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Comparative study on internal egg quality traits in indigenous and improved chicken

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Abstract

The present experimentation was conducted at Animal farm, Department of Animal Production, Rajasthan College of Agriculture Udaipur. One hundred eighty eggs were collected from four different chicken breeds (40 week old) were used in 4 treatments with 3 replications, each consisting of 45 eggs. The treatments were (T₁) Kadaknath, (T₂) RIR, (T₃) Mewari, (T₄) Pratapdhan. In this experiment internal egg quality traits were measured to comparison of indigenous and improved chicken breeds. Results showed that the highest albumin weight was found to be highest ($p < 0.05$) in RIR (33.36g) followed by Pratapdhan (29.60g), Kadaknath (27.15g) and the lowest albumin weight was found in Mewari (25.41g). The haugh unit was found to be higher ($p < 0.05$) in RIR (75.78) as compared to rest of breeds. The difference in haugh unit between Kadaknath and Pratapdhan were small and statistically non-significant and lowest haugh unit was found in Mewari. Maximum yolk weight was found in RIR (17.70g) followed by Pratapdhan (15.99g) and the minimum yolk weight was found in Kadaknath (12.27g) and Mewari (12.03g). It may be concluded that the internal egg quality traits were significantly higher in improved chicken germplasm namely RIR and Pratapdhan as compared to indigenous chicken.

Keywords: Internal egg quality, improved chicken, indigenous

Introduction

Poultry farming is one of the fastest growing segments of the agriculture sector. Egg production in India is around 122.11 billion in 2020-21. The hen's egg has been conventionally believed as a good source of nutrients for human beings. Poultry products constitute an important component of human diet. Eggs contain all the essential amino acid, several vitamins and minerals required for human. As far as egg consumption is concerned it has been accepted worldwide as a staple food and included as an important ingredient in a balanced human diet. It is generally agreed that all characteristics of egg quality have a genetic basis. Egg quality has been defined by Stadelman (1977) [17] as the characteristics of an egg that affect its acceptability to the consumers. Egg quality is the more important price contributing factor in table and hatching eggs. Among many quality characteristics, external factors including cleanliness freshness, egg weight and shell weight are important in consumers acceptability of shell eggs (Song *et al* (2000) [16]. Quality of chicken eggs may vary due to several factors like rearing temperature, season, relative humidity and also a breed difference.

Materials and Methods

This research work was carried out with four chicken genotypes Kadaknath, Rhode Island Red, Mewari and Pratapdhan maintained at Poultry farm, Department of Animal Production, Rajasthan College of Agriculture Udaipur. The birds of each breed were reared in different pens separately on deep litter system under optimum temperature, humidity and other management conditions.

Internal egg quality traits

- Albumin weight (g):** Weight of albumin (g) was calculated by subtracting the weight of yolk and shell from the weight of whole egg.
- Yolk weight (g):** Weight of yolk (g) was measured by separating the yolk from albumin. The weight of egg yolk was recorded in grams using digital balance to the nearest of 0.1g accuracy.
- Yolk colour:** Yolk colour of each egg was scored by using egg analyzer.

d. Haugh unit (HU): Haugh unit is the measure of albumin quality which determines the quality of the egg. The higher Haugh unit may indicate the superior quality of the albumin. Haugh unit was measured by the automatic egg analyzer. The egg was placed on egg weight tray, the weight was recorded in first step then the egg was broken and placed on tray in such a way that the yolk is placed in the centre and surrounded by albumin on egg tray. The tray is put inside the analyzer for estimation of haugh unit, yolk colour and egg quality grades. The egg analyzer automatically displays the Haugh unit of the sampled egg for which results are also obtained as print.

Results and Discussion

Internal egg quality traits

Albumin quality traits in different breeds of chicken

Albumin weight: The albumin weight in different breeds of chicken ranged from 25.41g to 33.36g and the values were 27.15±0.20, 33.36±0.13, 25.41±0.23 and 29.60±0.45g in Kadaknath, RIR, Mewari and Pratapdhan, respectively. Significantly highest albumin weight was found in RIR followed by Pratapdhan, Kadaknath and the lowest albumin weight was found in Mewari. The albumin percentage in different breeds of chicken ranged from 58.01% to 60.73% and the values were 60.65±0.09, 58.66±0.09, 60.73±0.05 and 58.01 ±0.09% in Kadaknath, RIR, Mewari and Pratapdhan, respectively. Significantly higher albumin weight percentage was found in Mewari and Kadaknath as compared to RIR and Pratapdhan. The difference in albumin percentage between Kadaknath and Mewari as well as between RIR and Pratapdhan were small and statistically non-significant.

Haugh Unit

The haugh unit in different breeds of chicken ranged from 73.90 to 75.78 and the values were 74.13±0.3, 75.78±0.06, 73.90±0.02 and 74.46 ±0.04 in Kadaknath, RIR, Mewari and Pratapdhan, respectively. Significantly higher haugh unit was found in RIR as compared to rest of breeds. The difference in haugh unit between Kadaknath and Pratapdhan were small and statistically non-significant and lowest haugh unit was found in Mewari.

Yolk quality traits in different breeds of chicken

Yolk Weight: The yolk weight in different breeds of chicken ranged from 12.03 g to 17.70 g and the values were 12.27±0.05, 17.70±0.07, 12.03±0.13 and 15.99±0.26g in Kadaknath, RIR, Mewari and Pratapdhan, respectively. Significantly maximum yolk weight was found in RIR followed by Pratapdhan and the minimum yolk weight was found in Kadaknath and Mewari. The difference in egg yolk weight between Kadaknath and Mewari was found to be statistically non-significant. The yolk percentage in different breeds of chicken ranged from 27.42% to 31.33% and the values were 27.42±0.03, 31.14±0.06, 28.64±0.08 and 31.33±0.02% in Kadaknath, RIR, Mewari and Pratapdhan, respectively. Significantly highest yolk percentage was found in RIR and Pratapdhan followed by Mewari and the lowest in Kadaknath. The difference in yolk percentage between RIR and Pratapdhan was statistically non-significant.

Yolk colour

The yolk Colour in different breeds of chicken ranged from 7.30 to 9.37 and the values were 7.78 ±0.09, 9.37±0.11,

8.01±0.09 and 7.30±0.05 in Kadaknath, RIR, Mewari and Pratapdhan, respectively. Significantly highest pale yellow yolk colour was found in Pratapdhan and Kadaknath followed by Mewari and the lowest in RIR.

Table 1: Albumin quality traits in different breeds of chicken

| Observation | T ₁ (Kadaknath) | T ₂ (RIR) | T ₃ (Mewari) | T ₄ (Pratapdhan) |
|------------------------|-------------------------------|--------------------------|----------------------------|--------------------------------|
| Albumin weight (g) | 27.15 ^c ±0.20 | 33.36 ^a ±0.13 | 25.41 ^d ±0.23 | 29.60 ^b ±0.45 |
| Albumin percentage (%) | 60.65 ^a ±0.09 | 58.66 ^b ±0.09 | 60.73 ^a ±0.05 | 58.01 ^b ±0.09 |
| Haugh unit (HU) | 74.13 ^b ±0.03 | 75.78 ^a ±0.06 | 73.90 ^c ±0.02 | 74.46 ^b ±0.04 |

Figures bearing different superscripts in a row differ significantly ($p < 0.05$)

Table 2: Yolk quality traits in different breeds of chicken

| Observation | T ₁ (Kadaknath) | T ₂ (RIR) | T ₃ (Mewari) | T ₄ (Pratapdhan) |
|---------------------|-------------------------------|--------------------------|----------------------------|--------------------------------|
| Yolk weight (g) | 12.27 ^c ±0.05 | 17.70 ^a ±0.07 | 12.03 ^c ±0.13 | 15.99 ^b ±0.26 |
| Yolk percentage (%) | 27.42 ^c ±0.03 | 31.14 ^a ±0.06 | 28.64 ^b ±0.08 | 31.33 ^a ±0.02 |
| Yolk colour score | 7.78 ^b ±0.09 | 9.37 ^a ±0.11 | 8.01 ^c ±0.09 | 7.30 ^b ±0.05 |

Figures bearing different superscripts in a row differ significantly ($p < 0.05$)

Conclusion

From the experiment it was concluded that, internal egg quality traits such as albumin weight, yolk weight haugh unit etc. were superior in improved chicken breeds as compared to indigenous chicken.

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References

1. Ali A, Anjum R. Evaluation of egg quality traits among different breeds of chicken locally available in Pakistan. *Scientific journal of animal science*. 2014;3(1):27-34.
2. FAOSTAT. Food and agriculture organization corporate statistical database, United Nation's; c2020.
3. Haunshi S, Padhi MK, Niranjan M, Rajkumar U, Shanmugam M, Chatterjee RN. The comparative evaluation of native breeds of chicken for persistency of egg production, egg quality and biochemical traits. *Indian journal of animal sciences*. 2013;83(1):59-62.
4. Hrnar C, Dazazga BB, Nikolova N, Hanusova E, Hanus A, Bujko J. Comparative analysis of the external and internal egg quality in different pure chicken breeds. *Acta Fytotechn Zootech*. 2016;19:123-127.
5. Islam M, Dutta R. Egg quality traits of indigenous, exotic and crossbred chickens in Rajshahi, Bangladesh. *Life earth science*. 2010;5:63-67.
6. Jha DK, Prasad S. Production performance of improved varieties and indigenous breed of chicken in Jharkhand. *Indian journal of poultry science*. 2013;48(1):109-112.
7. Jena PK, Panigrahi B, Panda N, Mohapatra LM, Mallik BK, Bagh J. Reproductive performance and egg quality traits of Kadaknath in intensive management condition under hot and humid climate. *International journal of livestock research*. 2018;8(12):105-112.

8. Khawaja T, Khan SH, Mukhtar N, Mian AA, Ahmed T, Ghafar A. Comparative study of growth performance, egg production, egg characteristics and haemato-biochemical parameters of Desi, Fayoumi and Rhode Island Red chicken. *Journal of Applied Animal Research*. 2012;40(4):273-283.
9. Karunakaran C, Huxley VAJ. A comparative study on egg qualities of two indigenous chicken Breeds Vanaraja and Kadaknath reared under intensive and backyard systems. *Journal of Natural Remedies*. 2020;21(8):162-166.
10. Kejela Y, Banerjee S, Taye M. Some internal and external egg quality characteristics of local and exotic chickens reared in Yirgalem and Hawassa towns. *International Journal of Livestock Production*. 2019;10(5):135-142.
11. Monira KN, Salahuddin M, Miah G. Effect of breed and holding period on egg quality characteristics of chicken. *International journal of poultry science*. 2003;2(4):261-263.
12. Niranjana M, Sharma RP, Rajkumar U, Reddy BLN, Chatterjee RN, Battacharya TK. Comparative evaluation of production performance in improved chicken varieties for backyard farming. *International journal of poultry science*. 2008;7(11):1126-1131.
13. Parmar S, Thakur MS, Tomur SS, Pillai PVA. Evaluation of egg quality traits in indigenous Kadaknath breed of poultry. *Livestock Research for Rural Development*. 2006;18(9):1-5.
14. Pathak SS, Barua N, Kalita N. Comparison of egg quality characteristics of indigenous and broiler parent line crossed with indigenous chicken. *The Indian journal of veterinary sciences and biotechnology*. 2015;11(3):12-16.
15. Sinha B, Kumari R, Kumari T. Estimate and effect of breeds on egg quality traits of poultry. *International journal of livestock research*. 2018;8(4):8-20.
16. Song KT, Choi SH, Oh HR. A comparison of egg quality of pheasant, Chukar, Quail and Guinea fowl. *Asian Australasian Journal of Animal Sciences*. 2000;13:986-990.
17. Stadelman WJ, Meinert CF. Some factors affecting meat yield from young ducks. *Poultry Science*. 1977 Jul 1;56(4):1145-7.