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Effects of fish oil alone and in combination with clofibric acid on serum levels of triacylglycerol and cholesterol in rats

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Rats were fed a diets prepared with soybean oil (SO), perilla oil (PO), or fish oil (FO) for 4 weeks, and some of the rats received daily s.c. injections (100 mg/ kg) of *p*-chlorophenoxyisobutyric acid (clofibric acid) for 1 week before being killed. The levels of serum triacylglycerol and cholesterol were conspicuously lower in FO-fed rats than in SO-fed rats. The administration of clofibric acid further decreased serum levels of triacylglycerol and cholesterol in SO-fed rats, but not in FO-fed rats. The decreased levels of these serum lipids with FO-feeding alone were comparable to those observed in SO-fed rats which had received clofibric acid. The activity of peroxisomal β-oxidation the liver of FO-fed rats was significantly higher (2.48 times) than that of SO-fed rats. The treatment of FO-fed rats with clofibric acid caused an additional increase in activity, as compared to the SO-fed control. The activity of peroxisomal β-oxidation in SO-fed rats treated with clofibric acid was 3.74 times that of FO-fed control. In contrast to peroxisomal β-oxidation, the activities of catalase, glutathione (GSH) oxidase toward hydrogen peroxide and GSH reductase were not increased by clofibric acid, regardless of the type of oil ingested. Moreover, the activities of GSH *S*-transferases toward 1-chloro-2,4-dinitrobenzene (CDNB) and 1,2-dichloro-4-nitrobenzene (DCNB) were both depressed to the same level by the administration of clofibric acid, regardless of the type of dietary oil, although FO-feeding can reduce the dose of clofibric acid required to lower serum lipids, which concomitantly may prevent hepatocytes from oxidative stress that might be caused by an imbalance of hydrogen peroxide metabolism due to the increased activity of

peroxisomal β-oxidation and to the decrease in the activities of detoxification by GSH *S*-transferase.