

21 and  $189 \pm 22 \mu\text{mol.L}^{-1}$ , respectively), while arterial isotopic enrichment was higher than the venous one ( $7.6 \pm 0.7$  and  $2.9 \pm 0.7$  Atom % Excess, APE). Arterial turnover was lower than the apparent venous turnover ( $26 \pm 3$  and  $106 \pm 24 \mu\text{mol.kg}^{-1}.\text{min}^{-1}$ ,  $P < 0.001$ ). *Protocol 2:* the concentrations did not differ between arterial ( $122 \pm 26 \mu\text{mol.L}^{-1}$ ), venous ( $121 \pm 29 \mu\text{mol.L}^{-1}$ ) and portal plasma ( $131 \pm 24 \mu\text{mol.L}^{-1}$ ). The isotopic enrichments at the plateau were higher in the artery ( $4.9 \pm 0.6$  APE,  $P < 0.05$ ) as compared to venous ( $1.7 \pm 0.3$  APE) and portal plasma ( $1.2 \pm 0.2$  APE). The apparent turnover was higher in venous and portal blood compared to the artery ( $80 \pm 19$ ,  $111 \pm 20$ ,  $23 \pm 4 \mu\text{mol.kg}^{-1}.\text{min}^{-1}$ , respectively,  $P < 0.05$ ). We conclude that the digestive tract produces acetate in dogs fasted 24 h (fermentation free), and that peripheral tissues yield more acetate than they use it.

## POSTERS

**Validation of a food frequency questionnaire. I. Foods.** M Gerber<sup>1</sup>, C Bonifacj<sup>2</sup>, J Scali<sup>1</sup>, JP Daurès<sup>2</sup> (<sup>1</sup>Groupe d'épidémiologie métabolique; <sup>2</sup>Unité d'épidémiologie, de biostatistiques et de recherche clinique, IURC, 34000 Montpellier, France).

Most of the questionnaires for diet assessment conducted in various countries are validated on nutrients. Only two of these studies considered foods [Pietinen et al (1988), *Am J Epidemiol* 128, 655-666; Bingham et al (1994), *Br J Nutr* 72, 619-643]. However, when studying the etiological relationship between nutrition and cancer, foods and dietary habits appeared more consistently associated with reduced or increased risk than specific nutrients. The disappointing results of some intervention studies [the ATBC study group (1994), *N Engl J Med* 330, 1029-1035] also strengthen the importance of foods over nutrients in the rela-

tionship between nutrition and cancer. Besides, our validation study was intended to pilot an investigation on Mediterranean diet, which is known for its large variety of foods. Thus, the objective of this study was to validate the dietary assessment instruments on food quantitative data, since one of our aims is to make food comparisons.

Three different assessment methods were submitted to a sample of volunteers, 150 women and men. Ninety-eight completed the protocol: a weighed dietary record (PETRA) and a 7-day record using a food check-list with a set of photographs at each season of the year, plus a semi-quantitative food-frequency questionnaire with information on socio-demographic and anthropometric data once in the year. Because no dietary assessment method can safely be qualified as a gold standard, the methods were compared two by two to isolate specific components of the validation: measurement method (set of photographs versus weighed records), qualitative and semi-quantitative pattern of consumption (food frequency questionnaire versus estimated 7-day diet record).

Results are presented here for 16 groups of foods. The Spearman correlation coefficients between PETRA and the estimated dietary record ranged from 0.63 for fish and sea-food to 0.90 for wine (mean: 0.76). There was practically no misclassification. For FFQ, the de-attenuated Spearman correlation ranged from 0.19 for fish and sea-food to 0.78 for wine (mean: 0.49). Misclassification occurred for 8% or less of the subjects (except for the groups agrumes and fish-sea-food, 11%).

Because it is possible to identify qualitatively and quantitatively insufficient questions for specific foods, assessment of foods appeared to be more efficient for questionnaire improvement than for nutrient assessment. Besides, validation on foods might be more justified with regard to the next uses of the questionnaire.