

Abstract number: 994569

Session n°1:

12 - Nutrition and poultry health

Session n°2:

1 - Safety of poultry products

Abstract title:

Use of natural phenols as feed supplements with antioxidant effects on poultry products.

Abstract:

The oxidation of lipids is the main cause of nutritional and organoleptic deterioration of bird's meat and eggs. This process originates compounds responsible for unpleasant odours, reduces the amount of polyunsaturated fatty acids, vitamins and pigments, decreases the acceptability on consumers and generates compounds that may present toxicity. Dietary supplementation is a simple strategy to include compounds in animal tissues. Synthetic antioxidants are regularly supplemented in poultry. However, recently, it has increased the search for replacing those compounds for others of a natural origin. This work evaluates the potential use of natural phenols (main components of essential oils) as diet supplement antioxidant agents. Firstly, we evaluated the effects of thymol and carvacrol on the delay of oxidative deterioration in domestic chicken muscle samples storage at 4°C for 0, 5 and 10 days, and in comparison with BHT (a synthetic antioxidant compound massively used). The results show that supplementation with the 3 compounds were equally effective to delay the lipid oxidation of peroneus longus samples with no significant effects on pectoralis major. Quail diet supplementation with thymol or isoeugenol did not show significant changes in meat samples, however, the oxidation levels of fresh egg-yolk samples were affected. Isoeugenol showed a yolk antioxidant effect of similar magnitude than BHT suggesting a protective effect of that phenol during the formation of the oocyte. Thymol showed intermediate effects. Results suggest that the level of lipid oxidation protection is dependent on the species and the type and age of the product. Secondly, we assess the effects of thymol and isoeugenol supplementation on liver and egg yolk fatty acid composition. Thymol increased total unsaturated liver fatty acids compared to isoeugenol, BHT and control samples. Isoeugenol increased palmitoleic acid in yolk samples compared to BHT and controls, with thymol showing intermediate results. Interestingly, BHT samples, showed a non expected increase in the saturated/unsaturated ratio. The results suggest the usefulness of natural phenols to delay lipid oxidation. The findings may be considered relevant from a human nutritional and avian biology point of view because phenol supplementation could affect reproductive and embryonic development.

Oral presentation: yes

Poster presentation: yes

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Keywords:

meat and egg lipid oxidation
antioxidant
feed supplement