Egypt. Poult. Sci. Vol (37)(IV): (1047-1061)(2017) **(1761)**

Egyptian Poultry Science Journal

http://www.epsaegypt.com

ISSN: 1110-5623 (Print) – 2090-0570 (Online)

TESTING HETEROTIC EFFECT AND STRAIN DIFFERENCES FOR CARCASS TRAITS OF SOME DEVELOPED LOCAL STRAINS OF CHICKEN AND THEIR CROSSES

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Received: 30/09/2017 Accepted: 16/10/2017

ABSTRACT: To analyze the improvement of carcass traits in some developed local chicken strains, crossbreeding experiments were carried out of eight strains of chicken (basic flocks): Golden Montazah (GM), Matrouh (MAT), Mandarah (MN), Silver Montazah (SM), Bahig (BAH), Gimmizah (GIM), Mamourah (MAM), Sina (SIN). Carcass traits to either basic flocks, their crosses and reciprocal crosses were determined. The main results showed that, Mamourah strain had significantly the heaviest live body weight compared to other strains; while, Mamourah, Golden Montazah and Mandarah strains had significantly higher carcass percentage (60.92, 60.85 and 60.44 %, respectively) and total edible parts percentage compared to other one. It had significantly lower total inedible parts percentage compared to other studied developed local chicken strains.

GM×MN and GIM×MAM crosses had significantly heavier live body weight compared to other crosses. GM×SIN cross had significantly higher carcass percentage and total edible parts (%) in comparison with other studied crosses. This cross recorded higher value of carcass percentage compared to their parents. GM×MN cross had significantly higher liver percentage (2.60 %) and giblets percentage (5.52 %) in comparison with other crosses, and this cross recorded higher values of liver and giblets percentages compared to their parents. Reciprocal cross (MN×GM) had significantly higher live body weight, carcass percentage and total edible parts (%) compared to other reciprocal crosses.

There are positive heterosis of live body weight in all crosses and reciprocal crosses, except MAM×GIM. On the contrary, there are negative heterosis of carcass and total edible parts percentages in all crosses, except GM×SIN cross had positive heterosis.

Key Words: Heterosis - Developed local strains - Crosses - Carcass traits.

INTRODUCTION

The way and date by which chicken entered the African continent remain poorly understood. It is suggested that chickens were first introduced into Africa via Egypt from South-western Asia via the middle-east (Magothe et al., 2012). Local chickens are known to own desirable characteristics such as resistance to some diseases, wonderful meat flavor and taste (Aberra, 2000; Fanatico et al., 2005). Therefore, consumption of meat products from local chickens has increased in countries of East Asia and Europe although their relatively high prices (Yang and Jiang, 2005). The same trend, we can observed in Africa and the developing countries.

In the developing countries, poultry is very importance as a major source of meat, egg and as a source of income (Zaman et al., 2004). In Egypt, intensive poultry production depends local strains of chickens beside commercial hybrids. Many trails were made to produce Egyptian local strains of chicken. All of them used a cross breeding between a local strain and foreign strain, followed by selection for many traits on some crosses under Egyptian environmental condition. The mainly important aspect in improving a new line of chicken is to include differences between breeds for productive traits. Most of the Egyptian consumers still prefer meat from local strains. Significant differences between breeds and strains for carcass traits were detected by El-Labban (1999) and Habeb (2007). Carcass traits like other quantitative traits are mostly affected by the interaction between genetic and environmental factors (Abou El-Ella et al., 2005; and Shafey et al., 2013).

Aly and Abou El-Ella (2006) reported that crossing of chickens plays an important role in the improvement of the native strains in Egypt. Aly et al. (2005) reported that crossing between Gimmizah and Bandara local strains improved body weight, and some carcass traits. Direct positive effect of crossing on body weight was reported by Sato et al. (1992).

The main objectives of this work were to analyze the improvement of carcass traits in some developed local chicken strains through crossing.

MATERIALS AND METHODS

Eight developed local strains of chicken (basic flocks): Golden Montazah (GM), Matrouh (MAT), Mandarah (MN), Silver Montazah (SM), Bahig (BAH), Gimmizah (GIM), Mamourah (MAM), Sina (SIN) and their crosses:

Golden Montazah × Mandarah (GM×MN),
Golden Montazah × Sina (GM×SIN),
Matrouh × Silver Montazah (MAT×SM),
Bahig × Silver Montazah (BAH×SM),
Gimmizah × Mamourah (GIM×MAM),
Also, and their reciprocal crosses:
Mandarah × Golden Montazah (MN×GM),
Sina × Golden Montazah (SIN×GM),
Silver Montazah × Matrouh (SM×MAT),
Silver Montazah × Bahig (SM×BAH).
Mamourah × Gimmizah (MAM×GIM),

were used in this study. All birds were housed in floor pens under the same environmental, managerial and hygienic conditions. The feed and water were provided ad libitum. All diets were formulated to provide the nutrient requirements according to NRC (1994).

Composition of the experimental diets is summarized in Table (1).

At 12 weeks of age, a total number of 90 chicken (5 from each strain or cross) were randomly taken and slaughtered for carcass evaluation. They were weighed, slaughtered and defeathered. The birds were eviscerated by removing the viscera. Inedible viscera length was measured in (cm) using a measuring tape. The giblets (gizzard, liver and heart) were dissected from the viscera and the gizzard was cut, opened and its contents cleaned. The carcass, liver, gizzard, heart, inedible viscera, head, neck, leg and feather were individually weighed using second decimal scales. All parts (edible and inedible) were expressed as a proportion of the live body weight.

The crossbreed effect (Hybrid vigor) or hetrosis expressed as a percent was calculated as the superiority of the cross breed chicken over that of the pure bred ones for all carcass traits studied. The heterosis was calculated as follows:

$$\text{Heterosis \%} = \frac{\text{Mean cross bred} - \text{Mean pure bred}}{\text{Mean pure bred}} \times 100$$

Statistical analysis:

Data were analyzed using one-way analysis of variance with the strain as a main effect using the General Linear Model (GLM) procedure of SAS (2002) according to the following model;

$Y_{ij} = \mu + S_i + e_{ij}$

Where;

Y_{ij} = Trait measured,

μ = Overall mean,

S_i = Strain effect

e_{ij} = Experimental error.

When significant differences among means were found, means were separated using Duncan's multiple range tests.

RESULTS AND DISCUSSION

Developed Local Strains

Data presented in Table (2) clarify edible meat parts of some developed local strains of chicken at 12 wks of age. The present results showed that Live body weight, carcass (%), heart (%), and total edible parts were significantly affected by strain. Mamourah strain had significantly the heaviest live body weight compared to other strains. While, Mamourah, Golden Montazah and Mandarah strains had significantly higher carcass percentage (60.92, 60.85 and 60.44 %, respectively) compared to other strains.

Strain differences in live body weight were stated by Younis and Abed-Ghany (2003) in four local chicken strains, and Kosba and Abd El- Halim (2008) in 14 local strains. LBW records in the present study were higher at 12 wk of age than those reported by Habeb (2007) and El-Anwer et al. (2010).

In the present study, the carcass (%) of all local strains of chicken was lower than that reported for Italian local chickens (De Marchi et al., 2005) and Benin local chickens (Youssao et al., 2012) and Tunisian local chickens (Moujahed and Haddad, 2013). Golden Montazah (GM) and Matrouh (MAT) strains had significantly higher heart percentage in comparison with other strains. MN, GM and MAM strains had significantly higher total edible parts percentage (66.01, 65.91 and 65.90 %, respectively) compared to other strains. No significant difference (p ≥0.05) between strains for percentages of liver, gizzard and giblets were found.

Inedible parts of some developed local strains of chicken at 12 wks of age are shown in Table (3). Data indicate that all inedible parts were significantly affected by strain, except relative viscera weight. MN and GM strains had significantly lower blood percentage (3.81 and 3.89 %, respectively) compared to other strains. MAM strain had significantly higher feather percentage (13.58 %) in comparison with other strains. MN and MAM strains had significantly higher viscera length (169.4 and 165 cm, respectively) compared to other strains. Similar trend was observed by Elawa (2004), Habeb (2007) and El-Anwer et al. (2010), who obtained a significant difference in small intestine length between two local strains of chickens at about 12 weeks of age. It could be observed that the increase in the length of viscera of MN and MAM strains was related with an increase in carcass percentage for the same strains (Tables 2). BAH strain had significantly lower head percentage; while, MAM strain had significantly lower neck percentage, and MAT strain had significantly lower leg percentage compared to other strains. Finally, MN and GM strains had significantly lower total inedible parts percentage (31.61 and 32.44 %, respectively) compared to other strains. Conversely, SM strain had significantly higher total inedible parts percentage (35.59 %) in comparison with other strains.

Crosses and Reciprocal Crosses

Edible meat parts of some crosses and reciprocal crosses between developed local chicken strains at 12 wks of age are shown in Table (4). GM×MN and GIM×MAM crosses had significantly heavier live body weight compared to other crosses. We can observe that GM×MN cross had heavier live body weight (1163 g) compared to their parents; GM (1079 g) and MN (1157 g). Also, the same trend was observed of GIM×MAM cross (Table 2). Aly and Abou El-Ella (2006) reported that crossbreeding of chickens plays an important role in the improvement of the native strains in Egypt. GM×SIN cross had significantly higher carcass percentage (60.91) in comparison with other crosses. This cross recorded higher value of carcass percentage compared to their parents (Table 2). Carcass yield is affected by a number of factors including genetic, slaughtering conditions, feed, and live weight (Havenstein et al., 2003; and Brickett et al., 2007). GM×MN cross had significantly higher liver percentage (2.60 %) and giblets percentage (5.52 %) in comparison with other crosses, and these crosses recorded higher values of liver and giblets percentages compared to their parents. While MAT×SM cross had significantly higher heart percentage (0.52 %) compared to other crosses. it recorded higher value of heart percentage compared to their parents (Table 2). GM×SIN cross had significantly the highest total edible parts percentage (65.68 %) compared to other crosses. Reciprocal cross (MN×GM) had significantly higher live body weight, carcass percentage and total edible parts (%) compared to other reciprocal crosses, while SIN×GM had significantly higher heart percentage compared to counterparts. No significant difference between reciprocal crosses for liver, gizzard and giblets percentages were found.

Table (5) reveals inedible parts of some crosses and reciprocal crosses between developed local chicken strains at 12 wks of age. It was observed that BAH×SM cross had significantly lower blood percentage (4.07 %) compared to other crosses. No significant difference (P ≥0.05) between crosses for feather percentage, viscera weight (%), neck percentage and total inedible parts (%) were found. GM×SIN cross had significantly lower viscera length (144.8 cm); while, GM×MN cross had significantly lower head percentage (3.56 %), and GM×SIN cross had significantly lower leg percentage (4.35 %) compared to other crosses. Reciprocal crosses (MAM×GM and SIN×GM) had significantly lower feather percentage; while, MAM×GIM and MN×GM had significantly lower head percentage compared to other crosses. We can observed that SIN×GM and SM×MAT had significantly lower leg percentage. Finally, SIN×GM reciprocal cross had significantly lower total inedible parts percentage (32.04 %) compared to other counterparts.

Heterosis

Data presented in Table (6) clarify effect of heterosis (%) on carcass traits of some crosses. From present results we can concluded that there are positive heterosis of live body weight in all crosses, however, there are negative heterosis of carcass and total edible parts percentages in all crosses except GM×SIN cross. With respect to total inedible parts (%), GM×MN, GM×SIN and GIM×MAM crosses had positive heterosis, however MAT×SM and BAH×SM crosses had negative heterosis.

Effect of heterosis (%) on carcass traits of some reciprocal crosses are shown in Table (7). There was positive heterosis of live body weight in all reciprocal crosses, except for MAM×GIM there was negative value (-2.78). There are positive heterosis of carcass and total edible parts (%) in in all crosses, opposite trend was noticed in SM×MAT and MAM×GIM crosses. Concerning total inedible parts (%), the heterosis had negative effect in all reciprocal crosses, except in MN×GM cross was positive heterosis (9.58).

CONCLUSION

It could be concluded that, Mamourah (MAM), Golden Montazah (GM) and Mandarah (MN) strains had significantly higher carcass percentage and total edible parts (%), and it had significantly lower total inedible parts (%) compared to other developed local chicken strains. GM×SIN cross had significantly higher carcass percentage and total edible parts (%) in comparison with other crosses. The same trend was observed to reciprocal cross (MN×GM). There are positive heterosis of live body weight in all crosses and reciprocal crosses, except MAM×GIM. There are negative heterosis of carcass and total edible parts percentages in all crosses, except GM×SIN cross had positive heterosis.

ACKNOWLEDGEMENT

I deeply grateful and thanks to professor N. A. Hattaba, Anim. Produ. Rese. Insti., Mins. of Agric., Dokki-Cairo for his help and providing the facilities of work. I wish to express thanks to professor A. Zein El-Dein, Poult. Produ. Dept., Fac. of Agric., Ain Shams Univ., for useful comments and correction.

Table (1): Composition of the experimental diets

Ingredients	Diets		
	Starter (0-6 wks)	**Grower (6-8 wks)**	**Finisher (8-12 wks)**
Yellow Corn	62.5	67	70.5
Soybean Meal (48%)	32	27.5	23
Bone meal	2.5	2.5	2.5
Corn oil	2	2	3
Limestone	0.4	0.4	0.34
Salt (Nacl)	0.3	0.3	0.3
Premix (Vitamins + Minerals)	0.3	0.3	0.3
Lysine	--------	--------	0.06
Total	100	100	100
ME Kcal/ Kg diet	3077	3118	3222
Crude Protein, %	20.37	18.53	16.70
Lysine	1.167	1.035	0.961
Methionine	0.355	0.332	0.307
Methionine & Cysteine	0.683	0.633	0.580
Ca, %	0.93	0.92	0.89
A. Phosphors, %	0.44	0.43	0.43
Sulfur, %	0.1908	0.1746	0.1576

Table (2): Edible meat parts of some developed local strains of chicken at 12 wks of age (Means ± SE)

Trait	Strain								Prob.
	Golden Montazah (GM)	**Matrouh (MAT)**	**Mandarah (MN)**	**Silver Montazah (SM)**	**Bahig (BAH)**	**Gimmizah (GIM)**	**Mamourah (MAM)**	**Sina (SIN)**	
Live body weight, (g)	1079^{c} ±19.35	1078^{c} ±17.44	1157^{b} ±12.51	1022^{ed} ±25.82	1018^{ed} ±14.88	1038^{cd} ±15.70	1227^{a} ±16.93	980^{e} ±18.77	<0.0001
Carrcass, (%)	60.44^{ab} ±0.60	59.99^{abc} ±0.56	60.85^{a} ±0.66	57.97^{c} ±1.14	57.78^{c} ±0.80	59.54^{abc} ±0.58	60.92^{a} ±0.89	58.29^{bc} ±0.68	0.02
Liver, (%)	2.50 ±0.05	2.49 ±0.26	2.47 ±0.08	2.18 ±0.15	2.36 ±0.17	2.11 ±0.12	2.34 ±0.10	2.25 ±0.04	NS
Heart, (%)	0.47^{a} ±0.02	0.48^{a} ±0.02	0.40^{b} ±0.02	0.48^{a} ±0.02	0.43^{ab} ±0.01	0.40^{b} ±0.02	0.44^{ab} ±0.02	0.45^{ab} ±0.02	0.04
Gizzard, (%)	2.51 ±0.15	2.54 ±0.24	2.30 ±0.12	2.58 ±0.19	2.46 ±0.13	2.64 ±0.19	2.21 ±0.11	2.50 ±0.18	NS
Giblets, (%)	5.48 ±0.15	5.51 ±0.38	5.17 ±0.08	5.24 ±0.32	5.25 ±0.18	5.16 ±0.16	4.99 ±0.11	5.19 ±0.18	NS
Total edible parts, (%)	65.91^{a} ±0.55	65.51^{ab} ±0.56	66.01^{a} ±0.69	63.20^{c} ±0.94	63.02^{c} ±0.68	64.70^{abc} ±0.67	65.90^{a} ±0.93	63.48^{bc} ±0.55	0.01

$^{a, b, c, d \text{ and } e}$ Means within the same main effects with different letters are significantly differed, NS= Non-significant.

Table (3): Inedible parts of some developed local strains of chicken at 12 wks. of age (Means ± SE)

Trait	Strain								Prob.
	Golden Montazah (GM)	**Matrouh (MAT)**	**Mandarah (MN)**	**Silver Montazah (SM)**	**Bahig (BAH)**	**Gimmizah (GIM)**	**Mamourah (MAM)**	**Sina (SIN)**	
Blood, %	3.89^{b} ±0.51	4.00^{ab} ±0.36	3.81^{b} ±0.33	5.22^{a} ±0.64	4.04^{ab} ±0.23	4.53^{ab} ±0.10	4.08^{ab} ±0.38	4.58^{ab} ±0.22	0.05
Feather, (%)	10.14^{b} ±0.42	11.61^{b} ±0.28	10.70^{b} ±0.54	11.85^{b} ±0.48	11.89^{b} ±0.14	11.36^{b} ±0.16	13.58^{a} ±1.17	11.92^{b} ±0.42	0.01
Viscera length, (cm)	158.80^{ab} ±7.05	156.80^{ab} ±6.08	169.40^{a} ±5.16	145.00^{b} ±5.09	157.40^{ab} ±4.88	153.00^{ab} ±4.15	165.00^{a} ±6.49	153.60^{ab} ±5.28	0.05
Viscera weight, (%)	4.84 ±0.17	4.78 ±0.25	4.63 ±0.18	4.89 ±0.29	4.63 ±0.29	4.56 ±0.13	4.43 ±0.16	4.91 ±0.09	NS
Head, (%)	3.95^{a} ±0.30	4.07^{a} ±0.14	3.60^{ab} ±0.15	4.06^{a} ±0.16	3.38^{b} ±0.02	4.13^{a} ±0.16	3.90^{ab} ±0.17	3.76^{ab} ±0.20	0.05
Neck, (%)	4.19^{a} ±0.08	4.34^{a} ±0.08	3.80^{ab} ±0.24	4.29^{a} ±0.16	4.03^{a} ±0.31	4.13^{a} ±0.22	3.37^{b} ±0.15	3.93^{a} ±0.13	0.02
Leg, (%)	5.41^{a} ±0.21	4.01^{e} ±0.17	5.07^{abc} ±0.25	5.27^{ab} ±0.18	4.69^{cd} ±0.14	4.80^{bcd} ±0.15	4.44^{de} ±0.17	4.47^{de} ±0.07	<0.0001
Total inedible parts, (%)	32.44^{b} ±0.69	32.82^{ab} ±0.85	31.61^{ab} ±0.83	35.59^{a} ±1.28	32.66^{ab} ±0.79	33.50^{ab} ±0.43	31.80^{ab} ±1.63	33.58^{ab} ±0.30	0.05

[a, b, c, d and e] Means within the same main effects with different letters are significantly differed, NS= Non-significant.

Table (4): Edible meat parts of some crosses and reciprocal crosses between developed local chicken strains at 12 wks. of age (Means ± SE)

Trait	Crosses					Prob.	Reciprocal Crosses					Prob.
	GM× MN	GM× SIN	MAT× SM	BAH× SM	GIM× MAM		MN× GM	SIN×GM	SM× MAT	SM× BAH	MAM× GIM	
Live body weight,(g)	1163[a] ±3.00	1076[b] ±24.21	1095[b] ±12.75	1104[b] ±5.79	1163[a] ±17.65	0.001	1135[a] ±20.19	1056[b] ±14.78	1098[ab] ±19.91	1074[ab] ±15.60	1101[ab] ±27.95	0.05
Carcass,(%	59.94[ab] ±0.97	60.91[a] ±0.80	58.55[ab] ±1.14	57.79[b] ±0.41	58.86[ab] ±0.74	0.05	60.89[a] ±0.25	59.78[ab] ±0.81	58.35[b] ±0.64	59.81[ab] ±0.77	60.17[ab] ±0.57	0.05
Liver, (%)	2.60[a] ±0.19	2.14[b] ±0.07	2.31[ab] ±0.10	2.30[ab] ±0.15	2.36[ab] ±0.14	0.05	2.08 ±0.06	2.12 ±0.17	2.49 ±0.08	2.28 ±0.16	2.22 ±0.20	NS
Heart, (%)	0.41[b] ±0.02	0.48[bc] ±0.01	0.52[a] ±0.04	0.49[ab] ±0.05	0.46[ab] ±0.02	0.05	0.47[bc] ±0.01	0.57[a] ±0.03	0.52[ab] ±0.01	0.46[c] ±0.02	0.45[c] ±0.01	0.001
Gizzard, (%)	2.52 ±0.16	2.15 ±0.22	2.46 ±0.19	2.46 ±0.09	2.52 ±0.24	NS	2.58 ±0.10	2.45 ±0.09	2.41 ±0.15	2.37 ±0.10	2.56 ±0.10	NS
Giblets, (%)	5.52[a] ±0.22	4.77[b] ±0.18	5.29[ab] ±0.15	5.25[ab] ±0.09	5.34[ab] ±0.27	0.05	5.13 ±0.13	5.14 ±0.20	5.42 ±0.20	5.11 ±0.22	5.22 ±0.23	NS
Total edible parts, (%)	65.46[ab] ±0.77	65.68[a] ±0.69	63.84[ab] ±1.18	63.04[b] ±0.49	64.20[ab] ±0.56	0.05	66.02[a] ±0.36	64.92[ab] ±0.74	63.77[b] ±0.52	64.92[ab] ±0.57	65.39[ab] ±0.48	0.05

[a, b and c] Means within the same main effects with different letters are significantly differed, NS= Non-significant.

Table (5): Inedible parts of some crosses and reciprocal crosses between developed local chicken strains at 12 wks. of age (Means ± SE)

Trait	Crosses					Prob.	Reciprocal Crosses					Prob.
	GM× MN	**GM× SIN**	**MAT× SM**	**BAH× SM**	**GIM× MAM**		**MN× GM**	**SIN× GM**	**SM× MAT**	**SM× BAH**	**MAM× GIM**	
Blood, %	4.56^{ab} ±0.22	4.93^{a} ±0.26	4.20^{ab} ±0.25	4.07^{ab} ±0.23	4.56^{ab} ±0.20	0.05	4.64 ±0.37	3.60 ±0.48	4.55 ±0.13	3.92 ±0.21	4.60 ±0.35	NS
Feather, (%)	11.69 ±0.45	12.92 ±0.42	11.24 ±0.42	11.95 ±0.56	12.69 ±1.40	NS	13.03^{a} ±0.28	11.84^{b} ±0.37	12.13^{ab} ±0.41	12.40^{ab} ±0.32	11.71^{b} ±0.23	0.05
Viscera length, (cm)	164.20 ^{a}±8.51	144.80^{b} ±2.82	152.00^{ab} ±2.47	159.00^{ab} ±4.87	157.80^{ab} ±3.98	0.05	157.80 ±4.69	147.20 ±8.48	151.40 ±6.19	152.80 ±7.71	157.40 ±5.34	NS
Viscera weight, (%)	4.56 ±0.32	4.24 ±0.10	4.65 ±0.24	4.69 ±0.19	4.89 ±0.44	NS	4.86 ±0.14	4.35 ±0.17	4.37 ±0.22	4.86 ±0.36	4.54 ±0.22	NS
Head, (%)	3.56^{b} ±0.16	3.65^{b} ±0.09	4.19^{a} ±0.12	3.69^{b} ±0.13	4.06^{ab} ±0.25	0.04	3.67^{b} ±0.05	3.84^{ab} ±0.18	4.11^{a} ±0.11	3.85^{ab} ±0.08	3.56^{b} ±0.05	0.02
Neck, (%)	4.00 ±0.21	3.88 ±0.14	4.17 ±0.25	3.64 ±0.23	4.28 ±0.33	NS	4.23 ±0.10	4.39 ±0.11	4.43 ±0.25	4.21 ±0.15	3.96 ±0.30	NS
Leg, (%)	4.84^{ab} ±0.20	4.35^{b} ±0.16	4.52^{b} ±0.17	5.12^{a} ±0.17	4.50^{b} ±0.14	0.03	4.66^{a} ±0.12	4.03^{b} ±0.10	4.15^{b} ±0.10	4.75^{a} ±0.17	4.93^{a} ±0.26	0.001
Total inedible parts,(%	33.20 ±0.63	33.97 ±0.89	32.95 ±0.62	33.17 ±0.59	34.98 ±1.30	NS	35.09^{a} ±0.51	32.04^{c} ±0.62	33.75^{ab} ±0.62	33.98^{ab} ±0.34	33.30^{bc} ±0.45	0.001

$^{a, b, c, d \text{ and } e}$ Means within the same main effects with different letters are significantly differed, NS= Non-significant.

Table (6): Effect of heterosis (%) on carcass traits of some crosses

Trait	**Crosses**				
	GM×MN	**GM×SIN**	**MAT×SM**	**BAH×SM**	**GIM×MAM**
Edible Parts					
Live body weight, (g)	4.01	4.50	4.29	8.24	2.69
Carcass, (%)	-1.16	2.62	-0.74	-0.14	-2.28
Liver, (%)	4.61	-9.81	-1.06	1.56	5.93
Heart, (%)	-6.41	4.13	8.07	7.73	9.55
Gizzard, (%)	4.66	-14.05	-3.78	-2.36	4.04
Giblets, (%)	3.76	-10.60	-1.54	0.22	5.33
Total edible parts, (%)	-0.76	1.53	-0.81	-0.12	-1.69
Inedible Parts					
Blood, %	18.35	16.31	-8.97	-12.03	5.87
Feather, (%)	12.12	17.10	-4.24	0.68	1.76
Viscera length, (cm)	0.06	-7.30	0.73	5.16	-0.75
Viscera weight, (%)	-3.76	-12.98	-3.95	-1.44	8.66
Head, (%)	-5.77	-5.51	5.86	-0.97	1.23
Neck, (%)	0.09	-4.48	-3.51	-12.54	14.37
Leg, (%)	-7.69	-11.99	-2.63	2.82	-2.63
Total inedible parts, (%)	3.67	2.90	-3.68	-2.82	3.95

Table (7): Effect of heterosis (%) on carcass traits of some reciprocal crosses

Trait	Reciprocal Crosses				
	MN×GM	**SIN×GM**	**SM×MAT**	**SM×BAH**	**MAM×GIM**
Edible Parts					
Live body weight, (g)	1.50	2.55	4.57	5.29	-2.78
Carcass, (%)	0.41	0.70	-1.08	3.35	-0.10
Liver, (%)	-16.30	-10.69	6.43	0.27	-0.47
Heart, (%)	9.23	24.94	9.69	1.92	6.67
Gizzard, (%)	7.19	-2.17	-5.92	-5.86	5.33
Giblets, (%)	-3.6	-3.63	0.84	-2.53	2.89
Total edible parts, (%)	0.09	0.35	-0.92	2.86	0.13
Inedible Parts					
Blood, %	20.61	-14.97	-1.41	-15.4	6.88
Feather, (%)	24.96	7.32	3.41	4.45	-6.06
Viscera length, (cm)	-3.84	-5.76	0.33	1.06	-1.01
Viscera weight, (%)	2.57	-10.81	-9.65	2.04	0.83
Head, (%)	-2.84	-0.58	0.94	3.39	-11.25
Neck, (%)	5.99	7.88	2.74	1.27	5.75
Leg, (%)	-11.13	-18.50	-10.40	-4.71	6.66
Total inedible parts, (%)	9.58	-2.94	-1.34	-0.42	-1.04

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Heterosis - Developed local strains - Crosses - Carcass traits

الملخص العربى

إختبار تأثير قوة الهجين وإختلافات السلالة لصفات الذبيحة لبعض سلالات الدجاج المحلية المُحسنة وتهجيناتها

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لتحليل تحسين صفات الذبيحة فى بعض سلالات الدجاج المحلية المُحسنة، تم عمل تجارب تهجين لثمانية سلالات من الدجاج (القطعان الأساسية): المنتزه الذهبى (GM)، مطروح (MAT)، مندرة (MN)، المنتزه الفضى (SM)، بهيج (BAH)، جميزة (GIM)، معمورة (MAM)، سينا (SIN) . وتم تقدير صفات الذبيحة لكل من القطعان الأساسية، وتهجيناتها، والتهجينات العكسية لها. وقد أظهرت النتائج الرئيسية أن سلالة المعمورة سجلت وزن جسم أثقل معنوياً مقارنة بباقى السلالات، بينما سجلت كل من سلالة المعمورة، المنتزه الذهبى، المندرة نسبة ذبيحة أعلى معنوياً (60,92، 60,85، 60,44 % على التوالى) وأيضاً نسبة أجزاء مأكولة أعلى مقارنة بمثيلتها. وهى فى ذات الوقت قد سجلت نسبة أجزاء غير مأكولة أقل مقارنة بباقى سلالات الدجاج المحلية المدروسة.

سجلت الهُجن GM×MN ، GIM×MAM وزن جسم حى أعلى معنوياً مقارنة بباقى الهُجن. سجل الهجين GM×SIN نسبة ذبيحة وكذلك نسبة أجزاء جسم مأكولة كلية أعلى مقارنة بباقى الهُجن المدروسة. وقد سجل هذا الهجين قيمة أعلى لنسبة الذبيحة بالمقارنة بالآباء. سجل الهجين GM×MN نسبة كبد (2,60 %)، ونسبة حوائج (5,52 %) وهى الأعلى مقارنة بباقى الهُجن. وقد سجل هذا الهجين قيمة أعلى لنسبة الكبد والحوائج بالمقارنة بآبائه. وجد أن الهجين العكسى (MN×GM) كان الأعلى فى وزن الجسم الحى، نسبة الذبيحة، ونسبة الأجزاء المأكولة الكلية وذلك بالمقارنة بالهُجن العكسية الآخرى.

وجد أن هناك قوة هجين موجبة لوزن الجسم الحى فى كافة الهُجن وكذلك الهُجن العكسية لها، ما عدا الهجين العكسى MAM×GIM . وعلى العكس وجد أن هناك قوة هجين سالبة لنسبة الذبيحة والأجزاء المأكولة الكلية فى جميع الهُجن، فيما عدا الهجين GM×SIN والذى سجل قوة هجين موجبة.