



**THE PHENOTYPIC AND PRODUCTIVE CHARACTERIZATION OF BENHA-LINE CHICKEN UNDER EGYPTIAN CONDATIONS**

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**ABSTRACT:** This project started in 2008 and aimed to produce a synthetic line of chickens under hot climate conditions in Egypt. A description of the main features of the line Benha chickens (Line B) is carried out. It was founded in 2011 as a synthetic line between the Egyptian Golden Montazah (50%) and the White Leghorn (50 %). The procedure of foundation began mating Golden Montazah cocks to White Leghorn hens and it was followed by three generations of “inter se” mating. Afterwards the line has been selected to highly egg production and quality according to the predicted breeding values based the BLUP procedure using animal model.

The phenotypic and productive characters for this line are recorded. The main characteristics of this line are: Feather colors in adult chickens were mostly White (70%), 15% red golden and 15% grey, good adaptation for hot climate conditions (25-35 °C). It has high resistance for Pasteurellosis and Salmonella diseases, high fertility (93%) and hatchability (86%), low mortality rate (1%) during the production period, moderate body weight at sexual maturity (1742 g) and age at sexual maturity 159.6 d, high annual egg production (230 egg), moderate egg weight (55 g), white egg color, egg shape index was 79.1%, high Haugh units (93.8 %), live body weight was 1970 g and 1269 g for males and females respectively, carcass weight was 1273 g for cocks and moderate dressing percentage (65%). Thus, the B-line has showed high productive traits under hot climate conditions in Egypt.

**Key words:** Line B chickens- heat stress- egg production line- productive performance

### Description of line-B

#### 1. Breed name

- (i) Breed name synonyms: line B
- (ii) Strains within breed: none
- (iii) Breed purpose: dual purpose

#### 2. General description

##### 2.1. Population data

###### 2.1.1. Population size and census data

Total number of females being used in pure breeding: 800

Total number of females being used in crossbreeding: 786

Percent of females being used pure 50.4 %.

###### 2.1.2. Populations sizes

Adult birds: 800

Young birds: 3000

##### 2.2. Origin of the breed

Line B was founded in 2011 (Iraqi et al., 2012&2013 and Khalil et al., 2013) as a synthetic line between the Egyptian Golden Montazah (50%, Mahmoud et al., 1974) and the White Leghorn (50 %). The procedure of foundation began mating Golden Montazah cocks to White Leghorn hens and it was followed by three

generations of “inter se” mating. Afterwards the line has been selected to highly egg production and egg quality according to the predicted breeding values.

##### 2.3. Morphological traits:

2.3.1. Body shape: Triangle

2.3.2. Comb type: Single

2.3.3. Feather morphology: Normal

2.3.4. Feather distribution: Normal

2.3.5. Breed temperament: Active, Hardy, Very strong

2.3.6. Climate Tolerance: hot climate

2.3.7. Broodiness: Seldom

2.3.8. Feathered legs: No

##### 2.4. Color

2.4.1. Feather color in adult chickens mostly White (70%), Red Golden (15%) and Grey (15%)

2.4.2. Skin: Mostly White and Yellowish-white

2.4.3. Earlobe: Red

2.4.4. Shank: White and Dusky white

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2.4.5. Egg: White

2.4.6. Hatched chicks (yellow – white – black –grey) (Fig. 1)



Fig. 1. Hatched chicks color of Line B.

2.5. Special characteristics of the breed:

This line is being selected in Moshtohor farm, Faculty of Agriculture, Benha University, Egypt, for egg production and egg quality at 120 day. All vaccinations against virus diseases (e.g. Marek's disease, avian influenza, Newcastle, Gumboro, Infectious bronchitis, Laryngotracheitis, etc.) and Bacterial diseases (Pasteurellosis, Salmonella, Mycoplasma, etc.) were carried out according to vaccinations program for layers chickens.

**3. Pattern**

3.1 Main features of farming

3.1.1. Elevation and topography: This line is raised in crossbreeding all around middle and east of the Delta of the Nile, Egypt.

3.1.2. Favorable climate: Temperature and relative humidity ranged from 15 - 35 °C and 30 - 70%, respectively.

3.1.3. Mating method: Natural mating

3.1.4. Nutrition

(i) Pelleted (ad libitum)

(ii) Water: Freely available

(iii) Seasonality of nutrition: No seasonality

**3.2.4. Housing**

(i) Cages: brooded on the floor and were grown in open houses up to 16 weeks of age, then transferred to breeding pens on the floor.

(ii) Photoperiod: Natural

3.3. Common diseases and parasites: Pasteurellosis and Salmonella

**4. Performance**

4.1. Reproductive traits:

4.1.1. Incubation rate:

4.1.1.1. Fertility percentage: 93%

4.1.1.2. Hatchability percentage: 86%

4.1.2. Mortality rate:

4.1.2.1. During the brooding period (1:10 week): 4.5%

4.1.2.2. During the rearing period (11:20 week): 3.2%

4.1.2.3. During the production period (52 week): 1%

4.2. Productive traits: 4.2.1. Body weight (Table 1).

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**Table (1):** Body weight (g) at different ages

Trait	Mean		Range	
	Male	Female	Male	Female
Body weight at hatch	34	34	30-41	30-41
Body weight at 8 weeks	830	645	520-1180	440-925
Body weight at 12 weeks	1297	1085	824-1755	742-1410
Body weight at sexual maturity	2025	1742	1710-2300	1542-1985
Body weight at 52 weeks	2388	1940	1925-2811	1632-2248

4.2.2. Egg production traits (Table 2).

**Table (2):** Egg production traits

Trait	Mean	Range
Age at sexual maturity (days)	159.6	148-172
Weight of first egg (g)	32.7	29-36
Egg weight (g)	55	49-60
Egg production at 52 – week (egg)	230	210-243

**Line B chickens- heat stress- egg production line- productive performance.**

## 4.2.3. Egg quality traits (Table 3).

**Table (3):** Egg quality traits

<b>Trait</b>	<b>Mean</b>	<b>Range</b>
Egg shape index (%)	79.1	74.2-85.2
Albumen index (%)	9.6	6.2-12.1
Yolk index (%)	45.7	40.3- 49.9
Albumen weight (g)	28.7	25.2 -33.4
Yolk weight (g)	14.6	12.3-17.4
Shell weight (g)	6.3	5.1-8.7
Haugh units (%)	93.8	79.1-113.1
Shell thickens (mm)	0.34	0.30-0.39

## 4.2.4. Carcass traits (Table 4).

**Table (4):** Carcass traits at 16 weeks

<b>Trait</b>	<b>Mean</b>		<b>Range</b>	
	<b>Male</b>	<b>Female</b>	<b>Male</b>	<b>Female</b>
Live weight (g)	1970	1269	1600-2494	953-1675
Hot carcass weight (g)	1675	1083	1500-2100	850-1370
Shank length (cm)	9.77	7.70	8.5 - 11	6.5 - 10
Body circumference (cm)	29	25	24 - 32	21 - 28
Carcass weight (g)	1273	805	891 - 1640	586 - 1085
Liver weight (g)	31	28	27 - 38	22 - 33
Gizzard weight (g)	51	43	48 - 57	40-46
Heart weight (g)	14	7.5	12-16	6-9
Dressing percentage	65	63	62 - 69	60 - .68

LINE BENHA (Egypt)



LINE BENHA, MALE, WHITE



LINE BENHA, FEMALE, WHITE



**LINE BENHA, MALE, RED-GOLDEN**



**LINE BENHA, FEMALE, RED – GOLDEN**



LINE BENHA, MALE, GREY



LINE BENHA, FEMALE, GREY



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**المخلص العربي**

**الصفات الشكلية والإنتاجية لخط دجاج بنها تحت الظروف المصرية**

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إجرى هذا المشروع خلال الفتره من عام ٢٠٠٨ الى ٢٠١١ م بهدف تكوين خط جديد من الدجاج تحت الظروف الجوية المصرية . تم وصف الملامح الرئيسية لخط دجاج بنها الذى تم استنباطه عام ٢٠١١ نتيجة خلط ذكور المنتزة الذهبى مع إناث دجاج اللجهورن الأبيض لمدة ثلاث اجيال متتالية مع إجراء التزاوج البينى ، حيث تم إجراء الانتخاب لصفات إنتاج البيض وجودة البيض بناءً على القيم التربوية المقدرة بطريقة BLUP باستخدام نموذج الحيوان. الصفات المظهرية والإنتاجية لخط بنها.

لون الريش أبيض للطيور البالغة معظمه ويمثل حوالى ٧٠% ، و ١٥% ذهبى ، ١٥% رمادى - السلالة متأقلمة جيدا لدرجات الحرارة المرتفعة (٢٥- ٣٥م) - تتميز بمقاومة عالية للأمراض الباستيرلا والسالمونيلا ، تبلغ نسبة الخصوبة حوالى (٩٣%) ، نسبة الفقس مرتفعة (٨٦%) ، نسبة النفوق منخفضة خلال فترة الإنتاج (١%) - وزن الجسم عند النضج الجنسى ١٧٤٢ جرام - العمر عند النضج الجنسى ١٥٩.٦ يوم - إنتاج البيض السنوى ٢٣٠ بيضة - متوسط وزن البيضة ٥٥ جرام - لون قشرة البيضة أبيض - دليل شكل البيضة (٧٩.١%) وحدات هو (٩٣.٨%) - وزن الذكور والإناث الحى ١٩٧٠ و ١٢٦٩ جرام على التوالى ، وزن الذبيحة ١٢٧٣ جرام للديوك و ٨٠٥ جرام للإناث ، نسبة التصافى (٦٥%) للذكور و (٦٣%) للإناث . فى النهاية يتميز دجاج خط بنها بالإنتاجية العالية لمعظم الصفات الإنتاجية تحت الظروف المناخية الحارة الموجوده فى مصر.