

Influence of Herring (*Clupea harengus*) Intake on Inflammation and Oxidation Markers in Overweight Humans and Rats

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Increasing evidence supports the involvement of inflammation and oxidation in the development of atherosclerotic plaque. Incorporation of oxidized LDL particles in the vessel wall induces production of cell-adhesion molecules (CAMs), proinflammatory cytokines and C-reactive proteins (CRP). A few previous studies have reported that intake of n-3 PUFA influence oxidation and have anti-inflammatory effects. However, information on the role of fish intake for these parameters is very limited.

We have therefore performed three intervention studies, two with crossover design (n=14, 2x4weeks and n=40, 2x6weeks) in overweight humans and one with parallel design in rats (n=29) put on a western- style cafeteria diet. Levels of circulating markers of vascular inflammation, oxidation and antioxidation were assessed after herring or chicken/pork intake in humans and after herring-, herring oil or chicken intake in rats. So far the results have shown that herring intake compared to chicken/pork had no effect on IL-6, IL-18 or ICAM-1 in humans. In rats, neither herring nor herring oil intake influenced IL-4, IL-6 or IFN-gamma.

Several oxidation and antioxidation markers like TBARS, ORAC, GSH, GSH-px and catalase was measured in serum from the rat study. Also F2-isoprostanes were measured in rat urin. TBARS decreased in rats consuming herring but not herring oil compared to the group that consumed chicken. GSH, GSH-px and catalase were unaffected by the diets. In the human studies, ox-LDL in plasma was followed. The ox-LDL/LDL-ratio was slightly decreased after herring diet compared to the reference diet in humans, but not statistically significant.