

**EFFECT OF THREE GENETIC GROUPS OF KURDISH LOCAL CHICKEN AND ISA BROWN  
ON EGG EXTERNAL QUALITY AND EARLOBE COLOR**

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**ABSTRACT:** A total of 500 eggs from Three genetic groups of Kurdish local chicken (Pure Black, Black with Brown Neck, White) and Isa Brown genetic groups were collected immediately after lay to determine egg weight, egg length, egg width, egg shape, egg shape index and earlobe color from age (70-80) weeks. Genetic groups significantly affected the egg weight, egg length, egg shape and earlobe color. Black with Brown Neck and White significantly has heavier egg weight (62.095 and 62.258g) compared with Pure Black and Isa Brown (58.40 and 57.62g) respectively. Local chickens were significantly superior in egg length than Isa Brown, while egg shape significantly higher in Pure Black than other Groups. Earlobe color in Pure Black and Isa Brown groups was (100%) pink and (100%) Red respectively, while in Black with Brown Neck and White groups was (81.68 and 85.66%) white, and (18.32 and 14.34%) pink respectively. Results were detects that there were significant differences among the groups for all the external egg parameters except egg width and egg shape index.

**Key words:** local chickens, Isa Brown, external egg traits, earlobe.

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**INTRODUCTION**

It is generally agreed that all characteristics of egg quality have a genetic basis (Monira et al., 2003). Several studies found that breed, strain, and age of hens directly influence the size and composition of eggs has cited by Cook and Briggs (1977). Tumova et al. (2007) found effect of genotype on egg shape index. However, the influence of strains, genotype, and breeds on egg weight, egg length, egg width, egg shape, and egg shape were studied by previous researchers (Carter and Jones, 1970; Potts et al., 1974; Arafa et al., 1982; Pandey et al., 1986; Tumova et al., 2007; Zita et al. 2009; Monira et al., 2003; Silversides et al., 2006; Zita et al., 2009; Ali, 2010 Hermiz, et al., 2012; Hanusová et al., 2015). Warren (1928) found that genotype effect on the earlobe color of different breeds. The correlation between egg external traits were found by Hermiz, et al. (2012); (Hafez et al. (1954); Scott and Silversides (2000); Silversides and Scott (2001); Ali (2010).

This study aimed to estimate the effect of different Genetic groups on egg external traits and their correlation, in addition to determine the earlobe color for these genetic groups.

## MATERIAL AND METHODS

This study was designated to evaluate some external characteristics of local chickens and Isa brown eggs; chickens were reared in Animal Production Division Sulaimani Research Station–Director of Agricultural Research. Data on 500 eggs produced by three genetic groups local chickens: Pure Black (PB), Black with Brown Neck (BBN), and White (W) was generated to 11 generation and reared with Isa Brown under similar environmental, managerial and hygienic conditions, were used to determine some external egg parameters. All eggs were sampled immediately after lay and weighed individually. The width and length of each egg were measured to determine egg shape and egg shape index using the following equation.

Egg shape = egg length/egg width

Egg shape index = (egg width/ egg length)/ 100

Earlobes color were estimate by which illustrated by Warren (1928) “the color of the earlobe of the chicken is a structure on the skin of the face just below the ear, the outline f which is marked by a slight thickening f the tissues”.

### Statistical Analysis

Data were statistically processed by Statistical program PASW Statistics Student Version 18 (SPSS). An ANOVA using the general linear models procedure included the main effects of genetic groups on some external eggs traits. Duncan Multiple Range Test (Duncan, 1955) was used to test the significant differences between the means of the levels. The simple correlations between external eggs traits were estimated by (SPSS) computer program.

## RESULTS AND DISSECTION

Effect of genetic groups on egg weight, egg length, egg width, egg shape, and egg shape index was significant ( $p>0.05$ ) as shown in (Table 1). Egg weight in PB and Isa brawn was significantly ( $p>0.05$ ) heavier than BBN and W. Studies by Tharrington et al. (1999); Monira et al. (2003); Silversides et al. (2006); Zita et al. (2009); Ali, (2010); Hermiz et al. (2012); Sreenivas et al. (2013); and Hanusová et al. (2015) were also reported significant differences in egg weights between breeds, strains and lines. Line 4 revealed

**Table 1: Effect of genetic groups on egg weight, egg length, egg width, egg shape and egg shape index.**

Traits	Genetic groups	Mean*	± Std. Error
Egg Weight (g)	PB	58.40b	0.3683
	BBN	62.095a	1.175
	W	62.258a	0.435
	Isa brawn	57.62b	1.084
Egg Length (mm)	PB	58.460a	0.302
	BBN	58.540a	0.576
	W	58.775a	0.603
	Isa brawn	56.963b	0.167
Egg Width (mm)	PB	42.403	0.163
	BBN	43.723	0.287
	W	42.898	0.906
	Isa brawn	42.398	0.537
Egg Shape	PB	1.380a	0.004
	BBN	1.350ab	0.003
	W	1.350ab	0.019
	Isa brawn	1.340b	0.111
Egg Shape Index	PB	72.588	0.289
	BBN	74.508	0.472
	W	79.820	0.136
	Isa brawn	74.723	0.686

\*Means in the same column with different superscripts differ significantly ( $P<.05$ ).

The differences between genetic groups of earlobe color of chickens were illustrated in (Table, 2). PB revealed (100%) pink color; while BBN and W revealed (81.675 and 85.658%) pink color, (18.325 and 14.342%) white color, however, the earlobe color of Isa brawn (100%) was red. This result could be attributed to the genotype effect of each line Genetic groups (Warren, 1928).

The significant differences were also found in egg length and egg shape, however, no significant differences were found in egg width and egg shape index between Groups. Local Genetic groups have significantly higher egg length and egg shape compared with Isa Brown. While the PB revealed higher egg shape (1.38) compared with other Groups. Hanusová et al. (2015) found significant differences between breeds in egg length and Breadth with no significant effect on egg shape index. Hermiz et al. (2012) found significantly higher egg index in White Group compared with Black with Brown Neck, Isa Brown, Spotty and pure black Groups. Monira et al. (2003) found although difference among the breeds was significant in the egg length, shape index, the difference was not significant in egg width.

**Table 2: Chickens ear lops color percentage of each strain.**

Ear Lop Color	Genetic groups	Mean%	±Std. Error
White	PB	0.000b	0.000
	BBN	81.675a	9.952
	W	85.6575a	5.12336
	Isa brawn	0.000b	0.000
Pink	PB	100.000a	0.000
	BBN	18.325b	9.952
	W	14.343bc	5.123
	Isa brawn	0.000c	0.000
Red	PB	0.000b	0.000
	BBN	0.000b	0.000
	W	0.000b	0.000
	Isa brawn	100.000a	0.000

It was shown from Table (3) that the values of correlation were (-0.069) ( $P < 0.01$ ) between egg weight and egg shape and (-0.83) ( $P < 0.01$ ) between egg width and egg shape, while the correlation were (-0.147) between egg shape index and egg shape. Several studies reported a significant correlation between egg weight and its components (Hafez et al., 1954; Scott and Silversides, 2000; Silversides and Scott, 2001; Ali, 2010; Hermiz et al., 2012).

**Table 3: Simple correlation coefficient between external traits of eggs.**

Control Variables		el	eb	shi	esh
Egg weight	Correlation	0.726**	0.549*	0.294	-0.069
Egg Length	Correlation		0.100	0.207	0.471
Egg Width	Correlation			0.292	-0.830**
Shell index	Correlation				-0.147

\*\*Correlation is significant at 0.01 levels. \*Correlation is significant at 0.05 levels.

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