Viscosity of algal soluble fibres determines glycemic and insulinemic postprandial response in healthy humans. N Bentouimou [1], N Mekki [2], D Lairon [2], C Cherbut [1] *([1] Centre de recherche en nutrition humaine, Inra, BP 1627, 44316 Nantes cedex 03; [2] Inserm U 130, av Mozart, 13009 Marseille, France).*

Dietary seaweeds are a source of soluble fibres which could influence absorption and metabolism of glucose in humans. We evaluated the effects of two algal soluble fibres: xylans of *Palmaria palmata* (PP), whose intrinsic viscosity was low (41 mL/g), and highly viscous alginates from *Laminaria digitata* (LD, 1 096 mL/g), on fasted and postprandial concentrations of plasmatic glucose and insulin, after 21-day adaptation to a diet containing either cellulose (Cel) or an algal fibre, in 12 healthy subjects. The data (mean ± SE) were compared using the Student's *t* test for paired data (significance level: $P < 0.05$).

Fasted concentrations of glucose and insulin were not significantly affected by 21-day ingestion of PP (10 g/day) or LD (6 g/day) [glucose (mmol/L): 4.68 ± 0.23 (PP) and 4.85 ± 0.18 (LD) vs 4.79 ± 0.19 (Cel); insulin (mU/L): 12.2 ± 2 (PP) and 9.5 ± 1.7 (LD) vs 13.1 ± 1.5 (Cel)]. However, whereas PP had no effect, LD decreased the postprandial peak of glucose and insulin and reduced the areas under the curve of glucose and insulin, monitored over 195 min after the ingestion of a test-meal, by 55 ± 18% ($P = 0.03$) and 45 ± 6% ($P = 0.005$) respectively.

In conclusion, only the fibre exhibiting a high viscosity is able to reduce postprandial glycemia and insulinemia, whereas the poorly viscous fibre has no effect. Thus, viscosity seems to play a key role in the action of soluble fibres of dietary seaweeds on absorption and metabolism of glucose in healthy humans.

Contribution of diabetic rat kidney to glycerol utilization and to gluconeogenesis from glycerol. O Peroni, M Odeon, V Large, F Diraison, M Beylot *(Laboratoire de physiopathologie métabolique et rénale et Inserm U 197, faculté de médecine René-Laënnec, 69372 Lyon cedex 08, France).*

One generally considers that liver is the near exclusive tissue utilizing circulating glycerol. Recent studies suggest however, that other tissues also utilize significant amounts of glycerol. In particular, kidney could use glycerol to produce glucose by gluconeogenesis (GNG) and this could be an important phenomenon during fasting and diabetes. To test this hypothesis, we measured endogenous glucose (EGP, 3-^{3}H glucose) and glycerol (2-^{13}C glycerol) production and GNG from glycerol (incorporation of ^{13}C in glucose) in diabetic rats (streptozotocin) fasted for 24 h. The vein and the artery of the kidney were ligatured (kidney-, $n = 5$) or not (kidney+, $n = 7$) at the beginning of the infusion. Blood samples were collected at the end of the infusion (3 h), in the carotid (peripheral blood) and in the portal vein. All rats had a glycaemia above 3 g/L. Renal ligature resulted in an increase of circulating glycerol concentration (kidney-: 370 ± 40 vs kidney+: 210 ± 10 mmol/L, $P < 0.01$) due to a fall of glycerol metabolic clearance (29.1 ± 3.9 vs 66.9 ± 6.4 mL/kg/min, $P < 0.01$). The appearance rate of endogenous glycerol (calculated with isotopic enrichment, IE, of glycerol in arterial blood) decreased slightly (10.3 ± 0.7 vs 13.5 ± 0.6 mmol/kg/min, $P < 0.05$). EGP diminished in rat kidney- (69.1 ± 2.5 vs 83.9 ± 3.3 mmol/kg/min, $P < 0.01$) as well as GNG from glycerol calculated with the IE measured in portal vein (7.9 ± 0.5 vs 11.25 ± 0.6 mmol/kg/min, $P < 0.01$) or in peripheral blood (carotid) (7.15 ± 0.5 vs 10.04 ± 0.3 mmol/kg/min, $P < 0.01$).

Conclusion: These results are in favour of an important role of kidneys in glycerol utilization and GNG from glycerol during insulin dependent diabetes.