International Journal of Science, Environment and Technology, Vol. 6, No 6, 2017, 3520 – 3523
ISSN 2278-3687 (O)
2277-663X (P)

# COMPARATIVE STUDY OF EGG QUALITY TRAITS IN WHITE PEKIN AND INDIGENOUS DUCKS OF TAMIL NADU

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**Abstract:** A study was carried out to assess the external and internal qualities of White Pekin and Indigenous duck eggs. External egg quality traits such as Egg Weight, Shape Index, Surface Area and Air Cell depth and Internal egg quality traits such as Albumen Index, Haugh Unit, Yolk Index, Shell Thickness and Yolk Colour were recorded once in 15 days from 20$^{th}$ week onwards for the period of two months. The results revealed that White Pekin duck eggs had significantly ($P<0.01$) higher Egg weight and also significantly ($P<0.05$) higher Surface Area than the Indigenous duck eggs. Shape Index and Air Cell depth were found to be non-significant. Internal egg quality traits such as Albumen Index, Haugh Unit and Yolk Index were significantly ($P<0.01$) higher in Indigenous duck eggs whereas Shell Thickness was significantly ($P<0.05$) higher in White Pekin duck eggs than Indigenous duck eggs.
**Keywords:** Duck egg, External egg quality traits, Internal egg quality traits.

## INTRODUCTION

Ducks (*Anas platyrhynchos*) occupy the second position among the domesticated poultry in India. Of the 500 million ducks of world population, about 90 per cent are reared in Asia-Pacific region. In India, Indigenous ducks constitute about 90 per cent of the total duck population. Duck eggs have twice the nutritional value of a chicken egg and stay fresher, longer due to their thicker shell. In Tamil Nadu, duck rearing is practiced as a profitable traditional backyard enterprise. The eggs produced in this state are transported to Kerala, an adjoining state. Duck eggs contain nutrition in well balanced ratio; which also contain unsaturated fatty acid which helps in control of cholesterol. The present study was aimed to compare the external and internal quality of eggs between White Pekin and Indigenous Duck eggs.

## MATERIALS AND METHODS

The study was carried out at Post Graduate Research Institute in Animal Sciences (PGRIAS), Kattupakkam. A total of eighty number of 20 weeks age ducks comprising 20 males and 20 females each in White Pekin and Indigenous ducks of Tamil Nadu were reared under

*Received Nov 25, 2017 * Published Dec 2, 2017 * www.ijset.net*

standard managemental conditions. Ducks were provided with *ad-libitum* feed and water. Egg quality traits were recorded once in 15 days for the period of two months. In the external egg quality parameters: egg weight, length, width, air cell depth were recorded and shape index and surface area were recorded as per the formula of Shultz (1953).

In internal egg quality parameters: height of the albumen and yolk, length and width of the albumen and yolk and yolk colour score and egg shell thickness were recorded and albumen index, yolk index, haugh unit were calculated as per the formula of Heiman and Carver (1936), Sharp and Powell (1930) and Haugh (1937) respectively.

## RESULTS AND DISCUSSION

External and Internal egg quality traits were represented in the Table 1 and 2 respectively. Mean egg weight in White Pekin and Indigenous ducks of Tamil Nadu were recorded as 59.79 and 55.83 g respectively. White pekin duck eggs had significantly (P<0.01) higher egg weight than indigenous ducks of Tamil Nadu. Similar observation were made by Kalita *et al.* (2004) and Padhi and Sahoo (2011) in different breed of ducks. Higher egg weight is recorded in White Pekin ducks which could be due to heavier body weight than Indigenous ducks of Tamil Nadu. Surface area of White Pekin and Indigenous ducks of Tamil Nadu were recorded as 76.79 $cm^2$ and 71.39 $cm^2$ respectively. White Pekin ducks had significantly (P<0.05) higher surface area of 76.79 ± 1.48 $cm^2$ than Indigenous ducks. Shape Index and Air Cell depth were found to be non-significant.

**Table 1. Mean (±SE) External Egg Quality traits in White Pekin and Indigenous Ducks of Tamil Nadu (n=40)**

| Parameters | White Pekin Ducks | Indigenous Ducks | t value |
|---|---|---|---|
| **Egg weight(g)** | 59.03 ± 0.94 | 54.78 ±0.90 | 2.39** |
| **Shape index (%)** | 75.63 ± 0.70 | 74.23 ± 0.59 | 1.01$^{NS}$ |
| **Surface area ($cm^2$)** | 76.79 ± 1.48 | 71.39 ± 1.80 | 2.32* |
| **Air Cell Depth (mm)** | 3.03± 0.09 | 2.95 ± 0.09 | 1.44$^{NS}$ |

**- Highly Significant (P<0.01), *- Significant (P<0.05) and NS-Not Significant.

**Table 2. Mean (±SE) Internal Egg Quality traits in White Pekin and Indigenous Ducks of Tamil Nadu (n=40)**

| Parameters | White Pekin Ducks | Indigenous Ducks | t value |
|---|---|---|---|
| **Albumen Index** | 0.13 ± 0.00 | 0.19 ± 0.00 | 7.88** |
| **Haugh Unit** | 84.20 ± 1.2 | 99.64±0.87 | 9.99** |
| **Yolk Index** | 0.41 ± 0.01 | 0.48 ± 0.01 | 3.41** |
| **Shell thickness(mm)** | 0.47 ± 0.24 | 0.40 ± 0.02 | 2.44* |
| **Yolk Colour** | 7.45 ± 0.09 | 6.95 ± 0.12 | $3.21^{NS}$ |

**- Highly Significant (P<0.01), *- Significant (P<0.05) and NS-Not Significant.

White Pekin ducks had significantly (P<0.01) higher Albumen Index and Haugh Unit of 0.13 ± 0.00 and 84.20 ± 1.28 than the Indigenous ducks. The present work was comparable with the value reported by Kalita *et al*. (2004), Padhi and Sahoo (2011) and Islam and Dutta (2010) in different breeds of Duck and Chicken. The variation in Albumen Index related to the agitation of egg during transportation and time exposed between laying and quality measurement and high Haugh Unit score might be due to strain of the bird and storage condition. Significant (P<0.01) effect was observed in yolk index between White Pekin and Indigenous ducks of Tamil Nadu with the average of 0.41 and 0.48 respectively which was closer to the value (0.40) recorded by Ponnuvel Palanivel and Harikrishnan (2011) in White Pekin ducks. Shell Thickness of 0.47 ± 0.24 mm in White Pekin ducks was significantly (P<0.05) higher than Indigenous ducks. High yolk index value is attributed to the heaviest yolk weight in Indigenous ducks of Tamil Nadu. Yolk colour was found to be non significant between White Pekin and Indigenous ducks of Tamil Nadu. The present study inferred that the breed had a significant influence in White Pekin and Indigenous ducks of Tamil Nadu.

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