

Effects of Dietary Supplementation and Storage Conditions on the Oxidative Stability Pork Meat Lipids

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The aim of this study was to evaluate the effects of dietary supplementation with high-oleic sunflower oil (HSO) and/or α -tocopheryl acetate (vit.Eac), as well as the influence of storage conditions, on the oxidative stability of pork meat lipids. Four different isocaloric and isolysinic diets (control; 3% HS; 250 mg/Kg vit.EAc; 3% HS + 250 mg/Kg vit.EAc) were given to females and castrated males until slaughtering (160-170 kg). Meat slices obtained from the different groups of animals, were packed in vessels with transparent shrink film (half of them were covered with aluminum foil) and subjected to photo-oxidation with a white fluorescent light for three days (at 8°C under commercial retail conditions). Peroxide value (POV), thiobarbituric acid reactive substances (TBARs) and cholesterol oxidation products (COPs), were determined before and after photo-oxidation.

The highest levels of POV (0.2–11.6 meq O₂/kg of lipids) and TBARs (0–6.7 mg MDA/kg of meat) were detected in the group fed with the control diet, thus confirming the antioxidant effect of vit.Eac. In general, during storage under darkness conditions, both oxidation parameters increased, whereas exposure to light led to hydroperoxide breakdown with a consequent increase of TBARs.

Total sterol content ranged from 352 to 1388 mg /100 g lipids, which corresponded to 0.03 and 0.09 mg sterols/100 g meat. Total cholesterol was about 97% of total sterols, followed by campesterol (60%-70% of phytosterols), β -sitosterol, 5-avenasterol and stigmasterol (traces). The highest amount of COPs (5.0-25.3 ppm of lipids and 0.3-1.7 ppm of meat) were found in the group fed with the control diet. In general, the cholesterol oxidation rate was 0.1-0.2% of total cholesterol. After light exposure, COPs exhibited a similar trend to that of POV.

In general, vit.Eac increased the oxidative stability of pork meat subjected to photo-oxidation under commercial retail conditions, whereas no particular effects were observed for the supplementation with HSO.