

Improvement of Fatty Acid Composition in Common Carp (*Cyprinus carpio*) Muscle

Jan Mráz^{1,2}, Jana Pickova^{1,2}

¹Swedish University of Agricultural Sciences, Uppsala, Sweden and ²Research Institute of Fish Culture and Hydrobiology, Vodňany, Czech Republic

Common carp (*Cyprinus carpio*) is, globally, one of the most important farmed fish species. We aimed to investigate if the lipid composition of carp muscle can be easily improved in terms of healthy fatty acids (FA) profile and if common carp could be an important source of n-3 highly unsaturated FA (n-3 HUFA) for human nutrition. Four carp crosses were analyzed for lipid content and composition. No pronounced differences among crosses except lipid content and therefore different proportion between two main lipid classes phospholipids and triacylglycerols were found. Three sites from carp fillets were dissected and analyzed for lipid content and composition. The FA composition of the leanest part, the dorsal white muscle was similar to that of marine-farmed species; it contained a large proportion of n-3 HUFA, the n-3/n-6 ratio was 1.1, and the proportion of phospholipids was high. The abdominal wall was rich in monounsaturated FA, the n-3/n-6 ratio was lower, 0.5, the red muscle showed intermediate composition and these two tissues were more affected by the cereal feed. In addition, carps from three natural pond-production systems in South Bohemia were sampled. Ongrowing fish had access to plankton or plankton with addition of cereals or pellets containing rapeseed cake. White muscle FA were investigated and compared among treatments. The fish without any supplementation were characterized by high content of n-3 FA, especially eicosapentaenoic (EPA) and docosahexaenoic acid (DHA). The fish supplemented with rapeseed pellets had modest level of n-3 FA and the fish supplemented with cereals were characterized by high content of oleic acid and low level of n-3 FA. The plankton fatty acid composition, which is natural in the ponds and food for carp, was rich in n-3 FA, EPA and DHA with the n-3/n-6 ratio around 3. Additionally, effect of a biological active lignan sesamin was investigated in a small tank experiment as an additive in the formulated diets offered to carp. No effect on enhancement of n-3 HUFA biosynthesis when FA were analyzed in contrary to the effects shown in rainbow trout. Other physiological effects could be discussed.