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EFFECT OF HIGH CHRONIC INTAKE OF SUCROSE ON LIVER METABOLISM IN AGING RATS: MODULATION BY RUTIN AND OTHER MICRONUTRIENTS

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High added sugar intake and senescence share common deleterious effects, in particular in the liver, but a combination of these two factors has not been widely studied. Our aims were to examine the effect of a high sucrose diet in liver of old rats and also the potential benefices of a micronutrient supplementation.

Four groups of 22 month-old male rats fed during five months with a diet containing either 13 or 62% sucrose, supplemented or not with rutin, vitamin E, A, D, selenium and zinc were compared. We measured liver macronutrient composition, glycation /oxidative stress, enzyme activities (lipogenesis, β -oxidation, fructokinase), gene expression (enzymes and transcription factors), *in vivo* protein synthesis rates and plasma parameters.

Sucrose induced an increase in plasma and liver lipid content, and a stimulation of liver protein synthesis rates. Gene expression barely changed by sucrose, with lower levels for LXR- α and - β . Micronutrient supplementation tended to limit liver triglyceride infiltration through variations in fatty acid synthase, acyl coA oxidase and possibly ATP citrate lyase activities.

Despite differences in enzymatic regulations, and blunted responses of gene expression, high sucrose diet was still able to induce a marked increase in liver lipid content in old animals. However, it probably attenuated the positive impact of micronutrients.