# Relation Between Egg Shell Colour and Hatchability of Eggs

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**ABSTRACT**

Egg shell plays an important role influencing consumer attraction and purchasing decision towards egg. Egg shell colour may not directly cause a significant in hatchability of egg, rather the shell colour may be an indicator of some of the traits of eggs such as shell quality and thickness, breaking strength and freshness of egg etc. Hatchability itself is a broad term which depends on many factors such as on age of birds at the time of collection of eggs, shell cleanliness, shell quality, storage position and period, storage temperature and humidity, and other factors necessary for incubation of eggs.

## INTRODUCTION

Eggshell colour is the most intuitive traits perceived by consumers that directly influence the preference of the consumers and, also affects sales and market value of eggs. Eggs with good quality shell are not only selected for hatching purpose but also have a huge impact during storage, incubation and hatching of eggs, during transportation, processing and consumption of eggs. In India, people generally prefer eggs with darker shell colour and consumes at higher prices compared to white shelled eggs. In general, brown eggs are laid most commonly by medium to heavy chicken breeds having red earlobes like Rhode Island Red, Australorb, and dual-purpose chickens like Vanaraja,

Giriraja, Srinidhi etc. On other hand, chickens with white earlobes generally lay white shelled eggs such as White Leghorn. Although, there always exits an exception where certain factors which plays an important role to determine the egg shell colour.

During egg formation, yolk passes through infundibulum and travels through, magnum, isthmus and finally reaches uterus where eggshell glands are present. Eggshell gland plays an important role in formation of egg colour and shell structure. It secretes three major pigments such as protoporphyrin, biliverdin and zinc chelate; and combination of these pigments at specific proportions produces every conceivable shades of eggshell. For example, in blue colour eggs, the content or proportion of biliverdin and zinc chelate is more, however, the proportion of protoporphyrin is more in dark or pink shelled eggs. In contrast, white eggshell have little or no pigment.

Egg typically resides in the uterus pretty long time of 20- 21 hours that is approximately 80% of the whole time required from ovulation to oviposition. Egg shells are formed at uterus and pigments are deposited on shell during shell formation. Due to pigment deposition and mineralization process being conducted simultaneously, there not only exits a positive correlation between amount or thickness of shell and amount of pigment deposited on eggs but also a positive relation with breaking strength of eggs. In addition, quality of egg shell also depends on several factors such as eggshell membrane, porosity of eggshell and ultrastructure of eggs. Godfrey, 1949 reported that the correlation coefficients between egg shell colour and breakings strength was +0.363, and between egg shell colour and shell thickness was +0.372 which suggested that darker shell colour have increased shell thickness and breaking strength of eggs. Also, in the same year, Godfrey and Jaap, 1949, suggested that darker pigmented shell have higher specific gravity and low percentage of weight loss during incubation of eggs than that of light brown shelled eggs of low specific gravity; which have a high percentage of weight loss during incubation period.

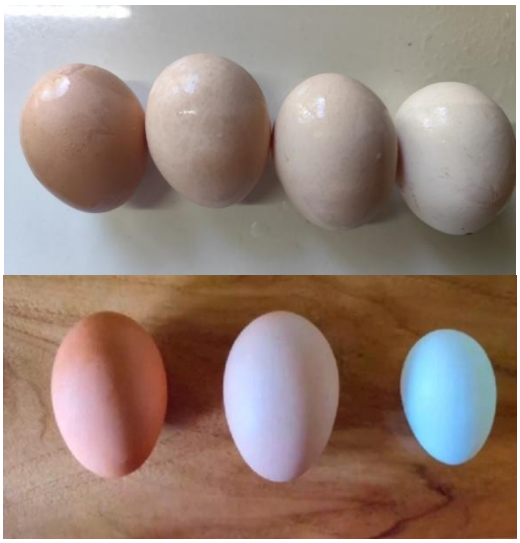

**Fig. Different shades of egg shell**

Therefore, darker shelled eggs are characterized by higher shell thickness with higher breaking strength, tendency to dehydrate slowly, maintains excellent freshness etc. which may be conducive to better hatchability compared to white shelled eggs which exhibits poorer shell quality, lower breaking strength, higher moisture loss as a result of which it affects the internal quality of eggs making higher embryonic loss resulting to subsequent low hatchability. A number of studies conducted in different poultry species like turkey and geese reported that hatchability of thick shelled eggs is 20-40% higher than that of thin shelled eggs (Koneva, A.1968).In contrast, hatchability of turkey eggs was found to be higher with thinner shell eggs (Andrews, 1972). As reported by Abhay *et al.,* 2012, hatchability of brown shelled egg is approximately 73.72%, light brown is 67% and creamy white is 52% on total egg set basis (TES). However, the phenomena chicken breeds, laying brown eggs ranging medium to dark brown shelled hatch better than eggs with

light brown shell colour may not be universal as tendency of hens to lay darker shelled eggs increased as the flock aged, increased in lightness and there are many varieties or strains of chickens that lay white shelled eggs with high rate of hatching percentage.

## CONCLUSION:

Hatchability of eggs also depends on age of birds (hen and cock), birds health, genetics, egg weight, shell cleanliness, shell quality, storage position and period, storage temperature and humidity, other factors necessary for incubation of eggs etc. It is therefore concluded that hatchability of eggs depends on several factors rather than only on colour of egg shell. Further studies may be required to investigate the complex relationship between eggshell colour and hatchability of eggs.

## REFERENCES:

Abhay, K. Keshab, D., Mukjeyjee, K., Alok, B. (2012). Frequency of different shell color and its effect on the fertility and hatchability in Black Rock, Gramapriya and Vanaraja breeds of chicken. *Veterinary World,* 5(**10**), 594-598.

Andrews, L.D. (1972). Phenotypic correlation of certain turkey egg parameters. *Poultry. Science,* 51, 2010-2014.

Aygun, A. (2014). The relationship between eggshell colour and egg quality traits in table eggs. *Indian Journal of Animal Research.* 48(**3**), 290-294. Godfrey, G.F. (1949). Shell colour as a measure of egg shell quality. *Poultry Science*, 28(**1**), 150-151

Godfrey, G.F. and R.G. Jaap. (1949). The relationship of specific gravity, 14-day incubation weight loss and egg shell color to hatchability and eggshell quality. *Poultry Science*, 28, 874-889.

Koneva, A. (1968). Relationship of morphological traits of turkey eggs with hatching of chicks. *Ptitsevodstvo*, 11, 32-33.