Comparison of the metabolic fate of an oral long-chain triglyceride (TG) (LCT) load and a medium-chain TG (MCT) load in healthy humans. C Binnert [1], C Pachiaudi [1], M Beylot [1], P Chantre [2], J Goudable [1], JP Riou [1], M Laville [1] *([1] CRNH and Inserm 449, Lyon; [2] Laboratoires Arkopharma, Nice, France)*

Since carnitine plamitoyl transferase I (CPT I) is not required for the oxidation of MCT, MCT are preferentially oxidized rather than stored. Thus, MCT could be potentially interesting for the diets of obese patients, especially if they enhance total lipid oxidation. We compared the metabolic fate of 30 g of olive oil (LCT) with a mixed load of 15 g of olive oil + 15 g of MCT oil (80% of trioctanoate) in ten healthy women (23 ± 2 years, 21 ± 2 kg/m^2). In order to calculate the fraction of the load oxidized, we added 200 mg [1-1-1-$^{13}C_3$]triolein to the LCT load or 150 mg [1-1-1-$^{13}C_3$]trioctanoate to the MCT-LCT load.

Each protocol lasted 630 min. At T_{360} min the subjects were given a nonlabelled mixed meal in order to avoid any starvation effects. Indirect calorimetry measurements were performed throughout the test. Blood samples were collected every 30 min to measure metabolite concentrations. Expired gas samples were collected every 30 min for ^{13}C enrichment of CO_2 measurements ($^{13}CO_2$) in order to calculate the fraction of ingested TG having been oxidized.

After the ingestion of LCT, plasma TG levels increased with a peak at 180 min (1.4 ± 0.2 mM vs 0.8 ± 0.1 mM) but not after the MCT-LCT load (T_{240}: 0.9 ± 0.1 mM). NEFA concentrations increased more rapidly with the LCT load than with the MCT-LCT load (T_{120}: 0.63 ± 0.06 mM vs 0.39 ± 0.03, respectively, $P < 0.05$). On the contrary, ketone body concentrations increased as early as 30 min with the MCT-LCT load (T_{30}: 0.13 ± 0.02 mM). Insulinemia moderately but significantly increased during both protocols (T_{90}: 11 ± 1 mUI/L vs 8 ± 1 mUI/L at T_0, $P < 0.05$). The kinetics of the appearance of $^{13}CO_2$ was more rapid with the MCT-LCT load, and the amount oxidized was greater: 82 ± 4% of the MCT load was oxidized within 630 min but only 38 ± 3% fo the LCT load ($P < 0.01$). Total lipid oxidation was moderately and significantly increased during the MCT-LCT load: 21.3 ± 1.1 g vs 17.8 ± 1.4, $P < 0.01$.

Our results showed that a fraction of the MCT-LCT load was preferentially oxidized (80% of the 15 g ingested) and the total lipid oxidation was greater for the MCT-LCT load compared with the LCT load. Thus, MCT seems to be interesting for use in the diets of obese patients, if our results are confirmed in this pathology and during a mixed load.

Influence of meal time on postprandial lipemia. J Dallongeville [2], C Le Fur [1], P Lebel 2, JL Edme [3], JC Fruchart [2], M Romon [1] *([1] Service de nutrition, CHRU-Lille; [2] Serlia, Institut Pasteur de Lille; [3] Cereste, CHRU-Lille, LIlle, France)*

The goal of our study was to assess the influence of the actual time of a meal on postprandial lipemia. Nine healthy subjects aged 19 to 32 years were given a meal at 1:00 pm or 1:00 am in a random order. The sessions were given at 1 to 3 week intervals. The meal contained 40% of daily energy expenditure (15% protein, 40% lipid, 45% carbohydrate). The experimental meal was given 4 h after a standardized meal. Blood samples were drawn at baseline and hourly for 8 h (T_0 to T_8). Plasma total cholesterol (C), very low density lipoproteins (VLDL)-C, low density lipoproteins (LDL)-C, high density lipoproteins (HDL)-C, triglycerides (TG), VLDL-TG, and the LpE:B and LpC-III:B particles were measured postprandially. A two-way analysis of variance ('time of meal' and 'postprandial time') with two repeated measures was used for sta-