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LIVER METABOLIC EFFECTS OF A HIGH-FAT LOW-CARBOHYDRATE DIET IN RATS: A STUDY UNDER DIFFERENT ENERGY CONDITIONS

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The beneficial effects of high-fat, low-carbohydrate (HFLC) diets on glucose metabolism have been questioned and its effects on liver metabolism are not totally clear. This work aimed to evaluate the HFLC diet effects under different energy conditions on glucose homeostasis, fatty liver development and hepatic gluconeogenesis using the isolated perfused rat liver. HFLC diet (79% fat, 19% protein, and 2% carbohydrates in Kcal%) was administered to rats over four weeks under three conditions: hypercaloric*;* isocaloric and hypocaloric (energy reduction of 20%). Fasting blood glucose levels and total fat in the liver were higher in all HFLC diet rats. Oral glucose tolerance was impaired in isocaloric and hypercaloric groups, although insulin sensitivity wasn´t altered. HFLC diet also caused marked liver metabolic alterations: higher gluconeogenesis rate from lactate and a reduced capacity to catabolize alanine, the latter effect more intense in the hypocaloric condition. We concluded that, even when HFLC diets are used for weight loss, our data imply that they can potentially cause harmful consequences for the liver.

Keywords: Carbohydrate Restriction, Liver Metabolism, Steatosis
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