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Effect of maternal CLA consumption on liver triacylglycerol regulation of adult offspring

Claudio Adrian Bernal, Lavandera J, Gerstner C, Farina A, Sain J and Gonzalez M
University of Litoral, Argentina

Animal studies reveal that conjugated linoleic acid (CLA) has beneficial effects against cancer, obesity, diabetes, inflammation and atherosclerosis. However, CLA was associated with liver steatosis in mice, while detrimental and protective effects on fatty liver have been shown in rats. Since there is an association between maternal nutrition and risk of offspring chronic disease, the aim was to investigate the potential effects of maternal CLA consumption on the liver regulation of triacylglycerol accretion of adult offspring. Female Wistar rats were fed control (C) or CLA-supplemented diet (CLA) during 4 weeks before and throughout pregnancy and lactation. Male offspring of CLA rats were fed C (CLA/C) or CLA (CLA/CLA) diets, while male offspring of C rats were fed C (C/C) diet (9 weeks). Hepatic triacylglycerol content and the activity and expression of lipogenic and oxidative enzymes were measured. Comparing with C/C, CLA/CLA rats showed a tendency for decreased triacylglycerol depots (-22%) associated with a significant reduction of FAS (-37%) and ACC (-27%) enzyme activities as well as of the mRNA levels of FAS (-44%), ACC (-48%), SCD (-54%) and SREBP1c (-25%), without changes in β -oxidation parameters. CLA/C rats did not show changes in hepatic triacylglycerol levels but the FAS (-38%) and ACC (-31%) activities as well as the expression of ACC (-62%) were significantly diminished, associated to a lower expression of the key enzyme of β -oxidation (CPT-1a) (-23%), PPAR- α (-22%) and PPAR- γ (-45%). Maternal CLA consumption could metabolically contribute to prevent or attenuate the risk of fatty liver of adult offspring.

Biography

Claudio Adrian Bernal has completed his PhD from University of Litoral, Argentina and his Postdoctoral studies from University of Pittsburgh, USA. He is currently the Head of Food Science and Nutrition at the University of Litoral. He has published more than 40 manuscripts, directed national and international research projects and received several Scientific Awards in the field of nutrition. He was the President of Argentine Chapter of the Latino American Society of Nutrition. His research focuses on the impact of dietary fats and functional compounds on experimental animals. In addition, he is working in food analysis, infant formulas and functional foods.

cbernal@fcb.unl.edu.ar

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