



## Production of Poultry Eggs: Contemporary Research Outcomes

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### Short Communication

Eggs are highly preferred food source in modern world as they are excellent source of energy, nutrients, and also highly popular in food industry as they are used in stabilization of emulsions, foaming stability and thermal gelation. Poultry eggs are important and rich source of nutrients particularly for children. Eggs contain high quality proteins and fats. The ratio of unsaturated to saturated fats in the eggs is 2:1. Eggs are considered as complete source of food. Eggs are good source of iron, zinc, phosphorus, and other essential vitamins and minerals. The phospholipids in the eggs regulate the absorption of intestinal cholesterol. Prevailing malnourishment and undernourishment are also leading to increased egg consumption. Therefore, the eggs need to be nutritionally adequate and safe for consumption [1].

The demand for native chicken eggs is increasing. Cross breeding of birds and vaccinations are integral to intensive development in the poultry farming. Egg production involves the use of vaccines, drugs, vitamins and antibiotics as feed additives for enabling good productivity and safe consumption. However, the indiscriminate use of the antibiotics can result in the residual accumulation in the livestock products which can hamper the food safety and the physiological functioning as well. Moreover, the high cholesterol and saturated fat content are the main limitations for egg consumption [2]. Nutritional quality of the eggs is controlled by the poultry husbandry as well as the feed quality. In order to ensure global food supply and food security eggs are an integral and indispensable food source. It is also important to develop safe vaccines particularly in the context of avian influenza and for the development of the specific pathogen free eggs.

To alleviate the harmful effects in poultry industry, probiotics are recommended that increase growth, productivity and health of the livestock and they also provide health benefits to the human health. Probiotics contain several types of beneficial bacteria that aid in digestion and absorption of nutrients that ultimately increases the quality of the eggs.

Some research outcomes suggested feeding the laying hens with alfalfa leaves in the dried form as they contain n-3 fatty acids, vitamins, carotenoids, minerals beta carotene, xanthophyll, flavonoids, antioxidants and other nutrients. However it was found that certain anti-nutritional factors such as cellulose, saponins, beta glucans and xylans interfere with the digestion process can reduce the cholesterol content of the eggs. The relation between the nutritional compositions of the feed with the nutritional composition of the eggs is such that the transfer of the fat soluble vitamins to the eggs is lower than the transfer of the water soluble vitamins [3].

Poultry feed is the most dominant factor of the poultry egg production. Sufficient intake of nutrients is essential for egg production. Therefore, the nutrient density of the feed intake has to be adjusted. The designing and optimization of the diet composition is also important. To achieve the production potential high nutrient density diet is essential to maintain the energy needs.

Generally for the growing birds the feed intake increases with age but the egg mass output decreases. Therefore, the laying hens need to

be provided with sufficient nutrients by adjusting the diet density in conjunction with the feed intake rate [4]. Additionally the conditions also influence the feed intake. High temperature particularly in the summer reduces the feed intake therefore the nutrient density needs to be increased for enhanced egg production with good quality.

Antibiotics are generally used to counter pathogens such as *Salmonella* and *Campylobacter*. Such usage of the antibiotics has to be minimal as they tend to accumulate in the eggs and may even give rise to antibiotic resistant microbes which may become a threat to the humans upon consumption. The solution lies in providing prebiotics, probiotics and symbiotic that has no side effects with good potential for egg production [5]. These, beneficial microorganisms produce digestive enzymes, benefit host physiology, balance the microbial flora pattern in the gut and promotes the immune system. The use of probiotics was found to improve the egg quality by reducing the cholesterol level, increase of the yolk weight, increase of the yolk color score, albumin height, better immune response and decreased oxidative stress with good feed conversion ratio.

Certain fatty acids such as eicosapentanoic acid and docosahexaenoic acid are beneficial for prevention of disorders arising from the cholesterol and fatty acids. Polyunsaturated fatty acids have roles in proper functioning of the brain, retinal tissue and neural tissues in humans. It was previously established that the fatty acid composition of the egg yolk can be modified using the dietary manipulation. Therefore with proper feed design the fatty acid and the antioxidants in the eggs could be modified [6].

Important beneficial food sources such as flax seeds, fish oil, garlic pearls, fenugreek seeds, basil leaves, bay leaves and Spirulina feeds can be formulated for designing feed composition. The synthetic antibiotics have alternate in the form of Moringa leaves. These Moringa leaves have several bioactive phytochemicals as well as antioxidants that have antiseptic and antimicrobial properties. Apart of this there are several plant based diets that can be included in the feed formulation for deriving maximum benefits in terms of egg production and egg quality.

In conclusion, it was found that eggs for an important and indispensable source of food for human consumption particularly among children as the egg digestibility and bioavailability of fatty acids and amino acids is very good. Eggs are also important for food industry in the manufacture of the commercial foods such as bakery items. Therefore there is increased demand for eggs and to meet the demands egg production needs to be raised while maintaining the

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nutritional quality and safety. Several studies have recommended safe and alternate protocols for designing the feed of chickens for higher production of eggs yet retaining their nutritional quality and microbial safety.

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