

Evaluation of Some External and Internal Egg Quality Traits of Pati Duck Reared in Assam

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Abstract

The present investigation was designed to evaluate some external and internal qualities of Pati duck eggs. A total of 200 eggs were randomly collected from the Pati ducks in the farm complex of College of Veterinary Science, Khanapara, Guwahati, Assam, India under ICAR-NASF project. The egg quality traits like egg weight (g), specific gravity, shape index, egg shell thickness (mm), eggshell membrane thickness (mm), albumen index, yolk index and Haugh unit were found as 54.57 ± 0.81 , 1.287 ± 0.034 , 73.23 ± 0.40 , 0.391 ± 0.013 , 0.086 ± 0.008 , 0.144 ± 0.006 , 0.413 ± 0.024 and 100.73 ± 0.56 , respectively. The result obtained in this study will be helpful in future selection and breeding strategies of Pati duck.

Keywords: Albumen Index, Egg Weight, Eggshell Thickness, Pati Duck, Yolk Index



Introduction

The state of Assam is a rich repository of indigenous duck breeds which thrive well in watershed areas of Assam. Pati duck is the most common in the Brahmaputra valley of Assam recognized by National Bureau of Animal Genetics Resources in 2017, which is squat in posture with dark brown plumage and greyish black head in drakes and solid brown plumage in ducks. White ring may or may not be seen at the neck of both sexes. The beak, shank and feet are predominantly yellow in colour. The mean body weight is 1.56kg and the age at sexual maturity is between 220-235 days. The annual egg production ranges from 75 to 90 with the average weight of 60.5g (Kalita *et al.*, 2009; Mahanta *et al.*, 1993).

Egg is considered to be a complete food for human as most of the essential nutrients are available in required concentration and it is the single animal origin food accepted worldwide. The albumen height is an important measure for the freshness of egg (Toussant and Latshaw, 1999). External qualities of egg like cleanliness, freshness and egg weight are important for consumers' acceptance and egg qualities such as shape index, albumen index, yolk index, specific gravity, eggshell thickness and eggshell membrane thickness are important for egg product industry which makes liquid egg, frozen egg, egg powder and yolk oil (Silversides and Scott, 2001). Presently, the egg quality traits are becoming important parameters of selection and breeding in poultry and to improve the quality of day-old chicks and their growth (McDaniel *et al.*, 1978) and also to improve the hatchability percentage of fertile eggs set (Nordstrom and Ousterhout, 1982). In the egg processing industry, the weight of eggshell, albumen and yolk decides the price of egg and its products (Altan *et al.*, 1998). Although there are enough studies on internal and external egg quality traits in chicken (Narahari *et al.*, 1988), the same is found to be less in indigenous duck breeds of India. So, this study was aimed at evaluating some external and internal quality traits of Pati duck eggs.

Materials and Methods

The Pati ducks used in this study were reared in the farm complex of College of Veterinary Science, Khanapara, Guwahati, Assam, India under ICAR-NASF project with ad libitum feed and water. The eggs were collected in the early morning and cleaned with antiseptic solution. A total of two hundred eggs were randomly taken and various external qualities like egg weight, specific gravity, length and width of the egg (to calculate shape index), eggshell thickness and eggshell membrane thickness and internal qualities like albumen height and width (to calculate albumen index) and yolk height and diameter (to calculate yolk index) were measured on the day of collection itself at room temperature. After recording all the above parameters, the mean values of egg weight, specific gravity, shape index, eggshell thickness, eggshell membrane thickness, albumen index, yolk index and Haugh unit were calculated.

Results and Discussion

The present study revealed that the average weight of Pati egg was 54.57 ± 0.81 g, specific gravity was 1.287 ± 0.034 , shape index was 73.23 ± 0.40 , egg shell thickness was 0.391 ± 0.013 mm, eggshell membrane thickness was 0.086 ± 0.008 mm, albumen index was 0.144 ± 0.006 and yolk index was 0.413 ± 0.024 . Compared to this study, numerically higher egg weight (57.83g) and yolk index (0.43) and lower shape index (70.29), egg shell thickness (0.37mm) and albumen index (0.12) was reported by Sarma *et al.* (2017) in Pati duck eggs. Meantime, Das *et al.* (2000) reported numerically lower egg weight (52.56g), eggshell thickness (0.289mm), albumen index (0.126) and almost similar shape index (73.01) and yolk index (0.408) in desi duck eggs of Assam. Mahanta *et al.* (1993) observed lower shell thickness (0.37mm) and albumen index (0.114) in Pati duck eggs. Kavitha *et al.* (2017) reported little higher egg weight (74.23g) and shell thickness (0.40) in indigenous ducks of Tamil Nadu compared to the result of present study. Another study on specific gravity of Nageswari duck egg (1.099 ± 0.001) was reported by Sharma *et al.* (2002). Taer *et al.* (2014) observed the duck eggshell membrane thickness as 0.10mm. Present results indicated the average Haugh unit as 100.73 ± 0.56 in Pati ducks. However, Sarma *et al.* (2017) reported Haugh unit in Pati duck and Nageswari ducks of Assam as 80.28 ± 0.97 and 84.74 ± 1.23 , respectively. Sumiati *et al.* (2020) studied the performances and egg quality of laying ducks fed with diets containing Cassava leaf meal and Golden snail and found physical egg quality as following viz. albumin weight (%) 51.37 ± 3.25 , eggshell weight (%) 12.39 ± 0.73 , shell thickness 0.40 ± 0.03 mm and Haugh unit 91.22 ± 3.59 . Kokoszynski *et al.* (2007) studied the egg quality of Pekin ducks at three different stages (beginning, peak and end) of the first egg laying period and observed an increase in egg weight (from 71.7 to 86.7 g), egg length (from 61.9 to 65.1 mm), egg width (from 45.0 to 48.8 mm) and eggshell area (from 81.7 to 92.7 cm²). They also reported decrease in eggshell and albumen percentage

from 10.1 to 9.6 and from 61.2 to 57.1, respectively, while the yolk percentage has increased from 28.7 to 33.1.

Conclusion

The present study on external and internal quality of Pati duck eggs will prove to be important baseline information for formulation of selection and breeding strategies in near future.

Conflict of Interests

There is no conflict of interest.

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