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

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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
   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).  

**ACKNOWLEDGEMENTS**  
We would like to thank the Benha University, Egypt for supporting the faculty of Agriculture at Moshtohor of the project.
Table (1): Body weight (g) at different ages

<table>
<thead>
<tr>
<th>Trait</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Body weight at hatch</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>Body weight at 8 weeks</td>
<td>830</td>
<td>645</td>
</tr>
<tr>
<td>Body weight at 12 weeks</td>
<td>1297</td>
<td>1085</td>
</tr>
<tr>
<td>Body weight at sexual maturity</td>
<td>2025</td>
<td>1742</td>
</tr>
<tr>
<td>Body weight at 52 weeks</td>
<td>2388</td>
<td>1940</td>
</tr>
</tbody>
</table>

4.2.2. Egg production traits (Table 2).

Table (2): Egg production traits

<table>
<thead>
<tr>
<th>Trait</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at sexual maturity (days)</td>
<td>159.6</td>
<td>148-172</td>
</tr>
<tr>
<td>Weight of first egg (g)</td>
<td>32.7</td>
<td>29-36</td>
</tr>
<tr>
<td>Egg weight (g)</td>
<td>55</td>
<td>49-60</td>
</tr>
<tr>
<td>Egg production at 52 – week (egg)</td>
<td>230</td>
<td>210-243</td>
</tr>
</tbody>
</table>
4.2.3. Egg quality traits (Table 3).

Table (3): Egg quality traits

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

4.2.4. Carcass traits (Table 4).

Table (4): Carcass traits at 16 weeks

<table>
<thead>
<tr>
<th>Trait</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Live weight (g)</td>
<td>1970</td>
<td>1269</td>
</tr>
<tr>
<td>Hot carcass weight (g)</td>
<td>1675</td>
<td>1083</td>
</tr>
<tr>
<td>Shank length (cm)</td>
<td>9.77</td>
<td>7.70</td>
</tr>
<tr>
<td>Body circumference (cm)</td>
<td>29</td>
<td>25</td>
</tr>
<tr>
<td>Carcass weight (g)</td>
<td>1273</td>
<td>805</td>
</tr>
<tr>
<td>Liver weight (g)</td>
<td>31</td>
<td>28</td>
</tr>
<tr>
<td>Gizzard weight (g)</td>
<td>51</td>
<td>43</td>
</tr>
<tr>
<td>Heart weight (g)</td>
<td>14</td>
<td>7.5</td>
</tr>
<tr>
<td>Dressing percentage</td>
<td>65</td>
<td>63</td>
</tr>
</tbody>
</table>

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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

REFERENCES

