

Effect of high chronic intake of sucrose on liver metabolism in aging rats. Modulation by rutin and other micronutrients

Eva E. Gatineau, Frédéric Capel, Dominique Dardevet, Jérémie David, Corinne Pouyet, Sergio Polakof, Laurent Mosoni

▶ To cite this version:

Eva E. Gatineau, Frédéric Capel, Dominique Dardevet, Jérémie David, Corinne Pouyet, et al.. Effect of high chronic intake of sucrose on liver metabolism in aging rats. Modulation by rutin and other micronutrients. 14. annual CTPIOD meeting, Sep 2017, Saragosse, Spain. hal-02733473

HAL Id: hal-02733473 https://hal.inrae.fr/hal-02733473

Submitted on 2 Jun2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers. L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - ShareAlike 4.0 International License

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

<u>Eva Gatineau</u>^{1,2}, Frédéric Capel^{1,2}, Dominique Dardevet^{1,2}, Jérémie David^{1,2}, Corinne Pouyet^{1,2,3}, Sergio Polakof^{1,2}, Laurent Mosoni^{1,2}

¹INRA, UMR 1019 Nutrition Humaine, Saint Genès Champanelle, France ²Univ. Clermont 1, UFR Médecine, UMR 1019 Nutrition Humaine, Clermont-Ferrand, France ³INRA, UMR 1019, Plateforme d'Exploration du Métabolisme, UNH, F-63122 Saint Genès Champanelle, France

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.