The effect of arabinose on sucrose-induced glycemic response and glycemic kinetics as measured by a dual stable isotope methodology

No registrations found.

Ethical review	Positive opinion
Status	Recruitment stopped
Health condition type	-
Study type	Interventional

Summary

ID

NL-OMON24860

Source
NTR

Health condition

Glucose metabolism, glycemic control.

Sponsors and support

Primary sponsor: Maastricht University
Source(s) of monetary or material Support: Sensus B.V.

Intervention

Outcome measures

Primary outcome

Total rate of glucose appearance (RaT)

Exogenous rate of glucose appearance (RaE)

Total rate of glucose disappearance (RdT)

Exogenous rate of glucose disappearance (RdE)

Plasma glucose concentration

Plasma insulin concentration

Secondary outcome

Plasma FFA and glycerol concentrations

Whole-body carbohydrate and fat oxidation rates

Study description

Background summary

A good glycemic control is essential for cardiometabolic health. Hyperglycemia and glycemic variability have been indirectly or causally related to obesity, T2DM and cardiovascular disease. A delay in and/or inhibition of carbohydrate digestion may assist in avoiding hyperglycemia and may therefore be useful in the prevention of chronic metabolic diseases. The monosaccharide L-arabinose may act as a sucrose substitute in many foods and may have beneficial effects due to its uncompetitive inhibition of sucrase activity, which then inhibits sucrose digestion.

A dual stable isotope methodology will be used to compare the glycemic and insulinemic responses as well as the glycemic kinetics of a sucrose plus arabinose load vs. a sucrose only load in healthy, young subjects. Secondary objectives include plasma FFA and glycerol concentrations, and whole-body carbohydrate and fat oxidation rates. The study will be performed in a double-blinded, randomized crossover manner.

Participants will arrive at the university after an overnight fast for two tests. There will be a washout period of at least two weeks between the tests. All 13 participants will receive both interventions in a randomized order. The drinks will be consumed in a fasted state.

Recruitment will take place in The Netherlands.

Study objective

The addition of arabinose to a sucrose load leads to a decreased or delayed entry of glucose, derived from the ingested sucrose, into the circulation and a decreased glycemic response and insulinemic response when compared to sucrose only.

Study design

Every subject will visit the university three times. A screening including an OGTT will take place during the first visit, and the two tests will take place during the final two visits.

Plasma collection: 3 times before drink, and at 15, 30, 60, 90, 120, 150, 180, 210 and 240 minutes after drink.

Exhaled breath collection for 13C and indirect calorimetry measurement: at -60, 0, 30, 60, 90, 120, 150, 180, 210 and 240 minutes relative to drink.

Intervention

Two test days in random order: 1) Drink containing sucrose; 2) Drink containing sucrose + L-arabinose

Both drinks will contain a sucrose-(13C-glucose) tracer. There will be a continuous infusion of 2H-glucose during both tests.

Contacts

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Eligibility criteria

Inclusion criteria

- Male/Female

- Aged 18 – 35 y inclusive

- BMI 18.5 – 25.0 kg/m2 inclusive

- Healthy

- Recreationally active (participating in recreational sports activities ≤ 3 times per week)

Exclusion criteria

- Smoking

- Food allergies

- Diagnosed diabetes (type 1 or type 2); fasting glucose ≥7.0 mmol/l and/or glucose ≥11.1 mmol/l after 2 h OGTT

- Diagnosed metabolic or gastrointestinal disorders

- Previous participation in a 13C-glucose or 2H-glucose tracer study within the last two weeks

- Unstable weight over the last three months

- Blood donation in the past two months

- Use of medication

- High alcohol consumption (>2 drinks per day; >7 drinks per week)

Study design

Design

Study type:	Interventional
Intervention model:	Crossover
Allocation:	Randomized controlled trial
Masking:	Double blinded (masking used)
Control:	Placebo

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	01-10-2018
Enrollment:	13
Type:	Actual

IPD sharing statement

Plan to share IPD: No

Ethics review

Positive opinion

Date:	01-10-2018
Application type:	First submission

Study registrations

Followed up by the following (possibly more current) registration

ID: 45763
Bron: ToetsingOnline
Titel:

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
NTR-new	NL7302
NTR-old	NTR7518
CCMO	NL65825.068.18
OMON	NL-OMON45763

Study results