Journal of Advances and Scholarly Researches in Allied Education
Vol. 15, Issue No. 11, November-2018, ISSN 2230-7540

A Study of Poultry Nutritional and Protein Products Quality in Chicken

Manish Kumar*

Assistant Professor, Zoology, Thakur Yugraj Singh Mahavidyalaya, Fatehpur

Abstract – The majority of an animal's dietary protein requirement is supplied by plant protein sources. In view of their lack in some amino acids, plant proteins for the most part require an advantageous wellspring of amino acids or other protein sources, for example, animal protein. Plant proteins are generally less expensive than animal proteins; in any case, there is a confinement to their utilization in light of their substance of hostile to nutritional factors (ANFs). The majority of these ANFs can be devastated by warm preparing that causes an expansion in the nutritional worth once in a while and protein level of plant proteins because of the end of ANFs and liberating the protein in the plant protein items. When all is said in done, vegetable (plant) protein sources are nutritionally unequal and poor in certain EAA and this abatements their natural incentive as they may not outfit the necessary restricting amino acids required by birds for egg and meat production. Worldwide, traditionally, the most used energy and protein sources are respectively, maize and soybean. Grains, similar to wheat and sorghum, and some plant protein dinners are utilized everywhere throughout the world too. Soybean meal (SBM) is the favored protein source utilized in poultry feed fabricating. Its CP content is about 40e48%, and this relies upon the amount of structures expelled and the oil extraction process. Contrasted with the protein dinner of other oilseed grains, soybean protein is supported because of its well-adjusted amino corrosive profile, particularly the essential ones, empowering it to adjust most oat based diets. Poultry nutritionists have given more consideration to the utilization of animal protein sources to make a decent eating routine. Animal proteins are very much adjusted regarding EAA that are important for body development and improvement; however they are costly for business grill production. Along these lines, they are normally used to supplement the amino corrosive equalization in the diets instead of as the principle protein source.

Key Words – Nutritional, Quality, Protein, Chicken, Animal's, Protein Sources, Nutritional Factors

----------X----------

INTRODUCTION

Chicken have been appeared to benefit from quick access to sustain. In spite of the fact that the focal point of nutrition has been on arrangement of energy, chicks would benefit from an increasingly adjusted nutrient profile, especially protein and amino acids. To adapt to market interest for protein (meat), current grills are arriving at market age sooner every year. Protein supplements are most important in the poultry feed plan after the energy-efficient raw materials, and attention has been centered on the protein and energy levels in the feed. Food costs are heavily contributed by fulfilling the bird's requirements for dietary protein. The two most common protein sources in poultry diets are vegetables (plant) and animal products. The importance of poultry's protein feeds depends on its ability to provide an appropriate measure of the bird's essential amino acids (EAAs), as well as the protein edibility and the amount of dangerous substances associated with it. The flexible nature of chicken eggs makes it one of the most important sources of nutrition. It contains the nine essential amino acids and essential vitamins and minerals necessary to optimal health. It contains high quality complete proteins. The multi-functional properties (spumming, gelling, coagulation and emulsification) of eggs are commonly used in the food industry.

In this manner progresses in nutrition will be crucial to verifying this quick development accomplishment and keeping up supportable grill production. In like manner, the basic focal point of nutrition, to just stock nutrients for support and development has gotten old. Master zones, for example, safe nutrition, are quickly picking up consideration. Along these lines during oven diet definition, picking fixings to expand nutrient accessibility, as opposed to just gathering energy or amino corrosive levels, is vital. While detailing grill diets, the fundamental accentuation is put on the crude protein (CP), in light of the fact that protein is the basic constituent of poultry diets, and together with the other primary nutrients, for example, starches, fat, water, vitamins, and minerals, is essential forever. Proteins are

polymers that are made out of aamino acids, which are connected together by peptide bonds. Proteins are separated and hydrolyzed in the stomach related framework into amino acids. At that point, after retention, the amino acids will be amassed and processed to shape proteins that are utilized in the structure of various body tissues. They likewise serve crucial metabolic jobs as blood plasma proteins, compounds, hormones, and antibodies, every one of which has a particular job in the body. Be that as it may, protein is additionally one of the most costly fixings in poultry diets. Accordingly, nutritionally and monetarily, appropriate protein use is essential in all sustaining frameworks, and inefficient use expands the expense of production.

REVIEW OF LITERATURE

Amal et al (2016) in their examination on impact of beeswax, gelatin and Aloe vera gel covering on physical properties and time span of usability of chicken eggs put away at 300 C presumed that honey bees wax and gelatin were better covering materials in protecting the interior quality and broadening the timeframe of realistic usability of chicken eggs put away at 300 C.

Olamide et al (2016) led an examination on impact of ground nut oil and palm oil on egg safeguarding. They utilized eggs of commercially-bread Lohman dark colored layers covered with ground nut oil and palm oil and put away at room temperature during hot wet stormy seasons months and they analyzed the adjustments in the quality parameters with the control eggs. It was reasoned that covering of eggs didn't control microbial development inside the eggs yet was powerful in forestalling inside quality and physical appearance of the eggs.

Chukwuka et al (2011) expressed that egg quality is relies on physical and chemical pieces of the eggs. Giving steady quality of eggs to consumer involves challenge. The quality of eggs as for yolk, egg whites and by and large quality is the serious issue in the poultry industry.

Nahed et al (2014) contemplated the impact of various additive techniques on egg quality and legitimacy. For which they gathered new commercial eggs and protected by cooling, sanitization and oiling. Different eggs were broken and partitioned into three gatherings, for example, egg white, egg yolk with salt and egg yolk with nectar that experienced freezing. It was seen that as the capacity time expanded the all-out bacterial, yeast and complete form tallies of solidified eggs items diminished slowly.

Rakonjac et al (2014) expressed that that the commercial egg production offices, for example, restriction offices, fake lighting and ventilation, an enormous number of exceptionally profitable crossover laying hens kept generally in battery confines that gave a constrained measure of room, utilization of complete feeds, utilization of many homestead cleanliness and support items. This sort of egg production gives moment supply of eggs to consumers during the time in more numbers at generally less expensive costs.

Vaarst et al (2015) contemplated that the developing interest and the moderately significant expenses for chicken turned into an immense drive for large scale manufacturing, prompting specialization in the production procedure. Village poultry makes a noteworthy contribution to destitution easing and family unit nourishment security in many creating nations.

Zemkova et al (2007) in their examination on the impacts of lodging frameworks and period of hens on the weight and cholesterol focus in the dark colored egg laying hens of various ages uncovered that there were not critical distinction in the lodging framework or ages on the egg weight in any case, huge contrast was found on yolk and cholesterol fixation

FUNCTIONAL USES OF EGGS

Egg is a multipurpose item. It is a rich nutrient source that allows people to grow better in their metabolism. Egg components make it an excellent source of proteins, vitamins and trace minerals of high quality. Using egg as food can prevent blindness. Eggs contain many essential antioxidants, including zeazanthin and lutein. For the eye, they are important. Age-related blindness and cataract complications are minimized by egg consumption. For the weight loss program it is recommended to eat egg. Overweight leads to obesity and many health problems are further induced. Eggs are used to improve color and flavor in certain candies and icings while reducing the formation of crystals. In the food industry, protein in egg white is used to reduce lipid oxidation in foodstuffs. Most usable peptides have been produced and labeled with beneficial health effects in recent decades. Four separable parts are composed of eggs: shell, shell membranes, albumen and yolk. -element has importance for various applications.

Nutritional Values of an egg:

The egg has a number of valuable nutrient values which are required particularly for the growth of children during the basic biological growth process. Egg use prevents many problems in health, not just in children but in adults. Egg is an abundant source of proteins, vitamins, minerals and fatty acid. Eggs contain vitamins such as A, D, E, K and B. Not only does this vitamin enhance the brain's function, but it also enhances thought and memory. Since egg contains vitamin D, it has been used to strengthen the bones and to improve immunity. The healthy hair

and skin are improved. Women who receive the most choline are 24% less likely to develop breast cancer than women with the lowest level of choline in their diets. Iron in the eggs helps to shape the body's red blood cells. This increases the immune response in the human body and decreases atherogensis. Egg is a good source of antibody. In both laboratory and business activities egg antibodies are being used. The white component of the overegg is known as the cholesterol-free albumin. It comprises both saturated and unsaturated fatty acids with a ratio of 2:1. The primary component of yolk is lipids. Lipid consists of roughly 65% triglyceride, 28%-30% phospholipide and 4-5% cholesterol. Different factors, including hen age, genotype and changes in hen diet can affect the composition of yolk lipids. In average, the cholesterol content of the yolk is approximately 226 mg and the bird genotype is determined by its cholesterol content. The content of yolk cholesterol is not significantly different with the age of a hen. Fatty acid "Omega 3" is also noted for being present in eggs. The omega 3 fatty acid is extremely important for normal brain growth and equally important for retinal development. This also increases the immune response and decreases atherogensis in the human body. In addition to these qualities, phosphorous and trace minerals are present in egg.

The details of nutritional contents of an egg is given in table 1

Table 1 Nutritional Contents of a chicken egg

Component (Units)	Quantity per egg	Component (Units)	Quantity per egg
Egg Shell (%)	10.5	Calcium (mg)	56.0
Egg Yolk (%)	31	Magnesium(mg)	12.0
Egg White (%)	58.5	Iron (mg)	2.1
Water (%)	74.5	Phosphorus (µg)	180
Energy (kacl)	162	Zink (mg)	1.44
Protein (g)	12.1	Thiamine (mg)	0.09
Carbohydrate (g)	0.68	Riboflavin (mg)	0.3
Lipids (g)	12.1	Niacin (mg)	0.1
Saturated Fatty Acid (g)	3.3	Folic Acid (µg)	65.0
Monounsaturated Fatty Acid (g)	4.9	Cyanocobalamin(µg)	66.0
Polyunsaturated Fatty Acid(g)	1.8	Pyridoxine (mg)	0.12
Cholesterol (mg)	410	Retinal Equivalents (µg)	227.0
Iodine (µg)	12.7	Potassium (mg)	147
Tocopherols(µg)	1.93	Carotenoids (µg)	10
Selenium (µg)	10	Cholecalciferol (µg)	1.8

COMPOSITION OF PHYSICAL PARTS OF AN EGG

Every egg is constituted by three major parts such as egg shell, albumin (White part) and yolk.

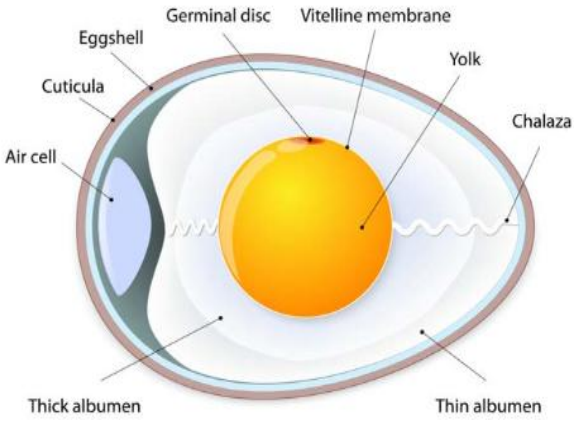

Fig. 1. Parts of chicken egg

The egg shell contributes 10 per cent of the total part of the egg. The inner parts of the egg are albumin and yolk (Table 2). Albumin covers 58 per cent of total egg's composition which is cholesterol free and this is followed by yolk which covers 32 per cent of the total egg's composition. Two colours of eggs are commonly found. They are white colour eggs and brown Colour eggs.

Table 2. Composition of a chicken egg (%)

Yolk		Albumen		Shell	
Water	49 %	Water	87 %	Water	< 1 %
Protein	16 %	Protein	11 %	Protein	3 %
Fat	33 %	Fat	0 %	Fat	2 %
Carbohydrate	1 %	Carbohydrate	1 %	Carbohydrate	0 %
Mineral	1 %	Mineral	1 %	Mineral	95 %

Just 10% of the eggs cover the egg shell, which protects the inner parts from the microorganism being introduced into the egg. The yolk is a strong source. The total amount of energy for an egg is 313 kilograms. Of this total energy, 80% is yolk. 80%. The size of the eggs is not the same and varies by the method of breeding and age. But the big egg has 78 colors, 6.3 g of protein, and 5.3 g of fat, 1.6 g of saturated fat and 212 mg of cholesterol. For basic egg yolk cholesterol is higher, for egg yolk it is lower.

The genetic background and pigment determine the color of the shell of the egg. The nutritional nature of hens influences the egg shell color. The shell's color does not, however, affect the inner properties of the eggs. The color of the egg and the characteristics of the inner parts of the eggs are not associated. The color of her eggs is thus determined by the genetic background, ethnicity and diet. For white and brown shell shells, the levels of nutrients are not substantially different. Consumers typically choose the white shell of egg rather than the brown shell, although shell color does not imply the internal quality of eggs. The shell in deep color is caused by long shell formation. Long-term shell formation results in more pigment and calcium deposits.

PROTEIN PRODUCTS IN BROILER CHICKEN NUTRITION

The importance of protein, as a major constituent of biologically active compounds in the body, places the greatest focus in poultry nutrition on protein products. It also supports body tissue synthesis and body renovation and development. Proteins still exist, and play an important role in the biology of any living organism, in the form of enzymes and hormones. The high requirements of dietary protein in broiler diets require more information about the birds ' needs for protein and amino acid and their impact on their bird growth and development, thus identifying the optimum protein concentration in broile diets for maximization of griler output or benefit. Awareness of available protein sources that can be used in poultry diets is also important. The main purpose of this study is to underline the value of some of the quality specialist protein products available for feeding broiler chickens of both animal and plant origins. The emphases of intestinal health-friendly broiler diets are minimization of anti-nutritional (ANF) concentration and immunologically active compound supplementation. The composition of food ingredients and feed processing are affecting these diet features. In general, these protein products are easily digestible and have no or lower ANFs. Feeding these products to broiler chicks can help early gut development and digestive physiology, improving the output for broiler growth and immunity, particularly at an earlier age.

The use of immediate food access was demonstrated to Broiler chicks. Although the emphasis in nutrition is on energy supply, the nutritional profile of chicks, particularly protein and amino acids, would be more balanced. Modern broilers hit a consumer age earlier every year, in order to meet market demand for protein (meat). Progress in nutrition is therefore crucial to ensure rapid growth and sustainable broiler production. The traditional emphasis of nutrition is therefore obsolete in the provision of nutrients simply for maintenance and development. Field et al., 2000; Okamoto et al., 2009 are fast gaining attention in specialized fields, such as immune nutrition. In order to maximize nutrient availability during the formulation of a broiler diet, it is therefore important to choose ingredients instead of simply following the energy or amino acid levels. The crude protein (CP) is an important component of poultry diets when preparing broiler diets, since it is critical for life together with other key nutrients, e.g. energy, fat, water, vitamins, and minerals. Protein is an amino acid filament that is bound together by peptide bonds. In the digestive system proteins are broken down into amino acids and hydrolyzed. Then the amino acids are then assembled and metabolized after absorption to form proteins used in the development of various body tissues. The plasma proteins, enzymes, hormones and antibodies also play essential metabolic functions, each with a particular role in the body. Protein is also one of the most costly ingredients in poultry diets, however. Accordingly, the proper use of protein in all feeding processes is important in terms of nutritional and economics and excess raises production costs.

ROLE OF SPECIAL PROTEIN PRODUCTS IN POULTRY NUTRITION

1. Synthetic amino acids

The ban on the use of animal protein sources in poultry feed and the relatively high prices of these products in many countries require new alternative products. In this case, the use of plant protein is the possible alternative. It is, however, well known that one or more EAAs have deficiencies in plant-based proteins, depending on the source. The achievement of an optimal balance of nutrients from a certain variety of raw materials to meet the requirements of the animal is a significant problem in the formulation of feed. As there are greatly differing ratios among the individual amino acids found in protein concentrates, it may be possible that in the variety of available raw materials, the animal's demand for all amino acids cannot be fulfilled. In these situations, it would be very successful to supplement free synthetic amino acids. However, dietary addition to poultry diets of synthetic amino acid enhances feed conversion efficiency, lowers feed costs per unit weight-raising or production, decreases nitrogen excretion and has other positive effects. Plant protein feed is used to replace synthetic amino acids, rather than animal protein feed in poultry feeding. To order to reduce feed costs and optimize meat production with a minimum total intake of amino acids, an increase to protein and amino acid use is crucial. Synthetic amino acids were found to make diets with suitable amino corruption profiles easier to formulate. One of the important parts of synthetic amino acids in animal nutrition is their potential to increase the quantity and promotion of lean meat production in readily available amino acids (nitrogen). Antibodies in animals are also associated with amino acids. Therefore, immune function production in poultry is improved by the adequacy of amino acids in the diet.

2. Processed plant proteins

Plants provide a large part of animals ' protein needs. Nevertheless, plant proteins are typically induced by synthetic amino acids or by other sources, such as refined oleaginum meal or animal protein concentrates, due to their deficit of one or several amino acids. Plant proteins contain many anti-nutritional components within their structures that can negatively affect the protein content and reduce the usefulness of the protein in animal nutrition. ANFs are substances made from natural feed as by-products of various species of metabolic processes (e.g., nutrient inhibition or activation;

digestive or metabelic decrease) that subtract from the value of feed. ANTs are a substance formed in a natural feedstuff. Toxic amino acids, saponins, cell cyanogenic acids, tannins, phytic acid, gossypol, oxalates, goitrogens, lectins, protease inhibitors, chlorogens, and amylase inhibitors are the most common anti-nutrients present in protein sources in plants. Both variables can be separated into heat and rain. Trypsin-inhibitors, haemagglutinins, phytate, goitrogens and anti-vitamin factors are among the heat-labile causes. Saponins, testosterone, flatulence and lysinoalanine are the heat-stable variables. Most potentially valuable animal protein sources will remain untapped if ways of overcoming the antinutrient components of these sources are not established. Several processing methods for expanding the available feed products and integrating them in the animal feed industry have been established. Thermal treatment is the common method used in plant and animal protein processing. Thermal therapy will diminish the thermal-friendly ANFs in plant proteins and this process improves plant protein qualities and protein levels. In animal nutrition, the most commonly used type of plant protein is soya. But there is also heavy use of certain cereal grain such as wheat, maize and sorghum as well as certain vegetable protein food such as canola, sunflower and peas. Soybeans are used in the poultry industry as a SBM, which consists of molten defatted pellets. New soybean varieties with high protein content and a lower oligosaccharide content have lately been produced compared to conventional soybeans. Ultimately, due to its nutrient structure, SBM is considered the best source for plant proteins. For both poultry and swine, soya beans are good sources of protein and energy. With its high protein content, the SBM is an essential protein for human and no ruminant feeding, with a well-equilibrated and easily digestible amino acid. But SBM has a very high level of NAFs that reduce its nutrient value, as is common to plant proteins, and restricts its inclusion in the grille chicken diet, in particular during the beginning process. Due to the fact that old animals are harder to digesting components than younger animals, the only good quality ingredient in the beginning food will achieve good health and a higher growth rate be high quality ingredients with low ant nutritive rates During the beginning of diets.

3. Animal and blood by-products

An animal by-product can be described simply as a portion of an animal being slaughtered that does not contribute directly to human food. Rendering, meat packing, processing of poultry and eggs, milk and milking production, fish processing and fish processing are the components of protein supplements of animal origin. The main categories of animal byproducts used in animal nutrition are meat and bone offal, blood, bones, intestines, rumen material and carcasses of meat inspector's rejected animals. The high levels of protein and energy of these by products, a strong EAA profile and a lack of crude fiber and other ANFs in their composition are characteristically important. They are thus used in animal feeding as useful protein sources. Animal nutritionists expressed a preference for blood and blood products blended into feed of these animal by-products. Blood meal is a slaughterhouse by-product and used in livestock diets as a protein source. Blood meal is considered one of lysine's best sources and an excellent source of arginine, methionine, cystine and leucine, but it contains less glycine and much less isoleucine than bone or fishmeal. Blood meal as a protein supplement, as a lysine supplement and as a source of trace mineral is used to balance the vitamin. Fresh blood is high in protein, with a sufficient amino acid balance of approximately 17%, and a dry content of approximately 87% CP. Blood food contains a total of 9% lysine of 80 percent with a minimum organic operation. Dry blood products have been used for many years in the feeding industry and are usually considered to be quality protein sources in pig starter diets. Upon slaughter, blood is prepared for protein coagulation by selection, and then heated. Excess water is eventually discarded and dried and powdered. The purety and drying process of the commodity is a major factor in its consistency. The drying temperature is important because overcooked meals are undesirable for animals and their use has a negative effect on poultry growth efficiency. Porcine blood produced by the altered spray-drying process can be used for non-ruminant animals as a source of potentially beneficial proteins, amino acids, microwaves and certain organically active substances. For poultry and pig diets up to 25 percent of blood can be included. Blood meal Reports have previously shown that the inclusion of 1e4 per cent of blood meal in diets can boost pouls results, while others have no adverse effects of higher dietary meal levels to chicken growth. However, Castello and al. (2004) said that adding more than 3 percent blood meal to the broiler chicken diet had a negative impact on the consumption and weight gain of broilers. A large proportion of blood is used as a source of protein in pig and poultry diets for the processing of plasm proteins. Around ten years ago, the implementation of a more gentle spray drying process enhanced the responses obtained by feeding blood products to pigs substantially. Using various blood processing methods, various blood-derived products such as spray-dried plasma proteins and spray-dried blood cells were developed.

CONCLUSION

Egg is an essential foodstuff and eating people's eggs has become increasingly important. That per capita consumption of eggs shows that people are demanding large amounts of eggs. Eggs are recognised for their nutritional value and egg

consumption reduces human body nutritional deficiencies. Egg is a rich source of valuable vitamins, minerals, proteins and cholesterol vital to the human body's smooth metabolism cycle. Given the growing demand for eggs, poultry farms have become increasing in agriculture. The backward poultry farms with state-of - the-art technology are converted into modernized farms. The farming smallholders in the developing poultry sector are growing their farms. The sector enjoys an attractive profit margin and plays an important part in the gross domestic product of the country. Given the unprecedented growth rate of the layer farms, they are not free of certain development impediments. There is great concern about outbreaks and subsequent overproduction of eggs. The farmers and sellers suffer severe economic losses. The export markets for foreign importers are temporarily reduced. Egg producers and sellers are therefore obligated, during certain times, to find any way to preserve their eggs. Many traditional methods for the preservation of poultry eggs are available. Nonetheless, large numbers of eggs are difficult to store. The advantages and disadvantages of each conservatory technique are unique. For the coating of vegetable oils, the ratio of 2:2:1:3 was taken from rice bran oil, corn oil, cocoon and neem oil and the shell surface of the spectrum eggs was coated using this mixture of vegetable oil. About paraffin wax, a strong paraffin wax condition was heated until it became gel-like, and then cold. For coating the sample shells, this liquid forms of paraffin wax. The batch of eggs was bought with glycerine and silicone oil and poured over the shells. The eggs have been stored up to the 8th week kept at room temperature. The eggs were refrigerated at 4^0C to 5^0C and preserved for seventeen weeks to determine the impact of the child's temperature on the consistency of the egg. Such eggs have been checked once a week and findings have been reported.

REFERENCES

Chukwuka, O.K, Okoli, I.C., Okeudo, N.J., Udedibie, A.B.I., Ogbuewu, I.P., Aladi, N.O., Iheshiulor, O.O.M and Omede, A.A. (2011). Egg Quality defects in Poultry Management and Food Safety. Asian Journal of Agricultural Research, 5 (1): pp. 1-16.

Nahed, M.W., El-Shereif W.M. and Manal, M.A. (2014). The effect of different preservation methods on egg quality and validity. Assiut. Vet. Med. J., 60(143): pp. 42-45.

Rakonjac, S., Bogosavljevic, S., Boskoric, S., Pavlovski, Z., Skrbic, Z., Doskovic, V., Petrovic, M.D and Petricevic, V. (2014). Laying hen rearing system: a review of major production results and egg quality traits. World's Poultry Science Journal, 70: pp. 93-101.

Vaarst, M., Steenfeldt, S and Horsted, K. (2015). Sustainable development perspectives of poultry production. World's Poultry Science Journal, 71: pp. 610-617.

Amal, I.M., Dissanayakage S.W.R.W and Kodithuwakku, A.H.T. (2016). Effect of Beeswax, Gelatin and Aloe Vera Gel coatings on Physical Properties and Shelf Life of Chicken Eggs stored at 30 degree Celsius. Journal of World's Poultry Research, 6(1): pp. 6-13.

Olamide, T. O., Dotun, A. O and Olusola, O. A. (2016). Effects of Groundnut oil and Palm oil on Egg Preservation. IOSR – JAVS., 9: 15-20.

Zemkova, L., Simeonova, J., Lichovnikova, M., Somerlikova, K. (2007). The Effects of housing systems and age of hens on the weight and cholesterol concentration of the egg. Czech Journal of Animal Science, 52(4): 110-115.

Corresponding Author

Manish Kumar**

Assistant Professor, Zoology, Thakur Yugraj Singh Mahavidyalaya, Fatehpur

manish.kumar10781@gmail.com