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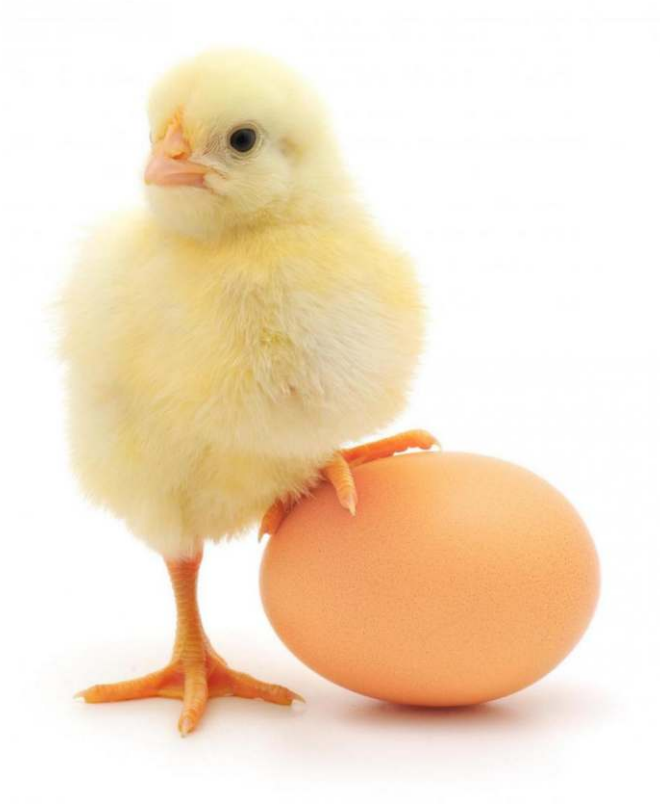

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A Survey Study on the Distribution of Saudi Baladi Chickens and Their Characteristics

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Abstract: Two surveys were conducted to determine the distribution and Characteristics of the local (baladi) chickens of Saudi Arabia. The results of the two surveys provided evidence that: 1. Local chickens exhibit large variations in body shape, feather color, comb type and shank color. They are small in size. 2. Most of the large baladi project (>1000 layers) were found in Makkah, Jedda and Madina. Medium size farms (250 - 600 hens) were found in Qasim, Madina, Makkah, Durma and Qatif. Smaller size farms (< 250 hens) were found in Makkah, Qasim and Hofuf. 3. Twenty three % of the large baladi projects were Poultry producers raising chicks as the main source of their income. 4. Eighty % of the small projects raise the baladi chickens along with other animals. 5. Average flock size of the large farms was 3479 birds. 6. Average marketing age of the birds were 14.6 weeks. 7. Baladi hens lay their 1st egg at 22.76 week of age and continue laying for 78.9 weeks producing 170 eggs. 8. Nine % of the large projects' owners found that New Castle disease (ND) was the most frequent occurring disease. All chickens owners vaccinate their birds against ND while 33 % vaccinate against Fowl pox. 9. About 80 % of small farms owners are making use of the broodiness phenomena to hatch eggs while only 8 % use small incubators for that purpose.

Key words: Local chicken, native, survey, chicken characteristics, Saudi Arabia, Baladi

Introduction

Native or local chicken are names of a bird that was originated in an area and adapted to it's environment. This definition can be applied to the Baladi chickens of Saudi Arabia. These birds are characterized by their small size, different plumage colors and different comb shapes. These birds are also known for their low production rate and small egg sizes. These characteristics have been developed through natural selection, which make them well adapted to the often harsh environmental conditions. They are valuable genetic materials need to be maintained and improved, and special efforts have to be made to conserve them.

Some attempts have been made by researchers in King Saud University to study some of the biological characteristic of these birds. Alsobayel (1986) studied the egg quality characteristic of Baladi chicken kept under two housing systems. Attia *et al*. (1991) reported the effect of rearing regimen and age of the bird on egg weight and weight of the component parts of Saudi Arabian Baladi chicken eggs. Alsobayel (1992) investigated the effect of protein rearing diet and age on fertility and hatchability parameters of Saudi Arabian Baladi chicken. Study by Alsobayel *et al*. (1990) included the effect of storage time, egg weight and moisture loss on hatchability parameters of Baladi chicken egg. Also, Alsobayel *et al*. (1991) revealed evidence on the influence of protein rearing regimens and age on egg quality characteristic of Saudi Arabian Baladi hens.

This study was conducted to determine the number and distribution of Baladi chickens in the Kingdom of Saudi Arabia and to Pinpoint Saudi local strains of chickens and classify them according to their characteristics.

Materials and Methods

Experimental procedure: A survey was conducted to collect the necessary information on the availability, distribution, importance, phenotypic characteristics and management systems of local strains of chickens in the kingdom of Saudi Arabia. Two questionnaires were designed, The first questionnaire (A) was conducted to collect the necessary information from the large projects in different locations of the kingdom while questionnaire (B) was designed for the small farmers raising Baladi chickens in the eastern region of the kingdom. Corresponding to that, the kingdom was divided into six different geographical zones, two central, one eastern, one southern and two western regions. Eleven agricultural directorates representing the main emirates of the kingdom in these zones, and two universities were contacted by phone and writing to collect the initial information on the locations of the Baladi chickens in the Kingdom and to arrange for the visits to the relevant locations. These directorates were : Arar, Asir, Hail, Al-baha, Najran, Jizan, Riyadh, Qasim, Madina, Makkah, and Dammam. The universities were: King Saud University in Riyadh and Qasim and King Abdel Aziz University in Jedda. Table 1, shows the locations and number of existing Baladi projects in the contacted agricultural emirates and universities according to their information.

As seen in the table, there was no local poultry projects located in the southern (Asir, Al-baha and Jizan) or in the northern (Arar and Hail) regions of the kingdom. Therefore, it was decided to visit only the locations that contains major projects of Baladi chickens, the central and west. The visits were arranged with the cooperations of the agricultural directorates of the emirates of these locations. The eastern region, Hofuf (where this study was originated) and Qatif (135 kilometers northeast of Hofuf) were covered through an intensive visits to farmers raising Baladi chickens in their farms or homes. The objective of theses visits were to determine the birds phenotype and to fill out, personally, the standard questionnaire .

Table 1: Locations and number of Baladi projects in the Kingdom of Saudi Arabia

Region	Location	Number
Arar	North	None
Hael	North	None
Asir	South West	None
Al-Baha	South	None
Najran	South	None
Jizan	South	None
Riyadh:		
Thadek	Central	None
Durma	Central	2
Qasim	Central	15
Madina	West	5
Makkah	West	5
Dammam	East	4
King Saud University:		
Riyadh	Central	1
Qasim	Central	1
King Abdul Aziz University:		
Jedda	West	1

Results and Discussion

Most of the large Baladi chicken projects were found in the Western province (Makkah, Jedda and Madina). Medium size projects (about 250- 600 hen) were found in different locations (Qasim, Madina, Makkah, Durma and Qatif). Small farms (< 250 hen) had also been found in Makkah, Qasim and Hofuf.

Results of the large Baladi chickens projects (Western province) survey: About 23% of the owners of large Baladi projects were poultry producers, raising chickens as the main source of their income. Seventy seven percent of owners considered raising chickens as a secondary economical activity (8% were farmers, 23% were governmental employee and 46% were merchants). All of them used hired labor for raising the birds. Most (80%) of the projects were raising chickens along with other animals and 90% of them produced fruits and vegetables as another agricultural activity in the farm.

Average flock size in this type of chicken farms was 3479±1138 (ranged from 1040 to 18000). Number of female layers and males were 1522±344 and 177±121, respectively. These numbers ranged from 50 to 400 and 400 to 4000 for males and females, respectively. The cock:hen ratio average was 1:8.

Local chickens exhibit a large variation in body shape and feather colors. They have various combinations of plumage colors, comb types and body size. Local birds are generally small in size. They were classified according to their body shape to different types. The average mature body weight is 1.26±0.23 kg for females and 1.8±0.26 kg for males. White (18%), red (21%), brown (22%), black (20%) and gray or golden (17%) are the possible plumage color of chickens available in the Western province of the Kingdom (Jedda and Makkah). The chickens with single type comb were (74%) or double (26%). The shank colors were also varied, gray (33%), yellow 33% and white (33%). Average marketing age of the birds was 14.6±1.5 weeks ranging from (6 to 24 wks).

Japaense researchers, Tanabe *et al.* (1991) studied the phylogenetic among native fowl breeds and others in adjacent areas and European and American breeds. They found close relationships among most of Japanese native fowl breeds in Honshu and Shikoku including Tosajidoris, Shokokus, Ohikis. Iwatejidoris, Chabos, Koshamos, Oshamos and Ukkokeis. However, Tomarus and Gifujidoris in Honshu and Tsushimajidoris in Tsushima island and Chans in Okinawahonto were different from other breeds. Also, a close relationship was observed among Chans, White Plymouth Rocks and White Cornishes and among Gifujidoris, White Leghorn and Rhode Island Reds. Nishada *et al.* (1989) studied the morphological and genetical characteristics of Nepalese native chickens in relation to the native chicken of other south and southeastern chickens. They found the following:

1 The Nepalese native cock was placed between the Lanka native chicken and non-game type Bangladesh chicken and close to the game- type Philippine and the brown leghorn cock .
2 The Nepalese native hen was placed similarly to the cock between the Lanka native chicken and the non-game type Bangladesh chicken.
3 Both sexes of the Nepalese native chicken were close to the South-Asian native chicken population.

Males and females of the Saudi local birds were sold at the price of 14.45±1.7 and 28.8±2.5 SR, respectively. Average price of 30 fertilized egg was higher than that of table eggs being 16.5±1 and 13.5±0.6, respectively. Hens laid their 1st egg at 22.76±1.55 wks and continued laying for 78.9±9.2 wks producing 170±29 egg. Price of 1 day old chick ranged from 1 to 3.5 SR (averaged 2.4 SR). All projects hd their own hatcheries to obtain their

requirements of chicks. Hatching was almost monthly throughout the year. The average % of hatched eggs ranged from 65% to 90% with overall average of 75%. Al-Sobayel (1985) compared the fertility and hatchability of Saudi Baladi chickens with the pure bred leghorn. He found that Leghorn had significantly higher fertility and hachability 90 and 80% than the Saudi Baladi 47.2 and 61.3%, respectively.

Most of the chicks mortality occurred during the first week of age, while 21% of the mortality occurred at the growing period. More mortality occurred in the winter (63%) than that occurred in the summer (37%).

Due to the fact that baladi birds are exposed to extreme environmental conditions during the year, all chickens owners vaccinate their birds against Newcastle and 33% of them vaccinate against Fowl Pox. Ninty one % of the owners found that Newcastle was the most frequently occurring disease. Other diseases such as Coccidia (58%), Fowl Pox (42%), eye disease, respiratory diseases and Coryza (16%) could also attack the birds.

All owners of the large projects were raising Baladi chickens for their premium price and they believed that Saudi consumers favor the Baladi meat and eggs over the exotic ones. Most of the owners (90%) raised Baladi chicken for their high ability to adapt to the harsh environmental conditions of Saudi Arabia and 75% of them favoring these birds for their low cost of production. In Contrast to the Baladi chicken houses is the environmentally controlled type of building required for raising exotic breeds. Only 12% of the owners believed that Baladi chickens were resistant to disease over the exotic ones.

Owners depended mainly on purchasing feed (88%) for their birds, while 12% used agricultural by-products from their own farms. Concentrate mixture, barley, rice, wheat barn and alfalfa are the types of feeds they used for feeding their flocks.

Results of the small owner's survey: The Eastern province of Saudi Arabia was chosen to conduct the survey in an area extending from Hofuf to Qatif. A total of 135 owners (chosen at random) were included in the study.

It was found that most of the owners (84%) were raising Baladi chickens as a secondary economical activity, among them there were 40% governmental employees, 17% merchants and 17% farmers. Only, 16% were specialized in animal and poultry production. However, 32% of the owners were raising chickens for more than 9 years while 27% and 40% of them raised chickens for 5-9 years and 1-4 years, respectively.

The study showed that 68 % of these owners were managing their birds by themselves or by the help of family members. The rest (32%) were using hired labor who has extra duties beside raising the birds. However, the owners were not only interested in raising Baladi chickens but also in raising other species of animals *i.e.*, large animals (16%), ducks (16%), pigeons (56 %) and other animals (12%).

Kitchen and table left-over food were the main source of feed for birds (88%) while (12%) used agricultural by-products from the farms when available. In addition to that, half of the owners offered purchased feeds for their birds. Table 2 indicates the type of supplemented feeds purchased by small owners.

Table 2: Types of supplemented feeds purchased by small owners

Supplemented feeds	% of small owners
Concentrate mixture	42
Barley	45
rice	33
Maize	20
Alfalfa	19
Wheat bran	7
Animal protein	1

Small owners favored raising Baladi chickens for their good taste of meat and eggs (83%), high sale price (60%) and their ability to resist disease and suits the prevailing conditions of Saudi Arabia (55%). Average sale price of single mature female and male are 30±13.65 and 43.35±12.99 SR for female and male, respectively. While the disadvantages of Baladi chickens were being noisy (71%), poor meat and egg performance (58%) and bad feed conversion (13%).

Mortality is rather low with an average of 7% . Most of the birds mortality (58%) occurred during the first week of life. Goher *et al.* (1983) showed that mortality of white baladi and Fayoumi (Egyptian breed) pullets decreased from 4.5% to 1.1% and from 3.8% to 1.2% as the birds advanced in age from month 1 to month 7 for those raised in floor.

Only 21% of the birds mortality in this study occurred during the rearing stage while 13% of it occurred during the production stage. Mortality of the chickens was generally associated with atmospheric temperature. Sixty six percent of mortality occurred in winter. Other seasons showed similar values i.e., 13% in spring, 11% in summer and 10% in autumn. This indeed support the fact that local birds of Saudi Arabia have more tolerant to high environmental conditions.

About 73% of the owners don't vaccinate their birds against diseases. In case they do, they vaccinate against Newcastle. The most frequent diseases that could attack the birds during their life time in the Eastern province of Saudi Arabia were as follows: Newcastle (33%), eye diseases (27%), Fowl Pox (18%), respiratory diseases (18%) and Coccidia (16%)

Birds are generally small in size and found to have poor performance in-terms of growth and egg production,

Table 3: Phenotypic characteristics of Baladi chickens in the Eastern Province

Plumage colour	%[1]	Shank colour	%	Comb type	%	Body[2] shape	%
Black	80	Black-Gray	98	Single	52	1	18
Brown	76	Yellow	67	Double (open)	78	2	54
Yellow	75	White	50	Double (closed)	78	3	28
White	3				4	2	

[1]Percentage don't add to 100 because some owners chose more than one category

achieving mature body weight of 1.33±0.37 kg for females and 1.77±0.44 kg for males and producing about 100 eggs per year. Goher *et al.* (1983) found that body weight of white baladi Fayoumi (Egyptian breed) and Fayoumi pullets ranged from 1054 to 981 gm for birds reared in cages and 1033 to 947 gm for those reared in floor. Hens in this study started laying eggs at 20±4 week of age and had a laying period of 92±5 weeks. Their poor egg producing capacity was mainly due to the prevalent characteristic of broodiness among the females. Percent egg production for Egyptian Fayoumi layer was 43.3% in normal environmental conditions and 45.4% in high constant temperature (Kamar *et al.*, 1984). Great percentage of the owners (80%) in this study were making use of this character to hatch eggs while 8% utilize the same phenomena on different species (ducks), the rest (8%) used small incubators. Hatching was rather high during the seasons that are moderate in temperature *i.e.* spring (45%) and autumn (30%). Darwish *et al.* (1990) reported similar results for Egyptian Fayoumi layers. They found that percentage fertility and hatchability were higher during spring and lower during summer.

Breeders did not prefer cold or hot seasons for hatching (10% in winter and 15% in summer).

The cock:hen ratio average was 1:8. Selection of sires was mainly based on the cock's phenotype particularly color plumage and comb type.

Fifty percent of the chickens owners preferred black plumage for both males and females, while forty three of them preferred birds with red and brown plumage. Only, seven percent preferred white birds. Almost all owners (96%) liked birds with double comb. Also, black shank (40%) and grayish (27%) were favored over whitish ones. Table 3 showed the phenotypic characteristics of Baladi chickens in the Eastern Province.

Conclusion: Based upon the results of the surveys, it is concluded that baladi (local chickens of Saudi Arabia exhibit large variations , in many aspects, among the different locations. These information can be of important assets to any future research.

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