



CAN CHICKEN BE A GOOD SOURCE OF ANTIOXIDANT

Physiology

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KEYWORDS

INTRODUCTION

During evolution specific antioxidant evolved as protective mechanisms against the free radicals continually being produced. These mechanisms allowed survival in an atmosphere where oxygen concentration was rising. In nature there are thousands of compounds possessing antioxidant properties.

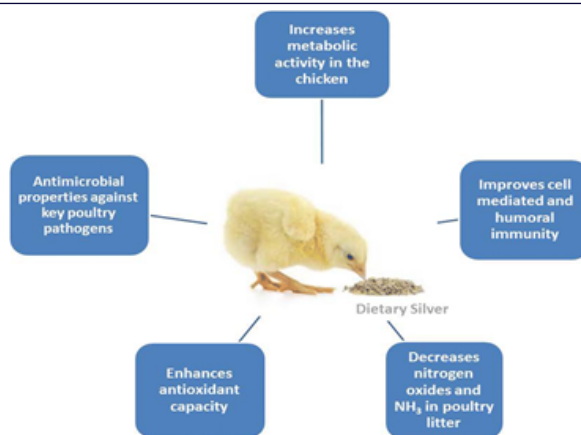
There are both fat-soluble (vitamin E and carotenoids, etc.) and water-soluble (ascorbic acid, glutathione, bilirubin, etc.), they can be synthesized in the body (ascorbic acid, glutathione) or are delivered with food/feed (vitamin E, carotenoids, Se etc.). The antioxidant enzymes that are synthesized in the body require metal co-factors. For example selenium in the form of selenocysteine is at the active site of several families of enzymes such as the glutathione peroxidases (GSH-Px) and thioredoxin reductase (TR).

Zinc, copper and manganese are integral parts of another antioxidant enzyme family called superoxide dismutase (SOD); and iron is an essential part of the antioxidant enzyme called catalase. Only when these metals are delivered with the diet in sufficient amounts can the body synthesize the antioxidant enzymes. Deficiency of those elements causes oxidative stress and allows damage to biological molecules and membranes.

Time between when the egg is laid and its cooling down for storage. Eggs should be collected more frequently on warm days. In such conditions free radical damage to lipids and proteins can occur and additional antioxidant protection would be beneficial.

Things that can make chicken an antioxidant

1. Egg storage before incubation could be associated with lipid peroxidation within the egg membranes. Increased Selenium concentration in combination with other antioxidants (vitamin E and carotenoids) could be an effective means to prevent damaging effects of free radicals produced within the egg.
2. Day 19 of embryonic development is an important point when risk of lipid peroxidation is very high. At the same time, concentrations of natural antioxidants (vitamin E and carotenoids) have not reached maximum. At this stage of development pipping occurs; and oxygen availability to tissues increases. Low antioxidant status in combination with high temperature, humidity could increase susceptibility to lipid peroxidation.
3. Disease challenge. Phagocytic immune cells themselves produce free radicals in the process of killing internalized pathogens. Without adequate antioxidant nutrient reserves, cellular machinery can be damaged by the free radicals thereby reducing the effectiveness of the immune cell. In addition, Se is considered to have a specific role in immune system regulation, which could be independent of its antioxidant functions.
4. Oxidized fat in the diet can cause oxidative stress in the intestine increasing antioxidant nutrient requirements. When a chicken diet includes spent fat after its high temperature treatment, the fat usually contains peroxides and hydroperoxides that can contribute substantially to oxidative stress.



Thus chicken enhances antioxidant activity due to present of selenium in it.

Effect of the addition of sage and garlic on lipid and cholesterol oxidation in chicken meat –

The content of unsaturated fatty acids did not change in the presence of sage; on the contrary, with garlic, the contents of these fatty acids were decreased after cooking and storage. The hexanal and pentanal contents were lower in chicken patties containing sage, and they were higher in patties with garlic. The 7-ketocholesterol was the cholesterol oxide, found in a higher amount in raw chicken on day 0, whereas the formation of 7 β - and 7 α -hydroxycholesterol was verified only from day 30. Sage was effective in controlling lipid and cholesterol oxidation, minimizing the prooxidant effects of salt, cooking, and storage.

Cinnamon deodorized aqueous extract (CinDAE) was evaluated for its antioxidant potential in chicken meatballs as a function of storage time under chilled conditions

Conclusion – From above it is concluded that upto some limits chicken can be a source of antioxidant under various conditions.

Acknowledgement–

I am dedicating this paper to my beloved mother, Anjali and father, Dr. Vasantrao who is not with the world but with me in the form of their ashirwad (Blessing). I am also much more thankful to my daughter vaishnavi, husband Rajendra, brother Dr. Mandar, sister Dr. Medha for giving me full mental support.