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Regulation by Carbohydrate and clofibric acid of palmitoyl-coA chain elongation in the liver of rats.

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Regulation of palmitoyl-CoA chain elongation (PCE) and its contribution to oleic acid formation was investigated in rat liver in comparison with stearoyl-CoA desaturase (SCD). Hepatic PCE activity was induced by the administration of 20% wt/vol glucose or fructose for drinking in normal rats. In streptozotocin-induced diabetic rats, the activities of both PCE and SCD were suppressed and fructose, but not glucose feeding caused an increase in the activity of both enzymes. Treatment of normal rats with clofibric acid in combination with carbohydrate further increased PCE but not SCD activity. Fatty acid analysis of hepatic lipids revealed that oleic acid (18:1(n-9)) proportion was increased upon carbohydrate administration or clofibric acid. The treatment of rats with clofibric acid in combination with carbohydrate greatly increased 18:1(n-9) proportion. Significant correlation was observed between PCE activity and hepatic proportion of 18:1(n-9) ($r^2=0.874$, $P<0.01$), while the relationship between SCD activity and 18:1(n-9) proportion was not significant ($r^2=0.552$, $P>0.05$). Taken together, carbohydrate induces PCE activity as well as SCD to increase hepatic 18:1 content in rat liver, and the increased PCE activity seems to be responsible for the further increase in 18:1(n-9) when administered with carbohydrate in combination with clofibric acid.