

Title Oxidation of lipid and protein in horse mackerel (*Trachurus trachurus*) mince and washed minces during processing and storage

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Citation Food Chemistry, Volume 114, Issue 1, 1 May 2009, Pages 57-65

Keywords Omega-3; Washed fish mince; Lipid oxidation; Protein oxidation; Surimi

Abstract

Protein and lipid oxidation was followed during processing and storage of mince and washed minces prepared from horse mackerel (*Trachurus trachurus*). Briefly horse mackerel mince (M0) was washed with three volumes of water, mimicking the surimi production and different washed products were obtained: M1, M2 and M3, with one, two and three washing steps, respectively. The different products were characterised (i.e. lipid content, protein, water, iron, fatty acid profile and tocopherol content) and analysed for protein and lipid oxidation in order to investigate the impact of the washing steps on oxidation. Subsequently the different products were stored for up to 96 h at 5 °C and samples were taken out regularly for analysis. Lipid oxidation was investigated by measuring primary oxidation products (lipid hydroperoxides) and secondary oxidation products (volatiles). Protein oxidation was followed by determination of protein solubility, protein thiol groups and protein carbonyl groups using colorimetric methods as well as western blotting for protein carbonyl groups. Lipid and protein oxidation markers indicated that both lipid and protein oxidation took place during processing and the ranking for oxidation was as follows $M0 < M1 < M2 \leq M3$ with M0 being significantly less oxidised than M3. Results indicated that washing creates an imbalance in the initial prooxidant-antioxidant equilibrium in the muscle tissue and contributes to the observed differences in the oxidative status of the four products obtained. In contrast, during storage of different products, lipid oxidation development was faster in M0 and the ranking was as follows $M0 > M1 > M2 \geq M3$. Lipid and protein oxidation developed simultaneously in different minces during storage, but it was not possible to determine at which level these two reactions were coupled.