# Het effect van probiotica op vitamine K status

Gepubliceerd: 27-09-2018 Laatst bijgewerkt: 13-12-2022

We hypothesize that probiotics with vitamin K2 producing properties can improve vitamin K status.

| | |
|---|---|
| **Ethische beoordeling** | Niet van toepassing |
| **Status** | Werving nog niet gestart |
| **Type aandoening** | - |
| **Onderzoekstype** | Interventie onderzoek |

## Samenvatting

### ID

NL-OMON21670

**Bron**
NTR

**Verkorte titel**
ProVitaK

**Aandoening**

vitamin K status, MGP, cardiovascular risk

### Ondersteuning

**Primaire sponsor:** VU medical center Amsterdam
**Overige ondersteuning:** Winclove B.V.

### Onderzoeksproduct en/of interventie

### Uitkomstmaten

**Primaire uitkomstmaten**

vitamin K status as measured by dephosphorylated <br>uncarboxylated matrix gla protein concentrations

# Toelichting onderzoek

### Achtergrond van het onderzoek

Rationale: Vitamin K is mainly known for its function in blood coagulation, but recently other functions in bone metabolism and vascular health have become apparent. Vitamin K is a fat-soluble vitamin present in green vegetables in the form of vitamin K1 (phylloquinone) and as vitamin K2 (menaquinones) in animal products (meat, cheese). Vitamin K2 is the most active form of vitamin K and the substantial part of vitamin K2 is derived from gut bacteria biosynthesis. Besides the production in the gut, vitamin K2 is also present in fermented dairy (cheese, yoghurt) and fermented soy beans (natto). Vitamin K is a cofactor involved in the carboxylation (activation) of several proteins, such as matrix Gla-protein (MGP) and reduces the inactive form of MGP, dephosphorylated uncarboxylated matrix gla protein (dp-ucMGP), and could thereby inhibit ongoing calcium deposition in the vascular system and eventually arterial calcification. Recently, it has been discovered in-vitro that certain probiotics – normally used for other indications– can also produce vitamin K2.

Observational studies have shown that a high vitamin K2 intake is associated with reduced coronary calcification and a reduced risk of coronary heart disease. The available randomized controlled trials have mainly used vitamin K1 supplements and these studies indicated that vitamin K1 supplements improved the elastic properties of the vessel wall and inhibit progression of coronary artery calcium. To date, few randomized controlled trials showed that vitamin K2 supplementation reduced dp-ucMGP with approximately 40% within 3 months and among postmenopausal women, vitamin K2 supplementation improved arterial stiffness among women with high arterial stiffness at baseline. This study will explore whether probiotics are an effective vehicle to increase vitamin K status and might be an alternative to diet and supplements. This study will assess whether supplementation with probiotics that produce vitamin K2 can improve vitamin K status as measured by inactive MGP in middle-aged adults with high risk of metabolic disturbances.

Objectives: To investigate the effect of a daily sachet of probiotics on vitamin K status for 12 weeks vs placebo.

Study design: Double-blind, placebo-controlled, randomized controlled pilot trial. Participants will be randomized into two equal groups, one group receives probiotics with bacteria that can produce up to 180 µg vitamin K2 daily and the other group receives placebo sachets daily for 12 weeks. The dose is based on a previous study that showed a 31% decrease of dp-ucMGP after 12 weeks of supplementation with 180 microgram MK-7 daily. The duration of the present study is 12 weeks, which will be long enough to achieve similar reductions in dp-ucMGP levels. Dp-ucMGP can be influenced after 2-4 weeks of supplementation, however, the effects of probiotics with vitamin K producing properties are currently unknown.

Study population: 20 participants will be recruited, aged 50-70 years, that participated in previous studies such as the DIRECT Study, New Hoorn Study and/or via an advertisement in the local newspaper in the vicinity of Hoorn.

Main study parameters/endpoints: The main study parameter is the difference in vitamin K status as assessed by plasma dp-ucMGP between the 2 groups after 12 weeks.

The participants are requested to use a daily sachet dissolved in lukewarm water with vanilla taste.

**Doel van het onderzoek**

We hypothesize that probiotics with vitamin K2 producing properties can improve vitamin K status.

**Onderzoeksopzet**

screening, baseline, 6 weeks, 12 weeks

**Onderzoeksproduct en/of interventie**

A daily sachet of 4 gram dried multispecies probiotics or placebo

# Contactpersonen

## Publiek

## Wetenschappelijk

# Deelname eisen

## Belangrijkste voorwaarden om deel te mogen nemen (Inclusiecriteria)

• Participants of previous studies who provided written consent to be contacted to participate in future studies

• High cardiovascular risk without type 2 diabetes – at least 1 of the following risk factors:

o systolic blood pressure > 140mm Hg, diastolic blood pressure > 90 mmHg or use of blood pressure lowering medication and/or

o impaired glucose tolerance – 2 hour glucose levels of 7.8 to 11.0 mmol/L after 75 gram oral glucose tolerance test

o Family history of cardiovascular disease < 65 years

o Total cholesterol > 6.5 mmol/l or use of statins

o Smokers ≥ 50 years

o Estimated glomerular filtration rate < 60 ml/min

• No gastrointestinal tract problems/stool problems

• Written informed consent

## Belangrijkste redenen om niet deel te kunnen nemen (Exclusiecriteria)

• Pregnancy, lactation or a female planning to conceive within the study period

• Any significant medical reason for exclusion as determined by the investigator

• Unable to give written informed consent

• Unable to speak, read and/or write Dutch

• Diabetes of any type.

• Age <50 or ≥ 70 years

• Body mass index < 20 or > 39 kg/m2

• Using vitamin supplements that contain vitamin K, or unwilling to stop two weeks before randomization.

• Using probiotic supplements

• Natto or goose liver consumers

• Use of vitamin K antogonists such as warfarin, acenocoumarol or coumarin derivates

# Onderzoeksopzet

## Opzet

| | |
|---|---|
| Type: | Interventie onderzoek |
| Onderzoeksmodel: | Parallel |
| Toewijzing: | Gerandomiseerd |
| Blindering: | Dubbelblind |
| Controle: | Placebo |

## Deelname

Nederland

| | |
|---|---|
| Status: | Werving nog niet gestart |
| (Verwachte) startdatum: | 01-01-2019 |
| Aantal proefpersonen: | 20 |
| Type: | Verwachte startdatum |

# Ethische beoordeling

Niet van toepassing

| | |
|---|---|
| Soort: | Niet van toepassing |

# Registraties

## Opgevolgd door onderstaande (mogelijk meer actuele) registratie

Geen registraties gevonden.

## Andere (mogelijk minder actuele) registraties in dit register

Geen registraties gevonden.

## In overige registers

| Register | ID |
|---|---|
| NTR-new | NL7296 |
| NTR-old | NTR7505 |
| Ander register | Winclove B.V. : 2004788 |

# Resultaten