**Supplemental figure 2. Urinary metabolites**

The mean urinary excretion of acylcarnitines and 6-sulphatoxymelatonin over 24 h is shown as the mean ± SEM (n = 11) for the session with meals rich in palmitic acid (gray box) and oleic acid (black box). Significant differences in urinary metabolites between the two trials were assessed by the paired t-test. \*, P < 0.05 vs. the palmitic acid trial.

**Supplemental figure 3. Peak times of core body temperature, heart rate, and autonomic nervous system activity**

The peak times of (a) core body temperature, (b) heart rate, (c) parasympathetic nervous system, and (d) sympathetic nervous system were evaluated using a cosinor analysis in the session with meals rich in palmitic acid (gray cycles) and oleic acid (black cycles). Gray arrows indicate the distribution width of the session with meals rich in palmitic acid and the black arrows that of oleic acid. The p-value in the pie chart was the result of the paired t-test. Radius of the pie chart = 1. Parameters are indicated as follows: CBT, core body temperature; LF/HF, low frequency to high frequency; HF, parasympathetic nervous system.

**Supplemental figure 4. Relationship between the respiratory quotient and the urinary excretion of acylcarnitines**

The relationship between the mean respiratory quotient and urinary excretion of acylcarnitines over 24 h is shown for the session with meals rich in palmitic acid (gray cycle) and oleic acid (black cycle). Pearson’s coefficient (R) and p-values for each dietary condition are indicated, with the regression line representing a correlation.

**Supplemental figure 5. Relationship between fat oxidation and the urinary excretion of acylcarnitines**

The relationship between mean fat oxidation and the urinary excretion of acylcarnitines is shown for the session with meals rich in palmitic acid (gray cycle) and oleic acid (black cycle). Pearson’s coefficient (R) and p-values for each dietary condition are indicated, with the regression line representing a correlation.