

Effects of dietary fat structure on short term changes in blood lipids and insulin sensitivity

Submission date 26/02/2009	Recruitment status No longer recruiting	<input type="checkbox"/> Prospectively registered
		<input type="checkbox"/> Protocol
Registration date 13/03/2009	Overall study status Completed	<input type="checkbox"/> Statistical analysis plan
		<input checked="" type="checkbox"/> Results
Last Edited 07/02/2012	Condition category Circulatory System	<input type="checkbox"/> Individual participant data

Plain English summary of protocol
Not provided at time of registration

Contact information

Type(s)
Scientific

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Additional identifiers

Protocol serial number
N/A

Study information

Scientific Title
The acute effects of triacylglycerol structure of palmitic acid rich fats on postprandial changes in lipid and glucose metabolism: a randomised cross-over trial

Acronym

IPART

Study objectives

Changing the triacylglycerol structure of palm oil by interesterification, to produce a fat with a high proportion of palmitic acid in the sn-2 position, will alter postprandial lipid and glucose metabolism. Postprandial responses to plant (interesterified palm oil) and animal (lard) fats with a high proportion of palmitic acid in the sn-2 position will be similar.

Ethics approval required

Old ethics approval format

Ethics approval(s)

West Kent Research Ethics Committee gave approval on the 14th January 2009 (ref: 08/H1101/122)

Study design

Randomised cross-over design trial

Primary study design

Interventional

Study type(s)

Treatment

Health condition(s) or problem(s) studied

Diet and cardiovascular disease

Interventions

In a single test meal consisting of a muffin and a milkshake, three test fats (50 g) are compared versus a control fat (high oleic sunflower oil; 50 g). These are; native palm olein , chemically interesterified palm olein and lard.

1. Palm olein represents a palmitic acid-rich fat with palmitic acid almost exclusively (~90%) in the sn-1 and -3 positions
2. Chemically interesterified palm olein represents a palmitic acid-rich fat with a high proportion of palmitic acid in the sn-2 position (~33%)
3. Lard represents an animal fat with a high proportion of palmitic acid in the sn-2 position (~58%)
4. High oleic sunflower oil will be used as a reference oil for the control test meal

Contact details for joint Principal Investigator:

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Intervention Type

Other

Phase

Not Applicable

Primary outcome(s)

Postprandial changes in plasma glucose (measured at: 0, 15, 30, 60, 90, 120, 150, 180, 240, 300, 360, 420 and 480 minutes) and plasma triacylglycerol concentrations (measured at 0, 60, 120, 180, 240, 300, 360, 420 and 480 minutes). Both will be measured using enzymatic assays.

Key secondary outcome(s)

1. Apolipoprotein B48 concentrations, measured at 0, 180, 240, 300 and 480 minutes
2. The positional distribution of chylomicron lipids in the sn-2 position, measured at 180, 240 and 300 minutes
3. Non-esterified fatty acids, measured at 0, 60, 120, 180, 240, 300, 360, 420 and 480 minutes
4. Plasma fatty acids, measured at 0, 60, 120, 180, 240, 300, 360, 420 and 480 minutes
5. Total cholesterol, measured at 0, 60, 120, 180, 240, 300, 360, 420 and 480 minutes
6. Insulin, measured at 0, 15, 30, 60, 90, 120, 150, 180, 240, 300, 360, 420 and 480 minutes
7. C-peptide, measured at 0, 15, 30, 60, 90, 120, 150, 180, 240, 300, 360, 420 and 480 minutes
8. Gut hormones (including the incretin, glucose-dependent insulinotropic polypeptide, peptide YY and cholecystokinin), measured at 0, 15, 30, 60, 90, 120, 150, 180, 240, 300, 360, 420 and 480 minutes
9. Cytokines (interleukin-6, tumour necrosis factor alpha, E-selectin), measured at 0, 180, 240, 300 and 480 minutes
10. Factor VII activated concentrations, measured at 0, 180 and 360 minutes

Completion date

01/10/2009

Eligibility**Key inclusion criteria**

Healthy males and females, aged 18 - 45 years.

Participant type(s)

Patient

Healthy volunteers allowed

No

Age group

Adult

Lower age limit

18 years

Sex

All

Key exclusion criteria

1. A reported history of heart disease, diabetes, cancer, kidney, liver or bowel disease (healthy volunteers are required)

2. Current cigarette smoker
3. History of substance abuse or alcoholism (previous weekly alcohol intake greater than 60 units /men or 50 units/women)
4. Current self-reported weekly alcohol intake exceeding 28 units
5. Unwilling to follow the protocol and/or give informed consent
6. Weight change of greater than 3 kg in preceding 2 months
7. Body mass index (BMI) less than 20 and greater than 35 kg/m²
8. Blood pressure greater than 160/90 mmHg
9. Fasting blood cholesterol greater than 7.8 mmol/l, fasting plasma triacylglycerol concentrations greater than 3 mmol/l, or fasting plasma glucose greater than 7 mmol/L
10. Presence of gastrointestinal disorder or use of a drug, which is likely to alter gastrointestinal motility or nutrient absorption
11. Greater than or equal to 20% 10-year risk of cardiovascular disease (CVD) as calculated using the risk calculator
12. Vegetarian dietary practices
13. Pregnant women

Date of first enrolment

20/02/2009

Date of final enrolment

01/10/2009

Locations

Countries of recruitment

United Kingdom

England

Netherlands

Study participating centre

Nutritional Sciences Division

London

United Kingdom

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Sponsor information

Organisation

King's College London (UK)

ROR

<https://ror.org/0220mzb33>

Funder(s)

Funder type

Government

Funder Name

Malaysian Palm Oil Board (MPOB) (Malaysia)

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary

Not provided at time of registration

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	01/12/2011		Yes	No
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes