pression of EGP under lipid infusion, and this impairment might have been underestimated the way we measured it.

Effects of purified soybean proteins and dietary cholesterol on unsaturated fatty acid biosynthesis. J. Bellenger, S. Madani, M. Narce, J. Prost, J.P. Poisson, J. Belleville (Unit of Cellular and Metabolic Nutrition, UPRES Lipids and Nutrition, Faculty of Sciences Mirande, University of Burgundy, BP 400, 21011 Dijon, France).

The aim of the present study was to investigate, in isolated rat hepatocytes, the effects of normoproteic (20 %) diets containing either casein or purified soybean proteins, with or without added cholesterol, on Δ6n-6, Δ6n-3, Δ5n-6 and Δ9 desaturase activities and total lipid fatty acid composition.

Twenty male Wistar rats (5 weeks old) were randomly divided into four groups. For 2 months they were fed, a diet containing 20 % of either casein (CAS) or highly purified (97 %) soybean proteins (SP), with or without 0.1 % added cholesterol. Isolated hepatocytes were incubated with 1-^{14}C 18:2n-6, 1-^{14}C 18:3n-3, 1-^{14}C 20:3n-6 or 1-^{14}C 18:0, precursors of Δ6n-6, Δ6n-3, Δ5n-6 and Δ9 desaturation steps, respectively. Desaturation rates were then determined after HPLC partition. The fatty acid composition of the isolated hepatocytes was measured by GLC. The significant differences of the results were assessed by the DUNCAN test.

Δ6n-6, Δ6n-3, Δ5n-6 and Δ9 desaturase activities were significantly lower in the SP group versus CAS group (–43, –44, –45 and –33 %). Δ6n-3, Δ5n-6 and Δ9 desaturase activities were decreased, when cholesterol was added to the CAS diet, by 47, 62 and 48 %, respectively, while the Δ6n-6 desaturase activity was not significantly modified. Δ6n-6 desaturase activity was increased by 36 % and Δ9 desaturation decreased by 30 % when cholesterol was added to the SP diet. Only the addition of cholesterol to the diets modified the fatty acid composition of the isolated hepatocytes, whatever the changes in the desaturase activities.

The decreased desaturase activities with the SP diet could be explained by the lower lysine/arginine ratio in SP than in CAS, which would have an activating effect on glucagon synthesis, as glucagon is known for its inhibitory effect on desaturase activities.

Effects of dietary lipid source and energy restriction on the liver fatty acid profile in zucker rats (*fa/fa*). R. Cantoral[a], M.T. Macarulla[a], M.I. Torres[b], M.P. Portillo[a] ([a]Department of Nutrition, Faculty of Pharmacy, University of País Vasco; [b]Department of Public Health of the City Council, Vitoria, Spain).

Genetic obesity induces disturbances in the hepatic lipid metabolism such as an increase in triglycerides, cholesterol and phospholipid concentrations and changes in the fatty acid profile. The aim of this work was to study the effects of the dietary lipid source and energy restriction on the hepatic fatty acid content.

Twenty-eight obese male Zucker rats (*fa/fa*) were divided into four groups: rats fed ad libitum (group A), rats fed a 25 % energy restricted diet which provided a standard amount of fat (group B), rats fed a 25 % energy restricted diet which provided a high amount of olive oil (group C) and rats fed a 25 % energy restricted diet which provided a high amount of coconut oil (group D). After 4 weeks of dietary treatment, animals were killed by decapitation and the livers were dissected. Liver fatty acids were measured by gas chromatography. ANOVA test was used for statistical comparisons.

Energy restriction had no effect on the liver fatty acid profile. In contrast, high-fat energy restricted diets (groups C and D) induced important modifications to the profile. By comparing groups C and D with group A, the following results were found: 14:0 –38.5 % and +55.2 %; 16:0 –8.7 % and +13.7 %; 16:1 –47.4 % and –29.5 %; 18:0 +32.1 % and +26.9 %; 18:1 +0.2 % and –13.2 %; 18:2 +55.8 % and +44.1 %; 20:4 +41.2 % and +25.9 %. It was interesting that the two lipid sources produced different changes.

It can be concluded that energy restriction was unable to modify the liver fatty acid profile in obese Zucker rats. In contrast, dietary lipids were a factor that could induce important modifications in this profile, depending on the nature of the fatty acids.

Modulation of the triglyceride-rich lipoprotein (trl) hepatic uptake by high satured or unsaturated fatty acids in the nzw rabbit. C. Juhel, A. Harbis, Y. Pafumi, D. Lairon (Inserm U 130, 18, avenue Mozart, 13009 Marseille, France).

A decreasing level of TRL clearance during the postprandial state allows the formation of atherogenic remnants and in the long term can lead to development of cardiovascular diseases. We studied one of the factors implicated in TRL clearance: the hepatic uptake by lipoprotein receptors. Rabbits (n = 36) were fed a cholesterol free, low fat (2.7 %) diet (T), or hypercholesterolemic diets containing 0.35 % cholesterol and 10 % fat which were either saturated (lard, L) or monounsaturated (olive oil, OOC) or polyunsaturated (sunflowers oil, SO) fatty acids, or cholesterol free but 10 % fat diets represented by either SFA (coconut oil, CO) or MUFA (olive oil, OO). The overall study lasted 28 d. We compared the uptake of TRL from L, OOC and SO rabbits by studying cultured liver cells freshly isolated from T, L, OOC and SO rabbits. We measured the lipoprotein binding to LDL receptor (LDL-R) and lipolysis stimulated receptor (LSR) using hepatocyte plasmic membranes isolated from T, CO and OO rabbits.

The hepatocyte culture experiments showed i) that the TRL disappearance was delayed in hypercholesterolemic rabbits as compared to T ones, ii) whatever the hepatocyte, uptake of TRL isolated from OOC and SO rabbits was faster than those of Ls. As compared to T rabbits, intracellular free cholesterol concentrations were two fold higher in rabbits on the atherogenic diet for 28 d. The SFA (CO) diet increased lipoprotein binding to LDL-R while it decreased with the MUFA (OO) diet. A comparable figure was noted for LSR after 14 d on fat rich diet.

In conclusion, the reduced LDL-R and LSR binding activity could explain the delayed clearance of TRL observed in hypercholesterolemic L rabbits, as compared to those on UFA diet. These data could be related to the hypercholesterolemic effect of SFA and to the protective effect of MUFA or PUFA on atherosclerosis in humans.

Effects of dietary coconut oil on blood transport and in vivo hepatic metabolism of fatty acids in the preruminant calf. D. Bauchart, D.Durand, C. Picherit, B. Graulet, D. Gruffat (Inra, LCMH, Theix, 63122 St-Genès-Champanelle, France).

The strict incorporation of triglycerides (TG) from plant origin in milk replacers for calves has become necessary to avoid any risks of bovine spongiform encephalopathy transmission. Coconut oil, rich in medium-chain fatty acids, stimulates the growth of the young calf by favouring muscle protein accretion, but its effects on the lipid metabolism have