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Characterization Of Some Birds Egg And Their Cholestrol Estimation

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ABSTRACT

A Study was conducted on varieties of birds eggs there by extracting yolk and albumin. The eggs of java, quail, hen and love bird were chosen for the study and they were procured from commercial farms, bird markets and breeding places. The physical characteristics such as weight, shape, size and colour of the egg were analyzed. The yolk and their albumin were separated and incubated at 50^0c for a period of 48 hours and their moisture loss was calculated. Similarly, the total cholesterol estimated found high in the hens egg followed by love birds, were least in the quail and java egg. Thus a conclusion was drawn that eggs of different birds are almost same colour but different in size, shape and possess different ratio of yolk and albumin.

Keywords: Yolk, Albumin, Java, Quail, Hen, Lovebird, Cholesterol.

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INTRODUCTION

There has been increase in using the number of eggs all over the world for the beneficial aspects present in it for the use of human being. At present, various type of fowls egg has been used for commercial purpose. Birds begin to loss weight as soon as they are laid but their volume and dimension do not change even after several days. The shell size of the birds vary from each other but the colour of shell remains same in hen, java and love birds except the quail bird have brown with white dots on its shell.

From centuries, chicken and its egg has been a good source of food due to high number of protein content in it. Consumption of saturated fats, rather than cholesterol in eggs leads to heart diseases, there is no recommended limit on egg consumption as per new in whole egg. General composition of large eggs, reported decade ago, consisted of 58% white, 31% yolk and 11% shell (Stadelman and Cotterill, 1977)[1]. The content of solids in whole egg is affected by factors such as ratio of yolk to white, and the solids content in yolk and white (Washburn,1979)[3]. The ratio of yolk to white varies widely with the size of eggs (Marion *et al*., 1964)[5]. The age of hens can affect eggs solids because egg weight increase with the age of hens (Fletcher *et al*., 1983)[4]. The proportion of yolk is reported to be less in small eggs than in larger ones (Kaminska and Skraba, 1991)[2].

Hen

The chicken (Gallus gallus domesticus) is a domesticated fowl, a sub species of red jungle fowl , humans first domesticated chickens for the purpose of cockfighting in India and other Europe countries. It is one of the very commonly used as food source, there are variety of hens compared to other species of birds. The hen weighs around 2.5-3.5kg and life span is around 13yrs.

Quail

The quail (Coturnix coturnix) is one of the small bird, it measures roughly 7.1-8.62 in cm and weighs 3.2-4.62g. Its body colour is streaked brown with a white eye stripe. Its egg is oval shaped and it has a thick shell covering and also has special thick paper like covering inside the shell, its life span is 3-5 yrs. These are the species which feeds on seeds and insects on ground. It is very difficult to find and also reluctant to fly, the only indication of its presence is humming of songs by the male birds. After attaining an age of 6-8 weeks it breeds , laying around 6-12 eggs in a ground nest, it takes around 17-18 days to hatch

Lovebird

It is one of the cute and beautiful bird, commonly found all over as pet birds which is also popular for its all time breeding. It's usually 13-17cm long and female weighs around 42-60g whereas

male weighs 45-70. Its body is yellow near head and green with black stripes on the whole body, life span is 10-15 yrs. Love birds are generally fed with apples, coconut, rice, raspberry, spinach etc. It lays around 8-9 eggs and these will hatch within 14-20 days.

Java Bird

The Java (Lonchura oryzivora), its a popular cage bird and found in large number in many countries. These birds have grey upper parts and breasts, pink belly, red eye ring , pink feet and thick red bill. It's about 15-17cm in length. Life span is 2-3 yrs, but some researchers have reported about 7 yrs. These birds feed mainly on grain and other seeds. They lay around 8 eggs and hatch within days.

MATERIALS AND METHOD

The birds eggs were collected within the period of 2-3 days of its laying. The physical characteristics of egg were done and weighed, later their yolk were separated from albumin followed by their incubation at 50^0C for a period of 3-4hrs, until all the moisture contents are completely removed and analyzed using AOAC method (AOAC,1980)[6]. The cholesterol estimation in yolk and albumin of hen, quail, java and lovebirds was done using standard cholesterol solution at 600nm colorimeter reading.

Cholesterol estimation method:

Cholesterol Solution – 0.02g of cholesterol is dissolved in 100ml of water.

Reagent solution - 2 ml of Conc. Sulphuric acid dissolved in 40ml of acetic anhydride.

Unknown solution preparation – 0.01g of yolk and albumin is dissolved in different test tubes containing 10 ml of distilled water each. From dissolved dissolution pipette 1ml of the solution in different test tubes and add 4ml of alkaline reagent for each test tube. Allow it in room temperature for 15 min and take the readings in colorimeter at 600 nm.

RESULTS AND DISCUSSION

The study was carried out with an aim of knowing cholesterol content and their beneficial aspects of different birds egg and thus the commonly available birds in the market was considered for the study. The size of the eggs were in the range of medium to small were as the shapes are oval. The total egg weight of hen was found largest with 60.57 g, 9.0 g in quail, 2.20 g in love bird whereas the java egg is 1.96 g.(Table 1)

The empty shell weight was proportionally high in hens egg with 6.45 g, quail egg with 1.62 g, less with javas egg of 0.21 g and least in lovebird of 0.1 g.(Table 1)

The moisture loss of eggs is obtained by incubating eggs at different interval of time. The hens egg with respect to yolk was found to be 74.79% and albumin 77.1% thus has more moisture loss

compared to other eggs. The quails moisture loss in yolk found to be 75.38% and albumin with 47.89% which is less compared to that of hens egg. Java moisture loss in yolk found to be 87.73% and albumin with 59.67% whereas lovebirds egg in yolk found to be 87.78% and albumin with 61.01% respectively (Table no. 2,3 and Graph 1,2) . Hen (gallus gallus)is considered as the only bird producing highest number of eggs and meat, providing a balanced diet for human population. They constitute 91% of global annual poultry income. It is said that quails egg contains highest of calcium than hens egg, as quail eggs has HDL cholesterol (good cholesterol) instead of LDL cholesterol (bad cholesterol).

Table-1 Physical characteristics of different eggs and their moisture loss in yolk and albumin

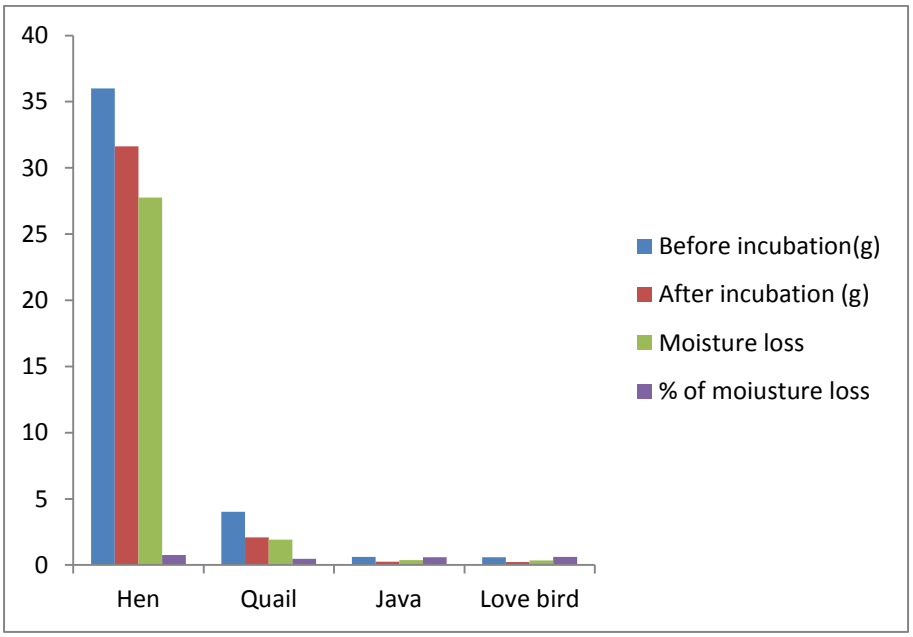
Characteristics	Source			
	Hen	Quail	Love bird	Java
Size	Medium	Small	Small	Small
Shape	Oval	Oval	Oval	Oval
Total weight of the egg (g)	60.57	9.0	2.20	1.96
Wt. of the shell (g)	6.45	1.62	0.1	0.21
Wt. of yolk before incubation (g)	17.3	4.03	0.59	0.62
Wt. of yolk after incubation (g)	9.07	2.1	0.23	0.25
Wt. of albumin before incubation (g)	35.99	3.21	1.31	1.06
Wt. of albumin after incubation (g)	31.63	0.79	0.16	0.13
Moisture loss in albumin	27.76	1.93	0.36	0.37
Moisture loss in yolk	12.94	2.42	1.15	0.93

Table-2 Comparison of moisture loss in albumin of different eggs at 50°C

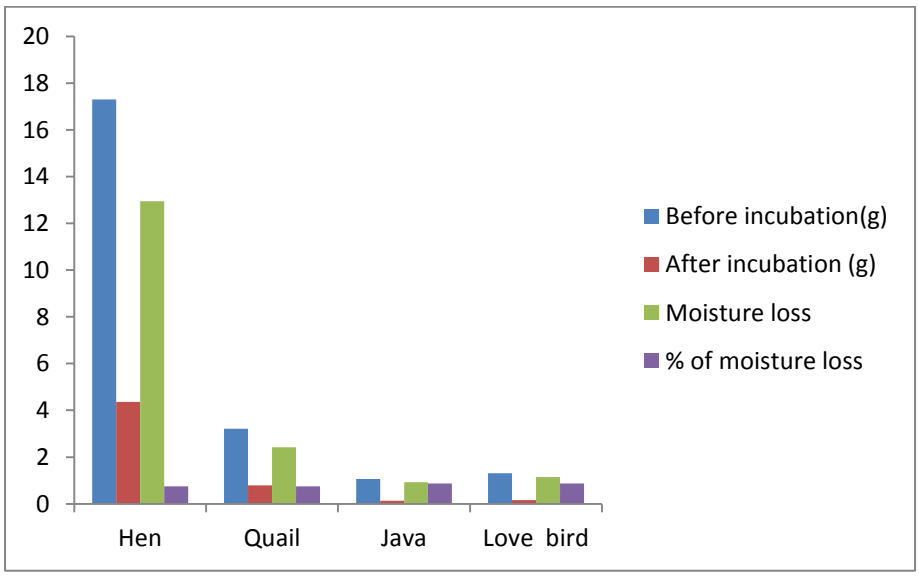
Source	Before incubation	After incubation	Moisture loss	% of moisture loss
Hen	35.99	8.23	27.76	77.1
Quail	4.03	2.1	1.93	47.89
Java	0.62	0.25	0.37	59.67
Love bird	0.59	0.23	0.36	61.01

Table-3 Comparison of moisture loss in yolk of different egg at 50°C

	Before incubation	After incubation	Moisture loss	% of moisture loss
Hen	17.3	4.36	12.94	74.79
Quail	3.21	0.79	2.42	75.38
Java	1.06	0.13	0.93	87.73
Love bird	1.31	0.16	1.15	87.78



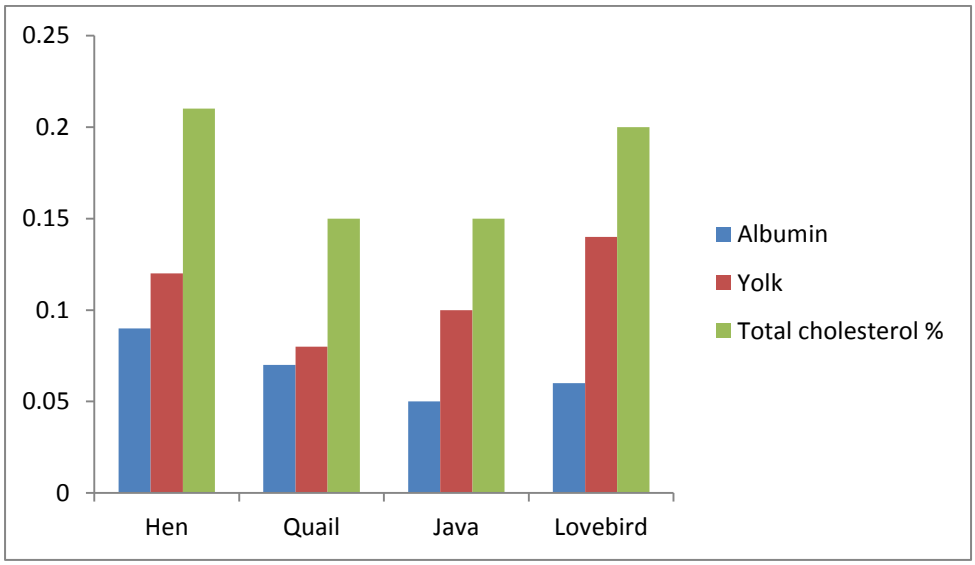
Graph-1 Comparison of albumin weight (g) before and after incubation, their moisture loss and its percentage of different eggs at 50°C



Graph-2 Comparison of yolk weight (g) before and after incubation, their moisture loss and its percentage of different eggs at 50°C

Table 4: Comparison of cholesterol content in yolk and albumin of different birds egg

Source	Yolk	albumin	Total % of cholesterol
Hen	0.12	0.09	0.21
Quail	0.08	0.07	0.15
Java	0.10	0.05	0.15
Lovebird	0.14	0.06	0.20



Graph-3 Comparison of cholesterol content in yolk and albumin of different birds egg

The total percentage of cholesterol obtained by cholesterol estimation method found that hens egg has highest % of cholesterol of 0.21%, followed by love bird of about 0.20% where as quails and java egg has less % of cholesterol of 0.15% when compared to that of hens and lovebirds egg.(Table no.4 and Graph 3). From the above results its been found that hens egg has more cholesterol than other birds. Earlier studies has showed that quails egg has good cholesterol than hens egg where the further work can be carried out in this respect.

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