

exceed the capacities of intestinal glutaminolysis, the dietary protein level has to be high. However, even with a large supply of protein, the splanchnic tissues continue to play a minor role in producing glutamine for muscles. In conclusion, under most usual nutritional conditions, there is an enterohepatic cycling of glutamine; the hepatic release of glutamine (and glutamate) may be interpreted as a nitrogen-salvaging process, independent of the acid/base status that becomes operative when the urea cycle activity is low.

**Kinetic study of apoB-100 metabolism in non-insulin-dependent diabetics.** C Maugeais, P Mahot, K Ouguerram, M Krempf, T Magot (*Centre de recherche en nutrition humaine, hôpital Laennec, 44035 Nantes cedex 01, France*)

Non-insulin-dependent diabetic (NIDDM) subjects exhibit abnormalities in their plasma lipid and lipoprotein profiles that increased their risk of cardiovascular diseases. This study was designed to examine the metabolic behavior of apoB-100 using stable isotopes.

The five patients (37–66 years old) with NIDDM (HbA1C 6.7–10.3%) had hypertriglyceridaemia (TG  $2.9 \pm 0.9$  g/L). They received a constant infusion ( $10^{-6}$  mol/kg/h) of deuterated leucine during 14 h. Patients were in fasting state during the experiment. Lipoproteins were isolated by ultracentrifugation and apolipoproteins by electrophoresis (SDS-PAGE). ApoB-100 was hydrolyzed and the tracer-to-tracee ratio in leucine was determined by mass spectrometry. Kinetic analysis of the tracer-to-tracee curves was performed by multicompartimental modeling.

Compared to control subjects, very low density lipoprotein (VLDL)-apoB production was higher (41.5 vs 24.8 mg/kg/day). In the experimental diabetic subjects, fractional

catabolic rates (FCR) of VLDL-, and intermediate density lipoprotein (IDL)-apoB decreased ( $0.16 \pm 0.05$  vs  $0.48 \pm 0.05$  h $^{-1}$ ,  $0.15 \pm 0.04$  vs  $0.62 \pm 0.08$  h $^{-1}$ , respectively), while FCR of low density lipoprotein (LDL)-apoB slightly increased ( $0.030 \pm 0.006$  h $^{-1}$  vs  $0.022 \pm 0.002$  h $^{-1}$ ).

The main perturbations of lipoprotein metabolism in NIDDM were upstream of LDL as an increase in VLDL synthesis and as a decrease in VLDL and IDL catabolism.

**Isotopic enrichment kinetics of the nitrogenous milk fractions in goats receiving a single intravenous injection of L-(U- $^{14}\text{C}$ )-leucine.** X Rubert-Aleman, G Rychen, C Claudon, F Laurent (*Ensaia-Inra, BP 172, 54505 Vandœuvre-les-Nancy, France*)

The aim of this experiment was to study the  $^{14}\text{C}$ -labelling kinetics of goat milk nitrogenous fractions (casein fraction [CN], whey protein [WP] and the nonprotein fraction [NPN]) after a single intravenous injection of L-(U- $^{14}\text{C}$ )-leucine, and to measure the apparition times of CN and WP labelling peaks to identify the labelled goat milk proteins which could be used for metabolic studies in monogastric animals (rat or pig).

L-(U- $^{14}\text{C}$ )-leucine (Amersham, UK) was used as an adapted marker for three main reasons: its metabolic pathways are well defined (transamination of leucine to  $\alpha$ -ketoisocaproate [KIC], decarboxylation or reamination of KIC to leucine), leucine is particularly abundant in milk proteins and its extraction rate from the plasma to the mammary gland is very high [Mepham and Linzell (1966) *Biochem J* 101, 76–83].

Three lactating Alpine goats (3 L milk/day) were each fitted with two temporary intravenous catheters placed respectively in each jugular vein. Isotope injection of L-(U- $^{14}\text{C}$ )-leucine ( $3.6 \times 10^6$  Bq/goat diluted in 5 mL 0.9 % NaCl solution) was