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Effects of perfluorooctanoic acid on the synthesis of phospholipids in the liver of mice fed a dietary soy bean oil, perilla oil or fish oil

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The effects of perfluorooctanoic acid (PFOA) on the synthesis of phospholipids were studied in combination with feeding of various dietary oils (soybean oil (SO), perilla oil (PO) or fish oil (FO)). Hepatic contents of phosphatidylcholine (PtdCho), phosphatidylethanolamine (PtdEtn) and phosphatidylinositol (PtdIns) did not differ between the three dietary groups except for a high level of PtdEtn in FO-fed mice. PFOA treatment increased the hepatic content of PtdCho and PtdEtn by 1.5 fold but did not affect that of PtdIns. Fatty acid compositions of phospholipids were different between the three groups, and the fatty acid composition in their diet reflected the fatty acid composition of hepatic phospholipids. The rate of incorporation of [³H]glycerol into PtdEtn in the FO-fed group was significantly higher and that into TG was lower, compared to other dietary groups in PFOA-untreated mice. PFOA treatment significantly increased the incorporation of [³H]glycerol into PtdEtn and PtdSer and decreased that into TG, whereas those into other lipid classes were not altered by PFOA treatment. These results suggest that acceleration of PtdEtn synthesis de novo is responsible for a marked increase in the hepatic content of PtdEtn in PFOA-treated mice, whereas an increase in hepatic content of PtdCho is thought not to be due to increased synthesis de novo.