Polyunsaturated fatty acid accumulation and antioxidant enzyme activity in red tilapia (Oreochromis hybrid) fed high omega-3 diets

ABSTRACT

This study was conducted to investigate the change of muscle fatty acid profiles with increasing age and to measure the activities of muscle antioxidant enzymes in red tilapia (Oreochromis hybrid) fed with relatively high n-3 diet. Fish were reared in aquaria and fed with a formulated diet which was high in n-3 polyunsaturated fatty acid (PUFA) for 75 days. Significant increase ($p<0.05$) of saturated fatty acids, monoenes and n-6 PUFA was observed at 60 days after start of the experiment, while significant increase of n-3 PUFA occurred at 75 days after start of the experiment. The superoxide dismutase and glutathione peroxidase activities were found to be 1.5 ± 0.1 and 0.4 ± 0.1 (U/g; Mean ± SE; n = 10), respectively. Lipid peroxidation value (MDA) was found to be 21.4 ± 0.5 nmol/g (Mean ± SE; n = 10). Our results suggested that feeding red tilapia with a high n-3 finishing diet from 75 days prior to harvesting can successfully increase the n-3 PUFA content of fillet. However, the relatively low antioxidant enzymes activity and high value of lipid peroxidation in the muscle tissue should be considered for proper storage and handling of red tilapia fillet to ensure the availability of desirable n-3 PUFA and to avoid the accumulation of undesirable oxidation products.

Keyword: Red tilapia; n-3 PUFA; Antioxidant enzyme; Lipid peroxidation; Finishing diet