



16-17 November, 2023

Natural Egg Yolk Pigmentation – a Solution for Nutritional Value and Consumers Preferences

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Abstract: Eggs are animal products with high nutritional quality, both for humans and animals, while eggshells could be a very important source of calcium for plants as well as bio-fertilizers. However, in recent years, consumers are not only looking for nutritional quality, but also certain special organoleptic properties, and in the case of eggs, the colour of the shell or the yolk is an interesting topic for certain categories of consumers. More than 90% of human sensory perception are visual, so eye stimuli are also important in nutrition, like the color of yolk does!

• Yolk pigmentation

- Because yolk pigments are important in the final colour, we have to take into consideration that birds cannot biosynthesize all pigments, and have to come and it is better to from feed.
- Natural pigments should come from the feed plan, and most of them have nutritional and medical properties, like antioxidants or vitamins.



Yolk and shell pigmentation

- Sometimes the results are not exactly expected, being unpredictable or disappointing because we are not sure about the quantity of pigments ingested, absorbed, and found in the yolk;
- It is better to increase the nutritional quality of eggs, having in the same time the pigmentation persistence to the final products at the same level, for all the availability period.

• Effects of pigments on yolk colour

- Influence the quality of the eggs due to:
 - ✓ pigment digestion and metabolism;
 - ✓ nutritional and anti-nutritional factors and feeding management;
 - ✓ organoleptic properties, environmental conditions
- The use of pigments in feeding plan for birds can influence favouring or can hindering some biochemical processes which easily can change the final organoleptic or nutritional quality appreciation

• Biochemical and others factors which influences the yolk pigmentation

- grass feed (darker yolk color)
- grains feed (lighter yolk color)
- carotenoids (lutein and zeaxanthin) provide yellow yolk
- canthaxanthin provide red yolk
- oxycarotenoids are key components for pigmentation of: yolk, egg shell, poultry legs, beak, feathers
- oxycarotenoids are sentive to oxydation, especially during storage
- heat treatment – oxycarotenoids are also senzitive to high temperatures
- saponification process – most of pigments are lipidic components which due to the free fatyy acids could be saponificated in the intenstinal tract of poultry (one measure is to use feed presaponificated pigments, for examples – use of red paprika). Saponification of red paprika provide a stronger shade of red)
- incorec feed mixture of pigments
- the quality and quantity of eed intake
- lipid content of feed (fat-soluble oxycarotenoids, soybean oil, citranaxanthin, long-chain polyunsaturated fatty acids, canthaxanthin,oxidised lipids),

• Conclusions

- yolk color is important for consumers
- different pigments can be used in the poultry feeding plan to achieve the wished yolk color
- some feed component with role of yolk pigments have biologic-active properties, being used also to enhance the nutritional value of egg