Research Application Summary

Comparison of the egg characteristics of different Sudanese indigenous chicken types

Dafaalla Mohammed Mekki, [1 2], Yousif Ibrahimm Abdalsalam[3], Abdelrahman Mohammed Kheir[2], Wang Jin-yu[1] & Musa Hassan Hussein[1]

[1]Department of Animal Genetics, Breeding and Reproduction, Yangzhou University, Yangzhou 225009, China

[2]Department of Animal Science, Faculty of Natural Resources and Environmental Studies, University of Kordofan, Sudan

[3]Department of Genetics and Animal Husbandry, Faculty of Animal Production, University of Khartoum, Sudan

Corresponding author: dmekki@yahoo.com

Abstract

Three local types of Sudanese indigenous fowls, large Baladi (LB), Bare-neck (BN) and Betwil (BT) were characterised for maturity live weight and egg characteristics. The BN average live weight (1547.2±274.5 gm) was heavier than either LB (1494.4±349.8 gm) or BT (1198.3±257.5 gm). The BT average live weight was significantly (P<0.05) lighter than those of other two types. The weekly hen-day egg production means were 3.7, 3.2 and 3.9 for (BN), (BT) and (LB) respectively, while the corresponding hen-housed egg production means were 3.3, 2.7 and 3.4. The rate of egg production during the laying period (36 weeks) was 47.14, 38.57 and 48.57 for BN, BT and LB respectively. There were significant differences (P<0.05) in average egg-shell thickness among local types. The means of egg-shell thickness for BT and BN, 36.2±4.2 and 36.2±4.0ì respectively were similar and both significantly thicker than that of LB, 34.3±3.6ì.

Key words: Chicken types, egg production, Sudanese indigenous

Résumé

Trois types locaux de volailles indigènes soudanaises, Baladi large (LB), cou-nu (NE) et Betwil (BT) ont été caractérisés en fonction de la charge utile de maturité et des caractéristiques des œufs. La charge utile moyenne des cou-nu (1547,2 ± 274,5 g) était plus grande que celle des Baladi larges (1494,4 ± 349,8 g) et celle des BT (1198,3 ± 257,5 g). La charge utile moyenne des BT était significativement (P <0,05) plus légère que celles de deux autres types. Les moyennes hebdomadaires de production des œufs des poules errantes étaient respectivement de 3,7, 3,2 et 3,9 pour les cou-nu, les BT et les Baladi larges, tandis que les moyennes correspondantes de production des

œufs des poules logées au poulailler étaient de 3,3 ; 2,7 et 3,4. Le taux de production des œufs durant la période de ponte (36 semaines) était respectivement 47,14; 38,57 et 48,57 pour les cou-nu, les BT et les Baladi larges. Il y avait des différences significatives (P <0,05) dans l'épaisseur moyenne des coquilles des œufs parmi les types locaux. Les moyennes de l'épaisseur des coquilles des œufs des BT et des cou-nu, 36,2 ± 4,2 et 36,2 ± 4.0i respectivement, sont semblables et aussi sensiblement plus grandes que celle des Baladi larges, 34,3 ± 3.6i.

Mots clés: Types de poule, production des œufs, indigènes soudanaises

Background

Sudanese fowls with their various types, which are collectively called Baladi, were earlier described by Desai (1962). These birds commonly known as large Baladi, Bare-neck and Betwil. The traditional system of small home flock and backyard scavengers are based on these native types with their low unit cost of production that confers considerable advantage on their equitable distribution across wide range of socio-economic activities. The indigenous fowl is less prolific compared with exotic breeds. Desai *et al*. (1961) reported 106, 68 and 86 egg per bird per year for Bare-neck, large Baladi and Betwil, respectively, while egg weight is smaller, resulting in low mass output (g/bird/day). The main factor that contributes to egg shell quality and strength is shell thickness. It affects market value through resistance to cracking and hatchability. Many genetic and non-genetic factors affect egg-shell thickness, in particular, breed effect and feed quality. Arad and Malder (1982) found significant differences (P<0.05) in egg-shell thickness between Sinai indigenous breed (37.0±38.5ì) and Leghorn (31.3ì).

Materials and Methods

Ninety pullets of each indigenous type chicken were purchased from the Nuba Mountains, south Kordofan State. Eighty pullets of each type were assigned, weighted, leg banded and randomly distributed individually in cages of single-deck batteries. The parent stock was kept for adaptation for four weeks, during which they were vaccinated against New castle and Fowl pox. They were also treated against ectoparasites, received multivitamins, antibiotics and piprazine prophylactic doses. They were kept under a 14 hr lighting programme. The flock were fed commercial layer ration ad libitum. Eggs were collected twice a day. Individual egg weight was determined on a daily basis and micrometer measurement made for egg-shell thickness including shell membrane. Means of shell thickness

were obtained from broad, middle and narrow sides. Data were subjected to analysis of variance (Snedecor, 1956).

Results and Discussion

The initial dams live weight is depicted in Table 1. The Bare-neck average live weight (154.7± 274.3 gram) was higher than either large Baladi (1494.4± 349.8g) or Betwil (1198.3 ± 257.5g). Decuypere *et al*. (1993) stated that at high mean ambient temperature, homozygous or heterozygous necked-neck birds were heavier than normal birds. The superiority of Bare-neck average live weight compared with other local dams is also reported by those of Berea and Howlider (1990). The Betwil average live weight is significantly ($P<0.05$) lighter than those of other two local types. The result is in agreement with those of Bullerman (1982) and Merat (1990) studies, who reported that the dwarf "dw" gene reduced body weight by 30 and 33%, respectively, compared with normal chickens. The relatively high s.d may be due to small samples, on the other hand, the high coefficient of variability estimated for local types average body weights could be due to genetical and phonotypical variations within those types.

Table 1. Means, standard deviation (s.d) and coefficient of variation (c.v) for local dams live weight (gm).

Type(s)	Mean ± SD	C.V. (%)
Large Baladi	1494.4±349.8 (80)	23.40
Bare-neck	1547.2±274.3 (80)	17.72
Betwil	1198.3±257.5 (80)	21.48

The weekly hen-day egg production means were 3.7, 3.2 and 3.9 for Bare-neck, Betwil and large Baladi respectively, while the corresponding hen-housed egg production means were 3.3, 2.7 and 3.4. There were no significant differences in egg production within local types. The rate of egg production during the laying period was 47.14, 38.57 and 48.57 percent for BN, BT and LB respectively. The low production capacity of Betwil type could be due to sex-linked dwarfing gene, which has been reported to have a negative effect on hen laying performance (Bullerman, 1982).

Table 2 shows the average egg weight per dam type. Although there were no significant differences in egg size among the three types, egg weight of Bare-neck and large Baladi were slightly heavier than that of the Betwil. Desai (1962) and Wilson (1985) reported close results for Sudan indigenous egg weight

Table 2. Mean, standard deviation and coefficient of variation for egg weight of local types (gm).

Type(s)	Mean ± SD	C.V. (%)
Large Baladi	38.46±2.86	7.43
Bare-neck	39.89±3.94)	10.36
Betwil	37.95±4.42)	11.62

and Pandy *et al.* (1989) for Aseel fowl. However, Yousif (1987) and Sulieman (1996) obtained higher average egg weight (42.2 and 40.6g) respectively, for Sudan large Baladi. Egg weight is largely affected by environmental factors, food restriction (Shaler and Pasternak, 1993) and parental average body weight; the differences could be attributed to these factors, moreover, evidence of genetic involvement including breed effect could be observed.

Shell quality, particularly shell thickness, is an important trait that primarily breeders of egg laying flock incorporate into their breeding programmes to reduce egg-shell breakage. There were significant differences ($P<0.05$) in average egg-shell thickness among local types. Table 3 represent the average egg-shell thickness.The average egg-shell thickness of Betwil (36.2 ± 4.2ì) and of Bare-neck (36.2 ± 4.0ì) were similar and both were significantly thicker than that of large Baladi (34.3 ± 3.6 ì). According to Jitendra *et al.* (1971), it seemed that there is a negative correlation between shell thickness and laying rate, the differences may be due to this negative correlation.

Table 3. Mean average egg-shell thickness (micron), standard deviation (s.d) and coefficient of variation (c.v).

Type(s)	(Mean±SD) µ	C.V. (%)
Large Baladi	34.32±3.68	10.72
Bare-neck	36.21±4.08	11.26
Betwil	36.21±4.22	11.65

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