

Immunititeit

Optimale nutritionele ondersteuning

Dr. Apr. Geert Vergote

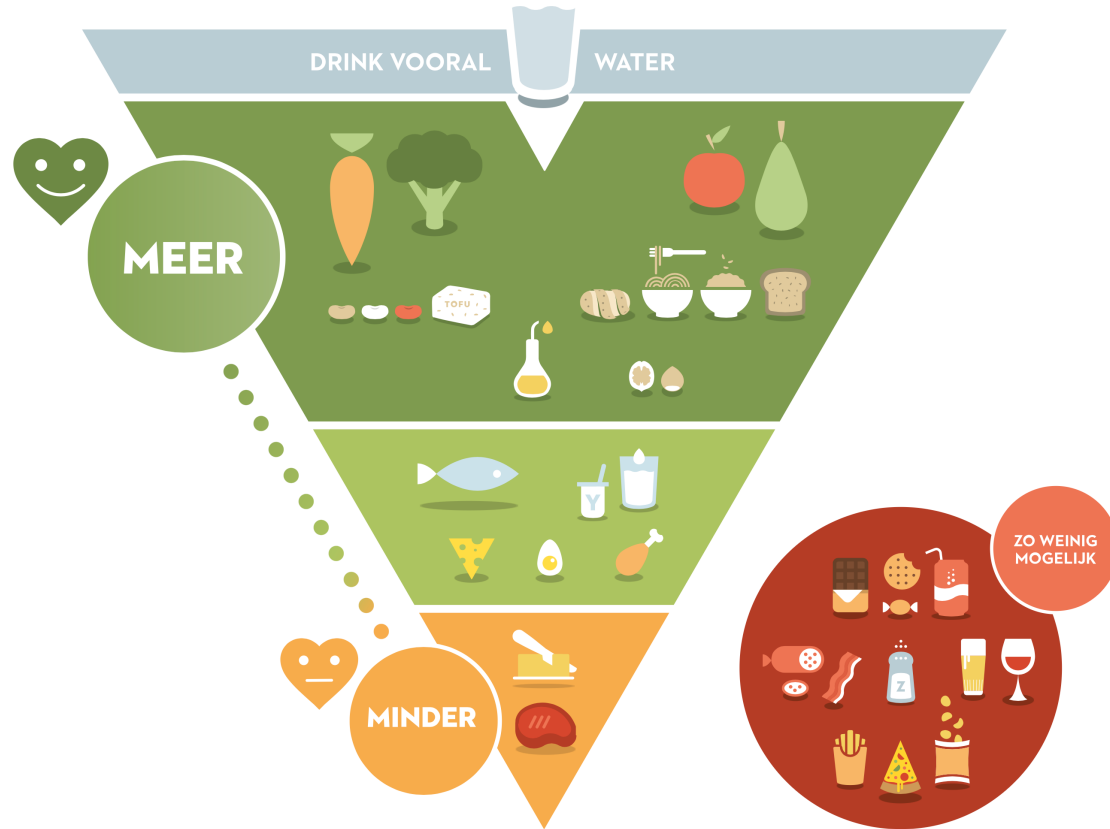
Directeur Verno Scientific bvba

Gastprofessor associatie KU Leuven

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Basisinterventies



Basisinterventies



Nutritionele interventies



Review

A Review of Micronutrients and the Immune System–Working in Harmony to Reduce the Risk of Infection

Adrian F. Gombart ¹, Adeline Pierre ² and Silvia Maggini ^{2,*}

¹ Linus Pauling Institute, Department of Biochemistry and Biophysics, Oregon State University, 307 Linus Pauling Science Center, Corvallis, OR 97331, USA; adrian.gombart@oregonstate.edu

² Bayer Consumer Care AG, 4002 Basel, Switzerland; adeline.pierre@bayer.com

* Correspondence: silvia.maggini@bayer.com; Tel.: +41-582-727-516

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Nutritionele interventies



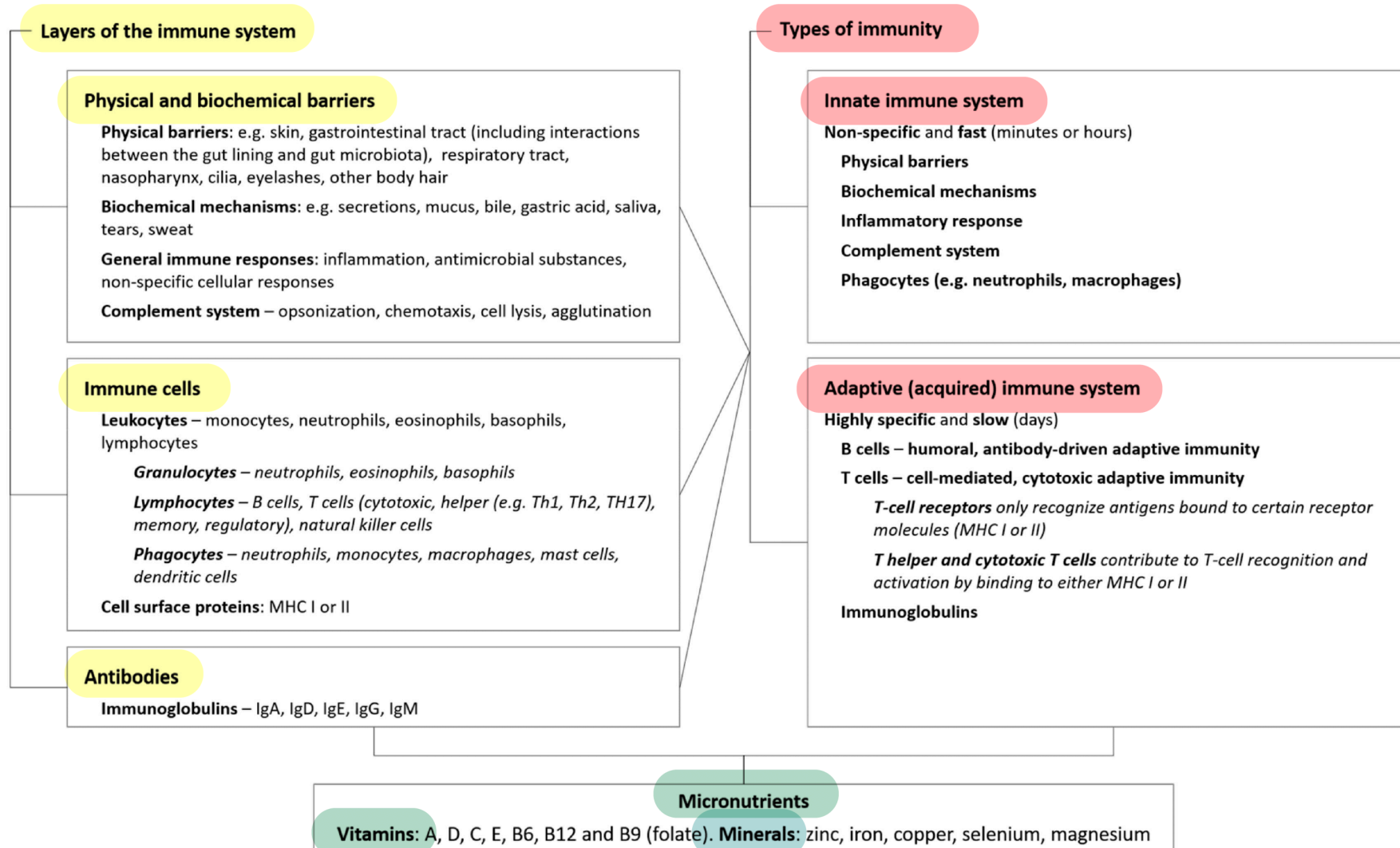
ak Medisch Coördinatie: michele.langendries@roularta.be

Cijfers uit de gegevensbank van AZ Delta wijzen erop dat de vitamine D-status beter is in de leeftijdsgroep tot 18 jaar dan in de oudere leeftijdsgroepen.

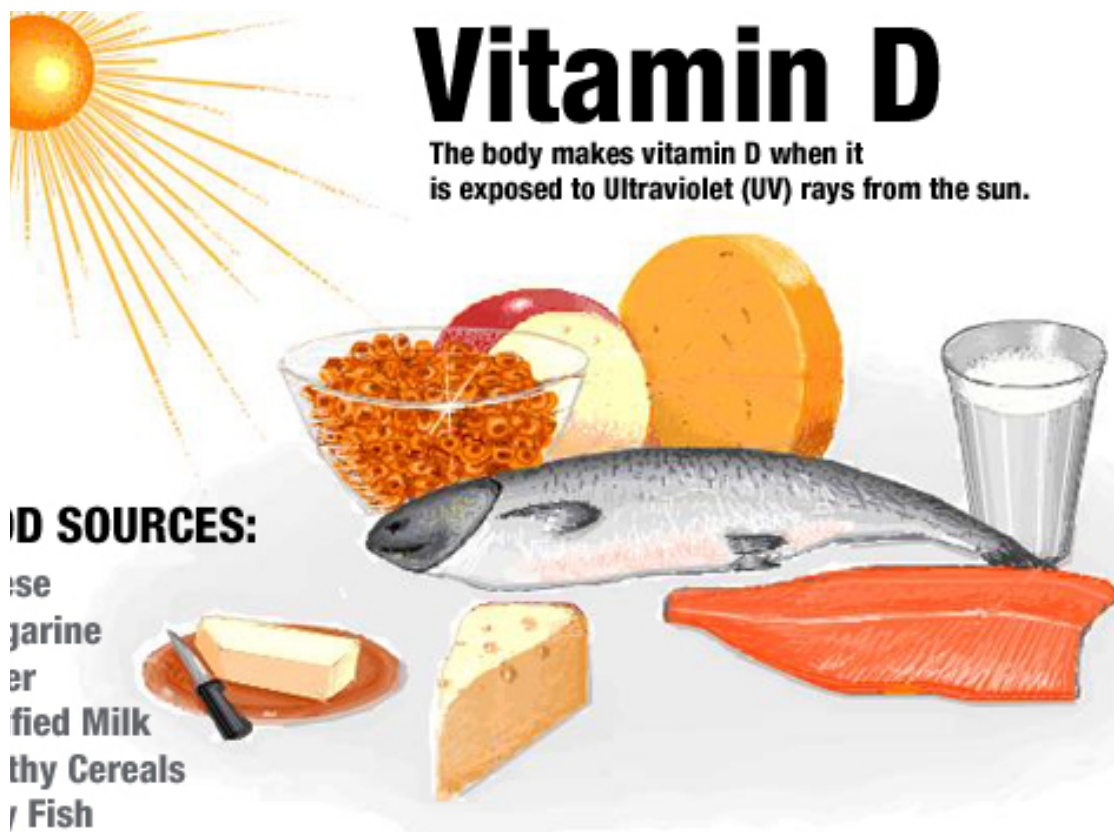
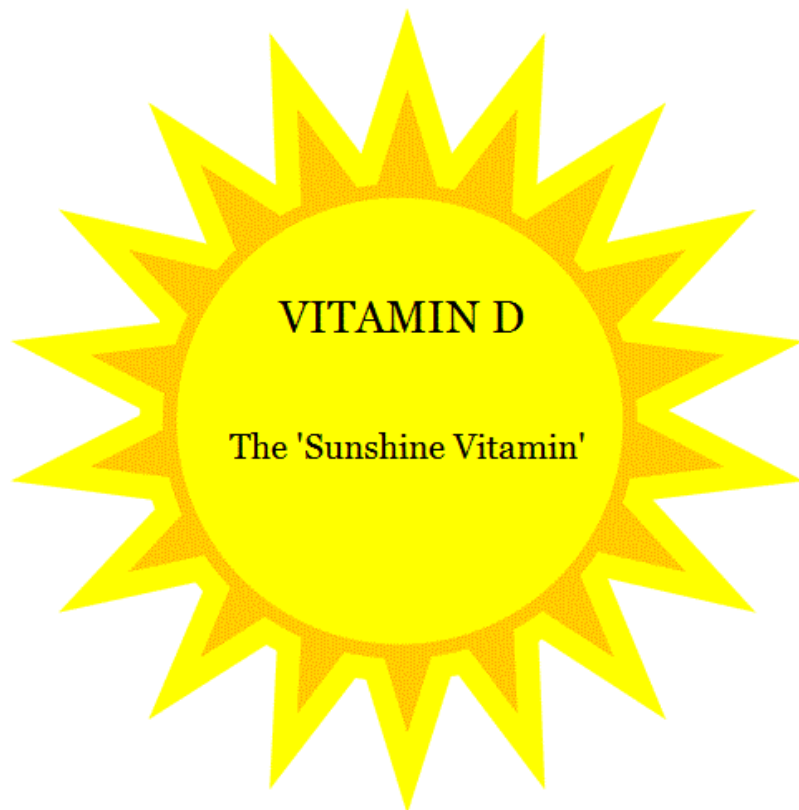
Laag vitamine D gecorreleerd met ernstige covid-19

CORONAVIRUS "We zien momenteel een convergentie van twee pandemieën", zeggen prof. Geert Martens en dr. Dieter De Smet (dienst Laboratoriumgeneeskunde, AZ Delta, Roeselare). "We waren ons al bewust van de bijzonder hoge prevalentie van vitamine D-tekort wereldwijd en ook in België. Nu komt daar covid-19 bij." Het team in AZ Delta vond een sterke correlatie tussen vitamine D-tekort en het risico op covid-19. Hoe ernstiger het vitamine D-tekort, hoe hoger de kans op gevorderde stadia van de longaantasting.

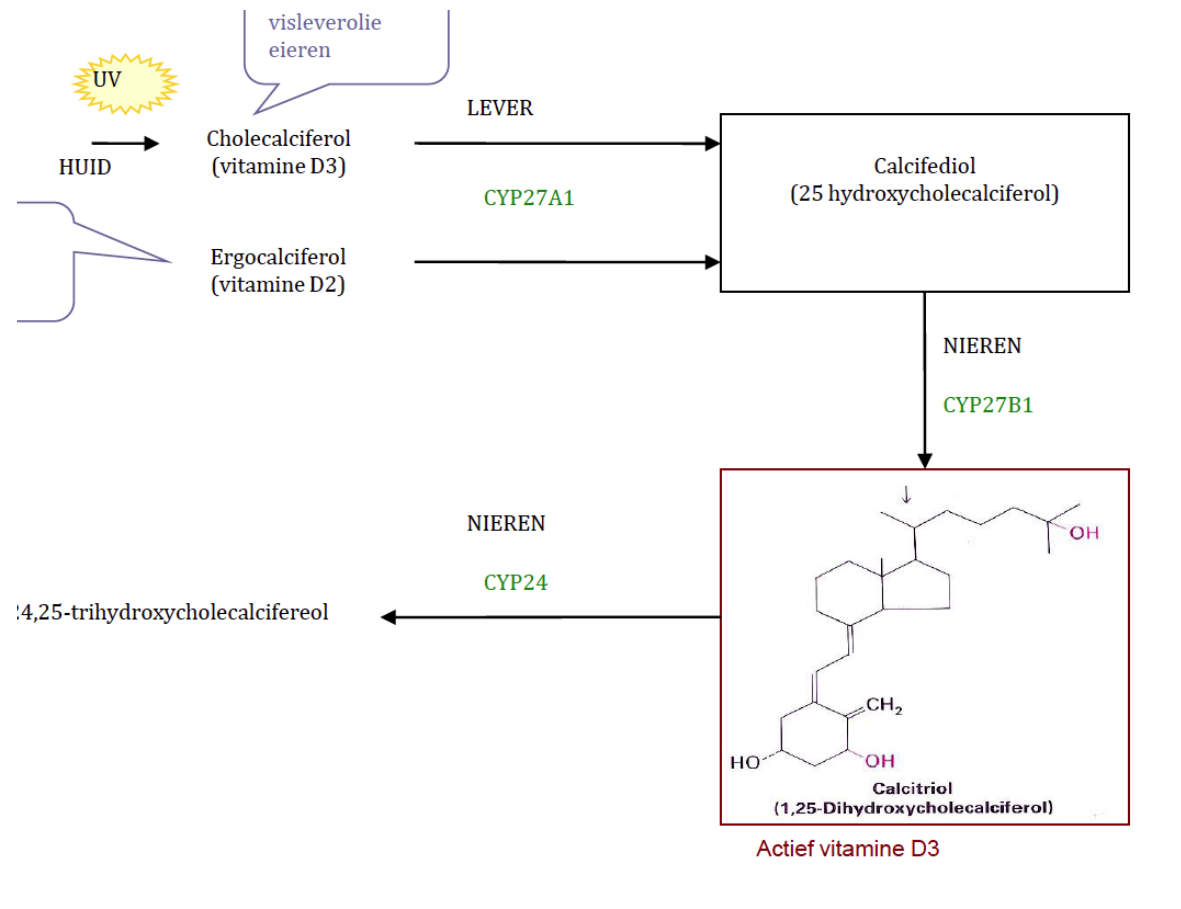
Nutritionele interventies



Nutritionele interventies / Vitamine D



Nutritionele interventies / Vitamine D



Nutritionele interventies / Vitamine D

Leeftijd	Geslacht	Vitamine D3, µg/dag
0-6 maand	M/V	10
7-12 maand	M/V	10
1-3 jaar	M/V	10
4-6 jaar	M/V	10
7-10 jaar	M/V	10
11-14 jaar	M/V	10-15
15-18 jaar	M/V	10-15
Volwassenen (19-70 jaar)	M/V	10-15
70-plussers	M/V	20
Zwangerschap	V	20
Borstvoeding	V	20

1 µg vitamine D3 komt overeen met 40 Internationale eenheden.

Voedingsaanbevelingen voor België. Partim I: vitaminen en sporenelementen. Juni 2015. HGR nr. 9164 & 9174.

Nutritionele interventies / Vitamine D

SCIENTIFIC OPINION

Scientific Opinion on the Tolerable Upper Intake Level of vitamin D¹

EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA)^{2, 3}

European Food Safety Authority (EFSA), Parma, Italy

ABSTRACT

Following a request from the European Commission, the Panel on Dietetic Products, Nutrition and Allergies was asked to re-evaluate the safety in use of vitamin D and to provide, if necessary, revised Tolerable Upper Intake Levels (ULs) of vitamin D for all relevant population groups. The ULs for adults including pregnant and lactating women, children and adolescents were revised. For adults, hypercalcaemia was selected as the indicator of toxicity. In two studies in men, intakes between 234 and 275 µg/day were not associated with hypercalcaemia, and a no observed adverse effect level (NOAEL) of 250 µg/day was established. **Taking into account uncertainties associated with these studies, the UL for adults including pregnant and lactating women was set at 100 µg/day.** Despite a continuing paucity of data for high vitamin D intakes in children and adolescents, the UL was adapted to 100 µg/day for ages 11-17 years, considering that owing to phases of rapid bone formation and growth this age group is unlikely to have a lower tolerance for vitamin D compared to adults. **The same applies also to children aged 1-10 years, but taking into account their smaller body size, a UL of 50 µg/day is proposed.** For infants, the UL of 25 µg/day based on previously available data relating high vitamin D intakes to impaired growth and hypercalcaemia was retained as limited additional evidence has emerged since the previous risk assessment. Data on vitamin D intakes from surveys in 14 European countries indicate that intakes in high consumers are below the revised ULs for vitamin D for all population groups. © European Food Safety Authority, 2012

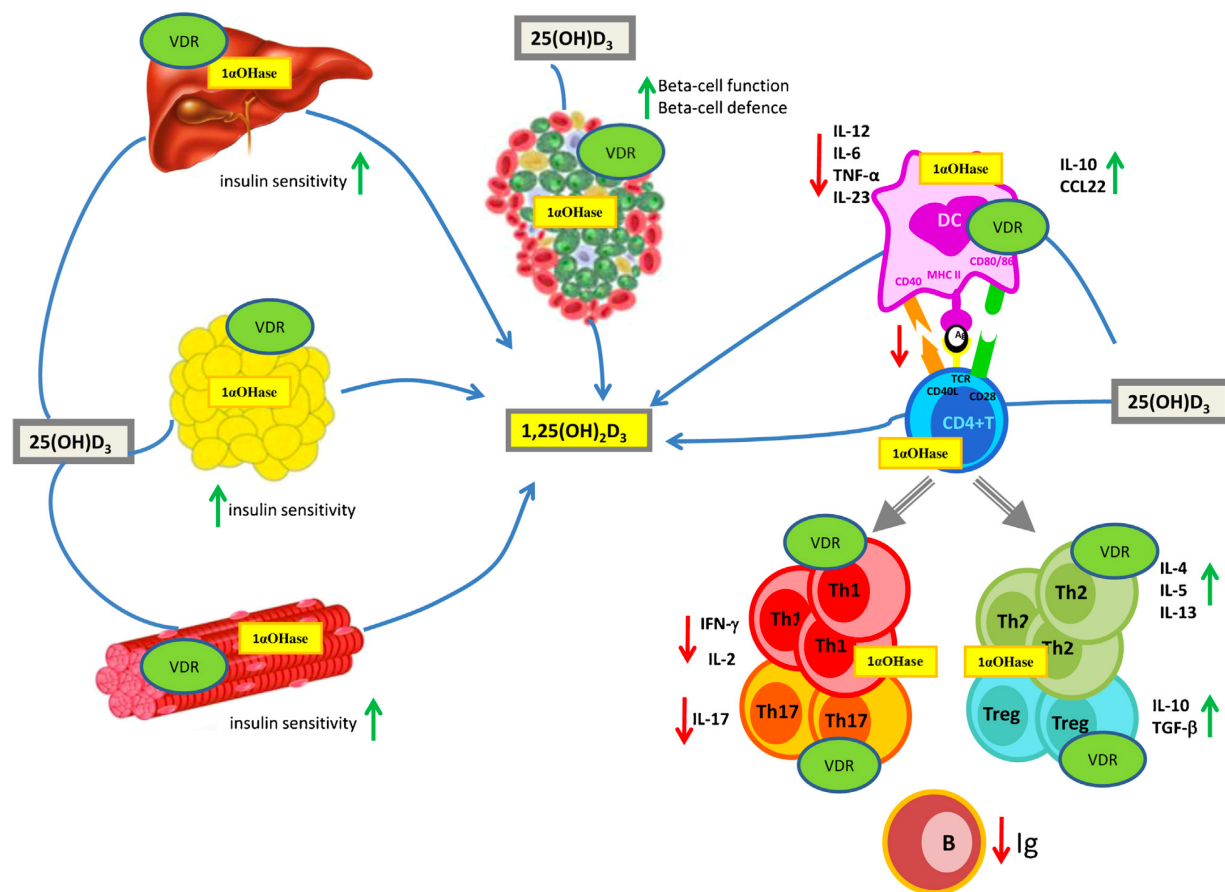
Voedingssupplementen:

- Vanaf 11 j en voor volwassenen:
 - max 75 mcg (3 000 IE)/dag
- Jonger dan 11 jaar:
 - max 25 mcg (1 000 IE)/dag

Geneesmiddelen:

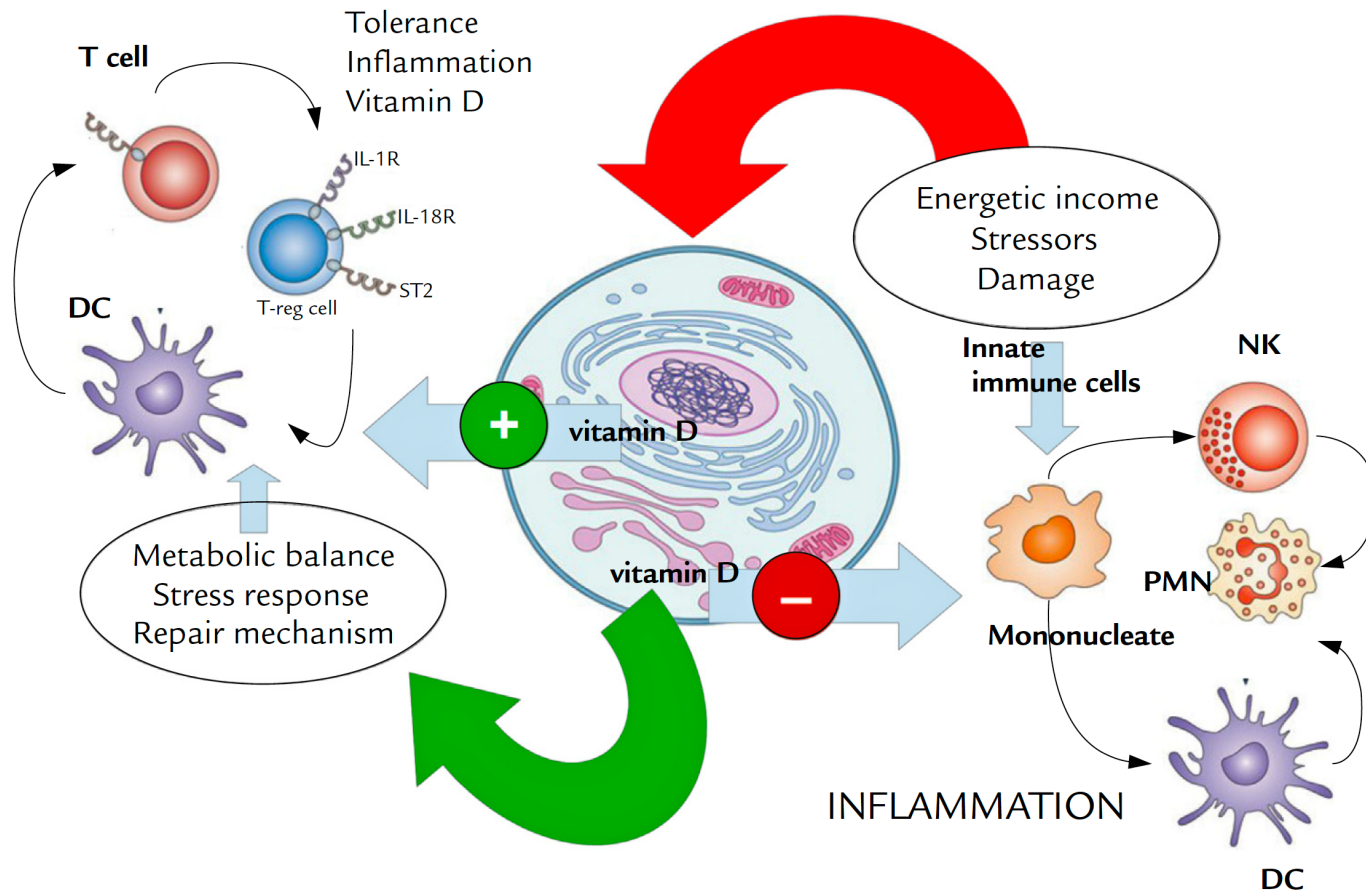
- Meer dan 75 mcg per dag toegelaten

Nutritionele interventies / Vitamine D



Mathieu C. Vitamin D and diabetes: Where do we stand? *Diabetes Res Clin Pract.* 2015 May;108(2):201-9.

Nutritionele interventies / Vitamine D



Chirumbolo S, Bjørklund G, Sboarina A, Vella A. The Role of Vitamin D in the Immune System as a Pro-survival Molecule. Clin Ther. 2017 May;39(5):894-916.

Nutritionele interventies / Vitamine D

Osteoporos Int (2008) 19:663–671
DOI 10.1007/s00198-007-0465-2

ORIGINAL ARTICLE

Efficacy of different doses and time intervals of oral vitamin D supplementation with or without calcium in elderly nursing home residents

V. Chel · H. A. H. Wijnhoven · J. H. Smit ·
M. Ooms · P. Lips

Received: 12 June 2007 / Accepted: 21 August 2007 / Published online: 14 September 2007
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Abstract

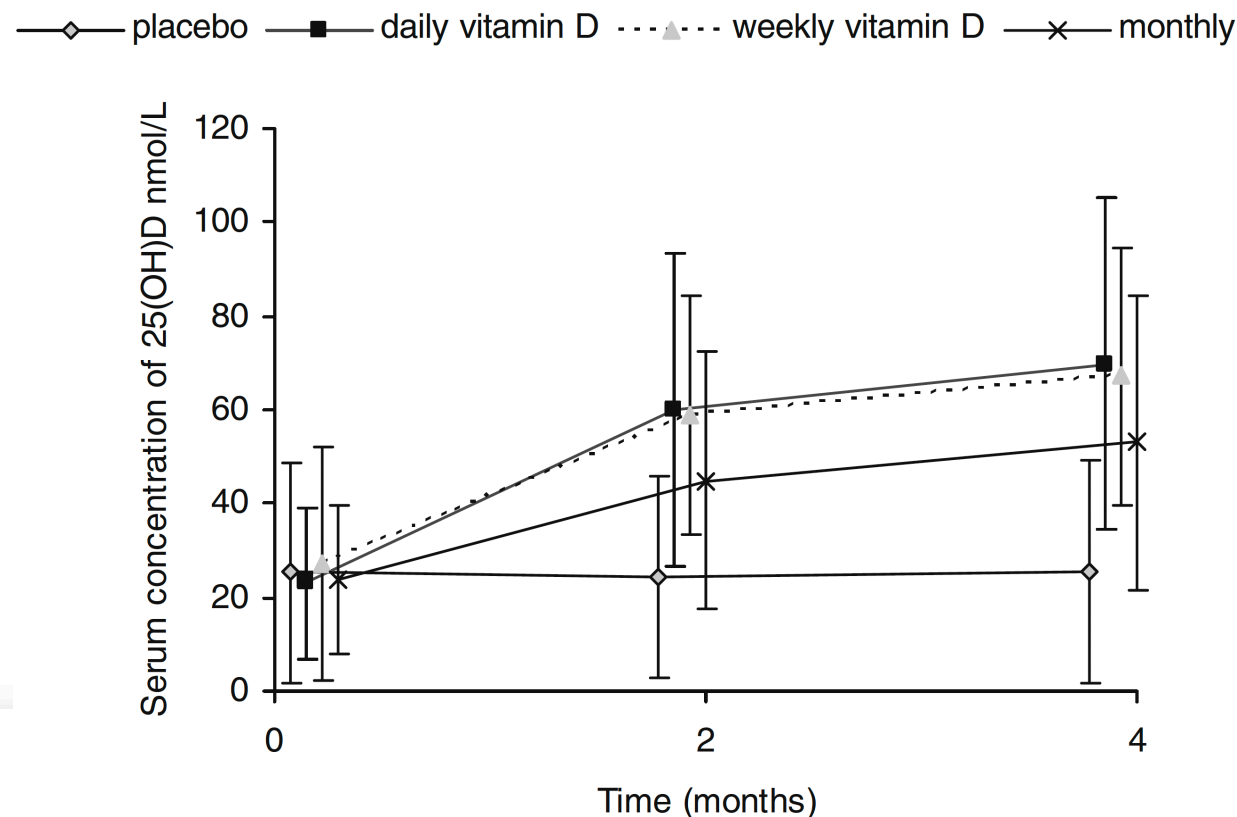
Summary The effect of equivalent oral doses of vitamin D3 600 IU/day, 4200 IU/week and 18,000 IU/month on vitamin D status was compared in a randomized clinical trial in nursing home residents. A daily dose was more effective than a weekly dose, and a monthly dose was the least effective.

Introduction It is assumed that equivalent daily, weekly or monthly doses of vitamin D3 equally influence vitamin D status. This was investigated in a randomized clinical trial in nursing home residents.

4 months, mean serum 25(OH)D levels increased to 62.5 nmol/L (after daily vitamin D3 69.9 nmol/L, weekly 67.2 nmol/L and monthly 53.1 nmol/L, $P < 0.001$ between groups). Median serum PTH levels decreased by 23% ($p < 0.001$). Bone turnover markers did not decrease. Calcium supplementation had no effect on serum PTH and bone turnover.

Conclusion Daily vitamin D was more effective than weekly, and monthly administration was the least effective.

Schermafbeelding



Nutritionele interventies / Vitamine D

- **Toedieningsvorm**

- Olie-achtige matrix

- **Populatie**

- Herfst en winter: iedereen

- **Posologie**

- 1. Zonder bloedanalyse**

- 20-25 mcg (800-1000 IE)/d

- 2. Bewezen tekort (op basis van bloedanalyse)**

- /R : dagelijkse of wekelijkse toediening



Nutritionele interventies / Magnesium



- Co-factor enzymen
- Immuniteit
 - Aangeboren
 - Proliferatie, differentiatie cellen
 - Verworven
 - Productie antilichamen

Nutritionele interventies / Magnesium

- **Zoutvorm**

- Bij voorkeur organisch
- Biologische beschikbaarheid
- Nevenwerkingsprofiel

- **Indicatie**

Verminderde immuniteit

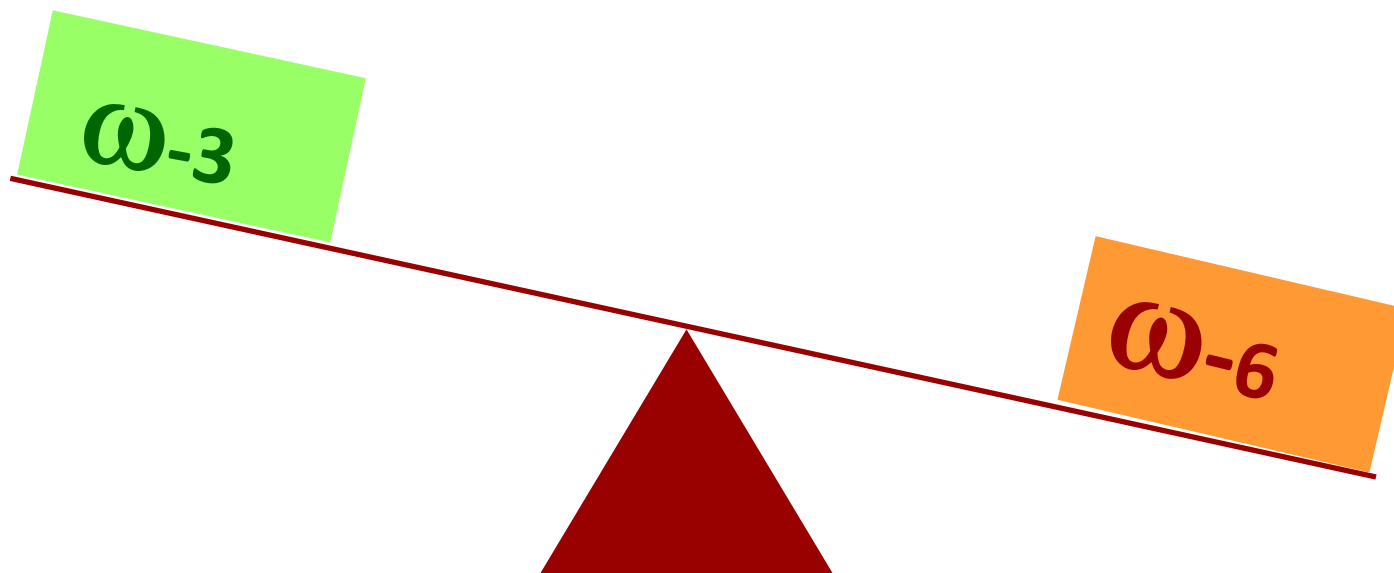
- Stress
- Foute voedingsgewoontes
- ...



Nutritionele interventies / Omega-3

Gezond: Omega-6/Omega-3 : 1/1 tot 5/1

Typisch westers dieet: 15/1 tot 16.7/1



Nutritionele interventies / Omega-3

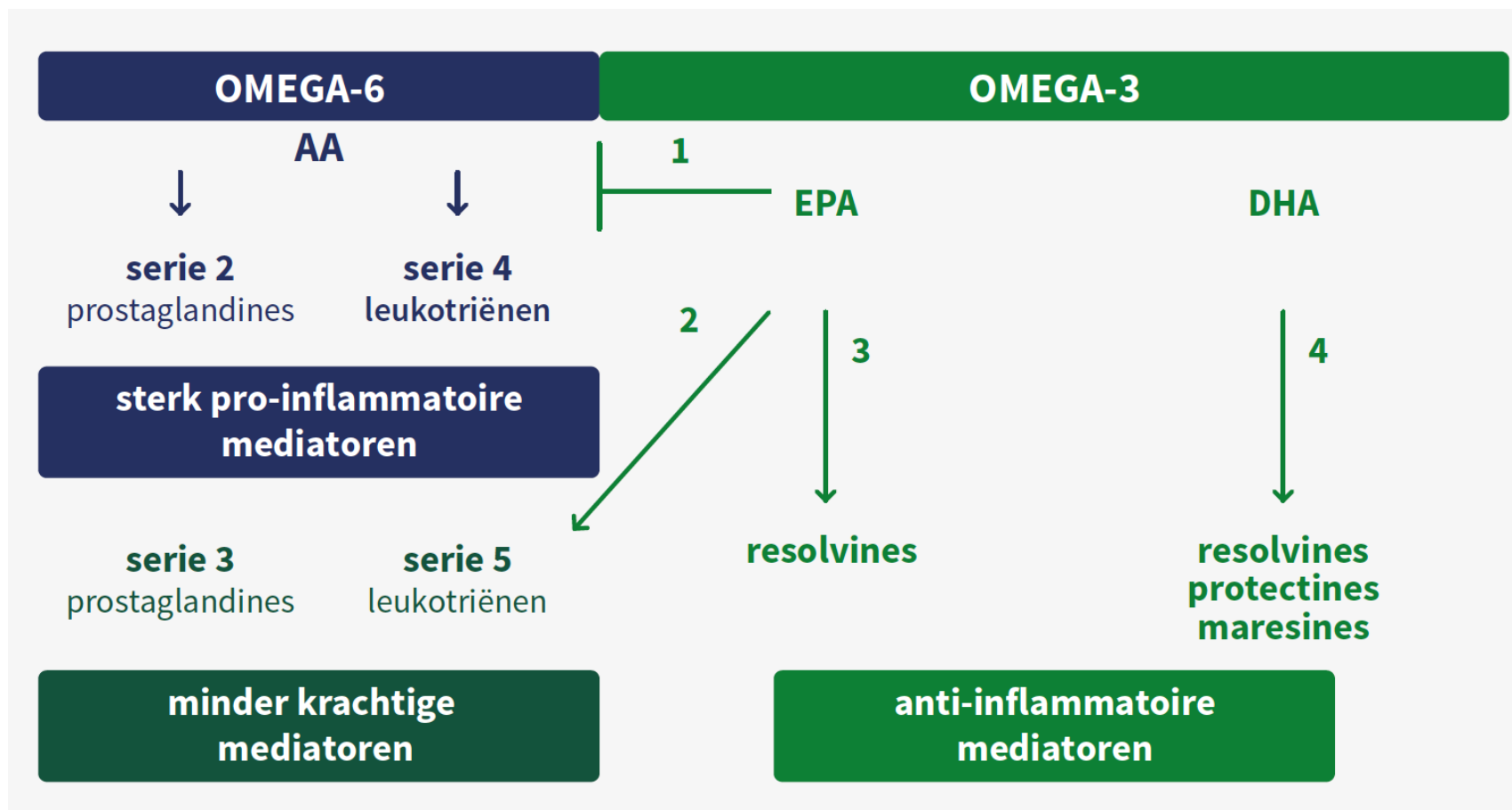
Omega-6		enzym	Omega-3	
Linolzuur (LA)	18:2		Alfa-linoleenzuur (ALA)	18:3
↓		Delta 6 desaturase	↓	
Gamma-linoleenzuur (GLA)	18:3		Stearidonzuur	18:4
↓		Elongase	↓	
Dihomogamma- linoleenzuur (DGLA)	20:3		Eicosatetraeenzuur	20:4
↓		Delta 5 desaturase	↓	
Arachidonzuur (AA)	20:4		Eicosapentaeenzuur (EPA)	20:5
↓		Elongase	↓	
Adreenzuur	22:4		Docosapentaeenzuur (DPA)	22:5
↓		Elongase	↓	
Tetracosatetraeenzuur	24:4		Tetracosapentaeenzuur	24:5
↓		Delta 6 desaturase	↓	
Tetracosapentaeenzuur	24:5		Tetrahexaeenzuur	24:6
↓		Bèta oxidatie	↓	
Docosapentaeenzuur (DPA)	22:5		Docosahexaeenzuur (DHA)	22:6

Het eerste cijfer duidt telkens op het aantal koolstofatomen (= de lengte van het vetzuur), het tweede cijfer op het aantal dubbele bindingen (= het onverzadigd karakter van het vetzuur).



Din JN, Newby DE, Flapan AD. BMJ 2004; 328(7430):30-5.

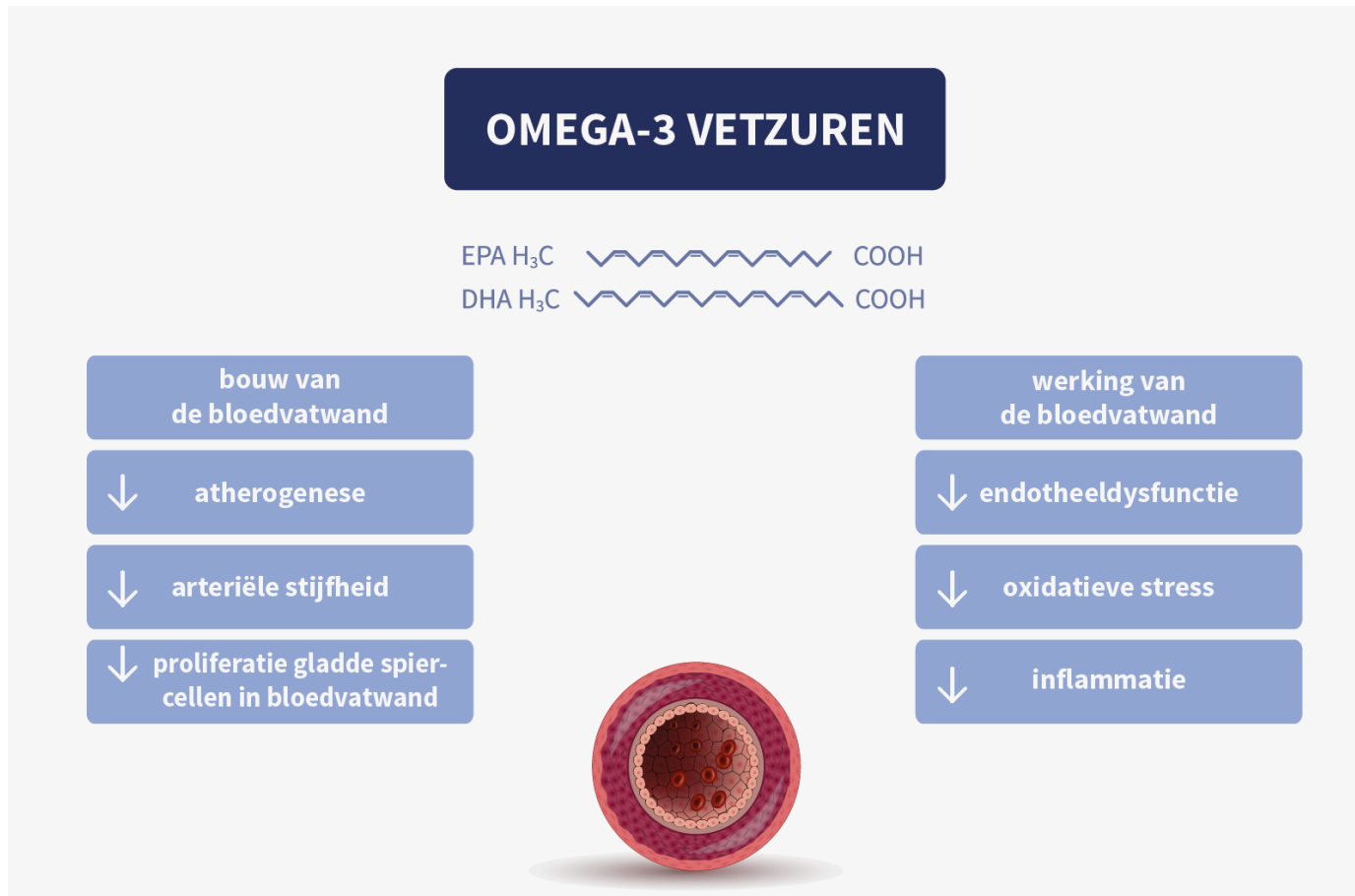
Nutritionele interventies / Omega-3



Endo J, Arita M. J Cardiol 2015 Sep 7.

Maehre HK et al. Int J Mol Sci 2015; 16(9):22636-61.

Nutritionele interventies / Omega-3



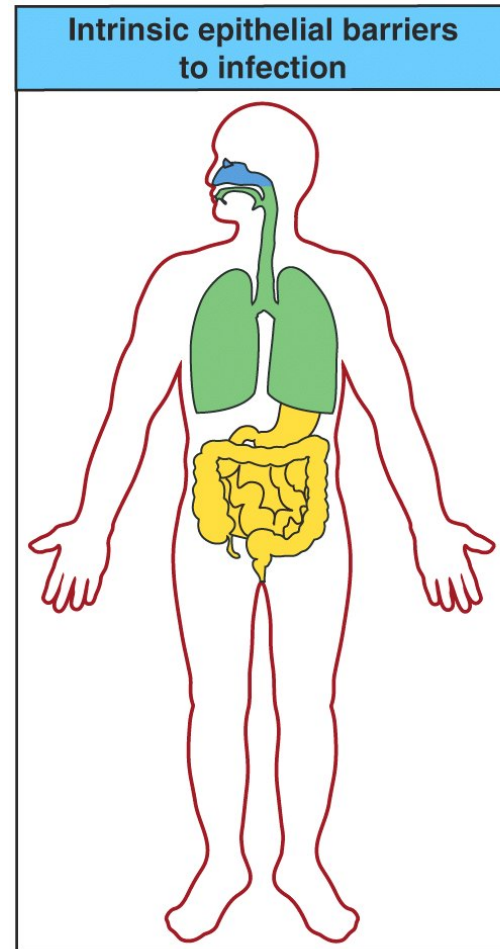
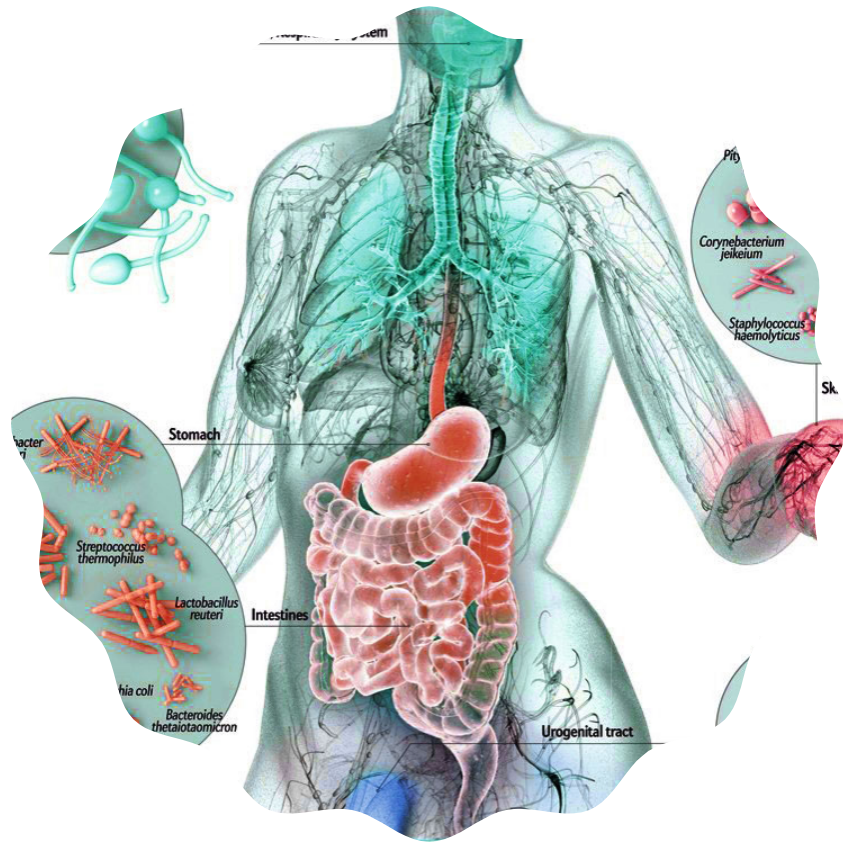
Zanetti M et al. Biomed Res Int 2015; 2015:791978.

Nutritionele interventies / Omega-3

- **Meer omega-3 vetzuren in het dieet**
 - Vette vis, nootjes, zaadjes, olie (koolzaad, algen)
- **Posologie**
 - 250-500 mg EPA+DHA per dag (advies HGR 2015)
 - Speciale aandacht: vegetariërs / veganisten
- **Farmacovigilantie**
 - Tot 5 g EPA + DHA (advies EFSA)
 - Analysecertificaat
 - oxidatie
 - contaminerende stoffen



Nutritionele interventies / Probiotica

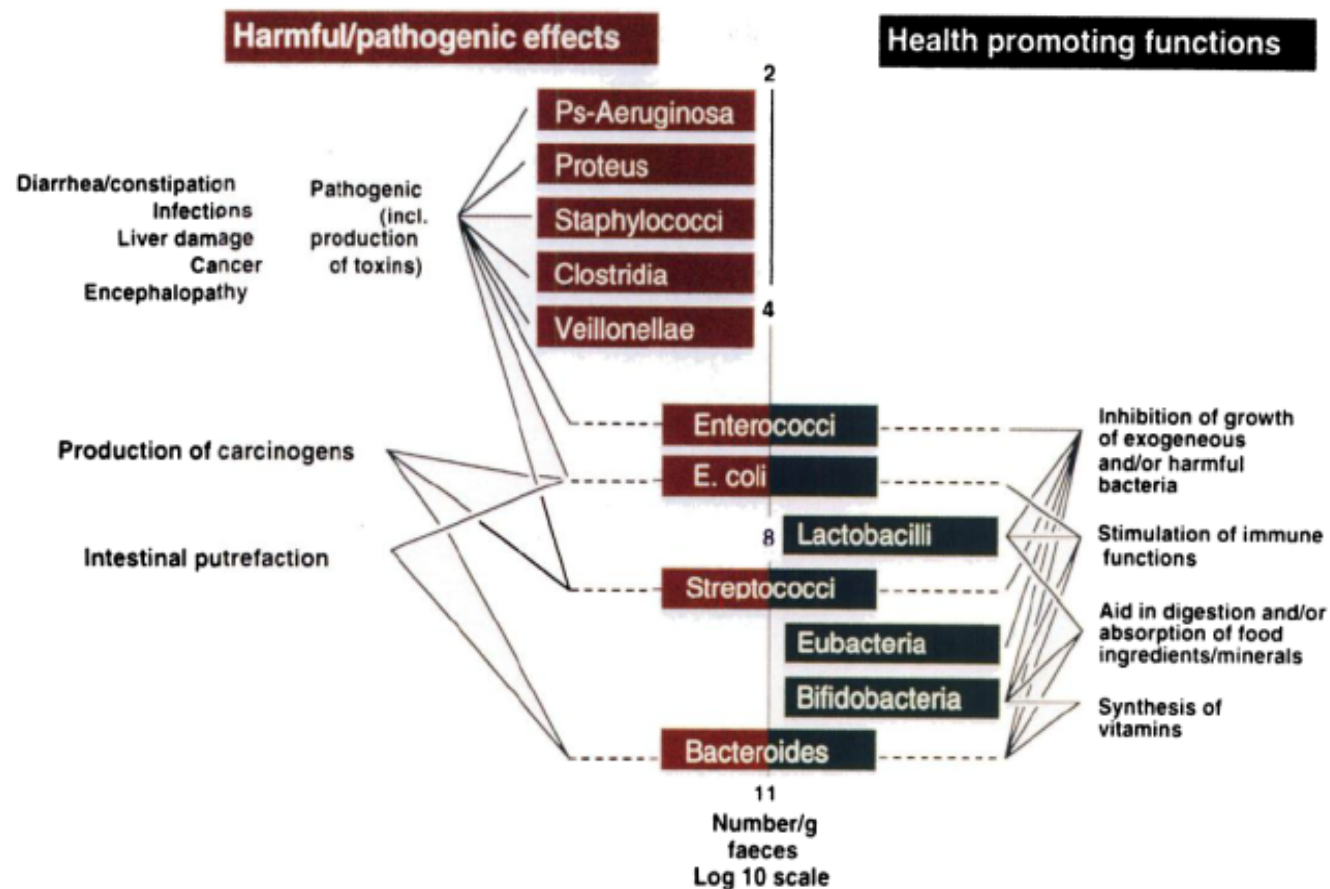
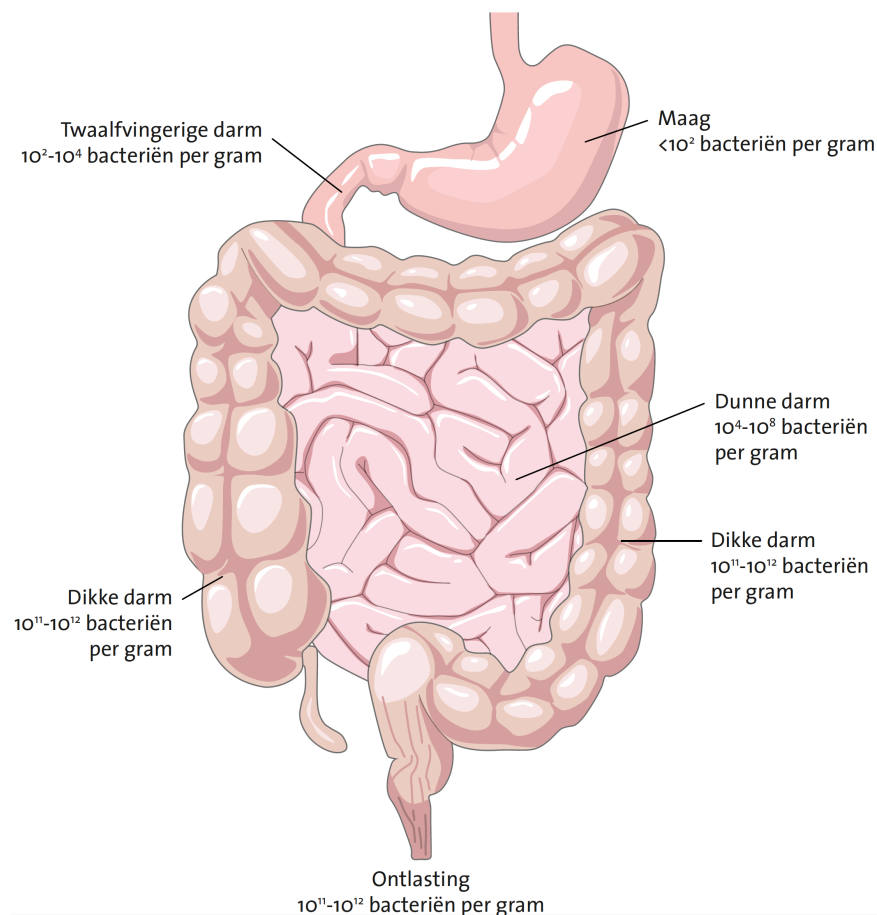


	Skin	Gut	Lungs	Eyes/nose
Mechanical	Epithelial cells joined by tight junctions			
	Longitudinal flow of air or fluid		Movement of mucus by cilia	
Chemical	Fatty acids	Low pH Enzymes (pepsin)		Salivary enzymes (lysozyme)
	Antibacterial peptides			
	Normal flora			
Microbiological				

www.nutritionreview.org

Immunobiology, 6/e. Garland Science. 2005

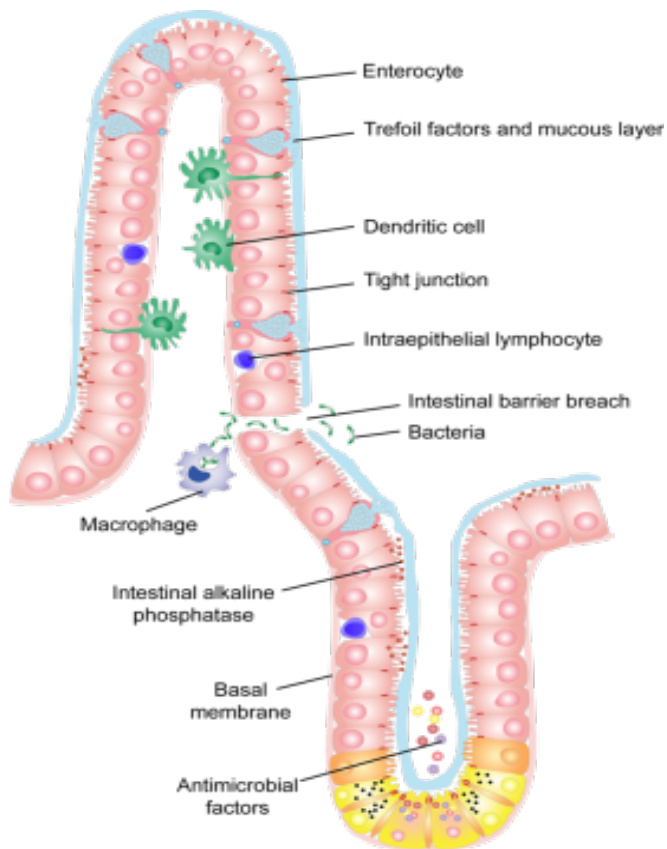
Nutritionele interventies / Probiotica



Kleerebezem. 2016. Biowetenschap en maatschappij.

Gibson J. utr. 1995 Jun;125(6):1401-12.

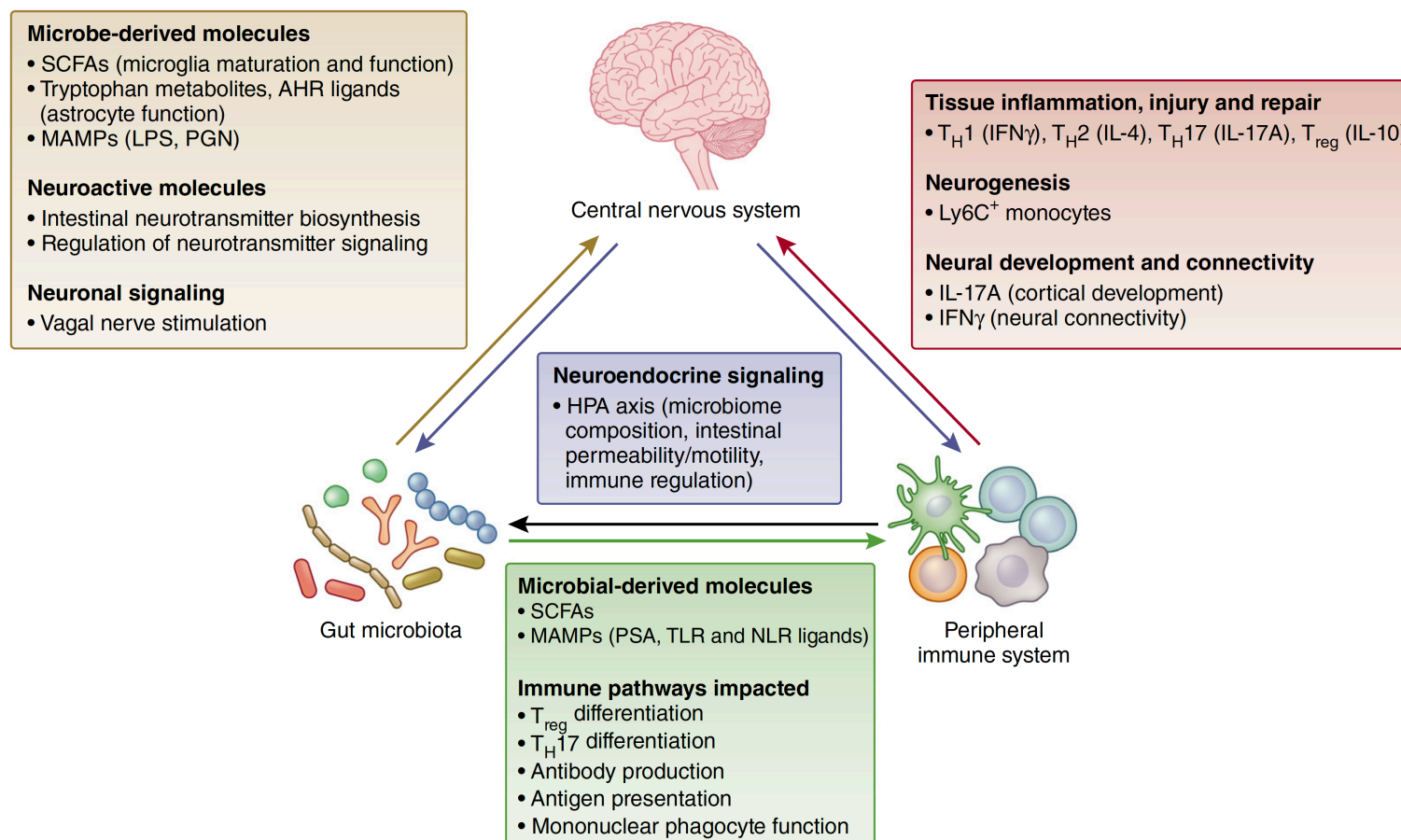
Nutritionele interventies / Probiotica



1. versterken "darmmuur"
2. verhinderen overwoekering pathogenen
3. productie korte keten vetzuren
4. synthese vit. (B-groep, vit. K)
5. interactie mucosaal immuunsysteem
6. afbraak xenobiotica

Aureli 2011

Nutritionele interventies / Probiotica



Fung. 2017. Nature neuroscience volume 20, number 2.

Nutritionele interventies / Probiotica

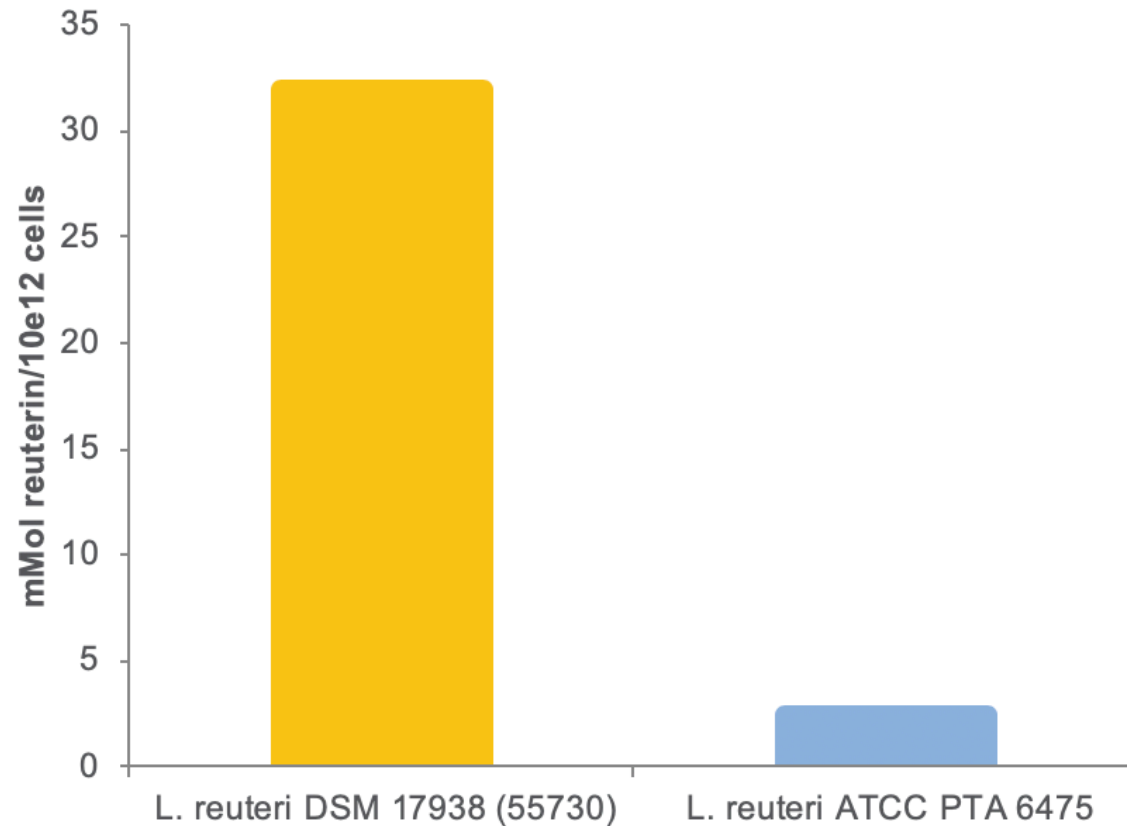


Nutritionele interventies / Probiotica

Micro-organismen met een *gezondheidsbevorderend* effect wanneer:

- de ***juiste stam*** wordt gebruikt
- een ***voldoende hoeveelheid*** wordt toegediend
- exact dezelfde samenstelling getest in ***placebogecontroleerde humane studies bij de geclaimde indicatie***

Nutritionele interventies / Probiotica



Jones SE and Versalovic J (2009)

Nutritionele interventies / Probiotica

APPLIED AND ENVIRONMENTAL MICROBIOLOGY, Feb. 2004, p. 1176–1181
0099-2240/04/\$08.00+0 DOI: 10.1128/AEM.70.2.1176–1181.2004
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Vol. 70, No. 2

Colonization and Immunomodulation by *Lactobacillus reuteri* ATCC 55730 in the Human Gastrointestinal Tract

Nana Valeur,¹ Peter Engel,² Noris Carbajal,³ Eamonn Connolly,^{3*} and Karin Ladefoged¹

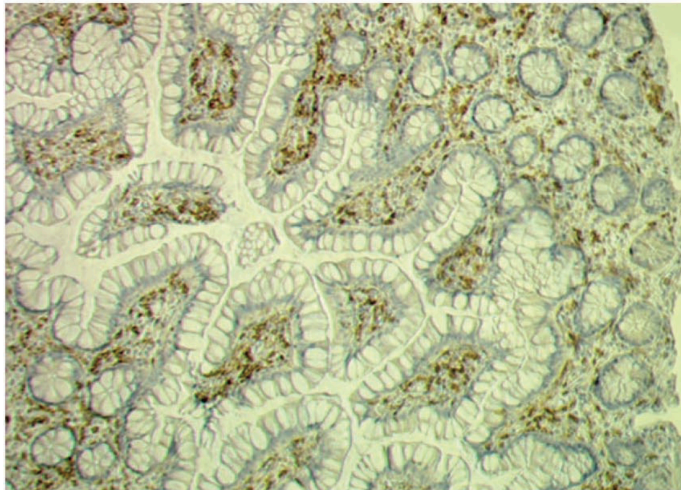
Department of Internal Medicine, Gastroenterology,¹ and Department of Pathology,² Roskilde County Hospital,
Køge, Roskilde, Denmark, and Research Laboratory, BioGaia Biologics Inc., Raleigh, North Carolina³

Received 16 April 2003/Accepted 28 October 2003

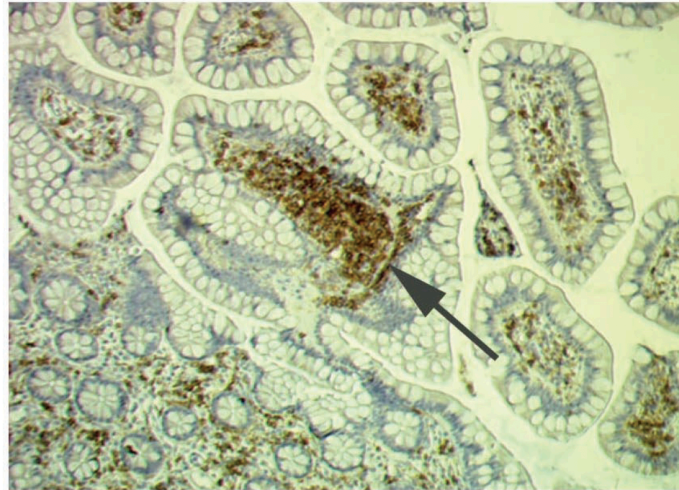
L. reuteri ATCC 55730 (DSM 17938)

- 4 x 10⁸ CFU
- 28 dagen
- CD4⁺ T-lymfocyten
- **Colonisatie**
- **Immuunsrespons GI-mucosa**
- **Remodulatie microbiom**

A

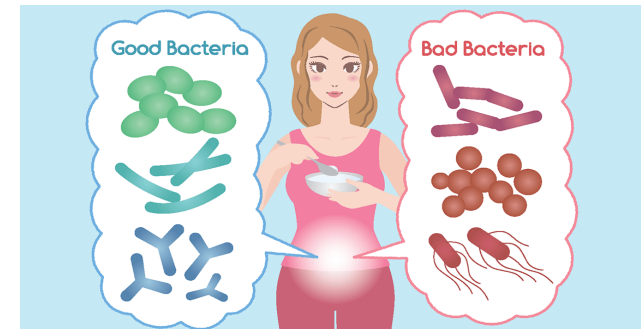


B



Nutritionele interventies / Probiotica

- Stam en dosis bepalen het effect
- **Kwaliteitscriteria**
 - Veiligheid (lange termijn)
 - Gebruikt in goed uitgevoerde klinische studies
 - Stabiël tot vervaldatum
 - Overleving in het spijsverteringsstelsel
- **Mono of multistamformules?**
 - Bewezen werkzaamheid in goed uitgevoerde studies véél belangrijker



Nutritionele interventies / β -1,3/1,6-glucanen



- **Pleurotus ostreatus**
 - Immuunmodulator
 - Geen overactivatie!
 - Geen risico op hypercytokinemie!
 - Gestandaardiseerde formules
 - Bèta 1,3/1,6 glucanen
 - 100-300 mg /dag

Nutritionele interventies / Conclusie

- Eet gekleurd en gevarieerd
- Beweeg in de buitenlucht
- Zorg voor een rustgevende slaap
- **Micronutritionele ondersteuning immuniteit**
 - Respecteer de aanbevolen doseringen
 - Vit. D, A, C, B6, B12, E en foliumzuur
 - Magnesium, koper, zink, selenium
 - IJzer (bloedanalyse!)
 - Gestandaardiseerde formules bèta 1,3/1,6 glucanen
 - Probiotica waarvan exact dezelfde samenstelling werd getest in klinische studies

