

The effect of docosahexaenoic and ecosapentaenoic acids on glucose and fructose utilization in liver slices

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Type 2 diabetes exhibits a stronger dependence on obesity than other health consequences of excessive accumulation of body fat. One of the major causes of obesity is high intake of lipids (Kopelman, 2000). The effect of n-3 and n-6 polyunsaturated fatty acids (PUFAs) on fat deposition does not result from a reduction in food intake, but rather reflects metabolic changes in several tissues. PUFAs are potent inhibitors of hepatic glycolysis and de novo lipogenesis, through the inhibition of genes involved in glucose utilization and lipid synthesis, including L-pyruvato kinase, fatty acid synthase and acetyl CoA-carboxylase (Postic et al., 2005). Therefore, the objective of this work was to verify the effects of docosahexaenoic and ecosapentaenoic acids on oxidation and lipid synthesis from glucose and fructose in liver. Female Wistar rats were maintained with different diets (rich or poor in PUFAs) during 2 months. Then, the animals were decapitated and the liver was removed. Glucose and fructose oxidation to CO<sub>2</sub> and lipid synthesis for both hexoses were determined. The oxidation of glucose and fructose to CO<sub>2</sub> did not present any difference. But the lipid synthesis was inhibited by PUFAs. These acids can increase sensitivity to the insulin by diminishing the lipid synthesis.

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