	P1	*P'1*	*P2*	*P'2*	*P3*	*P'3*	*P4*	*P'4*
Creaming (mm) d 3; d 14	1.5;2	1;1	1;2.5	0.5;1.5	1;2	1;1.5	1;2	0.5;1.5
Diameter of oil droplets (nm) d 1; d 14	323;325	328;324	353;329	327;324	359;345	323;320	362;352	331;327
Percentage of oil (%) d 1; d 14	< 3; < 3	< 3; < 3	< 3; < 3	< 3; < 3	< 3; < 3	< 3; > 3	< 3; < 3	< 3; < 3
pH d 1; d 14	6.40; 6.45	6.40; 6.35	6.38; 6.35	6.30; 6.32	6.31; 6.33	6.35; 6.33	6.40; 6.36	6.20; 6.17
Osmolality (mosm/L) d 1; d 14	1 041;1 017	1 414;1 419	1 486;1 482	1 524;1 454	1 557;1 541	1 386;1 385	1 541;1 539	1 478; 1 463
Stability (d)	11	14	12	14	12	14	4	14

d: day

This study demonstrated that cations play an important role in the stability of nutritional emulsions, although other factors are also involved. The CAN remains a valuable tool for predicting cation-induced destabilization and can be used to elaborate new nutrient solutions offering adequate stability for specific therapeutic indications.

VITAMINS–OLIGOELEMENTS

Effects of vitamin E on insulin sensitivity and peroxidation parameters in insulin-resistant rats. P Faure [1], E Rossini [1], PY Benhamou [2], S Halimi [2] *([1] GREPO and [2] Service de diabétologie, Université J-Fourier and CHU de Grenoble, 38700 Grenoble, France)*

A recent study revealed an improvement in insulin sensitivity in non-insulin dependent diabetic (NIDDM) patients after treatment with pharmacological doses of vitamin E. The aim of our study was to investigate in an animal model of insulin resistance, rats fed with a high fructose diet (58% of carbohydrates [CHO]), the effects of vitamin E on insulin sensitivity (glucose uptake = Rd). Measurement of glucose uptake was performed using an euglycemic hyperinsulinic clamp (2 mU/min/rat) in conscious animals. We measured the markers of lipid peroxidation (MDA) and protein oxidation (Thiols, SH) and protective enzyme against oxidative stress (Cu Zn SOD). We studied three animal groups: control rats ($n = 6$), fructose fed rats ($n = 9$) and fructose + vitamin E fed rats: 3.4 g/kg diet ($n = 8$). The animals fed with the high fructose diet showed a significant decrease of Rd (14.5 ± 1.3 vs control group 31.7 ± 1.6 mg/kg/min). Vitamin E administration significantly increased Rd (21 ± 2.7 mg/kg/min). The high fructose fed rats exhibited increased MDA concentrations, a decrease of SOD activity (0.87 ± 0.21 vs 1.44 ± 0.34 U/mg/Hb) and a decrease of thiols. These defects were corrected by vitamin E admistration. In summary, in this insulin-resistant rat model, vitamin E improves insulin sensitivity by 60%, which parallels an improvement in protein oxidative parameters and abnormal Cu Zn SOD activity. This study highlights the relationships between glucose homeostasis and oxidative stress and the possible utilization of antioxidant agents to increase insulin sensitivity.

The nature of dietary fatty acids affects the glycemic and insulinemic responses to carbohydrates in healthy subjects.

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The effect of a mixed meal composed of different kinds of carbohydrates and fats on postprandial plasma concentrations of glucose, insulin, free fatty acids and triglycerides was investigated in eight young normolipidemic men (24 ± 1 year, body mass index (BMI) 21.5 ± 0.8 kg/m^2). Three hours after a standardized breakfast (300 kcal, 18% fats, 70% carbohydrates, 12% proteins), the subjects ingested four test meals (1 200 kcal, 50% fats, 38% carbohydrates, 12% proteins) in 30 min on separate days in random order according to a Latin square design.

The meals contained two kinds of carbohydrates: instant mashed potatoes (high glycemic index 70–90%) or rice (low glycemic index 50–55%) and two mixtures of vegetable oils, with either a high monounsaturated/polyunsaturated fatty acids n-6 ratio (M), or a low one (P). Proteins, saturated and polyunsaturated fatty acids n-3 were comparable in all meals. The plasmatic parameters were measured every 30 min during 3 h after the beginning of the test meal.

During the postprandial kinetic, the glycemic response was significantly lower with rice-P than potato-M or rice-M ($P < 0.01$) after 30 min. The insulinemic response was lower for rice-P than with potatoes-M ($P < 0.05$). At 90 min, the average insulin level was similar for rice-P and rice-M and significantly lower than potato-P or potato-M ($P < 0.005$). No significant differences were found between meals in free fatty acid or triglyceride plasma levels.

In conclusion: i) The insulin response was significantly different between rice and instant mashed potatoes only when carbohydrates are associated with a polyunsaturated rich meal. ii) The polyunsaturated rich meals decreased the insulin response to the two kinds of carbohydrates. The same tendency was observed for the glycemic response.

Thus, the postprandial plasma concentrations of glucose and insulin are influenced by the nature of dietary fatty acids present in the meal.

Effect or selenium supplementation on clinical manifestations and plasma biochemical parameters in streptozotocin-diabetic rats mildly balanced by insulin.

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Seventy-six Sprague-Dawley rats were used in this study. Twelve rats were used as control (group C). Diabetes was induced in 64 rats by iv injection of streptozotocin (30 mg/kg). All rats with glycemia levels > 2.5 g were considered diabetics. All rats received a purified diet (in calories: 30% lipids, 15% proteins, 55% glucides). Three groups of 16 diabetic rats each were supplemented with selenium (Se): a Se-rich yeast (group DSel), or selenomethionine (group DSm) or selenomethionine + vitamin E (group DSmE). The supplementation of Se in all groups corresponded to