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EFFECT OF SELECTION FOR BODY WEIGHT ON BODY MEASUREMENTS AND CARCASS TRAITS IN EL-SALAM STRAIN OF CHICKEN IN EGYPT

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ABSTRACT

This work was carried out at Sakha, Poultry Production Research Station, Animal Production Research Institute, Ministry of Agriculture, during three successive generations to study the effect of the individual selection for high body weight at marketing age (12 weeks) on body measurements (shank length, keel length and body circumference), carcass traits (dressing, breast meat, thigh meat percentage, giblets, and offal percentages of live body weight) in El-Salam strain of chicken. Also, estimates of the genetic parameter for these studied traits. A total number of 789 pedigreed birds obtained from 697 dames mated by 92 sires through three successive generations. The chicks in each generation divided into two lines, first is the selected line and second is the control line. The pullets were transferred to individual laying cages until the end of production phase. Artificial insemination was used during the production season by eight females to each male. In base and later generation, checks were selected according to body weight as equal or greater than average of the flock at 12 weeks of age. Number of 36 checks (18 males and 18 females; 6 from each generation) from selected line and 18 checks (9 males and 9 females; 3 from each generation) from the control one at 12 weeks of age were slaughtered to measure the previous carcass traits.

Results showed that body weight at 12 weeks of age, increased ($p<0.05$) by generations in selected line more than the control line. Also, there were significant differences between generations, lines and sex in body weight and body measurements such as shank length, keel length and body circumference. Selected and unselected males were better than females within and between lines for the most of the studied traits. Chicken males had higher body weight than females in all generations. There were significant differences between generations, lines and sex in carcass traits [dressing, breast meat, thigh meat, giblets (gizzard, heart, and liver) and offal (blood, head, wings, shanks, feather, and viscera) percentages]. Heritability estimates for body weight, shank length, keel length and body circumference at 12 weeks of age were 0.55, 0.44, 0.51 and 0.48, respectively. Heritability estimates for dressing, breast meat, thigh meat, giblets, and offal percentages were 0.48, 0.47, 0.45, 0.52 and 0.47, respectively. All genetic correlations among body weight, body measurements, and carcass traits were positive, ranging from 0.11 to 0.91. All phenotypic correlations between different studied traits were positive ranging between 0.29 and 0.43. It could be concluded that the selection should be carried out to improve body weight, body measurements and carcass traits at marketing age (12 week) in El-Salam strain of chicken in Egypt.

Keywords: Chickens, local strain, selection, body weight, body measurements, carcass traits.

INTRODUCTION

Egyptian chicken breeds had a low growth rate, poor feed efficiency and less meat yield. These breeds were not subjected to any intensive selection programs and consequently, high additive and non-additive genetic variations are expected in them (Iraqi et al., 2000).

Direct response to selection for high body weight at marketing age (12 weeks) resulted in large body weight at different ages and positive changes in body measurements and growth rate for males and females in local strain of chickens (Salem, 1993, El-Wardany et al., 1999, Abd El-Ghany, 2006 and Saleh et al., 2008).

The individual selection is effective for traits that exhibited high heritability estimates such as body weight. The direct response or the genetic gain in a selected trait could be determined in standard deviation units or by the difference between the mean of selected group and population mean (Rishell, 1997).

Body measurements are usually used as an indication for the skeletal development in poultry as well as for the ability of covering with muscle fibers (Becker et al., 1984). The most important dimensions usually measured are shank length, keel length and body circumference for local strains (Goher et al., 1996 and Abou El-Ella et al., 2005). High and positive correlations between body weight and body measurements were found by several authors (Salem 1993; Abdellatif, 1999; Abd El-Ghany, 2006; Shemeis et al., 2007 and Saleh et al., 2008).

The most important carcass traits are percentages of dressing, breast meat, thigh meat, giblets and offal. Carcass traits like other quantitative traits are largely affected by the interaction between genetic and environmental factors (Goher et al., 1996; Abdellatif, 1989; Salem, 1993; Abou El-Ella et al., 2005 and Shafey et al., 2013).

The relationship between body weight and the other traits is very important, therefore, the knowledge of genetic and phenotypic correlations is very helpful in constructing proper selection indices and consequently performing selection at young ages of chicks, which will lead to an improvement in subsequent weights.

El-Salam strain was developed as a breeding project that carried out at Animal Production Research Institute (APRI) to develop the local strain of chicken to use it as commercial hybrid strain for meat production (Abd El-Gawad et al., 1983).

The present study is a part of the breeding program of the APRI for improving the productivity of the local Egyptian strains of chickens through selection. The main aim of this work is to study the effect of the individual selection for body weight at marketing age (12 weeks) on body measurements and carcass traits in El-Salam strain of chicken and estimate the genetic phenotypic parameters for different studied traits.

MATERIALS AND METHODS

Data:

This study was carried out on the flock of El-Salam strain chicken in Sakha Animal Production Research Station, located in the northwest of the Nile Delta, Kafr El-Sheikh governorate, Animal Production Research Institute, Ministry of Agriculture and Land Reclamation, Egypt.

Data included a total number of 789 pedigreed birds obtained from 697 dam mated by 92 sires through three successive generations at marketing age (12 weeks of age). Chicks were wing-banded and reared under conventional open-sided houses. Artificial Insemination (AI) had been applied by assigning about eight females to each male during the laying period, with avoiding mating between relatives. During the experimental period, feed and water were supplied *ad libitum* and all birds were kept and reared under similar environmental conditions. Live body weight for all birds were recorded at 12 weeks of age.

Birds in each generation were divided into two lines, first (selected line) was individually selected according to body weights as equal or greater than average of the flock (or generation) at 12 week of age to the nearest gram. The same criterion was used to select birds in each generation to improve body weight, body measurements, and carcass traits at marketing age (12 weeks). While birds the second line (unselected control line) were randomly taken.

In the selected line, the base generation birds selected were 197 females and 26 males to produce the first generation. The number of selected birds in the first generation were 201 females and 29 males to produce the second generation. While, the number of selected birds in the second generation were 210 females and 34 males to produce the next generation.

In the control line, the base generation number was 25 females and 4 males to be parents of the first generation. In the first generation, the number of birds was 23 females and 4 males to be parents of the second generation. In the second generation, birds were 30 females and 6 males to be parents of the next generation. Body measurements (shank length, keel length and body circumference) were determined to the nearest millimeter (mm).

A total number of 54 birds; 36 from selected line (18 males and 18 females; 6 from each generation) and 18 from the control one (9 males and 9 females; 3 from each generation) at 12 weeks of age were slaughtered for carcass traits and compositions. Carcasses were weighed individually while, head, wings, shanks, feather and viscera were separated and considered as the offal as well as the giblets (gizzard, heart, and liver). Carcass traits studied were dressing percentage, breast meat percentage, thigh meat percentage, giblets percentage, and offal percentage; all expressed as percentage of the live body weight.

Statistical analyses:

Data were analyzed by using General Linear Model procedure (PROC GLM) of SAS program (SAS, 1990) to estimate the significance of the main effects generation, line, sex, and their interactions for different studied traits. The significant differences among means were tested using Duncan's multiple range test within SAS program.

The arcsin transformation was performed on all percentage data. However, because the statistical patterns were similar for transformed and non transformed results, only the latter are presented.

All traits were analyzed according to the following fixed model:

$$y_{ijkl} = \mu + G_i + L_j + S_k + (G*L)_{ij} + (G*S)_{ik} + (L*S)_{jk} + (G*L*S)_{ijk} + e_{ijkl}$$

Where: Y_{ijkl} is an observation in generation (i), line (j) and sex (k), μ, is the overall mean, G_i is the effect of generation i (i=1, 2, 3), L_j, is the effect of line j (j=1, 2), S_k is the effect of sex k (k=1, 2), $(G*L)_{ij}$ = interaction between generation i and line j $(G*S)_{ik}$ = interaction between generation i and sex k, $(L*S)_{jk}$ = interaction between line j and sex k, $(G*L*S)_{ijk}$ = interaction between generation i, line j, and sex k and e_{ijkl} is the random error.

In multivariate Restricted Maximum Likelihood (REML) data were analyzed using animal model utilizing the MTDFREML programs developed by Boldman et al., (1995) to obtained the genetic parameters for different studied traits.

The full general animal model used was:

$$Y = Xb + Za + e$$

Where: Y = a vector of observation, b = a vector of fixed effects (generation, line and sex), a = a vector of direct genetic effects and e = the vector of residual effects. X and Z incidence matrices relating records to fixed and direct genetic effects, respectively.

Heritability was computed according to Boldman et al. (1995) as:

$$h_a^2 = \frac{\sigma_a^2}{\sigma_a^2 + \sigma_e^2}$$

Where σ_a^2 and σ_e^2 are variances due to effects of direct additive genetic and random error, respectively.

RESULTS AND DISCUSSION

Least square means of live body weight and body measurements of males and females in both selected and control lines in different generations are presented in Table 1. Mean of live body weight were 800.6, 861.4 and 1043.2 g for base, first and second generations, 966.0 and 773.2 g for the selected and control lines, and 971.9 and 831.6 g for males and females, respectively. All body measurements increased by increasing live body weight from one generation to the next one. The selected line had higher body measurements than control line. Also, the males had higher body measurements than females. Similar results were reported by Abdellatif (1999), El-Wardany (1999) and Saleh et al. (2008). Averages of body measurements in the present study are similar to those reported by El-Wardany et al. (1999), Abd El-Ghany (2006), Hassan (2006) and Abd El-Karim (2008) for two local strains of chicken.

Table 1: Least-square means ± standard errors of live body weight and body measurements at 12 weeks of age in El-Salam strain of chicken.

Gen.	Line	Sex	Live body weight	Body measurement		
				Shank length	Keel length	Body circumference
Base Gen.	Selected	M	956.8±56.0	7.41±0.35	8.50±0.26	23.33±0.95
		F	750.0±48.5	6.50±0.13	7.17±0.36	21.50±0.92
	Control	M	675.0±72.9	6.33±0.17	6.67±0.33	20.00±1.73
		F	615.0±23.3	6.17±0.44	7.00±0.50	20.33±2.40
First Gen.	Selected	M	1038.3±72.3	6.58±0.20	8.25±0.30	24.31±0.33
		F	846.7±58.6	7.42±0.20	8.42±0.47	23.33±0.49
	Control	M	750.0±181.9	7.33±0.83	7.50±1.04	22.00±2.65
		F	648.3±106.3	6.17±0.44	7.00±0.50	20.33±2.40
Second Gen.	Selected	M	1181.7±68.3	8.75±0.31	10.08±0.62	28.17±1.44
		F	1076.7±72.0	7.58±0.20	9.33±1.67	24.67±0.49
	Control	M	968.3±34.5	7.33±0.17	8.33±0.33	25.00±0.58
		F	774.3±34.8	6.67±0.17	7.67±0.17	24.33±0.33
Generation effect:						
Base Gen.			800.6±38.8^{b}	6.72±0.18^{c}	7.50±0.24^{b}	21.87±0.67^{b}
First Gen.			861.4±53.9^{b}	7.25±0.20^{b}	7.97±0.27^{b}	22.94±0.63^{b}
Second Gen.			1043.2±50.1^{a}	7.78±0.22^{a}	9.14±0.30^{a}	25.83±0.63^{a}
Line effect:						
Selected			966.0±34.7^{a}	7.46±0.14^{a}	8.56±0.22^{a}	24.06±0.48^{a}
Control			773.2±48.8^{b}	6.83±0.23^{b}	7.50±0.26^{b}	22.33±0.84^{b}
Sex Effect						
Male			971.9±45.2^{a}	7.61±0.19^{a}	8.46±0.27^{a}	24.30±0.68^{a}
Female			831.6±37.5^{b}	6.89±0.14^{b}	7.94±0.23^{b}	22.67±0.51^{b}
Interaction effects:						
Gen.			**	***	**	***
Line			***	**	**	*
Sex			*	***	*	*
Gen.*line			NS	*	NS	NS
Gen.*sex			NS	NS	NS	NS
Line*sex			NS	NS	NS	NS
Gen.*line*sex			NS	NS	NS	NS

^{a}, ^{b}, and ^{c}: Means having different letter exponents within each column within each classification are significantly different at P ≤ 0.05. Gen. = Generation, M = male, F = female, * significant at 0.05 level, ** significant at 0.01 level, * significant at 0.001 level, NS = non significant.**

As shown in table 1, highly significant differences were found among generations, lines, and sex for live body weight and body measurements. Moreover, birds in the selected line had significantly higher body measurements than control one. Through the comparison between the selected and control line after three generations of selection, it could be noticed that the selected line surpassed the control line by 9.5, 12.4 and 7.2% for shank length, keel length, and body circumference, respectively. Abdellatif (1999) reported that selected line had longer shank length compared to control line after five generations of selection for body weight in Dandarawi breed of chicken. For selected high live body weight, Ramadan *et al*. (2014) reported that keel and shank lengths of the selected line were significantly longer than those of the control line.

Results in this study indicated that live body weight and body measurements were significantly improved due to intensive selection that had been done for three generations.

Table (2) showed the least square means of live body weight and carcass traits. Means of all carcass traits increased by increasing body weight, while giblets and offal percentages showed an opposite trend from one generation to the next one, and, in selected line compared with unselected one. Males were higher than females for dressing, breast meat and thigh meat percentages, while males were lower than females for giblets and offal percentages. These results are in agreement with these reported by Goher et al. (1996), Yalcin et al. (2000), Abou El-Ella et al. (2005) and Ramadan et al. (2014).

As shown in table 2, there were highly significant differences between generations and lines for live body weight and all carcass traits, while offal percentage was not affected significantly by generations and lines. Also, there were highly significant differences between males and females in live body weight, while carcass traits, including thigh meat, giblets and offal percentages were not affected significantly by sex and birds. These results are in agreement with those obtained by Goher and El-Sayed (1990), who reported significant differences between sex in all traits, except for giblets parts (liver, heart and gizzard). Moreover, Abou El-Ella *et al*. (2005) found highly significant effect of sex on live body weight and significant effect on relative carcass weight and edible parts traits. Ramadan *et al*. (2014) pointed out that the males had significantly higher carcass, breast meat, and leg meat weights compared with the females.

Genetic parameters:

Estimates of direct additive genetic variance (σ_a^2), error variance (σ_e^2), phenotypic variance (σ_p^2) and heritabilities (h_a^2) for live body weight, body measurements and carcass traits are presented in Table 3. The results showed that the additive genetic variance for live body weight, body measurements and carcass traits ranged from 0.54 to 4.18. These estimates were lower than those obtained by Iraqi et al. (2000) and in agreement with the results previously reported by Iraqi (1999) on Dokki-4 chicken.

Table 2: Least-square means ± standard errors of live body weight and carcass traits; dressing, breast meat, thigh meant, giblets and offal percentages at 12 weeks of age in El-Salam strain of chicken.

Gen.	Line	Sex	Live body weight	Carcass trait				
				Dressing percentage	Breast meat percentage	Thigh meat percentage	Giblets percentage	Offal percentage
Base Gen.	Selected	M	956.8±56.0	68.7±1.47	22.60±0.33	27.48±1.00	5.85±0.17	26.3±7.72
		F	750.0±48.5	61.5±1.44	21.37±0.23	24.82±1.45	5.73±0.39	32.2±6.29
	Control	M	675.0±72.9	68.1±1.47	22.06±1.20	24.14±1.65	6.26±0.39	32.8±1.31
		F	615.0±23.3	53.3±3.40	20.85±1.22	29.01±3.13	6.92±1.82	33.5±1.80
First Gen.	Selected	M	1038.3±72.3	71.5±3.05	24.16±0.94	32.11±2.36	4.12±0.62	28.5±4.07
		F	846.7±58.6	70.6±1.06	21.60±0.56	29.20±1.58	5.74±0.26	29.4±2.60
	Control	M	750.0±181.9	72.4±5.68	22.88±0.65	27.17±1.92	6.30±0.47	27.6±9.84
		F	648.3±106.3	66.5±1.04	20.85±1.22	27.18±1.22	6.33±0.40	33.5±1.80
Second Gen.	Selected	M	1181.7±68.3	70.9±1.69	25.04±0.71	31.27±0.99	5.08±0.22	31.7±3.15
		F	1076.7±72.0	75.0±2.29	24.56±1.44	30.08±0.73	5.10±0.15	30.1±5.82
	Control	M	968.3±34.5	72.0±2.62	21.49±2.09	29.13±0.99	5.90±0.33	26.7±6.50
		F	774.3±34.8	67.8±3.30	21.20±0.85	29.51±0.60	6.42±0.47	28.1±9.85
Generation effect:								
Base Gen.			$800.6±38.8^{b}$	$64.7±1.23^{b}$	$21.81±0.31^{b}$	$25.31±1.15^{c}$	$6.06±0.31^{a}$	$30.6±6.29^{a}$
First Gen.			$861.4±53.9^{b}$	$70.7±1.27^{a}$	$22.54±0.50^{ab}$	$27.88±0.82^{b}$	$5.40±0.32^{a}$	$29.5±4.74^{a}$
Second Gen.			$1043.2±50.1^{a}$	$71.9±1.23^{a}$	$23.65±0.71^{a}$	$30.42±0.43^{a}$	4.45±0.17b	$29.7±5.71^{a}$
Line effect:								
Selected			$966.0±34.7^{a}$	$69.9±0.98^{a}$	$23.22±0.39^{a}$	$28.67±0.66^{a}$	$5.37±0.16^{b}$	$29.7±5.27^{a}$
Control			$773.2±48.8^{b}$	$67.5±1.49^{b}$	$21.55±0.48^{b}$	$26.27±0.97^{b}$	$6.40±0.30^{a}$	$30.4±6.15^{a}$
Sex effect:								
Male			$971.9±45.2^{a}$	$70.6±0.96^{a}$	$23.34±0.42^{a}$	$28.00±1.31^{a}$	$5.40±0.22^{a}$	$28.9±5.77^{a}$
Female			$831.6±37.5^{b}$	$67.7±1.30^{b}$	$22.00±0.46^{b}$	$27.24±0.90^{a}$	$5.90±0.23^{a}$	$30.9±5.19^{a}$
Interaction effects:								
Gen.			**	**	*	**	*	NS
Line			***	*	**	*	**	NS
Sex			*	**	*	NS	NS	NS
Gen.*line			NS	NS	NS	NS	NS	NS
Gen.*sex			NS	NS	NS	NS	NS	NS
Line*sex			NS	NS	NS	NS	NS	NS
Gen.*line*sex			NS	NS	NS	NS	NS	NS

^{a}, ^{b}, and ^{c}: means having different letter exponents within each column within each classification are significantly different at P ≤ 0.05. Gen. = Generation, M = males, F = females, * significant at 0.05 level, ** significant at 0.01 level, *** significant at 0.001 level, NS = non significant.

The results also showed that heritability estimate for body weight was 0.55, which was higher than those obtained by Abd El-Ghany (2006), who found that heritability estimate was 0.20 after two generations of selection to improve body weight at 12 weeks of age in Inshas strain of chicken. In the same trend, Saleh *et al.* (2008) found that heritability estimate was 0.16 after three generations of selection for high body weight at the same age. However, these results are in agreement with those reported by Ghanem (2003), Kosba *et al.* (2006), Enayat (2006) and Lariviere *et al*. (2009). Reviewed estimates in the Egyptian studies indicated that heritabilities of live body weight reported for local breeds at different ages were higher than those reported for foreign breeds, (being 0.39 after three generations of selection (Abdellatif, 1989), 0.34 after two generations of selection (Abd El-Ghany, 2006), 0.31 after three generations of selection (Ragaa, 2008) and 0.69 after two generations of selection (Kosba and Abd El-Halim, 2008). These results might be due to the high genetic variance component in local breeds than those of the corresponding estimate in foreign breeds. Iraqi *et al.* (2000) reported that estimates of heritability in local breed of chicken at early age were higher than those at later age (12 weeks of age).

Table 3; Estimates of direct additive genetic variance σ_a^2, error variance σ_e^2, phenotypic variance σ_p^2 and heritability h_a^2 of live body weight, body measurements and carcass traits at 12 weeks of age in El-Salam strain of chicken.

Trait	Direct additive genetic variance σ_a^2	Error variance σ_e^2	Phenotypic variance σ_p^2	Heritability h_a^2
Live body weight	0.84	0.68	1.53	0.55
Body measurements:				
Shank length	0.54	0.68	1.22	0.44
Keel length	0.91	0.86	1.77	0.51
Body circumference	1.56	1.69	3.25	0.48
Carcass traits:				
Dressing percentage	3.09	3.38	6.47	0.48
Breast meat percentage	1.45	1.62	3.07	0.47
Thigh meat percentage	1.27	1.56	2.83	0.45
Giblets percentage	0.65	0.59	1.24	0.52
Offal percentage	4.18	4.77	8.95	0.47

Heritability estimates for body measurements were 0.44, 0.51 and 0.48 for shank length, keel length and body circumference, respectively. Abdellatif (1999) and El-Wardany *et al*. (1999) reported that heritability estimates of shank length and body circumference were 0.56 and 0.67, respectively. Hassan and El-Turky, (1983), Salem (1998) and Shemeis et al. (2007) obtained lower estimate for body measurements.

Heritability estimates for carcass traits were 0.48, 0.47, 0.45, 0.52, and 0.47 for dressing, breast meat, thigh meat, giblets and offal percentages, respectively. These results are in agreement with those reported by Abdellatif (1989), being 0.43 for giblets percentage and 0.39 for dressing percentage at 12 weeks of age.

Estimates of genetic and phenotypic correlations among live body weight and body measurements are presented in Table 4. Estimates of genetic correlations among live body weight and body measurements ranged from 0.30 to 0.87. For body measurements the highest genetic correlation obtained between shank length and keel length (0.90), while the lowest was between shank length and body circumference (0.44).

Table 4: Genetic correlations (above diagonal) and phenotypic correlations (below diagonal) for live body weight and body measurements (shank length, keel length and body circumference) at 12 weeks of age in El-Salam strain of chicken.

Trait	Live body weight	Shank length	Keel length	Body circumference
Live body weight	---	0.87	0.72	0.30
Shank length	0.66	---	0.90	0.44
Keel length	0.72	0.85	---	0.56
Body circumference	0.29	0.47	0.67	---

Corresponding phenotypic correlations among live body weight and body measurements ranged between 0.29 and 0.72. The highest phenotypic correlation was between shank length and keel length (0.85), while the lowest was between shank length and body circumference (0.47, Table 4).

Genetic and phenotypic correlations among body weight and carcass traits are presented in Table 5. Estimates of genetic correlations among live body weight and carcass traits (dressing, breast meat, thigh meat, giblets and offal percentages) were 0.55, 0.80, 0.66, 0.45, and 0.17, respectively. The highest genetic correlation was between dressing percentage and breast meat percentage (0.91), while the lowest was between thigh meat percentage and offal percentage (0.11).

Estimates of phenotypic correlations among live body weight and carcass traits (dressing, breast meat, thigh meat, giblets and offal percentages) were 0.61, 0.89, 0.75, 0.55, and 0.78, respectively. Olawumi (2013) reported that phenotypic correlations estimates between live weight and all carcass traits in broiler chicken were significant and positive. Moreover, positive genetic and phenotypic correlations were reported by Salem (1993) and (1998), while, Abdellatif (1989) reported low and negative estimates of genetic and phenotypic correlations between body weight and dressing and giblets percentages. Several mechanisms appear to be responsible for higher meat production in chickens with reduced plumage, as well as less feather production leaves more protein for the synthesis of other tissues, mainly muscle as a result of meat production (Merat, 1986; Fathi *et al*., 2003). This result means that selection for high body weight at 12 weeks of age may increase carcass traits component as well as edible parts (breast and thigh meat) and dressing percentages.

Results of the present study indicated that the individual selection for body weight at marketing (12 weeks of age) in El-Salam strain of chicken can be successfully applied to increase body weight over generations to improve breast and high meat percentages and reducing giblets and offal percentages.

Table 5: Genetic correlations (above diagonal) and phenotypic correlations (below diagonal) for live body weight and carcass traits; dressing percentage, breast meat, thigh meat, giblets, and offal percentages at 12 weeks of age in El-Salam strain of chicken.

Trait	Live body weight	Dressing percentage	Breast meat percentage	Thigh meat percentage	Giblets percentage	Offal percentage
Live body weight	---	0.55	0.80	0.66	0.45	0.17
Dressing percentage	0.61	---	0.91	0.62	0.56	0.57
Breast meat percentage	0.89	0.87	---	0.83	0.63	0.17
Thigh meat percentage	0.75	0.51	0.80	---	0.52	0.11
Giblets percentage	0.55	0.56	0.70	0.48	---	0.47
Offal percentage	0.78	0.73	0.89	0.65	0.93	---

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تـأثير الانتخـاب لـوزن الجسـم علـي مقـاييس الجسـم وصـفات الذبيحـة فـى سـلالة دجـاج السلام فى مصر

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محطة بحوث الإنتاج الحيواني بسخا ، معهد بحوث الإنتاج الحيواني ، مركز البحوث الزراعية

أجريت هذه الدراسة بمحطة بحوث الإنتاج الحيوانى بسخا خلال ثلاثة أجيال متعاقبة بهدف دراسة تأثير الانتخاب الفردى لوزن الجسم عند عمر التسويق (١٢ أسبوع) في سلالة دجاج السلام المحلية علي مقاييس الجسم (طول الساق وطول عظمة القص ومحيط الصدر) وصفات الذبيحة (نسبة التصافى من الوزن الحي، نسبة لحم الصدر من الوزن الحي، نسبة لحم الفخذ من الوزن الحي، نسبة الأجزاء المأكولة والحلويات giblets (الكبد، القلب، القونصه) من الوزن الحي، ونسبة الاجزاء الغير مأكولة offal أيضا تقدير المعايير الوراثية لهذه الصفات المدروسة.

اشتملت هذه الدراسة على بيانات تم الحصول عليها من ٧٨٩ كتكوت منسب ناتج من تزاوج ٦٩٧ أم مع ٩٢ ذكر. تم تقسيم تلك الكتاكيت الي خطين من خطوط التربية، الأول الخط المنتخب وتم اختيار الكتاكيت فيه علي أساس وزنها الحي عند عمر التسويق (١٢ اسبوع) بحيث يساوي أويزيد عن متوسط القطيع وهكذا لمدة ثلاث اجيال متعاقبة. بينما الخط الغير منتخب او خط المقارنة تم اختيار الكتاكيت فية بشكل عشوائي. عند عمر ٢٠ أسبوع تم وضع كل من الإناث و الذكور فى أقفاص فرديه لجمع البيض الناتج منسب لكل أم وأب واستخدم التلقيح الصناعى حيث خصص ذكر لكل ثمانية اناث للحصول علي بيض مخصب لتكوين الجيل التالى.

- توضح النتائج زيادة في وزن الجسم عند ١٢ أسبوع من العمر عبر الأجيال بالمقارنة بخط الكنترول.
- توجد فروق معنوية بين كل من الأجيال والخطوط وكذلك وجد أن للجنس تأثير معنوي على صفات الوزن ومقاييس الجسم التى تتمثل في طول الساق - طول عظمة القص ومحيط الجسم.
- سجلت الذكور أفضل وزن جسم مقارنة بالإناث للخط المنتخب مقارنة بالكنترول في كل الخطوط وأيضا داخل كل خط في معظم الصفات تحت الدراسة. كما أن الذكور كانت أعلى في ووزن الجسم في جميع الأجيال.
- وجد تأثير معنوي لكل من الجيل والخط والجنس على صفات الذبيحة وتشمل صفات نسبة التصافي - لحم الصدر - لحم الفخذ - الأجزاء المأكولة (الكبد - القلب - القونصة) وكذلك الجزاء غير المأكولة (الدم - الرأس - الأجنحة - الأرجل - الريش - الأمعاء).
- سجل المكافئ الوراثي لكل من وزن الجسم وطول الساق وطول عظمة القص ومحيط الصدر حوالي ٠.٥٥ ، ٠.٤٤ ، ٠.٥١ ، ٠.٤٨ عند ١٢ أسبوع من العمر علي الترتيب.
- سجل المكافئ الوراثي لنسبة التصافي ولجسم الصدر ولحم الفخذ والأجزاء المأكولة والغير مأكولة حوالي ٠.٤٨ ، ٠.٤٧ ، ٠.٤٥ ، ٠.٥٢ ، ٠.٤٧ علي الترتيب.
- سجل الإرتباط الوراثي قيما إيجابية لجميع الصفات بين وزن الجسم ومقاييس الجسم وصفات الذبيحة حيث تراوحت قيمته بين ٠.١١ إلى ٠.٩١ كما أن الإرتباط المظهري في جميع الصفات سجل قيما إيجابية تراوحت قيمته بين ٠.٢٩ إلى ٠.٩٣ .
- بصفة عامة من هذه الدراسة أمكن تحسين كل من وزن الجسم ومقاييس الجسم وكذلك صفات الذبيحة عند عمر التسويق (١٢ أسبوع من العمر) في سلالة السلام المصرية.