

Effects of a 6-week fructose diet on the antilipolytic action of insulin in normal rat. J Luo, SW Rizkalla, J Boillot, F Bruzoz, A Chevalier, G Slama (*Hôpital Hôtel-Dieu, Laboratoire de Diabetologie, 1 Place du Parvis de Notre-Dame, 75181 Paris Cedex 04, France*)

The metabolic effects of fructose on the adipose tissue are not yet fully known. In a previous study, we found that fructose decreases isoproterenol-stimulated lipolysis. Thus, we designed the present experiment to study the effects of a fructose-rich diet on the antilipolytic effect of insulin in rat epididymal adipocytes. The evolution of nonfasting plasma parameters during the nutritional period was also studied.

Thirty-six male Sprague-Dawley rats were fed for 6 wk on one of 4 diets containing 57% CHO, either as starch, dextrose, fructose or an equivalent mixture of fructose and starch.

At wk 2, 4 and 6, nonfasting plasma triglycerides were higher in the fructose and fructose/starch groups than in the starch and dextrose groups ($P < 0.05$; ANOVA). At the end of the nutritional period, the maximal antilipolytic action of insulin in epididymal adipocytes was higher in the fructose ($28 \pm 2.5\%$), fructose/starch ($25 \pm 2.8\%$) and dextrose ($29 \pm 1.9\%$) groups than in the starch group ($16 \pm 2.9\%$) ($P < 0.05$). Sensitivity to insulin had a tendency to be lower in the fructose ($ED_{50} = 0.63 \pm 0.23$ ng/ml) and fructose/starch (0.60 ± 0.28) groups than in the dextrose (0.45 ± 0.18) and starch (0.29 ± 0.18) groups.

We conclude that in normal rats, the intake of fructose or dextrose increased the maximal antilipolytic action of insulin in adipocytes. Fructose, however, had a tendency to reduce the sensitivity of adipocytes. It also increased nonfasting plasma triglyceride levels.