J.Animal and Poultry Prod., Mansoura Univ., Vol.9 (7): 325 - 330, 2018

Phenotypic and Genotypic Trends for Body Weights Traits in Romanov Sheep

Ebtsam F. El- Ksas[1]; Shymaa M. El – Komy[1]; M. A. Sallam[2] and A. S. Khattab[1]
[1]Animal Production Department, Faculty of Agriculture, Tanta University, Egypt
[2]Animal Research Institute , Ministry of Agriculture, Dokki, Cairo , Egypt.

ABSTRACT

Data on 820 Romanov lambs progeny of 30 sires it covered the period from 1995 to 2005 were used in this study. Lambs traits studied were birth weight (BW) body weight at one month (BW1), body weight at two months (BW2), weaning weight at three month (WW) and average daily gain from birth to weaning (ADG). Data were analysis by using mixed model. Means of BW, Bw1, BW2, WW and ADG were 2.90 kg, 7.10 kg, 10.50 kg, 13.02 kg and 115.50 g respectively. Sire of lambs, ewes within sires had a highly significant effect on all traits**.** Season and year of lambing, type of birth and sex had a significant effect on all studied traits, expect the effect 0f year lambing on BW and type of birth on BW1 and WW. Also, inbreeding coefficients had a highly significant effect on all body weight traits studied and decreased as inbreeding coefficient increased. Two animal models were used. Model 1 includes the fixed effects season and year of lambing, type of birth and sex and random effects of direct genetic effect, permanent environmental effect and residual effect. Model 2, is similar to model 1 and added maternal genetic effect and covariance between direct and maternal genetic effect.Determination of direct heritability for body weights traits ranged from 0.17 to 0.39 for model 1 and ranged from 0.13 to 0.29 for model 2. The removal of additive maternal effects and covariance between direct and maternal genetic effects (model 1) increased estimates of direct heritability. Therefore, including maternal effects the model resulted in more accurate estimation of (co) variance and genetic parameters of growth traits. Determination of phenotypic and genetic correlations among growth traits studied were moral and highly significant. While, annual phenotypic and genetic trends for body weights traits were negative.

Keywords: Phenotypic, genetic trends, body weight, and Romanov sheep.

INTRODUCTION

Body weights and average daily gain in pre – weaning sheep are indicates an early of the late growth (Mohammadi *et al*., 2013).Body weights at different ages in sheep are affected by direct and maternal genetic effects as well as by environmental effects. Direct heritability estimates of body weights ranged from 0.17 to 0.48 as found that (Maria *et al*., 1993; Oudah, 2002; El- Wakil *et al*., 2009; Salem and Hammoud, 2017 and Awad, 2018). Maternal heritability estimates for body weights ranged from 0.07 to 0.15 The objective of the study are (1) appreciation phenotypic and genetic parameters for body weight at birth , one month, two month , weaning weight and average daily gain in Romanov lambs by using different animal models and (2) estimate annual phenotypic and genetic change for above studied traits.

MATERIALS AND METHODS

a– Source of Data:

Data used in this study investigation were collected from the history sheets of Romanov lambs was raised in Mehallet – Mousa Farm, belonging to the Animal Production Research Institute, Ministry of Agriculture. Data comprised 820 Romanov lambs progeny of 30 rams and 200 ewes collected during the period from 1995 to 2005. Romanov ewes were managed under the system of one mating per year and they mated during September - October with pure Romanov rams to obtain pure bred Romanov lambs in winter season (Jan – Feb). During winter and spring lambs were fed on concentrate feed mixture and Egyptian clover (*Trifolium alexandrinum*)which was replaced by hay during the rest of the year, according to the feeding system of the Mehallat – Mousa farm. Traits studied are body weight at birth (BW), body weight at one month (BW1), body weight at two months (BW2), weaning weight (WW) and average daily gain (ADG). Date components used in analysis were presented in Table 1.

Table 1.Date components used in analysis.

Observations	Numbers
No. of records	820
No. of sires	30
No. of dams	200
Model 1	
No. of iterations	8118
No. of mixed model equations (MME)	2816
Model II	
No. of iterations	19688
No. of mixed model equations (MME)	5128

b - Analysis

Data were analysis by using Statistical Analysis System (SAS, 2005). The model includes the fixed effects of season and year of lambing, type of birth, sex and inbreeding coefficient and the random effects of rams, ewes within rams and errors.

Inbreeding coefficients (1922) were estimated for each animal by means of the MTDFNRM model of the program of MTDFREML, according to Program of Boldman *et al*. (1995), which determines the kinship pattern between individuals. Inbreeding coefficients (F) of the animals were contained the model five classes, the first no inbred animals and the four other classes were 0.06, 0.12, 0.15 and 0.25.

c- Genetic parameters:

Body weight traits were analyzed by multiple trait derivate – Free Restricted Maximum Likelihood (MTDFREML) according to Boldman *et al*. (1995) using multiple Trait Animal Model (MTAM). Two multi traits animal models were used, model 1, including, the fixed effects of season and year of lambing, type of birth and sex and the random effects of animals, permanent environmental effects and errors.

The mixed model equation (MME) for the best linear unbiased estimator (BLUE) for estimable function for the best linear unbiased prediction (BLUP) was in matrix notation as follows

Model 2, includes the fixed effects of season and year of lambing, type of birth and sex, and the random effects of animals, in addition maternal genetic effects, permanent environmental effect and errors.

Estimates of h^2, genetic correlation and phenotypic correlations were calculated according to Boldman *et al*. (1995).

d - Phenotypic and genotypic trends

The annual phenotypic was estimated for various were calculated for the regression coefficients of the traits values on the year of lambing, after adjusting the records for the non genetic effects (season of lambing, type of birth and sex). Trends in transmitting abilities of sires for different traits studied were estimated from the regression estimates of sire breeding values on each year of lambing.

RESULTS AND DISCUSSION

a- Means

Unadjusted means, standard deviations (SD) and coefficient of variability (CV%) for studied different traits are presented in Table 2. Means of weights at birth (BW), at one month (BW1), at two months (BW2), weaning weight (WW) and average daily gain (ADG) were 2.90 kg, 7.10 kg, 10.50 kg, 13.02 kg ,and 115.50 g, respectively. Studies were provided for WW and ADG were lower than those reported by Maria *et al*. (1993) with Romanov sheep in Egypt, to be 14.07 kg and 220 g, respectively. In the same time, higher than those found by Heba Abd El – Halim (2008) working on another set of that herd,(2.51 kg, 6.75 kg, 9.57 kg, 12.03 kg and 105.55 g,) for BW, BW1, BW2, WW and ADG, respectively.

On the other hand, the present means of different traits studied are lower than those reported by many authors working in different breeds of sheep in different countries. Oudah (2002) reported that Rahmani lambs, reported that the average weaning weight was16.6 kg.

Salem and Hammoud (2017) reported overall mean, of BW, WW and ADG of Barki lambs were 3.70, 20.90 and 143.09 g, respectively, the corresponding values for Rahmani lambs were 3.52, 20.71 and 142.62, respectively.

The coefficient of variability for studied body weights traits ranged from 25.86% to 40.85% (Table 2). Similar rang (24.40 to 34.5%) are reported by Heba Abd El –Halim (2008) .In the same trend, CV % are higher than those reported by Salem and Hammoud (2017) on Barki and Rahmani sheep ; However, the higher CV % for the growth traits (Table 2) indicates to higher variation between lambs in body weight traits which reflect a great variation the side of the economic traits.

Table 2. Unadjusted means, standard deviation (SD) and coefficient of variability for birth weight (BW), body weight at month (BW1), body weight at two months (BW2) , body weight at weaning (WW) and average daily gain from birth to weaning (ADG) in Romanov lambs.

Traits	Mean	SD	CV%
BW kg	2.90	0.75	25.86
BW1, kg	7.10	2.90	40.85
BW2, kg	10.50	3.50	33.33
WW, kg	13.02	4.50	34.56
ADG, g	115.50	41.90	36.28
N= 820 records			

However, the higher CV % for the growth traits (Table 2) indicates to higher variation between lambs in body weight traits which reflect a great variation the side of the economic traits.

b - Non genetic effects

The analysis of variance for fixed effects on all traits are illustrated in Table 3. The results showed that Fixed effects on all traits were generally significant ($P < 0.01$ or < 0.05) except for effect of year of lambing on birth weight and type of lambing on BW1 and WW. Similar Significant fixed effects on body weight traits of different sheep breeds have been well documented in the literature (Oudah , 2002,Heba Abd El – Halim,2008; Boujenane and Diallo, 2017; Salem and Hammoud, 2017 and Awad, 2018).

Table 3. Analysis of variance for factors affecting birth weight (BW), body weight at one month (BW1) , body weight at two month (BW2), body weight at three weight (BW3) and average daily gain (ADG) for Romanov lambs.

		F – Values				
S.O.V	**df**	**BW**	**BW1**	**BW2**	**WW**	**ADG**
Between Rams	30	2.71**	4.74**	2.71**	2.21**	2.09**
Between ewes: Rams	230	3.26**	2.73**	2.45**	2.63**	2.35**
Between year of lambing	9	1.09ns	3.39**	2.33**	2.98**	2.96**
Between sex	1	17.20**	9.57**	16.12**	17.20**	7.66**
Between type of lambing	2	3.09**	1.36ns	4.41**	2.66ns	2.87*
Between inbreeding	4	2.22**	10.75**	5.60**	6.27**	6.53**
Error, M.S.	156	15.86	2.24	4.23	6.07	7.27

Inbreeding coefficient had highly significant effect on ($P < 0.01$) body weights at different ages. BW, BW1, BW2, WW decrease significantly with the increase level of inbreeding (Table 4). The non-inbred group showed higher body weight than the other inbred group. Examined traits in the non – inbred group were 2.70 kg, 7.29 kg, 10.07 kg, 12.58 kg and 111.52 g, while the inbred groups it were in range of body weights from 2.18 – 2.60 kg for BW, from 5.38 to 6.00 kg for BW1, from 8.19 to 9.11 kg for BW2, from 10.43 to 12.00 kg for WW and from 91.90 to 104.56 g for ADG . The inbreeding coefficients Showed decrease effect in BW, BW1, BW2, WW and ADG traits.

Table 4. Effect of inbreeding on body weight traits in Romanov sheep

	Mean , kg				Mean, g
Inbreeding coefficients	**BW**	**BW1**	**BW2**	**WW**	**ADG**
F = 0.00	2.70	7.29	10.07	12.58	111.52
F = 0.06	2.60	5.84	9.11	12.00	104.56
F = 0.12	2.54	5.79	8.91	11.50	100.00
F= 0.15	2.48	6.00	8.84	11.36	98.80
F= 0.25	2.18	5.38	8.19	10.43	91.90

Therefore, it is important to mention that under the management conditions of the present herd, statistical analysis of the data permitted use to show control the inbreeding decrease effect in body weights. In the same time, control degree of inbreeding is one of reasons for which a farmer should use a computerized mating program. Many authors working on different breeds of sheep reached to the same results. In this respect, Lamb arson and Thomas (1984) showed that inbreeding decrease birth weight and weaning weight by –0.013 kg and -0.111 kg, respectively. Awad(2018) recorded with 1% inbreeding negative significant effect ($P < 0.05$) on body weight of Saidi lambs at different ages. He obtained reduced in lamb weight at birth, 1, 2, 3, 6,

F- Values presented in Table 2, indicated that year of lambing, sex and type of lambing are considered to be the major factors affecting, BW, BW1, BW2, WW and ADG. Therefore, adjusted records for these factors are necessary for estimated genetic parameters, breeding values and genetic trends. The same results are reported by Heba Abd El – Halim (2008) using Romanov lambs, that adjusted the individual records will remove large portion of non genetic variation in growth performance. In addition,

c- Random effects

From Table 2, it could be noticed that Ram of the lamb and ewes within rams were highly significant effect on ($P < 0.01$,) BW, BW1, BW2, WW and ADG. These results indicated to the possibility of genetic improvement of body weights traits in Romanov lambs though ram and ewe selection. Similar results are found by Oudah (2002) working on Rahmani lambs, El-Wakil *et al*. (2009) working on Barki lambs, Baneh *et al*. (2010) working on Ghezel lambs ,Boujenane and Diallo (2017) working on Sardi lambs.

d – Variance components and heritability's

Variance components (σ^2a, σ^2m, σ^2pe, σ^2e and σ^2p), heritability's (h^2_d and h^2_m) and log-likelihood (Log L) for BW, BW1, BW2, WW and ADG of Romanov lambs are presented in Table 5. By model 1, which ignored the permanent environmental ,additive maternal effects and covariance between direct and maternal effects showed the highest Log Likelihood values (45667.34 , while Model II that included direct , maternal genetic effects ,covariance between direct and maternal genetic effects and permanent environmental effects obtained the lowest Log Likelihood values(10006.42) Table 5. Therefore, the full model (model II) was the most appropriate model for BW, BW1, BW2, WW and ADG.

The estimates of direct heritability by using animal model1 , including the fixed effects of season and yearling lambs, sex, and type of birth and random, permanent environmental effect and errors were 0.27, 0.31, 0.31, 0.39 and 0.17 for BW, BW1, BW2, WW and ADG respectively . The study used was estimates are within the range reported by many authors using in different breeds of sheep in different countries. In this respect, Maria *et al*.(1993) , reported that direct heritability estimates for birth weight, weaning weight and average daily gain were 0.22, 0.25 and 0.17, respectively. Oudah (2002) with Rahmani sheep, found that direct heritability estimates for BW and WW were 0.33 and 0.48, respectively.

Estimates of direct heritability and maternal heritability , by using animal model 2, including, the fixed effects of season and year of lambing, sex and type of lambing and random effects of animal, maternal, permanent environmental effects and errors were 0.18, 0.29, 0.29, 0.27 and 0.13 for BW, BW1, BW2, WW and ADG, respectively. It could be noticed that include maternal genetic effect and covariance between direct and maternal genetic effects in the model (model II) decrease the value of heritability. On the basis of the removal of additive maternal effects and covariance between direct and maternal genetic effects, but using (model 1) the values showed increase estimates of direct heritability. Therefore, including the maternal effects in the model resulted in more accurate estimation of (co) variance and genetic parameters of growth traits. Similar results are reported by Salem and Hammoud (2017) with Barki and Rahmani lambs. They found that direct heritability for BW, WW and ADG were 0.35, 0.17 and 0.17 in Barki lambs when using model 1(include additive genetic, permanent environmental effect), while the values decline to 0.16, 0.012 and 0.014, respectively when using the model 4 (including, additive genetic, maternal genetic and permanent environmental effect). For Rahmani lambs, the values were 0.168 and 0.125, respectively for model 1 and were 0.276, 0.125 and 0.125, respectively for model 4. The same authors concluded that maternal effects were a significant source of variation for growth traits of Barki and Rahmani lambs. Therefore, ignoring these effects from the model resulted in an over of direct heritability and an inaccurate genetic evaluation of early growth traits of both Barki and Rahmani lambs. Also, Awad (2018) arrived to the same results on Siadi lambs in Egypt.

Table 5. Phenotypic and genetic variance and covariance for different traits studied using two model 1 and model II of analysis.

Model	**Traits**				
1	**BW**	**BW1**	**BW2**	**WW**	**ADG**
σ2a	2.15	1.47	1.48	2.36	1.09
σ2m	-----	-----	-----	-----	------
σ am	---	-----	----	------	-----
σ2pe	0.23	0.22	0.24	1.25	2.94
σ2e	5.64	2.98	2.99	2.39	2.55
σ2p	8.02	4.67	4.71	6.00	6.53
h2d h2m	0.27±0.10	0.31± 0.10	0.31±0.10	0.39±0.11	0.17±0.09
Log2	45667.34				
Model	Traits				
II	BW	BW1	BW2	WW	ADG
σ2a	28.84		20.02	22.54	30.08
σ2m	6.26		3.02	4.37	15.05
σ am	-3.64		-0.33	-0.68	-0.85
σ2pe	4.50		8.57	2.70	2.70
σ2e	120.76		120.76	44.72	150.05
σ2p	160.36		70.17	33.74	225.62
h2d	0.18±0.09		0.29± 0.09	0.30±0.10	0.13±0.05
h2m	0.04+0.01		0.04+0.02	0.06+0.02	0.07+0.10
Log2	10006.42				

According to obtained moderate estimates of h^2 for BW, BW1, BW2, WW and ADG (Table 5) for model1 and model II, it is possible could be concluded that the genetic improvement of body weights of Romanov lambs at different ages could be achieved through rams and ewes selection. Also, the present results showed that including the maternal effects in the model caused more accurate estimation of variance components and genetic parameter for growth traits of Romanov lambs. In addition, the present estimates of heritability for body weights increased as age of lambs increased.

Also, present estimates of maternal heritability were low 0.04, 0.04, 0.04, 0.06 and 0.07 for BW, BW1, BW2, WW and ADG, respectively. Therefore, only small effect on selection response could be obtained. In this respect, Maria *et al*.(1993) recorded low maternal heritability for birth weight, weaning weight and average daily gain of Romanov lambs to be 0.10, 0.0 and 0.07, respectively.

Generally, the differences in the results could be related to the number of observations, different mating design, the models used in the analysis and the correction for the non genetic factors.

Table 6 shows the estimates of genetic correlations among examined body weights traits. The Genetic correlations between each weight and the other recorded weights BW ,BW1, BW2, WW and ADG were positive and significant. Nearly similar results were reported that different breeds of sheep (i.e., Maria *et al*., 1993; Oudah , 2002; El- Awady , 2011; Mohammadi *et al*., 2013; Boujenane and Diallo, 2017 and Awad, 2018) .

The Positive and significant genetic correlations among BW and all other body weight traits (Table 6) suggested that selection for heavier birth weights or any weights till weaning head to increase in body weight till the weaning weight and average daily gain. This mean that any Bw, Bw1and Bw2 could be considered in selection program to improve weaning weight.

Phenotypic correlations among different studied traits are presented in Table 6. The value of Phenotypic correlations between each of examined body weights ,BW1, BW2, WW and ADG showed similar trend values to be positive and significant. These results suggested that each of body weight at birth one and two months can be used as selection indicator for weaning weight. Similar results were found.

Table 6. Estimates of genetic correlations (below diagonal), phenotypic correlations (above diagonal) among body weights traits in Romanov lambs using model1 of multi trait animal

Traits	BW	BW1	BW2	WW	ADG
BW		0.60	0.55	0.65	0.49
BW1	0.23(0.05)		0.38	0.60	0.66
BW2	0.15(0.01)	0.42(0.01)		0.66	0.70
WW	0.61(0.01)	0.38(0.09)	0.49(0.09)		0.68
ADG	0.62 (0.01)	0.44(0.10)	0.45(0.10)	0.49(0.10)	

Effects of maternal genetic correlations among different studied traits are presented in Table 7. This effects between all body weight traits were positive and low to be ranged from 0.08 to 0.24 (Table 7).In septic of low effects of the present results it were lower than those reported by, Boujenane and Diallo (2017) recorded 0.66 value of maternal genetic correlation between birth weight and weight at 60 days.

Although the low maternal genetic correlations between body weights at different ages. Present results suggested that maternal effects are partly originating from prenatal period and extend the favorable effects on post-natal growth traits. Also, maternal genetic effects and covariance between direct and maternal genetic effects seem to make an important contributions to the phenotypic variance of birth weight, body weight at one and two months, weaning weight and average daily gain from birth to weaning. Therefore, maternal genetic effects should be included in accurate estimates of genetic parameters for early growth traits.

Table 7. Estimates of direct genetic correlations and maternal genetic correlation (mg) among body weight traits in Romanov lambs, by using model 2

Traits	a1	a2	a3	a4	a5	m1	m2	m3	m4	m5
a1										
a2	0.28									
a3	0.22	0.18								
a4	0.12	0.21	0.24							
a5	0.25	0.22	0.12	0.25						
m1	0.05	0.09	0.09	0.08	0.24					
m2	0.15	0.10	0.08	0.10	0.09	0.10				
m3	0.26	0.12	0.11	0.14	0.10	0.10	0.13			
m4	0.17	0.13	0.11	0.10	0.10	0.09	0.09	0.19		
m5	0.12	0.14	0.10	0.11	0.09	0.10	0.10	0.10	0.20	

e -Phenotypic and genetic trends

Annual Phenotypic trends for BW, BW1, BW2, WW and ADG were computed as the regression coefficients of the traits values on the year of calving, after adjusting the records for the non genetic effects (season of lambing, sex and type of lambing Table 8). Annual phenotypic trend for BW, BW1, BW2, WW and ADG were negative , significantly and being -0.036 kg, -0.177 kg, - 0.180 kg, -0.190 kg and -30.15 g, respectively (Table 8).Negative phenotypic trends for body weights may be attributed to some environmental inadequacies such as insufficient feeding, diseases, harsh climatic conditions and increase inbreeding coefficients in Romanov lambs.

Table 8. Phenotypic (PT) and genetic trends (GT) for birth weight (BW), body weight at one month (BW1), body weight at two months (BW2), weaning weight (WW) and average daily gain (ADG) for Romanov lambs.

Traits	PT± SE	GT±SE
BW, kg	-0.036 ± 0.001	- 0.074± 0.002
BW1, kg	- 0.177± 0.032	- 0.088±0.002
BW2, kg	- 0.180± 0.039	-0.021± 0.001
WW, kg	- 0.190± 0.049	- 0.100± 0.002
ADG, g	- 30.15±12.50	- 25.50± 10.00

El- Wakil and Elsayed (2013) with Barki sheep, showed that the annual phenotypic trends for birth weight, body weight at 120 , 360 and 480 days were - 0.018 kg, -0.702 kg, -0.322 kg and – 0.345 kg, respectively.

The average genetic change for BW, BW1, BW2, WW and ADG are presented in (Table 8). The genetic trend (regression of ram breeding values on time) indicated to decrease of -0.074 kg, -0.88 kg, -0.02 kg, -0.010 kg an d- 25.50 g, for BW, BW1, BW2, WW and ADG, respectively (Table 8). the present results it could be concluded that sires (rams) used in mating didn't prove to be superior, which reflected in ineffective selection or lack of acclimatization of the animals or both. The present estimates are in agreement with those of Shaat *et al*. (2004) working on 7298 Ossimi lambs and El- Wakil and Elsayed (2013) on Barki lambs, they concluded that the irregular genetic and phenotypic trends depicted among the examined years might reveal that there was no or little genetic improvement occurred in the evaluated flock as a result of lacking effective directional selection.

On the other hand, positive genetic trend for body weights were recorded by , Farokhad *et al*. (2011) with Amman sheep, and Mohammadi *et al*.(2013) working on Makooei sheep .

General Discussion

The present results showed that the moderate estimates of heritability for birth weight, weight at one month, two month, weaning weight and average daily gain from model 1 (including additive genetic effect, permanent environmental effect) and model II (including additive genetic effect, maternal genetic effect, covariance between additive and maternal genetic effect and permanent environmental effect) confirmed that improvement of body weight traits can be achieved by selection of rams and ewes. Also, including maternal genetic effect in the animal model caused more accurate estimation of variance components and genetic parameters for growth traits. Thus, this effect should be considered when carrying out genetic evaluations of early growth of Romanov lambs. In addition, negative phenotypic and genetic trends for body weight traits may be due to increase of inbreeding coefficients in present examined herd also the sires used in the later years didn't prove to be superior, this may be related to ineffective selection or lack of acclimatization of the animals or both, this may be under stress of differences in performance between years mainly due to different nutritional, climatic conditions and management practices prevalent over different times.

ACKNOWLEDGEMENT

The authors wish to express their gratitude to Dr. Heba Abel Halim, Researcher of Sheep department, Animal Production Institute, Ministry of Agriculture, Dokki, Cairo, Egypt for collect the data.

REFERENCES

Awad, M. (2018) Genetic study on Saidi sheep. Ph.D., Thesis, Faculty of Agric., Mansoura Univ., Egypt.

Baneh, H., S.H. Hafezian, A. Rashidi, M. Gholizadeh and G. Rahimi.(2010) Estimation of genetic parameters of body weight traits in Ghezel sheep .Asian. Aust., J. Anim. Sci., 23(2) 149-153.

Boldman, K. G., L. A. Kriese, L.D. Van Vleck., C.P. Van Tassell. And S.D. Kachman (1995).A Manual for use of MTDFREML. Agricultural Research Service, USDA, Washington DC, USA.

Boujenane, I. and I.T. Diallo (2017) Estimates of genetic parameters and genetic trends for pre- weaning growth traits in Sardi sheep. Small Ruminant Research. 146:61-68.

El- Awady, H.G. (2011) Different animal models for estimating genetic parameters of Barki sheep in Egypt. J. American Sci., 7: 882-887.

El- Wakil, Salwa, I and Manal Elsayed (2013) Genetic, phenotypic and environmental trends towards improving body weight in Barki Sheep. Egyptian J. of Sheep and Goat Sci., 8 (2) 11-20.

El- Wakil, Salwa.I., Manal Elsayed, A.M. Ahmed., R.R. Sadek and A.A. Nigm (2009). Genetic and phenotypic parameters of birth, weaning and yearling body weights of Barki sheep raised in the North Western Coast of Egypt. Egyptian. of Anim. Prod. 46(1) 43-52.

Farokhad, M. L., H. Roshanfekr, S. Amiri., K Mohammadi and K. Mirzadeh (2011) Genetic trends estimation for some of the growth traits in Arman sheep. J. of Animal and Veterinary Advances . 10 914) 1801-1803.

Heba Abd El – Halim , M. (2008) Genetic evaluation on sheep performance in Egypt. M.Sc., Thesis, Faculty of Agric., Mansoura Univ., Egypt.

Lamb arson, W.R., and D.L. Thomas (1984) Effect of inbreeding in sheep : A review . Anim. Breed. Abstr. 52:287-297.

Mandal, A., K.P Pant, Notter, P.K. Rout, R. Roy., R. Sinha and N. Sharma (2005) Studies on inbreeding and its effects on growth and fleece traits of Muzaffarnagari sheep. Asian- Australasia J. Anim. Sci., 10: 1363-1367.

Mandal, A. F.W. Cneser, P. K. Rout , R. Roy and D.R. Notter (2006) Estimation of direct and maternal (co) variance components for pre- weaning growth traits in Muzaffarnagari sheep. Livest. Sci., 99 (1) 79-89.

Maria, G. A., K.G., Boldman and L. D. Van Vleck (1993) Estimates of variances due to direct and maternal effects for growth traits of Romanov sheep. J. Anim. Sc., 71: 845-849.

Mohammadi, H., M. Shahrebabak., H. Bahrami and M. Dorosykar (2013) Model comparison and genetic parameters estimates of growth and the Kleiber ratio in Shal sheep. Arch. Teirz. 56(26) 264-275.

Oudah, E.Z. (2002) Genetic parameters and sire evaluation for growth traits in Egyptian Rahmani lambs. J. Agric., Sci., Mansoura Univ., 27(2) 927-943.

SAS Institute (2005) .SAS /STAT Software. Release 6.SAS Institute. Inc., Cary. NC.

Salem, M. and M. H. Hammoud (2017) Estimation of variance components and heritability's of pre-weaning growth traits of Barkai and Rahmani sheep. Egyptian. of Anim. Prod.(In press).

Shaat, ,I., S. Galal. and H. Mansour (2004) Genetic trends for lambs weights in flocks of Egyptian Rahmani and Ossimi sheep. Small Rumin. Res. 51(1) 23-28.

Shokrollahi, B. and H. Baneh (2012) (Co) variance components and genetic parameters for growth traits in Arabi sheep using different animal model. Genet. Mol. Res., 11: 305-314.

Supakorn, C., W. Pralomkarn and S. Anothaisnthawee (2013) Estimation of genetic parameters and genetic trends for weight and body measurements at birth in sheep population in Thailand. SongklanakarinJ .Sci., Technology. 35(1) 1-10.

Weigel, K.A. (2001) Controlling inbreeding in modern breeding programs. J. Dairy Sci., 85:2376-2383.

Wright, S. (1922) Coefficients of inbreeding and relationship. Am. Naturalist 56: 330-338.

الاتجاهات المظهرية والوراثية لصفات وزن الجسم فى اغنام الرومونوف فى مصر

ابتسام فتوح القصاص[1]، شيماء محمد الكومى[1] ، محمود عبد المؤمن سلامة[2] و عادل خطاب[1]
[1]قسم أنتاج الحيوانى - كلية الزراعة جامعة طنطا – مصر
[2]معهد بحوث الانتاج الحيوانى – وزارة الزراعة– الدقى – القاهرة – مصر

استخدم فى هذه الدراسة 820 حمل من أغنام الرومونوف ناتجة من 30 اب وذلك خلال الفترة من 1995 الى 2005. حللت البيانات باستخدام النموذج المختلط حيث اشتمل على تاثير كل من الاباء و الامهات داخل مجاميع الاباء كعوامل عشوائية و تأثير كل من فصل وسنة الميلاد ، نوع الولادة والجنس كعوامل ثابتة . الصفات التى درست هى الوزن عند الميلاد ، الوزن عند عمر شهر , الوزن عند عمر شهرين ، الوزن عند الفطام ومعدل الزيادة اليومية من الميلاد حتى الفطام. كانت المتوسطات 9.02 كجم ، 7.10 كجم ، 10.50 كجم ، 13.02 كجم و 115.50 جرام لكل من الوزن عند الميلاد ، الوزن عند عمر شهر ، الوزن عند عمر شهرين ، الوزن عند الفطام و معدل الزيادة اليومية على التوالى. أظهرت النتائج معنوية كل الاباء و الامهات داخل مجاميع الاباء على صفات الاوزان وكذلك معنوية كل من فصل و سنة الميلاد ونوع الولادة والجنس على الصفات المدروسة فيما عدا تأثير سنة الميلاد على الوزن عند الميلاد و نوع الولادة على كل من الوزن عند عمر شهر والوزن عند الفطام. كذلك كان تأثير التربية الداخلية على صفات الاوزان عالى المعنوية.أستخدم ايضا نموذجان للحيوان ، النموذج الاول اشتمل على تاثير كل من فصل وسنة الميلاد ، نوع الميلاد والجنس كعوامل ثابتة و كل من الحيوان و التأثير البيئ الدائم والخطأ كعوامل عشوائية . بينما اشتمل النموذج الثانى على نفس العوامل السابقة بالإضافة الى التأثير الوراثى الامى والتداخل بين التأثير الوراثى المباشر والتأثير الوراثى الامى. تراوحت قيم المكافئ الوراثى المباشر مابين 0.17 الى 0.39 لصفات الاوزان باستخدام النموذج الاول بينما تراوحت مابين 0.13 الى 0.29 لصفات الاوزان باستخدام النموذج الثانى. إضافة التأثير الوراثى الامى والتداخل بين التأثير الوراثى المباشر والتأثير الوراثى الامى أدى الى انخفاض قيم المكافئ الوراثى.كذلك كانت قيم معاملات الارتباطات الوراثية والمظهرية بين صفات الاوزان موجبة ومعنوية بينما كانت قيم الاتجاه المظهرى والوراثى السنوى سالبا لصفات الاوزان تحت الدراسة.