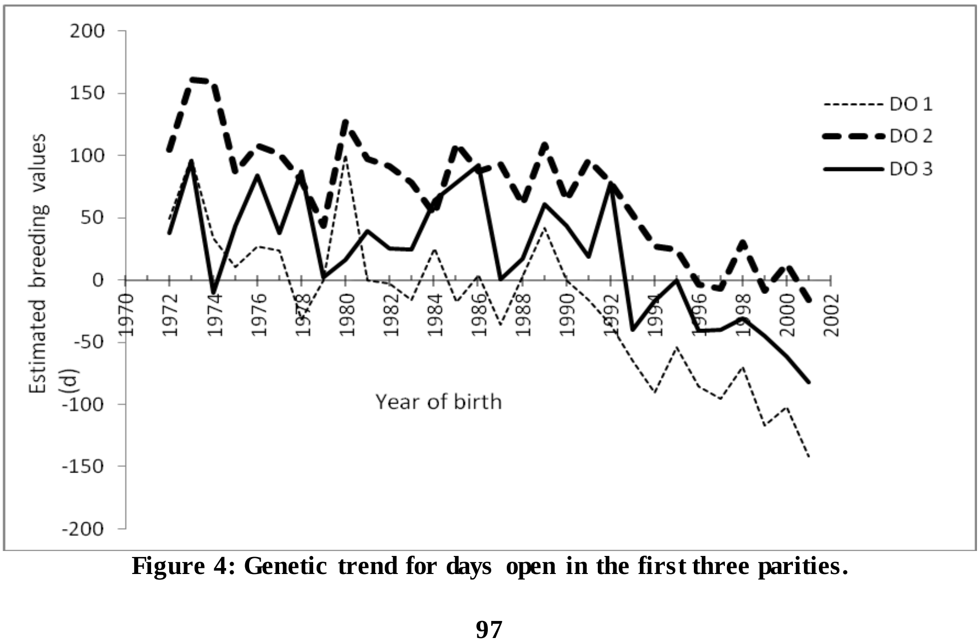


Figure 4: Genetic trend for days open in the first three parities.

The over all genetic trends (Figure 3) with various ups and downs during different years depicted a negative trend. Similarly to this, Khan (1998) reported a negative genetic trend for a different data set on Nili Ravi Buffaloes in Pakistan.

CONCLUSIONS

Heritability estimate for milk yield suggests that this trait would respond to the selection programme which suggested that the importance of genetic-environmentally interaction effect in all milk production traits.

REFERENCES

Afzal, M; Anwar, M. and Mirza, M.A. (2007). Some factors affecting milk yield and lactation length in Nili-Ravi buffaloes. Pakistan Vet. J., 27(3): 113 -117.

Aziz, M.A.; S.J. Schoeman; G.F. Jordaan; O.M. El-Chafie and A.T. Mahdy (2001). Genetic and phenotypic variation of some reproductive traits in Egyptian buffalo. South African Journal of Animal Science, 31(3): 195-199.

Badran, A.E., El-Barbary, A., Bedeir,L. and Shafie, O.M. (2005). Inbreeding, Genetic and Environmental Effects on The Milk Production Traits In Egyptian Buffaloes. Buffalo Journal 21(1):89-95.

Barros, C. C., Oliveira, D. P., Hurtado-Lugo, N. A., Aspilcueta-Borquis, R. R., and Tonhati, H. (2014). Estimates of genetic parameters for economic traits in dairy buffalo. In 10th World Congress on Genetics Applied to Livestock Production. Asas. pp:٨٠٤ .

Borghese, A. (2011). Situation and Perspectives of Buffalo in the World, Europe and Macedonia. Macedonian Journal of Animal Science 1(2): 281–296.

Fooda, T., Mourad, K.A. and Gebreel, LA. (2010). Phenotypic and genetic trends for milk production in an experiment stations buffalo herd. Proceedings 9th world Buffalo congress Buenos Aires, 21 SuppL, 1: 403-407.

Groeneveld, E., M. Kovač, and N. Mielenz. (2010). VCE User’s Guide and Reference Manual. Version 6.0. ftp://ftp.tzv.fal.de/pub/latest_vce/doc/vce6-manual-3.1-A4.pdf.

Hitesh N. Pawar, G.V.P.P.S. Ravi Kumar, and Raman Narang (2012). Effect of Year, Season and Parity on Milk Production Traits in Murrah Buffaloes. Journal of Buffalo Science., 1(1); 122-125.

Khan, M. S., (1998). Animal model evaluation of Nili Ravi buffaloes. Proc. 6th World Cong. Genet. Appl. Livest. Prod., Armidale, NSW, Australia January 11-16, 1998. Vol.24: 467- 470.

Khattab, A.S and Mourad, Kawther, A. (1992). Estimation of genetic parameters and genetic trends for some milk traits in a herd of Egyptian buffaloes. Egypt. J. Anim. Prod., 29: 33 - 44.

Livestock development sector, Ministry of Agriculture, Cairo, Egypt. (2014) P2.

Malhado, C. H. M., Ramos, A. A., Carneiro, P. L. S., Azevedo, D. M. M. R., Affonso, P. D. M., Pereira, D. G., and de Souza, J. C. (2009). Genetic parameters of reproductive and productive traits in cross-breed water buffaloes in Brazil. Revista Brasileira de Saúde e Produção Animal, 10(4): 830-839.

Malhado, C. H. M., Malhado, A. C. M., Ramos, A. D. A., Carneiro, P. L. S., Souza, J. C. D., and Pala, A. (2013). Genetic parameters for milk yield, lactation length and calving intervals of Murrah buffaloes from Brazil. Revista Brasileira de Zootecnia, 42(8): 565-569.

Marai, I. F. M., Daader, A. H., Soliman, A. M., and El-Menshawy, S. M. S. (2009). Non-genetic factors affecting growth and reproduction traits of buffaloes under dry management housing (in sub-tropical environment) in Egypt. Livestock Research for Rural Development. Volume 21, Article #30. Retrieved December 15, 2015, from http://www.lrrd.org/lrrd21/3/mara21030. htm

Morammazi,S.; R. Vaez Torshizi, Y. Rouzbehan,M.B. Sayyadnejad (2007). Estimates of genetic parameters for production and reproduction traits in Khuzestan buffalos of Iran. J.Anim.Sci. 6 (2), 421-424.

Mourad, M.A. and Khattab, A.S. (2009). A comparison between different selection indices for some productive traits on Egyptian buffaloes. Archiv Tierzuchi. 52(5): 476 - 484.

Ramos, A.A., Malhado, C.H.M., Carneiro, P.L.S., Goncalves, H.C. and Azevedo, D.M. (2006). Phenotypic and genetic characterization of the milk yield and calving interval in buffalo of the Murrah breed. Esquisa Agropecuaria Brasileira, 41 (8): 1261 -1267.

Rosati A. and Van Vleck L. D. (2002). Estimation of genetic parameters for milk, fat, protein and mozzarella cheese production for the Italian river buffalo Bubalus bubalis population. Livestock Production Science 74(2):185–190.

Seno L. O., Cardoso V. L., El Faro L., Sesana R. C., Aspilcueta-Borquis R. R., de Camargo G. M. F. and Tonhati H. (2010). Genetic parameters for milk yield, age at first calving and interval between first and second calving in milk Murrah buffaloes. Livestock Research for Rural Development. Volume 22, Article #38. Retrieved December 15, 2015, from http://www.lrrd.org/lrrd22/2/seno22038. htm

Thevamanoharan, K, Vandepitte, W, Mohiuddin, G., and Javed, K. (2002). Animal model heritability estimates for various production and reproduction traits of Nili-Ravi buffaloes. International J. of Agric. and Biol, 4(3): 357-361.

Thiruvenkadan, A. K., Panneerselvam, S., Rajendran, R., and Murali, N. (2010). Analysis on the productive and reproductive traits of Murrah buffalo cows maintained in the coastal region of India. Applied Animal Husbandry & Rural Development, 3(1), 1-4.

Tonhati H., Vasconcellos F.B. and Albuquerque L.G. (2000). Genetic aspects of productive and reproductive traits in a Murrah buffalo herd in São Paulo, Brazil. Journal of Animal Breeding Genetics 117(5):331-336.

Zinvand B, Farhangfar H, Emamjome Kashan N, and Jafari Khorshidi K. (2010). Estimation of environmental and genetic effects for production traits at buffaloes in Khuzestan Province. In: Proceeding of the 4th Congress on Animal Science, September, Tehran University, Tehran-Karaj, Iran, 2780-2783.

مقارنه بين بعض الصفات الانتاجيه والتناسليه و المعايير الوراثيه خلال الثلاث مواسم الحليب الاولى فى الجاموس المصرى

ناظم عبد الرحمن شلبى ، السعيد زهدى محمد عوده و ياسمين محمد سلام الشرقاوى
قسم إنتاج الحيوان – كليه الزراعه- جامعه المنصوره – رقم بريدى ٣٥٥١٦ المنصوره – مصر.

تهدف هذه الدراسه لتقييم كلا من المتوسط ، المكافىء الوراثى ، الأرتباط الوراثى و المظهرى والقيمه التربويه لبعض الصفات الانتاجيه وهى انتاج اللبن الكلى – انتاج اللبن فى ٣٠٥ يوم- طول موسم الحليب- فتره الجفاف وبعض الصفات التناسليه مثل الفترة مابين ولادتين - فتره التلقيح. استخدم فى هذه الدراسه بيانات سجلات ١٧٧٦ سجل من الجاموس المصرى و التى توجد فى مزرعه محله موسى بمحافظه كفر الشيخ و التى تتبع معهد بحوث الانتاج الحيوانى – وزاره الزراعه، فى الفتره من عام ١٩٧٢ وحتى عام ٢٠٠٢ تم تحليل البيانات بإستخدام برنامج قياس مكونات التباين –الاصدار السادس ٢٠١٠ ، وكانت قيم المتوسطات لكل من الصفات انتاج اللبن الكلى – انتاج اللبن فى ٣٠٥ يوم- طول موسم الحليب- فتره الجفاف - الفترة مابين ولادتين - فتره التلقيح خلال الموسم الاول كما يلى ١٠٥٧، ١٠٠٠ كجم ، ٢٢٦، ٣٧٢، ٥٣٨، ٢٢٤ يوم على التوالى . وكانت فى الموسم الثانى ١٤٤٦، ١٣٦٤ كجم ، ٢٥٣، ٢٨٨، ٥٠٣، ١٨٨ يوم على التوالى . كما كانت فى الموسم الثالث ١٥٨٦، ١٥٢٣ كجم ، ٢٥٣، ٢٤١، ٤٧٧ ، ١٦٠ يوم. وكانت قيم المكافىء الوراثى عامه منخفضه بالنسبه للصفات الانتاجيه خلال الثلاث مواسم الاولى وكانت تتراوح ما بين ٠.٠٣ – ٠.١٩ أما بالنسبه للصفات التناسليه فكانت قريبه من الصفر ٠.٠٠١- ٠.٠٠٠١ على التوالى وذلك فى الموسم الثانى. كان الارتباط الوراثى والمظهرى بين الصفات موجب فيما عدا بعض الصفات التى كان الارتباط بينها سالب. كذلك كانت القيمه التربويه لصفات انتاج اللبن الكلى – انتاج اللبن فى ٣٠٥ يوم- طول موسم الحليب- الفترة مابين ولادتين - فتره التلقيح سالبه خلال الثلاث مواسم الاولى للحليب وتتراوح بين -٣,٦٨١ إلى -٢٢,٥٧ بينما كانت القيمه التربويه موجبه لصفه فتره الجفاف وكانت تتراوح مابين ١,٠٤ إلى ١,٧٣٨ .

وقد أظهرت النتائج أن قياس المكافىء الوراثى لانتاج اللبن يوضح مدى استجابه هذه الصفه فى برنامج الانتخاب والتى بدوره يوضح مدى أهميه التفاعل بين التأثير الوراثى والبيئى على كل الصفات الانتاجيه.