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GENETIC ASPECTS IN SOME GROWTH AND MEASUREMENTS TRAITS IN BALADI BLACK RABBITS

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A total of 109 progeny of 8 sires and 19 dams from a Baladi Black random breed population were used to estimate the heritability and genetic correlations of juvenile growth traits. The traits were individual body weight (BW), body length (BL), chest circumference (CC) and thigh circumference (TC) at 6, 8, 10 and 12 weeks of age. Multi-Trait Derivative-Free Restricted Maximum Likelihood Animal Model (DFREML) was used to estimate the genetic variance components, permanent environmental variation and transmitting ability (BLUP) estimates. Additive genetic variance of body weight traits ranged from 16.7% at 6 weeks to 44.0% at 10 weeks. The heritability estimates ranged from 0.18 to 0.42 for body weights, from 0.25 to 0.63 for body lengths, from 0.23 to 0.62 for chest circumferences and from 0.02 to 0.45 for thigh circumferences. High positive genetic correlation estimates were obtained between most of the traits. The ranges of top 25% of the animals using BW and BL data seemed to increase with age. For CC and TC traits, inconsistent trends were revealed for the top 25% of all data

***Conclusively,** the results revealed moderate to high heritability estimates and positive BLUP estimates for growth traits with a sire replacement rate of 20-25%, and this indicates that selection for growth can be successfully practiced in Baladi Black rabbits.*

Keywords: Rabbits, growth, variance components, heritability and BLUP estimates.

Domestic rabbits are commercially raised in warm regions to serve as an affordable source of meat due to the low cost of feeding and high fecundity and prolificacy. The genetic improvement of rabbits is important in order to increase their contribution to the much-needed animal protein in Egypt. The genetic improvement requires having knowledge on genetic parameters for the economical traits. The development and evaluation of

sound breeding programs depend largely upon accurate knowledge of both environmental and genetic parameters. Environmental effects are responsible for an important portion of the rabbit productivity (Ferraz *et al.,* 1991) and these effects must be considered by researchers in the analysis of their data. Heritability provides information about the genetic nature of a trait and is needed for the genetic evaluation and selection strategies (El-Raffa *et al.,* 2005). The low heritability estimates are accountable for slow rates of genetic responses to selection (Lukefahr *et al.,* 1996). Therefore, the improvement of rabbit productivity depends basically on the heritability estimate of the trait and the relationship between the trait and other traits of economical importance.

The determination of the sources of random environmental variation that influence growth, and can be controlled by management, is required to accurately estimate the amount of genetic variation that can be exploited through selection in rabbit populations. In general, the inclusion of permanent environmental and common litter effects in model of analysis for post-weaning growth and conformational traits leads to accurate estimation of the direct genetic effect since it is associated with considerable reductions in proportion of error in most cases (Youssef *et al.,* 2009).

Therefore, the present study was carried out to estimate the genetic and environmental parameters that influence body weights and body conformation measurements of Baladi Black (BB) at 6, 8, 10 and 12 weeks of age.

منسّق:إلى اليسار

MATERIALS AND METHODS

The growth traits were measured for a Baladi Black rabbit population that is maintained in Sakha Research Station, Animal Production Research Institute, Agricultural Research Center, Dokki, Giza, Egypt, during three successive years from 1985-1987. The growth traits included body weight (BW), body length (BL) which is the distance between the atlas vertebra to the 7^{th} lumber vertebra, chest thoracic circumference (CC) which is the border behind the shoulder-blade and thigh circumference (TC) which is the border in front of the knee-cap (patella) as defined by Pacia *et al. (*1997) and Shahin and Hassan, (2000). All traits were measured at 6, 8, 10 and 12 weeks of age.

Eight sires were mated to 19 dams and a total of 109 progeny were obtained. The breeding does and bucks were separately lodged in individual collective galvanized wire cages arranged back to back in single-tier batteries provided with feeders and automatic nipple drinkers. Houses of does were supplemented with nest boxes at the 25^{th} days after fertile mating. The rabbits were fed on a commercial pellet diet (18% protein, 2.39% crude

fat and 12.8% crude fiber). Feed and water were provided *ad libitum*. Rabbits were weaned at six weeks after birth. Cages were cleaned and disinfected regularly and before each kindling. Through the experimental period, rabbits were medicated and subjected to harmonious managerial and environmental conditions.

Statistical analysis: Data of juvenile body weight and body conformation measurements were analyzed using MTDFREML program of Boldman *et al.* (1995). The variance components were estimated by REML method of VARCOMP procedure (SAS, 1996). The following animal model was applied:

$$Y = Xb + Z_a U_a + Z_c U_c + e$$

Where, Y is the column vector of observation on animal and X, Z_a and Z_c are the incidence matrices relating to the records of the trait, random additive and random common environmental effects,as an uncorrelated random effects (the parity which the animal was born x Dame of animal)respectively. The symbols b, U_a and U_c are the vectors of fixed effect peculiar to sex and parity, animal random additive and common environmental effects respectively, and e is the column vector of random errors. The proportions of additive genetic effects (narrow-sense h^2), common environmental effects (σ^2_c), and error (σ^2_e) as well as animal transmitting abilities (BLUP, predicted animal breeding values) were also estimated by the MTDFREML program. The BLUP values were used to evaluate the animals under the study. The matrix of variance components in MTDFREML program was used to estimate the predicted breeding value (PBV) and its standard error (SE) and accuracy (r^2).

منسّق:إلى اليسار

RESULTS AND DISCUSSION

Growth Performance:

Table 1 presents the growth performance of the Baladi Black rabbits. Body weight averaged 570 g at 6 weeks of age and increased to 1130 g at 12 weeks of age, showing weight gain of 560 g (98%) during the 6-12 wk period. These results are in agreement with the results of Khalil and Afifi (2000), Youssef (2004), Youssef *et al.* (2008; 2009). Body length averaged 20.19 cm at 6 weeks and increased to 27.96 cm at 12 weeks with a length gain of 7.77 cm (38.48%). Also, the chest circumference anf thigh circumference gained 3.43 cm (37.73%) and 2.62 cm (31.38%), respectively. The results of body conformation traits were comparable to those reported by Abdel-Ghany *et al.* (2000a; 2000b), Hassan *et al.* (2001) and Attalah *et al.* (2007). The coefficient of variation in body weights was 33.6% at 6 weeks and slightly decreased to 29.3% at 12 weeks. This could be due to the combination of the effects of common environmental and the genetic factors

Table 1: Growth performance (Mean±SE) of Baladi Black rabbits.

Traits	Number	Means ± S.E	CV, %
Body weight (g) at:			
6 weeks	107	508±1.64	33.6
8 weeks	97	753±2.13	29.0
10 weeks	86	930±3.13	31.6
12 weeks	78	1136±3.74	29.3
Body length (cm) at:			
6 weeks	107	20.19±0.25	13.0
8 weeks	97	23.77±0.27	11.11
10 weeks	86	26.15±0.31	10.94
12 weeks	78	27.96±0.36	11.41
Chest circumference (cm) at:			
6 weeks	107	9.09±0.15	17.02
8 weeks	97	10.56±0.18	16.67
10 weeks	86	11.44±0.20	16.13
12 weeks	78	12.52±0.23	16.06
Thigh circumferences (cm) at:			
6 weeks	107	8.35±0.14	16.80
8 weeks	97	9.43±0.15	15.60
10 weeks	86	10.26±0.19	17.60
12 weeks	78	10.97±0.24	19.12

(Falconer, 1989). Similar results were reported by Youssef (2004), Gharib (2008), Hassanein (2011) and Nowier (2012). The coefficients of variation in BL, CC and TC also declined with age and ranged from 10.94 to 13.00 %, from 16.13 to 17.02% and from 15.60 to 19.12%, respectively. The results of Abdel-Ghany *et al.* (2000a; 2000b) and Hassan *et al.* (2001) and Attalah

Variance components

The additive genetic variance (σ^2_a) and its percentage contribution to the variation of all body weight and body conformation measurements are presented in Table 2. The σ^2_a values seemed to be inconsistently age dependent. The additive genetic variance contributed to the total variation in body weights by 16.7-42.0%. Khalil *et al.* (2000) reported comparable magnitude of the additive genetic variance with an average of 31.7%. Also, Hassan (2004) found that σ^2_a estimates were 23.0, 35.5 and 37.4% for body weight of New Zealand White rabbits at 5, 8 and 10 weeks of age, respectively. The percentage of the additive genetic variance ranged from 0.02% to 63% for BL, 0.06% to 47% for CC and 1.6% to 45% for TC measurements. Similar results were reported by

Table 2: Additive genetic variance (σ^2_a, diagonal) and its percentage contribution to total variation in growth traits of Baladi Black rabbits

	6 weeks				8 weeks			
Traits	**BW**	**BL**	**CC**	**TC**	**BW**	**BL**	**CC**	**TC**
BW	0.004				0.012			
%	18.0				30.8			
BL		1.848				1.677		
%		29.0				26.3		
CC			0.666				0.886	
%			23.0				32.7	
TC				0.382				0.027
%				21.3				1.6

	10 weeks				12 weeks			
Traits	**BW**	**BL**	**CC**	**TC**	**BW**	**BL**	**CC**	**TC**
BW	0.027				0.037			
%	42.0				37.0			
BL		5.171				014		
%		63.0				0.02		
CC			1.965				2.339	
%			0.06				47.0	
TC				1.41				0.684
%				45.0				18.0

BW, BL, CC and TC indicate body weight, body length, chest circumference and thigh circumference, respectively.

Attalh *et al.* (2007), who found that the percentages of additive variance components in BL and CC traits, due to the sire effect, were somewhat low in Bauscat and Baladi Red rabbits.

The uncorrelated environmental variance estimates (σ^2_c) were in general high and contributed to the total variation in body weights by 23% to 63% (Table 3). These results were similar to those reported by Iraqi (2003), Youssef (2004) and EL-Degahadi (2005) on different rabbit breeds. The σ^2_c estimates for body conformation traits were age dependent. For body length, the percentages of σ^2_c were mostly moderate to high with a range of 19.7% to 46.2% for up to 10 weeks and then declined to zero at 12 weeks of age. For chest circumference, σ^2_c percentage ranged from 15.1 to 53.0%. The σ^2_c percentage ranged from 51.5% to 75.0% for thigh circumference. Similar trends and estimates were also observed by Youssef *et al.* (2008), Youssef *et al.* (2009) and Hassanein (2011) for body weight measurements. Iraqi *et al.* (2002) and Iraqi (2003) reported that common litter effects might be more important than additive genetic effects for post-weaning growth in rabbits. This might be expected and is attributed, to some extent, to the consequence

Table 3: Uncorrelated random variance (σ^2_c, diagonal) and its percentage contribution to total variation in growth traits of Baladi Black rabbits

	6 weeks				8 weeks			
Traits	**BW**	**BL**	**CC**	**TC**	**BW**	**BL**	**CC**	**TC**
BW	0.014				0.009			
%	58.3				23.1			
BL		2.948			0	1.309		
%		46.2				19.7		
CC			1.395				0.410	
%			47.5				15.1	
TC				1.006				0.879
%				56.1				51.5

	10 weeks				12 weeks			
Traits	**BW**	**BL**	**CC**	**TC**	**BW**	**BL**	**CC**	**TC**
BW	0.037				0.064			
%	58.0				63.0			
BL		3.02			0			
%		37.0				0.0		
CC			1.198				2.647	
%			38.0				53.0	
TC				1.682				0.030
%				54.0				75.0

BW, BL, CC and TC indicate body weight, body length, chest circumference and thigh circumference, respectively.

of the genetic variation of some characters (for instance the mothering ability) and inbreeding coefficients of dams (Mrode, 1996).

Heritability estimates

Heritability estimates for body weights were in general highly moderate and ranged from 0.18 to 0.42 (Table 4). The low heritability estimate of 0.18 at 6 weeks reflects that a considerable amount of the variation was due to the maternal effect. The results are in agreement with those obtained by Khalil *et al.* (2000), Iraqi *et al.* (2002), Youssef *et al.* (2009) and Hassanein (2011). Khalil *et al.* (1987) indicated that sire heritability estimates of body weights for the local breed (Giza White) were higher than those estimated for the exotic breed (Bauscat). It was indicated that local breeds have not been subjected to any intensive selection as that used on exotic breeds. The heritability estimates ranged from 0.29 to 0.63 for BL, from 0.25 to 0.62 for CC and from 0.02 to 0.45 for TC measurements. These estimates are comparable to the estimates reported by Szendro *et al.* (1988), Castelline and Panella (1988), Lukefahr *et al.* (1996), Janssens and Vandepitte (2004), Akanno and Ibe (2005), Attalah *et al.* (2007) and Elamin *et al.* (2012).

Table 4: The heritability estimates of growth traits in Baladi Black rabbits.

Age	BW	BL	CC	TC
6 weeks	0.18	0.29	0.23	0.21
8 weeks	0.30	0.25	0.33	0.02
10 weeks	0.42	0.63	0.62	0.45
12 weeks	0.37	---	0.47	0.17

BW, BL, CC and TC indicate body weight, body length, chest circumference and thigh circumference, respectively. h^2 estimate was not obtained.

Genetic correlation estimates

The estimates of genetic correlations among body weights and conformation measurements at 6, 8, 10 and 12 weeks are presented in Table 5. The genetic correlation estimates were mostly positively high. The averages, overall ages, were 0.85 between BW and BL, 0.92 between BW and CC and 0.85 between CC and TC traits. Comparable results were obtained by Enab *et al.* (2000), Enab (2001), Abdullah *et al.* (2003) and EL-Degahadi (2005). Negative and low estimate of -0.02 was obtained between BL and TC at 6 week of age. Akanno and Ibe (2005) obtained a negative estimate of -0.12 between body weight and head to shoulder length. The implication of these findings is that, for traits with high positive genetic correlation, selection for one trait may indirectly improve the other trait as a correlated response.

Table 5: The genetic correlation estimates among growth traits in Baladi Black rabbits

Age	BW*BL	BW*CC	BW*TC	BL*CC	BL*TC	CC*TC
6 weeks	0.89	0.93	0.44	0.69	-0.02	0.70
8 weeks	0.79	0.97	0.88	0.62	0.41	0.97
10 weeks	0.82	0.90	0.93	0.82	0.95	0.94
12 weeks	0.90	0.87	0.99	0.90	0.98	0.80
Average	**0.85**	**0.92**	**0.81**	**0.76**	**0.58**	**0.85**

BW, BL, CC and TC indicate body weight, body length, chest circumference and thigh circumference, respectively.

Breeding values

Information on the breeding values for growth traits of Baladi Black rabbit population are presented in Table 6. In general, the trends of BLUP estimates for all traits were expected. The BLUP values ranges and their accuracies revealed high levels of response at all ages. These expected levels of response were age dependent. Same trends were also observed in

the superior 25% of evaluated BB rabbits. The results purpose that BB rabbits would considerably respond to selection for any of these traits in the respective ages, because of their heritability estimates were moderate to high and the BLUP values were positive. The BLUP estimates of the superior sires were very advantageous, since the replacement rate of sires do not exceed 20-25% of the male rabbit population. Therefore, an elevated selection intensity pressure can be exerted which in turn is expected to yield a considerable selection response (Hassan *et al.,* 2013). In New Zealand White rabbit population (NZW), Hassan (2004) reported that the ranges of BLUP estimates were higher at 5 and 10 weeks than at 8 weeks of age. It was concluded that NZW rabbits would respond better to selection at weaning (5 weeks of age) and at 10 weeks of age than at 8 weeks of age.

Conclusively, the results revealed moderate to high heritability estimates and positive BLUP estimates for growth traits with a sire replacement rate of 20-25%, and this indicates that selection for growth can be successfully practiced in Baladi Black rabbits.

منسّق:إلى اليسار

RFERENCES

Abd El-Ghany, A.M.; Ahmed, E.G. and Hassan, N.S. (2000a). Crossbreeding genetic parameters of post-weaning growth traits of the Egyptian acclimatised New Zealand White and native Baladi Black rabbits. *The 7th World Rabbit Con. Valencia*, Spain, Vol. 2.

Abd El-Ghany, A.M.; Hassan, N.S. and Amin, A.A. (2000b). Heterosis, direct and maternal abilities of post-weaning daily gain in weight of two Egyptian native breeds on account of crossing with New Zealand White rabbits. *The 7th World Rabbit Con. Valencia*, Spain, Vol. 2.

Abdullah, A.R; Asokunbi, O. A; Nisola, O.O and Adewumi, M. K (2003). Interrelationships between body weight and linear body conformation in domestic rabbit (Oryctolagus cuniculus). *Proceedings of the 28 th Annual Conference of Nigerian Society for Animal Production*, 28: 133-136.

Akanno, E.C. and Ibe, S.N. (2005). Estimates of genetic parameters for growth traits of domestic rabbits in the humid tropics. *Livestock Research for Rural Development,*Umudike, P. M. B. 7267 , Umuahia, Abia State, Nigeria.

Attalah, G.E.Y.; Farid, A.M and Gharib, M.G .(2007). Factors effecting weaning and post-weaning body measurement in Bauscat, and Baladi Red rabbits. *Al-Azhar J. Agric. Res.*, **2**: 149-168.

Boldman, K.G.; Kriese, L.A.; Van Vleck, L.D.; Van Tassell, C.P. and Kachman, S.D. (1995). A manual for use of MTDFREML. A set of Programs to obtain estimated of variances and covariance's {DRAFT}. U.S. Department of Agricultural Research Service, USA.PP. 114.

Castelline, C and Panella, F. (1988). Heritability of pre- and post-weaning weight in rabbits. *Proceedings of 4th World Rabbit Congress*, pp. 112-119.

Elamin, K.M.; Yousif, I.A.;Ahmed,M.K.A.;Mohammed,S.A.and Tameen Eldar, A.A. (2012). Estimation of genetic, phenotpice and environmental parameters of morphometric traits in Sudanese rabbits. *Asian Journal of Animal Science*, 6 (4): 174-I81.

EL-Deghadi, S. A. (2005). Genetic evaluation for some productive traits in rabbits. Ph.D. Thesis, Fac. Of Agric., Banha Univ., Egypt.

El-Raffa, A.M.; Grasia, M. L.; Basalga, M.; Pules, M. (2005). Estimation of genotype environment interaction for reproductive and growth traits in rabbits. *The 4th inter. Con. in Rabbit Prod. in Hot Climate*, Sharm El-Sheikh, Egypt, 75-82.

Enab,A.A. (2001). Genetic evaluation of multi-trait selection indices for overall economic improvement in rabbit breeding programs. *Egypt. Poult. Sci.,* 21(1): 221-236

Enab, A.A.; Hekil,A.A.and Abdou,F.H. (2000). Analysis A Selection Experiment for some economic traits in rabbits. *Egyptian Journal of Rabbits Science,* 10 (2): 341-353.

Estany, J; Camacho, J; Baselga, M. and Blasco, A. (1992). Selection response of growth rate in rabbits for meat production. *Genet. Evol.*, 24: 257-537.

Falconer, D.S. (1989). *Introduction To Quantitative Genetic*. Third Edition, Longman, UK.

Ferraz, J.B.S.; Johnson, R.K. and Eler, J.P. (1991). Genetic parameters for reproductive traits of rabbits. *J. Appl. Rabbit. Res*., 14 (3): 166-171.

Gharib, M. G. (2008). A study of some productive and reproductive traits in two strains of rabbits and their crosses. Ph.D. Thesis, Fac. of Agric., Zagazig Univ., Egypt.

Hassan, N.S. (2004). New Zealand White rabbits' BLUP values for post-weaning individual body weight under Egyptian conditions. *8th World Rabbit Congress*, September 7-10, 2004 – Puebla, Mexico.

Hassan, N. S.; AbdelGhany, A.M.; Hanan ,H.; Ghanem, M. A.; El-Shennawy and Mona, M. Ghaly, (2113). Genetic Evaluation of The Native Baladi Black Rabbits Under North Delta Weather of Egypt Using Animal Model Procedure. A: Doe Litter Traits. *Journal of Animal, Poultry & Fish Production*, Suez Canal University.

Hassan, N.S.; Ahmed, E.G; Abdel-Ghany, A.M.; and Farid, A. (2001). Genetic effects of chest circumference of Egyptian Native breeds Giza White rabbits. *Anim. Prod.,* 45:123-1345.No. 6507.

Hassanein, E. A. (2011). Genetic studies on rabbits. Ph.D. Thesis, Fac. of Agric. Al-Azhar Univ. Egypt.

Iraqi, M.M. (2003). Estimation and evaluation of genetic parameters for body weight traits of New Zealand White rabbits in Egypt using different multivariate animal models. *Livestock Research for Rural Development*, 15 (6).

Iraqi, M. M., Youssef, Y. M. K., El-Raffa, A. M. and Khalil, M. H. (2002). Genetic and environmental trend for post-waning body weights in New Zealand White and Z-line rabbits using the Animal Model Approach. *3rd Sci. Con. in Rabbit Production in Hot Climates*. pp: 89-101.

Khalil, M.H. and Afifi, E.A. (2000). Heterosis, maternal and direct additive effects for litter performance and post-weaning growth in Gabli rabbits and their crosses with New Zealand White. *7th World Rrabbit Con*., Valencia Spain.

Khalil, M.H; Ibrahim, M.K; Youssef, Y.M.K. and El-Deighadi, A.S. (2000). Estimation of sire transmitting abilities for post-weaning growth traits in New Zealand White and California rabbits raised in the adverse hot climate of Egyptian conditions using an animal model. *J. Egypt. Poult. Sci*, 20: 65-90.

Khalil, M.H.; Owen, J.B. and Afifi, E.A. (1987). A genetic analysis of litter traits in Bauscat and Giza White rabbits. *Anim. Prod*., 45: 123-134.

Janssens, S. and Vandepitte, W. (2004). Genetic parameters for body measurements and linear type trait in Belgian Bleu du Maine, Suffolk and Texel sheep. *Small Ruminant Res*., 54: 13-24.

Lukefahr, S. D.; Odi, H.B. and Atakora, J. K. A. (1996). Mass selection for 70-day body weight in rabbits . *Anim. Sci*., 74: 1481-1489.

Mrode, R. A. (1996). Linear models for the prediction of animal breeding values- *CAB International*, Biddies Ltd, Guildford, UK.

Nowier, A.A. 2012). Using Of Different Genetic Techniques to Improve Some economic Traits In Animal Ph.D. Thesis, Fac. of Agric., Tanta Univ., Egypt.

Pacia, G.; Maroni, M.; Xing, J. J.; Bennati, L. (1997). Misur in vivo per la stimo delle carcase cumicole. *Atti XII Congresso Nazional A. S. P*. A. Pisa, Italia. pp: 391-392.

SAS, (1996). SAS "Procedure Guide. "Version 6.12 Ed." SAS Institute Inc., Cary, NC, USA.

Shahin, K. A. and Hassan, N. S. (2000). Sources of shared variability among body shape characters at marketing age in New Zealand White and Egyptian rabbit breeds. Ann, 435–445

Szendro, Zs.; Kutos, K. and Richter, J. (1988). Estimation of heritability of live weight and weight gains in different ages of rabbits. *Proceedings of 4th World Rabbit Congress*, Budapest. 11: 284-288.

Youssef, Y.M.K. (2004). Heritability's and common litter effects estimated by animal model for post-weaning growth traits in New Zealand White and Baladi Red rabbits. *Egypt. Poult. Sci.*, 24(1): 205-260.

Youssef, Y.M. K.; Baselga, M.; Khalil, M.H.; Gad-Alla, S. and García, M. L. (2008). Evaluation of litter traits in a crossing project of V-line and Baladi Red rabbits in Egypt. *Livestock Research for Rural Development*, 20 (9): 133.

Youssef, Y.M.K.; Farid, A.; Gad-alla, .S. A and Abo-Warda,M. (2009). Genetic evaluation for post weaning body weight traits in three genetic groups of rabbits under Egyptian condition. *The 5th Inter. Poultry Con.*, Taba, Egypt.

الخصائص الوراثية لصفات النموو مقا بيس الجسم بعد الفطام في الأرانب البلدى الأسود

منسّق:الخط: ١٤ نقطة، خط اللغة العربية وغيرها: ١٤ نقطة

منسّق: المسافة البادئة: السطر الأول: 0 سم، مسافة بعد: 0 نقطة

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~~الاسماء والعنوان~~

استخدمت بيانات 109 ارنب مفطوم من سلالة البلدي الاسود (سلالة محلية)، وذالك لتقدير قيمة المكافئ الوارثى والتاثير المشترك لبطن الولادة لصفات الوزن الفردى للارانب ومقاييس الجسم فى فترة مابعد الفطام عند اعمار 6 ، 8 ، 10 ، 12 أسبوع من العمر. حيث تم تحليل البيانات باستخدام نموذج الحيوان متعدد الصفات لتقدير قيم المكافئ الوراثية وقيم التأثيرالمشترك لخلفة البطن وكذالك القيم التربوية لهذة الصفات و قد أوضحت الدراسة النتائج آلاتية:-

- كانت قيم تأثير التباين ذو الاثر المضيف متوسطة وازدادت تلك القيم مع تقدم العمر وتراوحت من 18,4% الى 79,5% عند اعمار 6 ، 8، 10 و 12 أسبوع.
- وكانت قيم تأثير التباين ذو الاثر المضيف متوسطة فى صفة طول الجسم وتراوحت من 3،25% الى 4،29% ، وصفة محيط الصدر مابين المتوسط (18,5%)، العالي (72,1%) وصفة محيط الفخذ مابين المنخفضة (1,6%) الى العالي (73,7%) عند تلك الاعمار ولوحظ زيادة تلك القيم بالتقدم في العمر.
- كانت قيم التأثير المشترك لخلفة البطن لصفتي وزن الجسم ما بين المنخفض (10,8%) الى العالي القيمة (6،58%) و متوسطة فى صفة طول الجسم وتراوحت من 19,8% الى 46,2% ، وصفة محيط الصدر مابي المنخفضة (11,3%)، المتوسطة (47,5%) وصفة محيط الفخذ مابين المتوسطة (7،23%) الى العالي (1،56%) عند تلك الاعمار ولوحظ انخفاض تلك القيم بالتقدم في العمر.
- تراوحت تقديرات المكافئ الوراثي لصفات النمو بعد الفطام من (0,18) الي (0,80) ومتوسطة القيمة لصفة طول الجسم وانحصرت ما بين (0,25 الى 0,39) وصفة محيط الصدر من (0,19) الى (0,72) وصفة محيط الفخذ من (0,02) الى (0,74) عند تلك الاعمار.
- كانت قيم الارتباط الوراثي عالية و موجبة لمعظم الصفات المختلفة وبعضها ماعدا القيمة السلبية (-0,02) بين صفة طول الجسم وصفة محيط الفخذ عند عمر 6 اسابيع.
- كانت القيم الوراثية فى الترتيب المنطقى لها لآعلى 25 % لكل الحيوانات لصفة وزنِ الجسمِ تَراوحتْ مِنْ 0.04 إلى 69.0 وذالك بدرجة دقة تَراوحَت مِنْ 62.0 إلى 0.91 %. بينما سجلت امهات لارانب قيمة وراثية لآعلى 25 % بنفس الترتيب المنطقى السابق تَراوحتْ مِنْ 0.02 إلى 65.0 ، وذالك بدرجة دقة تَراوحَت مِنْ 66.0 إلى 83.0 %. بنفس الطريقة، سجلت اباء لارانب قيمة وراثية لآعلى 25 % تَراوحتْ مِنْ 0.01 إلى 26.0 ، بدرجة دقة – تَراوحَ مِنْ 53.0 إلى 0.70 0% بينما سجلت ابناء لارانب قيمة وراثية على 25 % بنفس الترتيب المنطقى السابق تَراوحتْ مِنْ 0.06 إلى 0.68 ، وذالك بدرجة دقة تَراوحَت مِنْ 0.70 إلى 0.87%.
- كانت القيم الوراثية فى الترتيب المنطقى لها لآعلى 25 % لكل الحيوانات لصفة طول الجسم تَراوحتْ مِنْ 0.94 إلى 3.93 وذالك بدرجة دقة تَراوحَت مِنْ 0.77 إلى 0.91 %. و لصفة محيط الصدر تَراوحتْ مِنْ 0.78 إلى 3.47 وذالك بدرجة دقة تَراوحَت مِنْ 0.55 إلى 0.88 %. و لصفة محيط الفخذ تَراوحتْ مِنْ 34.0 إلى 32.3 وذالك بدرجة دقة تَراوحَت مِنْ 0.71 إلى 0.91 %. ونفس الطريقة تم عمل الابناء والامهات و الاباء.

التوصية:

منسّق:الخط: ١٤ نقطة، خط اللغة العربية
وغيرها: ١٤ نقطة