Edible insects as a source of iron

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Edible insects contain iron at similar concentrations as meat and is mostly organically bound. It is currently not known to what extent iron from edible insects is absorbed in humans.

Ethische beoordeling	Positief advies
Status	Werving gestart
Type aandoening	-
Onderzoekstype	Interventie onderzoek

Samenvatting

ID

NL-OMON21631

Bron
NTR

Verkorte titel
INSECTAIR

Aandoening

Iron deficiency
Anemia
Bioavailability
Edible insects
Fractional iron absorption

Ondersteuning

Primaire sponsor: Wageningen University & Research
Overige ondersteuning: Wellcome Trust - UK

Onderzoeksproduct en/of interventie

Uitkomstmaten

Primaire uitkomstmaten

Fractional iron absorption

Toelichting onderzoek

Achtergrond van het onderzoek

Rationale: Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources. The fact that insects are a common food source for 2 billion people already provides excellent proof of its acceptability, especially in lower and middle income countries. In this project, we will carry out experiments to investigate the potential of insects as a source of iron when consumed as a common East African meal.

Objective: The primary objective is to assess the relative bioavailability of iron from insect (house cricket – Acheta domesticus) added to either a high- or low-phytate meal in humans and its potential to provide bioavailable iron. The secondary objectives are: To determine whether addition of edible house crickets enhances or inhibits the absorption of native or fortification iron from non-inhibitory or inhibitory meals

Study design: Single blind randomized partial Williams cross-over design

Study population: Twenty four (24) female volunteers, 18 - 30 years old with marginal iron status (ferritin <25 ng/ml) from the human volunteer database kept at the Division of Human Nutrition.

Intervention: Freeze dried and grinded house crickets labelled with 57Fe will be added to refined (non-inhibitory) maize porridge or to non-refined (inhibitory) maize porridge. Compared to two additional study test-meals which will contain 54Fe added to either non-refined/ refined maize porridge (inhibitory/ non-inhibitory food matrix respectively), the test meals will enable us to assess the relative bioavailability of iron from an house cricket-enriched low-phytate meal (non-inhibitory) or high-phytate (inhibitory) food matrix. The last two test meals will contain half the amount of freeze dried and grinded non-labelled house crickets labelled with 58FeSO4 added to either refined (non-inhibitory) or non-refined (inhibitory) maize porridge. These meals will enable us to answer the question whether edible house crickets enhance/inhibit absorption of native or fortificant iron in inhibitory and/or non-inhibitory meals.

Main study parameters/endpoints: The main study endpoint is the relative bioavailability (RBV) of iron from house crickets in a low phytate meal (non-inhibitory food matrix) compared to a high-phytate meal (inhibitory food matrix). As a secondary endpoint, we will investigate the RBV of native or fortification iron in non-inhibitory or inhibitory meals after addition of edible house crickets.

Doel van het onderzoek

Edible insects contain iron at similar concentrations as meat and is mostly organically bound. It is currently not known to what extent iron from edible insects is absorbed in humans.

Onderzoeksopzet

Fractional iron absorption will be determined at two time points for 3 experimental meals each.

Onderzoeksproduct en/of interventie

6 experimental meals consisting of maize meal porridge prepared from either refined or whole grain maize flour, enriched with intrinsically 57Fe-labelled crickets (freeze dried, grinded), with unlabelled crickets and 54Fe-labelled iron sulphate fortificant, or with 58Fe labelled iron sulphate fortificant.

Contactpersonen

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Deelname eisen

Belangrijkste voorwaarden om deel te mogen nemen (Inclusiecriteria)

- Female

- Age range: 18-30 years

- Body weight <65 kg

- Marginal iron status (serum ferritin <25 ng/ml/56.2 pmol/l)

Belangrijkste redenen om niet deel te kunnen nemen (Exclusiecriteria)

- Pregnancy or breastfeeding

- Hematologic diseases, e.g. hemochromatosis

- Severe anaemia (<80 g/L/ 4.96 mmol/L)

- Elevated CRP (>8.0 mg/L)

- Any self-reported metabolic, gastrointestinal, kidney or chronic diseases such as diabetes, renal failure, hepatic dysfunction, hepatitis, hypertension, cancer, or cardiovascular diseases.

- Continuous or long-term use of medication (except for contraceptives)

- Use of multivitamin/mineral supplements from 2 weeks prior to study until the end

- Blood transfusion, blood donation or severe blood loss (injury, surgery) over the past 6 months

- Having a history of medical or surgical events that may significantly affect the study outcome

- Inability to follow the study procedures, e.g. due to language, psychologic disorders or dementia

- Allergies to crustaceans or mites

- Medically prescribed diet

- Fear of blood draws

- Participation in other biomedical studies

Onderzoeksopzet

Opzet

Type:	Interventie onderzoek
Onderzoeksmodel:	Cross-over
Toewijzing:	Gerandomiseerd
Blindering:	Enkelblind
Controle:	N.v.t. / onbekend

Deelname

Nederland

Status:	Werving gestart
(Verwachte) startdatum:	22-01-2018
Aantal proefpersonen:	24
Type:	Verwachte startdatum

Ethische beoordeling

Positief advies

Datum:	25-01-2018
Soort:	Eerste indiening

Registraties

Opgevolgd door onderstaande (mogelijk meer actuele) registratie

ID: 46965
Bron: ToetsingOnline
Titel:

Andere (mogelijk minder actuele) registraties in dit register

Geen registraties gevonden.

In overige registers

Register	ID
NTR-new	NL6821
NTR-old	NTR7007
CCMO	NL59400.081.16
OMON	NL-OMON46965

Resultaten