

## Supporting Information

**Table S1:** Anthropometric characteristics and fasting blood chemistry values of the 6 male participants whose results were included in the final analysis

<i>Parameter</i>	<i>Reference range</i>	<i>Participants (n=6)</i>
<b>Anthropometric measurements</b>		
<i>Age (years)</i>	18-45	25 ± 4
<i>Body weight (kg)</i>	-	74.3 ± 12.7
<i>Body height (m)</i>	-	1.80 ± 0.1
<i>BMI (kg/m<sup>2</sup>)</i>	19 - 25	22.3 ± 1.6
<i>Systolic blood pressure (mmHg)</i>	< 130	116.5 ± 10.4
<i>Diastolic blood pressure (mmHg)</i>	< 90	79.8 ± 6.7
<b>Lipids</b>		
<i>Total cholesterol (mg/dL)</i>	< 200	177.6 ± 27.3
<i>LDL cholesterol (mg/dL)</i>	< 155	113.9 ± 20.7
<i>HDL cholesterol (mg/dL)</i>	35-100	54.0 ± 7.6
<i>LDL/HDL cholesterol ratio</i>	0.5 - 3.5	2.2 ± 0.6
<i>Triglycerols (mg/dL)</i>	< 200	94.3 ± 54.5
<b>Kidney and liver function markers</b>		
<i>γ-GT (U/L)</i>	< 60	23.2 ± 11.6
<i>AST (U/L)</i>	< 50	32.8 ± 10.2
<i>ALT (U/L)</i>	< 50	25.0 ± 9.3
<i>Alkaline phosphatase (U/L)</i>	40 - 130	76.2 ± 13.1
<i>Creatinine i.S. (mg/dL)</i>	0.70 – 1.20	0.9 ± 0.1
<i>Bilirubin (mg/dL)</i>	< 1.10	0.8 ± 0.5
<i>Uric acid (mg/dL)</i>	< 7	5.1 ± 0.9

**Table S2:** List of allowed foods during three-day strict diet of the washout week

<b>Vegetables:</b> Potatoes Mushrooms Garlic White onions Celery root Cauliflower White asparagus	<b>Fruits:</b> Lychee Coconut
<b>Others:</b> Sunflower oil Olive oil Nuts (except pistachios) Low-fat milk and dairy products Soy milk Coconut milk Almond milk Low-fat natural yoghurt Low-fat cream cheese Low-fat white cheese (feta cheese, brie, camembert) Mayonnaise Pickled white onions Peanut butter Chocolate spread Honey Syrup Salt White pepper Black pepper	<b>Drinks:</b> Coffee Water White wine Beer Low-fat milk
	<b>Meat / protein rich foods:</b> Pork meat Beef Chicken Sausage Beef extract Soy products White beans
	<b>Snacks:</b> Chocolate Nuts Salted potato Chips
	<b>Grain products:</b> White noodles (pasta) Wheat flour White rice Waffles Bread (no cornmeal-bread)

**Table S3:** Pharmacokinetic variables (mean  $\pm$  SD) calculated from baseline normalised concentrations of  $\beta$ -carotene in triacylglycerol-rich fraction (TRF) and  $\beta$ -carotene, triacylglycerol (TAG), high-density lipoprotein (HDL) and low-density lipoprotein (LDL) cholesterol concentrations in plasma of healthy human males after a single oral dose of 15 mg  $\beta$ -carotene together with a placebo, iron sulphate (25 mg iron) or zinc sulphate (30 mg zinc).

	$\beta$ -Carotene	$\beta$ -Carotene + iron	$\beta$ -Carotene + zinc
Triacylglycerol-rich fraction (TRF)			
$\beta$ -Carotene			
AUC (nmol/L · h)	-0.12 $\pm$ 0.52	0.21 $\pm$ 0.71	-0.09 $\pm$ 0.23
C <sub>max</sub> (nmol/L)	0.10 $\pm$ 0.14	0.20 $\pm$ 0.21	0.06 $\pm$ 0.04
T <sub>max</sub> (h)	5.33 $\pm$ 4.41	5.67 $\pm$ 3.01	4.33 $\pm$ 2.66
Plasma			
$\beta$ -Carotene			
AUC ( $\mu$ mol/L · h)	-29 $\pm$ 32.5	-24 $\pm$ 16.2	-28 $\pm$ 11.7
C <sub>max</sub> ( $\mu$ mol/L)	-4.1 $\pm$ 7.6	-0.8 $\pm$ 5.2	-2.9 $\pm$ 5.6
T <sub>max</sub> (h)	5.17 $\pm$ 2.86	4.83 $\pm$ 2.32	5.83 $\pm$ 3.37
TAG			
AUC (mg/dL · h)	457.8 $\pm$ 250.5	402.9 $\pm$ 218.4	402.7 $\pm$ 253.8
C <sub>max</sub> (mg/dL)	97.3 $\pm$ 48.3	88.0 $\pm$ 29.2	78.7 $\pm$ 34.3
T <sub>max</sub> (h)	8.83 $\pm$ 1.84	9.33 $\pm$ 1.21	7.67 $\pm$ 1.63
HDL-cholesterol			
AUC (mg/dL · h)	4.1 $\pm$ 12.2	-1.5 $\pm$ 8.9	-8.4 $\pm$ 16.3
C <sub>max</sub> (mg/dL)	2.43 $\pm$ 0.98	2.14 $\pm$ 1.46	1.71 $\pm$ 1.38
T <sub>max</sub> (h)	6.57 $\pm$ 4.08	6.00 $\pm$ 3.61	6.29 $\pm$ 4.19
LDL-cholesterol			
AUC (mg/dL · h)	5.08 $\pm$ 8.05	3.20 $\pm$ 2.32	6.25 $\pm$ 10.33
C <sub>max</sub> (mg/dL)	2.29 $\pm$ 3.4	2.43 $\pm$ 1.62	3.00 $\pm$ 4.20
T <sub>max</sub> (h)	3.57 $\pm$ 3.26	4.86 $\pm$ 2.34	4.00 $\pm$ 3.83

Differences between groups (n=6) were analysed for by one way ANOVA, but no significant differences were observed

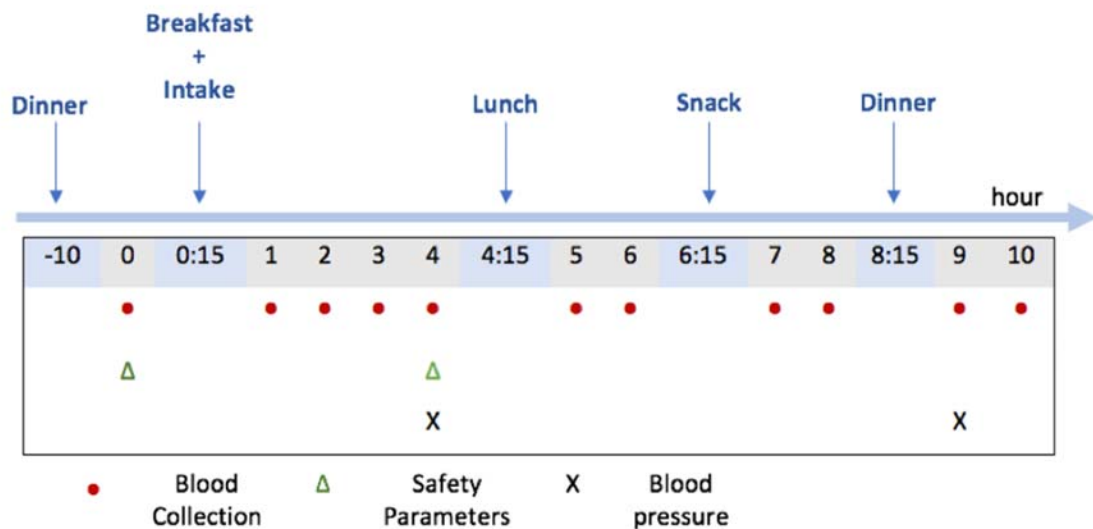


Figure S1: Scheme of the time points of meal intake, blood draws, and samples taken during each intervention day