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In vitro study of the intestinal conversion of linoleic and α linolenic acids. JP Blond¹, A Bernard², C Caselli², JP Poisson¹ (*Département de biologie appliquée, IUT de Dijon et*¹ *Unité de nutrition cellulaire et métabolique, EA DRED 1867, UFR Sciences de la Vie;*² *Département de nutrition EA DRED 580, ENSBANA, université de Bourgogne, France*).

We have investigated the bioconversion of the two essential polyunsaturated fatty acids (EFA), linoleic acid (18:2, $n = 6$) and α linolenic acid (18:3, $n = 3$) by homogenates or microsomes of rat intestinal mucosa and by mouse jejunal explants.

Eight milligrams of homogenate proteins or 5 mg of microsomal proteins were incubated with 20 or 120 nmol of each ¹⁴C labelled substrate, under the conditions used for rat liver desaturations. Desaturase activities were calculated from the conversion percentage measured by HPLC.

Desaturase activities 3.5 to 7-fold lower for the intestine than for the liver and 18:2, $n = 6$ was more desaturated than 18:3, $n = 3$.

In the mouse intestinal explants incubated with the same substrates, the conversion percentage of 18:2, $n = 6$ to desaturation-elongation products was 3.5%, whereas it was 2.1% with 18:3, $n = 3$ by homogenates. Arachidonic (20:4, $n = 6$) and docosahexaenoic (DHA, 22:6, $n = 3$) acids, the main biosynthesized essential fatty acids represented 20 and 90% of the fatty acids derived from 18:2, $n = 6$ and 18:3, $n = 3$, respectively.

These results confirm our previous studies performed on in vivo fatty acid absorption by rat intestine and confirm a bioconversion of the two studied EFA during the first step of their absorption in the intestine.

However, in the absorptive intestinal cells, only a few of each fatty acid was metabolized by desaturation-elongation. The differences between linoleic acid and α linoleic acid are probably related to a dif-

ference in the acylation rates into phospholipids and triacylglycerols synthesized during the absorption.

Gestational diabetes: influence of food intake on birth weight, HbA1c, and maternal weight gain. MC Nuttens, O Verier-Mine, S Biaisque, A Wambergue, M Romon (*DIAGEST group*).

There is still some controversy about nutritional management of gestational diabetes (GD). The aim of this work was to study the influence of energy and macronutrient intake on infant birth weight, maternal weight gain and glycemic control in women with GD undergoing intensive management. It was realised among 80 women (age 30.2 ± 5.3 years, BMI 25.2 ± 5.2 kg/m²), with GD or mild carbohydrate intolerance according to the criteria of Carpenter and Coustan. Management began between 24 and 34 weeks of gestation. Pre-management food intake (0) was assessed by a diet history. The energy content of the prescribed diet was based on the pre-pregnancy BMI and pregnancy weight gain, a carbohydrate intake of at least 50% of energy intake was recommended, insulin was prescribed if postprandial glycemia was higher than 1.2g/L.

Results: Follow-up weight gain was correlated to fat intake ($r = 0.25$, $P < 0.05$), hbA1c to energy ($r = 0.29$, $P < 0.01$), fat ($r = 0.38$, $P < 0.001$), and protein intake ($r = 0.24$, $P < 0.05$). Birth weight was correlated to gestational duration ($r = 0.36$, $P < 0.01$) and negatively to smoking ($P < 0.01$) and carbohydrate intake ($r = -0.27$, $P = 0.02$). For carbohydrate intake higher than 210 g/day, there are no macrosomes and percentage of low birth weight was the same. Predictors of birth weight were examined by a forward stepwise regression analysis. Three parameters were significant: gestation duration ($\beta = 0.35$, $P = 0.02$), Carbohydrate intake ($\beta = -0.24$, $P = 0.02$)

and smoking ($\beta = -0.26$, $P = 0.01$). These results confirm that, in nutritional management of gestational diabetes, carbohydrate intake has to be higher than 200 g/day and that fat intake must be restricted.

Growth and nutrition of children of Maghrebian origin living in Paris area.

F Rovillé-Sausse (*Laboratoire d'anthropologie biologique, Musée de l'Homme, place du Trocadéro, 75116 Paris, France*).

Nutritional investigations made among the Maghrebian population living in France showed a progressive change in the habits, the traditional Mediterranean diet becoming more western, especially among young people. The purpose of this study was to evaluate the influence of the diet on the growth of children born in France, whose both parents immigrated from Maghreb.

— Method: In this longitudinal study, we enrolled 300 children from Maghrebian parents and 320 French children, under 6 years of age. They were regularly followed by paediatricians in the centres of 'Protection Maternelle et Infantile' (PMI) of the Parisian area. The successive biometric data (height, weight, etc) were collected in their medical files, from birth, each month during the first year, every 2 months during the second year, then every 6 months. About 15 000 measurements were collected. The means of height, weight and body mass index (BMI) were computed for each age class. The BMI (W/H^2) is a good index of the nutritional status of the children, and its dynamic analysis can predict a possible obesity.

— Results: At birth, no difference was observed in height, weight and BMI between both populations ($P > 0.05$). From the first weeks of life, the BMI means of children from Maghrebian immigrated parents were significantly higher ($P < 0.01$) than those of French children. At 1 year of age, 23% of

the Maghrebian BMI were greater than the percentile 90 for the reference French population. Of these obese Maghrebian children, 28% showed a precocious adiposity rebound between 30 and 36 months of age (reference value is about 72 months).

— Interpretation: These results point to the risk of obesity in children of Maghrebian parents living in Paris. They might be interpreted as a consequence of the change in diet habits. 77 % of the Maghrebian newborns are exclusively breastfed at birth, but because an obese baby in this population is regarded as being in good health, mothers give readily cereals in addition of breastfeeding, which carries a faster growth of weight due to a supply of energy intake. When solid food is progressively introduced, many people think that 'westernization' of food is a good sign of social integration, favourable to the health. In fact, they introduce nutritional imbalances: for example, a high intake of meat, a considerable supply of saturated fats (butter) takes the place of mono- and poly-unsaturated fats (olive oil). The BMI growth of children of immigrated Maghrebian parents showed an evident overweight at each age, which could have an influence on precocious obesity and cardiovascular risks.

Tumor growth and oxidant-antioxidant status. M Gerber¹, C Astre¹, C Ségala¹, M Saintot¹, J Scali¹, J Simonny-Lafontaine², J Grenier², H Pujol² (¹*Groupe d'épidémiologie métabolique*; ²*Centre anti-cancéreux, 34000 Montpellier, France*).

Several lines of evidence suggest an alteration of the oxidant-antioxidant status in cancer. The biochemical analyses of experimental tumors show high levels of antioxidants and low levels of polyunsaturated fatty acids (PUFA) resulting in a low potential for lipid peroxidation. Such an alteration has been found in human cancer patients either in the plasma of breast cancer