

Reactions of Oxidized Lipids during Microwave Heating of Fish Muscle

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Marine fish contain polyunsaturated fatty acids – eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) – highly appreciated by nutritionists. Their content is much lower in fresh water fish. Carp (low fat) and mackerel (high fat) ground fish muscle was heated for up to 18 min in a microwave oven. The content of water and other volatiles appreciably decreased during the heating. Hydroperoxides present in small amount in the lipid fraction were decomposing from the beginning, while the content of free fatty acids increased. Conjugated fatty acids rapidly decreased, but attained a nearly constant value on further heating. Polar lipids were slowly formed, but changes of oxypolymers were negligible. Heated fish possessed typical odour and flavour of roasted fish. The colour on the surface of heated fish muscle changed to deep brown, as measured by the electronic image analysis. The browning was more pronounced in mackerel than in carp. The cause of browning were interactions between oxidized polyunsaturated fatty acids with free amino groups of fish protein. The reaction could be affected by addition of antioxidant to the ground fish muscle.