

Chemico-Biol. Interact. **118**, 69-83 (1999)

Alterations by perfluorooctanoic acid of glycerolipid metabolism in rat liver

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The effects of perfluorooctanoic acid (PFOA) feeding on hepatic levels of glycerolipids and the underlying mechanisms were investigated. Feeding of rats with 0.01% of PFOA in the diet for 1 week caused an increase in the content of phosphatidylcholine (PtdCho), phosphatidylethanolamine (PtdEtn), phosphatidylinositol (PtdIns), phosphatidylserine (PtdSer) and triglyceride (TG), which were 2.2, 2.4, 2.4, 1.6 and 5.2 times over control, respectively, on the basis of whole liver. The activities of glycerol-3-phosphate acyltransferase, diacylglycerol kinase and PtdSer decarboxylase were significantly increased upon PFOA feeding, whereas the activities of CTP: phosphoethanolamine cytidyltransferase and PtdEtn *N*-methyltransferase were decreased. On the other hand, the activity of CTP:phosphocholine cytidyltransferase was not increased by PFOA. Upon PFOA feeding, hepatic level of 16:0-18:1 PtdCho was markedly increased and, by contrast, the levels of molecular species of PtdCho which contain 18:2 were decreased, resulting in the reduced concentration of molecular species of serum PtdCho containing 18:2. The increased in the level of hepatic 16:0-18:1 PtdCho seems to be due to 3-fold increase in the activities of both $\Delta 9$ desaturase and 1-cylglycerophosphocholine (1-acyl-GPC) acyltransferase. The mechanism by which PFOA causes the accumulation of glycerolipids in liver was discussed.