



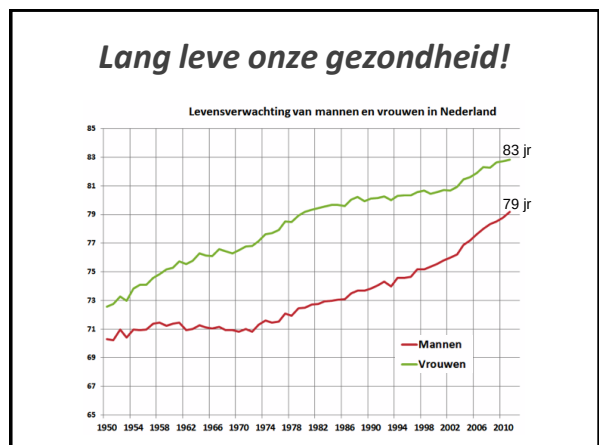
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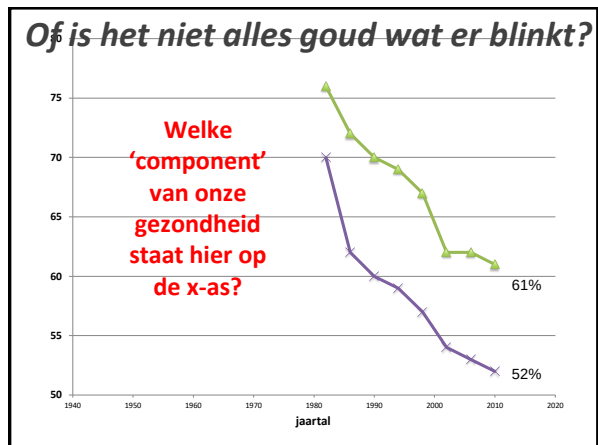
3

Disclosure belangen spreker	
(potentiële) belangenverstremgeling	Zie hieronder
Voor bijeenkomst mogelijk relevante relaties met bedrijven	<i>Speakers honoraria from:</i> ABN-Amro, Academy of Integrative Medicine, Bonusan, Care by Nature, Folia Orthica, Health Benefits 08, Hogeschool NHLStenden, Hormoonfactor, Hormooncommunity, ING, Nationale Nederlanden, Nutriphylt, Facebook, Natura Foundation, Otro Elements, Pro-Osteo, SCEM (Seinen Congres & Events Management), Stichting Education Atrium Innovations
Honorarium of andere (financiële) vergoeding	
- Sponsoring of onderzoeksgeld - Aandeelhouder	-Friesland-Campina - Eigenaar www.remkokuipers.com - Auteur: <i>Oerdieet</i> - Auteur: <i>Oergezond</i>
Andere relatie, namelijk ...	Supporter and practitioner of a healthy lifestyle

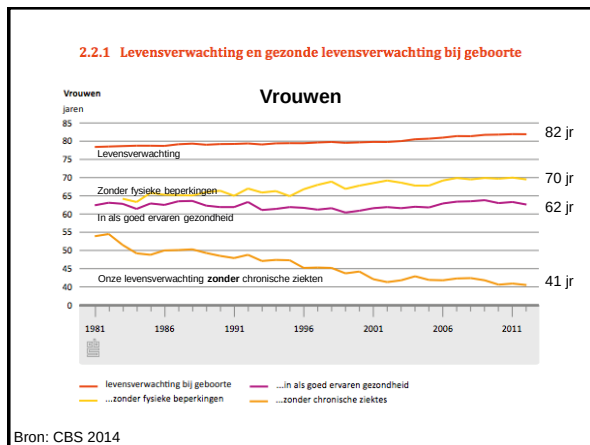
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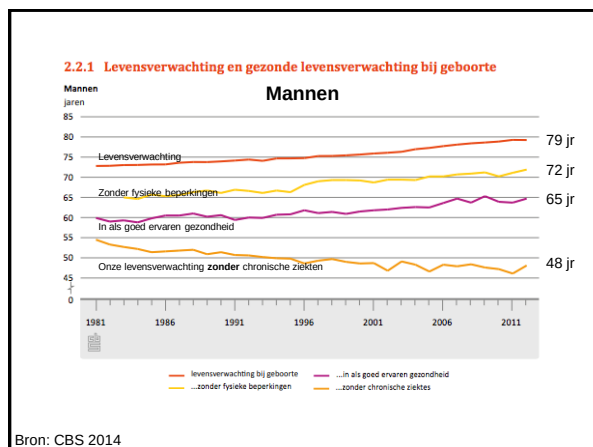
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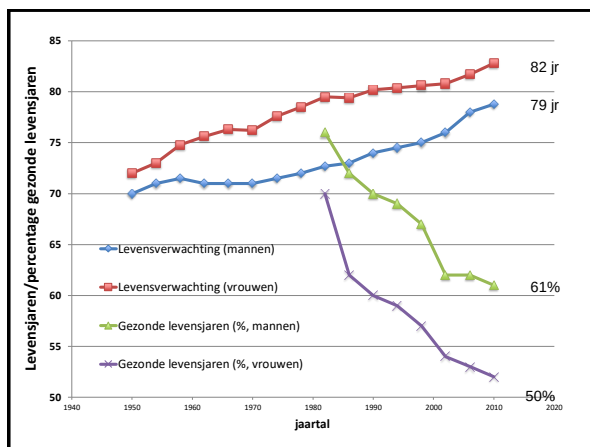
5



7



6



8

Take home message No. 1:

We worden **steeds ouder**
 maar ook
 steeds **jonger ziek**:
dubbel zo lang chronisch ziek



9

The problem starts... at ^(before?) birth

The epidemiological burden of obesity in childhood: a worldwide epidemic requiring urgent action

Table 3 Estimates of the proportion of obese children aged 3–4 years, by region

Region	Sex	1980	(% obese)	2015
Sub-Saharan Africa	Female	3.7 (1–4.4)		5.4 (4.6–6.5)
	Male	4.3 (3.4–5.5)		5.8 (4.7–7.1)
South Asia	Female	2.8 (1.5–4.9)		4.0 (2.6–7.1)
	Male	3.4 (1.3–4.2)		4.5 (2.9–8.1)
East and Southeast Asia and Oceania	Female	2.3 (1.4–3.8)		6.8 (4.2–10.8)
	Male	2.3 (1.4–3.7)		8.1 (4.8–12.5)
High-income countries	Female	6.0 (4.9–7.2)		8.9 (7.2–10.9)
	Male	6.1 (4.9–7.6)		10.0 (8.0–12.4)
Latin America and the Caribbean	Female	3.9 (2.7–5.7)		8.7 (6.0–12.4)
	Male	3.0 (1.2–8.0)		9.8 (6.4–14.1)
Middle East and North Africa	Female	4.3 (2.7–5.1)		9.2 (7.9–10.9)
	Male	3.5 (2.9–4.3)		8.8 (7.3–10.7)
Central and Eastern Europe and Central Asia	Female	9.0 (5.3–11.1)		9.3 (7.1–13)
	Male	11.5 (8.4–14.1)		12.6 (10.4–15.0)

Estimates were published by the Institute for Health Metrics and Evaluation (see Table 1)



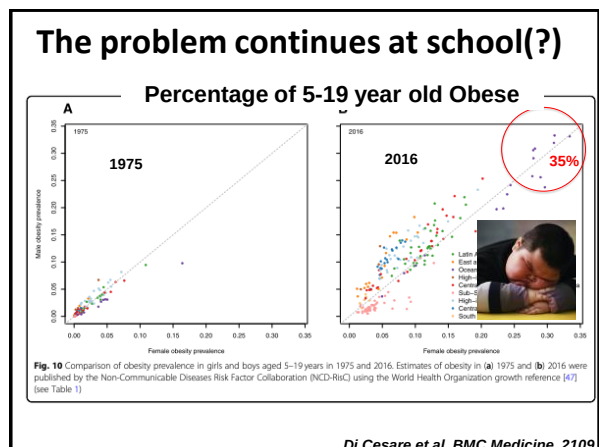
Di Cesare et al. BMC Medicine. 2109

11

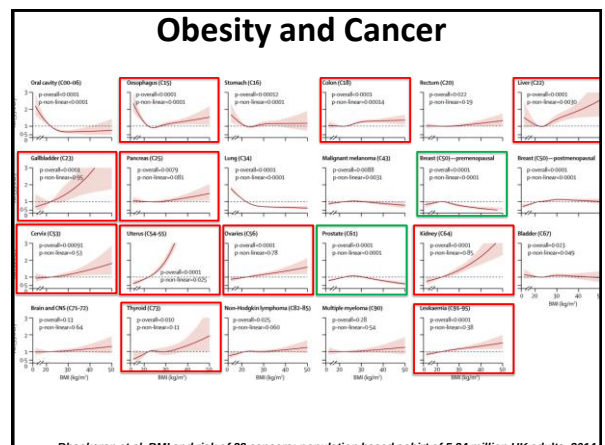
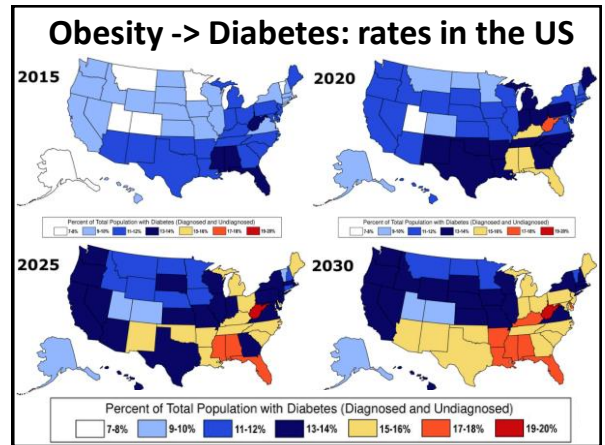
Hoe kan dit nou?



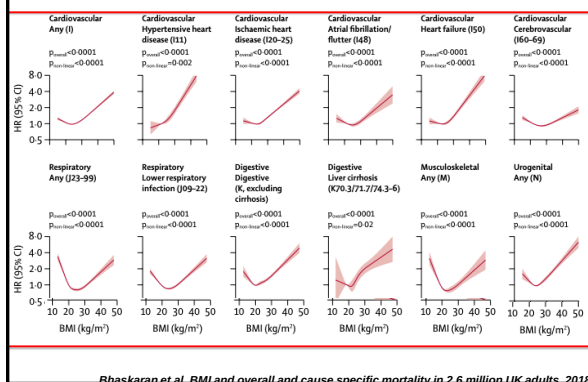
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12

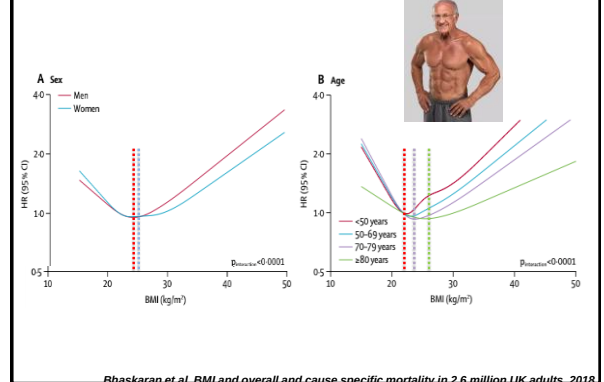


Obesity and CVD / other



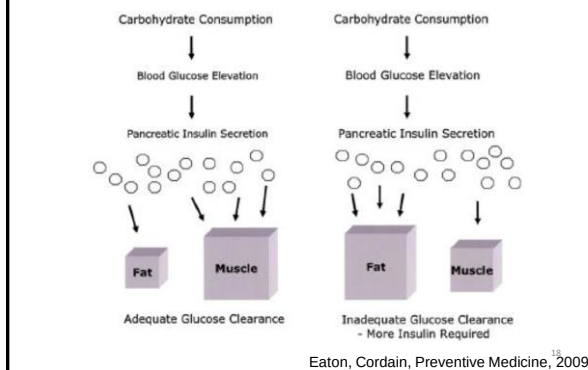
17

Obesity and all-cause mortality



19

Sarcopenie & diabetes



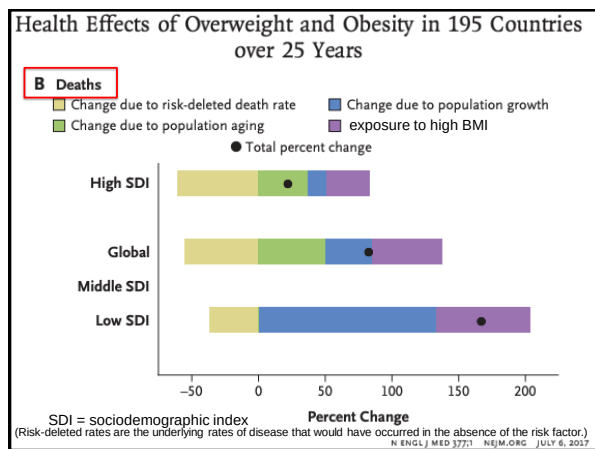
18

Take home message No. 3:

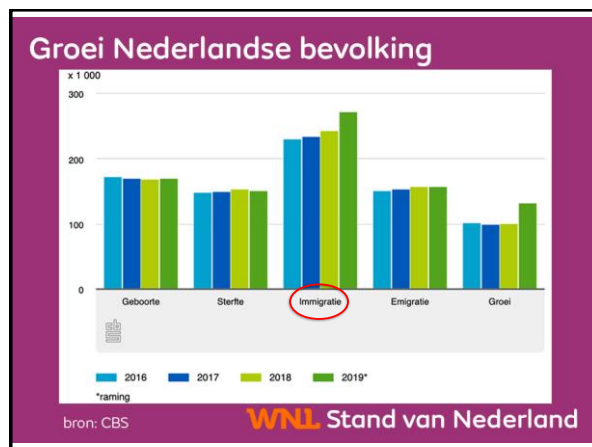
Obesitas is een wereldwijd probleem,
dat **gerelateerd** is aan vrijwel **ALLE** welvaartsziekten
en aan **vroegtijdige sterfte**



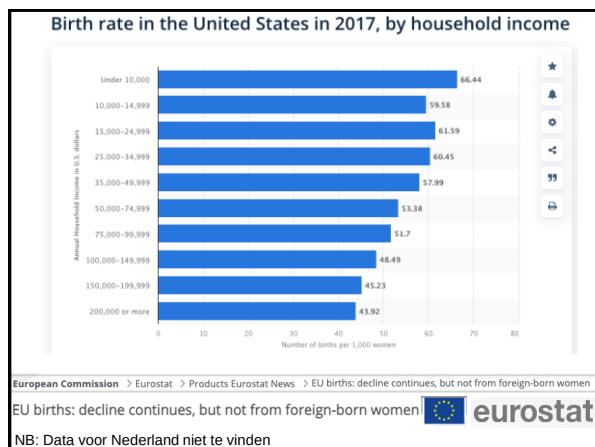
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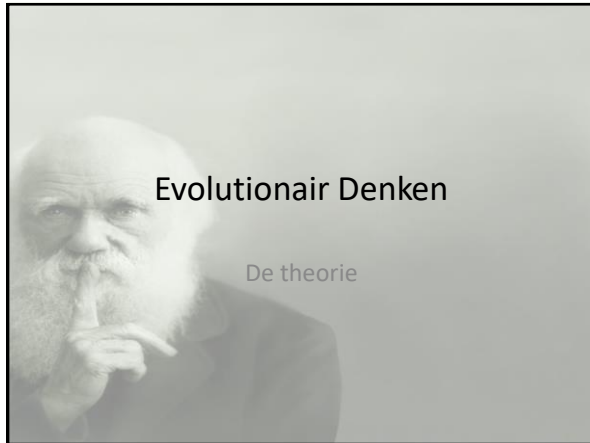
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Take home message No. 4:

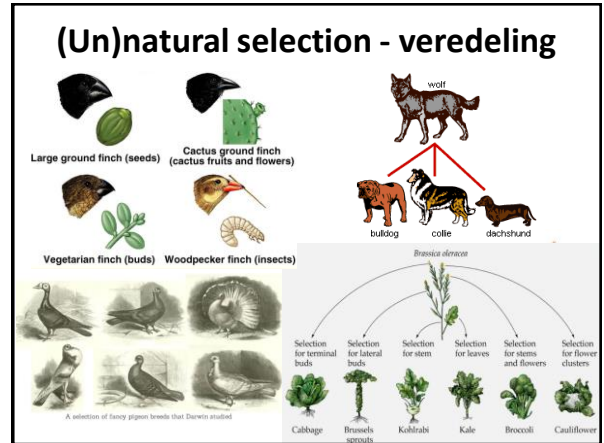
Oorzaken obesitas pandemie:

1. Globale toename welvaart / ongezonde leefomgeving
2. Mondiale vergrijzing (toename levensverwachting)
3. Krimpde hoog / (nog) groeiende laag-sociaal economische klasse

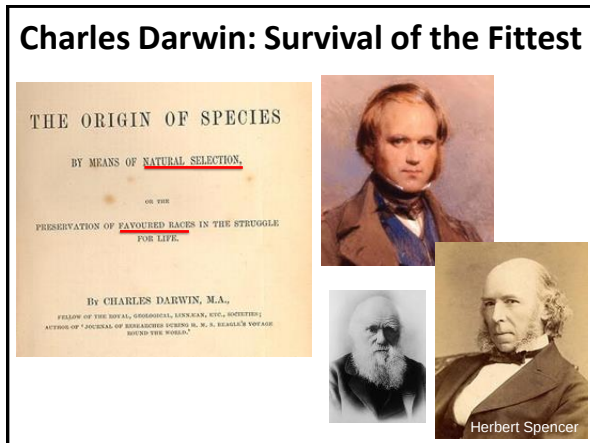
24



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27

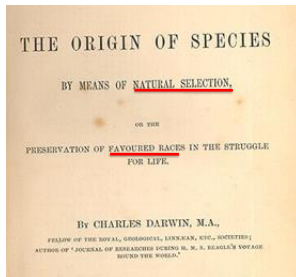


26



28

Charles Darwin: Survival of the Fittest



- Law 1. Conditions of existence
Law 2. Natural selection

29

Evolutionary Medicine

- Nothing in human (patho) physiology makes sense except in the light of evolution



31

Theodosius Dobzhansky

- Nothing in biology makes sense except in the light of evolution



30

Waarom we ziek worden?

- Proximale versus Evolutionaire verklaringen voor ziekte

» Why we get sick, Nesse & Williams, 1994

- **Proximale oorzaak = hoe**
 - Oorzaak op moleculair niveau
 - Behandelen = pappen en nat houden
- **Evolutionaire of ultieme oorzaak = waarom**
 - Oorzaak op evolutionair niveau
 - Wegnemen oorzaak – wegnemen ziekte



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Take home message No. 5:

Gezondheidszorg 1.0
=
symptoombehandeling






33

Voorbeeld 1: Koorts



Proximaal: Hoe *genees* ik koorts met *medicijnen*?

Oorzaak?



Gevolg



Oplossing

35

VOLUME 66, No. 1 March 1991

**THE QUARTERLY REVIEW
of BIOLOGY**

THE DAWN OF DARWINIAN MEDICINE
GEORGE C. WILLIAMS RANDOLPH M. NESSE




- Defense-mechanism
- Trade-offs/Conflicts
- Constraints
- Mismatches
- Genetics



Randolph M. Nesse George C. Williams
1926-2010
Kuipers, Luxwolda, Muskiet. Medisch Contact 2010

34

Evidence Based Medicine?

Should we treat fever in critically ill patients? A summary of the current evidence from three randomized controlled trials

Ary Serpa Neto¹, Victor Galvão Moura Pereira¹, Giancarlo Colombo², Farah Christina de la Cruz Scaria³, Camila Menezes Souza Pessoa⁴, Leonardo Lima Rocha⁴ *critical care*, 2014;12(4):516-23

Study or subgroup	Antipyresis Events Total	No antipyresis Events Total	Weight	Risk ratio M-H, Random, 95% CI Year	Risk ratio M-H, Random, 95% CI
Guzzoli V, 2001	2 18	3 29	23.6%	0.70 [0.14, 3.94]	2001
Schulman C, 2010	7 44	1 38	17.5%	6.05 [0.76, 46.95]	2005
Schongem F, 2012	35 101	43 99	58.9%	0.89 [0.56, 1.12]	2012
Total (95% CI)			100.0%	1.13 [0.46, 3.15]	
Total events	44	47			
Heterogeneity: $\tau^2 = 0.44$; $Z^2 = 3.90$, $df = 2$ ($P = 0.14$); $I^2 = 49\%$					
Test for overall effect: $Z = 0.23$ ($P = 0.82$)					

95% CI, 95% of confidence interval.

Figure 2. Meta-analysis of overall *paracetamol* for antipyresis or no antipyresis in critically ill patients

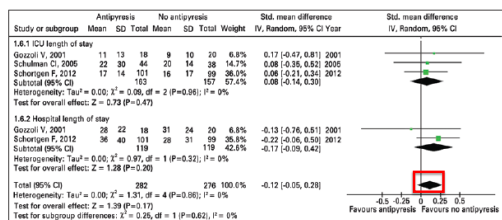
Paracetamol geven aan IC patienten met koorts:
géén verschil in mortaliteit

36

Should we treat fever in critically ill patients? A summary of the current evidence from three randomized controlled trials

Ary Serpa Neto¹, Victor Galvão Moura Pereira¹, Giancarlo Colombo², Farah Christina de la Cruz Scarin³, Camila Menezes Souza Pessoa⁴, Leonardo Lima Rocha⁵

einstein. 2014;12(4):518-23



95% CI, 95% of confidence interval; SD, standard deviation; ICU, intensive care unit.

Figure 3. Meta-analysis of intensive care unit and hospital length of stay for antipyresis or no antipyresis in critically ill patients

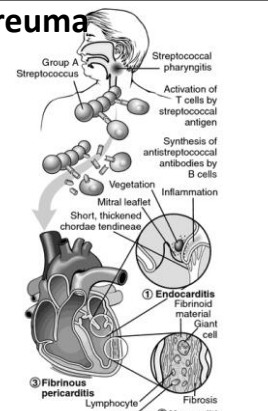
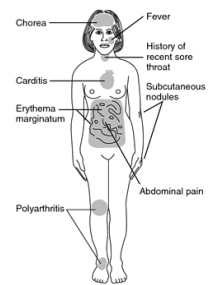
**Paracetamol geven aan IC patienten met koorts:
Geef, if anything, een LANGERE opnameduur**

37

Voorbeeld 2. Kinderreuma

Beta-hemolytische streptococ

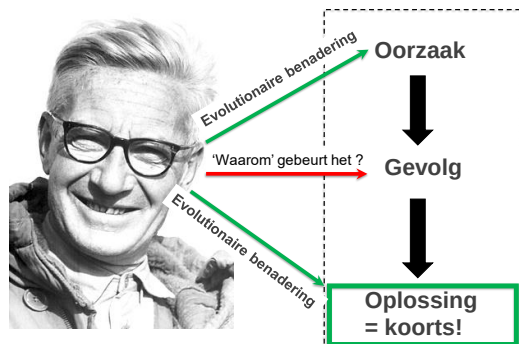
Major manifestations
Minor manifestations and later findings



Collateral damage van het ijverige immuunsysteem

39

Voorbeeld 1: Koorts



38

Voorbeeld 3: IJzergebreksanemie

- Afrikaanse kinderen krijgen een onderzoek naar hun gezondheid
- Ze blijken voor een groot deel slecht gevoed
- Veelal is er ijzergebreksanemie
- De tropenarts schrijft ijzersupplementen voor
- Wel of geen goed idee?

40

40

Proximate vs Evolutionary

Iron Supplementation in HIV-Infected Malawian Children With Anemia: A Double-Blind, Randomized, Controlled Trial

Michael O. Essa,^{1,2} Michael Boele van Hensbroek,¹ Ernest Nkomo,² Crispin Musicha,² Sarah A. White,³ Felice O. ter Kuile,^{1,2} and Kamija S. Phiri^{1,2}

Table 2. Morbidity Outcomes, by Study Arm and Period

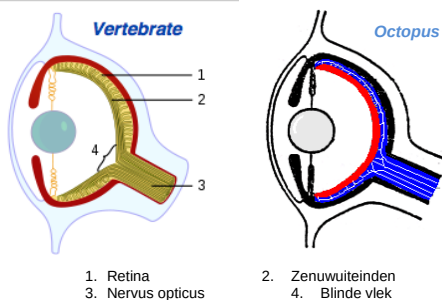
Outcome	Iron		Placebo		Unadjusted IRR (95% CI)	P	Adjusted IRR ^a (95% CI)	P
	Events, No. (%)	Incidence ^a	Events, No. (%)	Incidence ^a				
All cause outpatient sick-visits	133 (88)	350.0	135 (87)	383.0	0.95 (0.8-1.33)	.36	0.98 (0.7-1.43)	.91
All events over 6 mo follow-up	63 (27)	275.4	47 (26)	206.6	1.36 (0.83-2.19)	.22	1.48 (0.81-2.68)	.20
Postintervention period (0-3 mo)	70 (31)	323.7	68 (41)	400.1	0.79 (0.50-1.26)	.32	0.83 (0.51-1.36)	.45
All cause hospital admissions	14 (14)	28.6	20 (19)	42.3	0.61 (0.31-1.20)	.15	0.62 (0.27-1.42)	.26
All events over 6 mo follow-up	8 (8)	31.6	6 (6)	23.8	1.43 (0.54-3.78)	.47	1.56 (0.48-5.09)	.46
Postintervention period (0-3 mo)	6 (6)	24.2	14 (13)	61.9	0.40 (0.16-1.00)	.06	0.39 (0.13-1.14)	.09
Malaria	52 (27)	120.2	33 (24)	71.7	1.72 (1.04-2.86)	.03	1.81 (1.04-3.16)	.04
All events over 6 mo follow-up	25 (15)	78.1	9 (6)	26.3	2.76 (1.08-5.38)	.03	2.68 (1.06-6.83)	.04
Postintervention period (0-3 mo)	32 (22)	140.7	24 (16)	107.9	1.25 (0.65-2.31)	.47	1.44 (0.73-2.84)	.29
Respiratory infections	21 (17)	43.5	36 (26)	79.1	0.59 (0.30-1.09)	.09	0.59 (0.31-1.22)	.16
All events over 6 mo follow-up	14 (12)	56.6	13 (11)	52.8	1.16 (0.65-2.44)	.30	1.42 (0.63-3.63)	.46

Het middel is erger dan de kwaal...

41

Evolution has no way back

<https://www.youtube.com/watch?v=cQ1a1Ek-HD0>



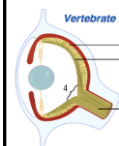
43

Voorbeelden Evolutionair denken



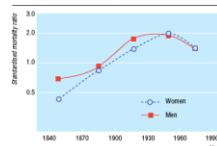
Het dierenrijk

- De grijze haren van de silverback gorilla
- Het oog van de octopus



De mens

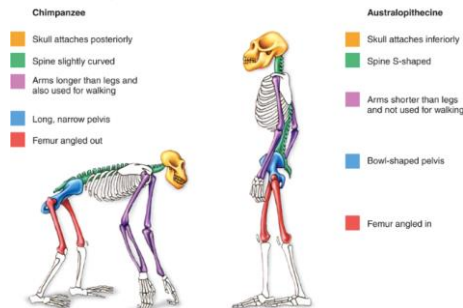
- Bipedalisme
- Menopauze
- Bilirubine
- FH



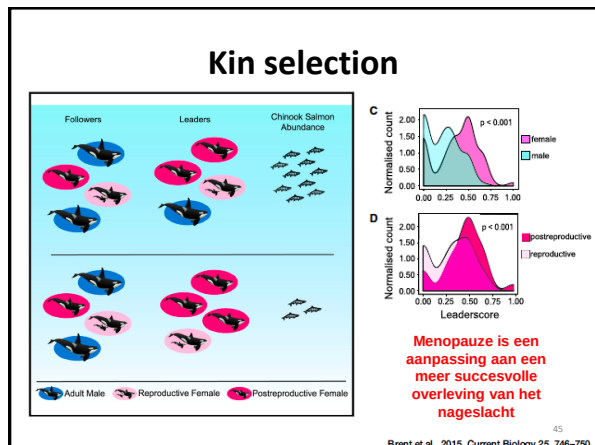
42

Bipedalism & Body hair

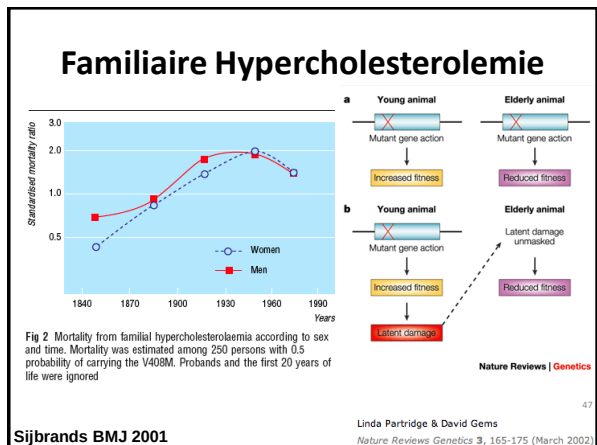
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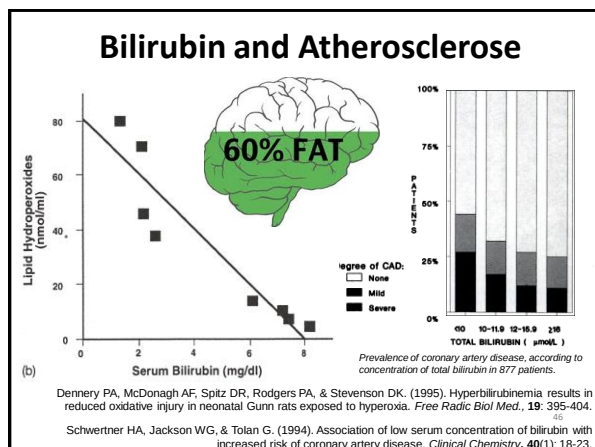
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45



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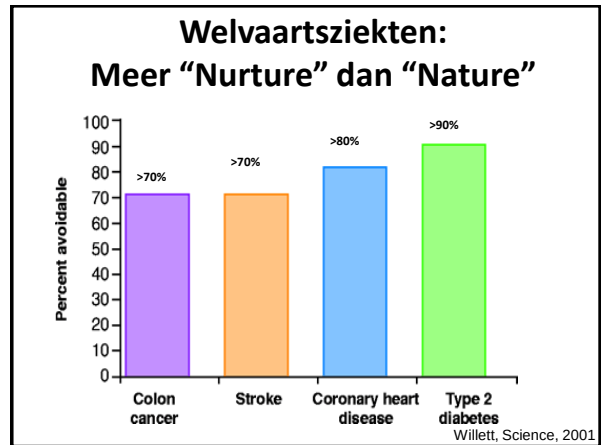
46



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Evolutionair onweerstaanbaar

the thrifty-gene hypothesis – hongerwinter epigenetics

- Zoet ->
- Vet ->
- Zout ->
- Vers ->

SUPERSTIMULI

50

Marktwerking in de zorg...

(wie verdient er niet aan?)

Apotheker

Arts

Big Pharma

Politiek

52

Gevolgen Gezondheidszorg 1.0

Wat er ook gebeurt, de uitgaven aan zorg stijgen

Uitgaven aan zorg als percentage van het bbp



53

Take home message No. 3:

Gezondheidszorg 2.0

=

preventie

=

jouw eigen
verantwoordelijkheid

55

Wie verdient er niet aan?



54

Wat is ONgezond?



56

Wat is Ongezond?

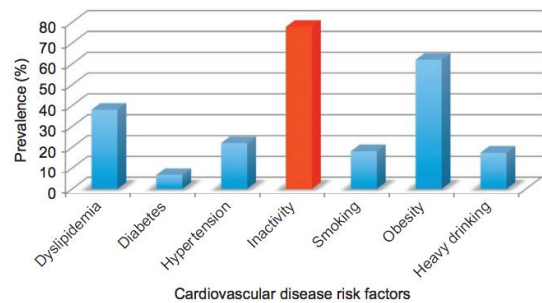
Tabel 21: De impact van ziekten op de levensverwachting

Ziekte	Aantal verloren levensjaren	
	Mannen	Vrouwen
Roken	-12	-7
Suikerziekte	-10	-8
Inactiviteit	-6	-8
Chronische stress	-6	-6
Hoge bloeddruk	-5	-6
Overgewicht	-4	-4
Teveel alcohol	-4	0
Groente/fruit tekort	-3	-2
Hoog cholesterol	-3	-2
Slaaptekort/teveel	-2	-2

Uit: Kuipers, *Oergezond*

57

Maar wat komt het meeste voor?



Warburton & Bredin. Lifestyle in heart health and disease. 2018

59

Maar wat komt het meeste voor?

Tabel 21: De impact van ziekten op de levensverwachting

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Maar wat komt het meeste voor?

Warburton & Bredin. Lifestyle in heart health and disease. 2018

58

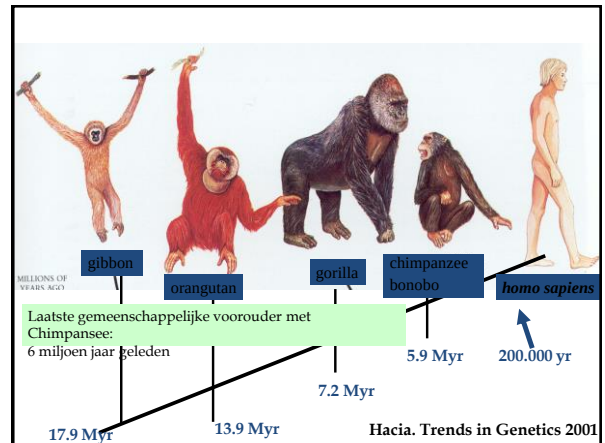
Preventie?

Maar hoe dan?

60



61



63

Take home message No. 4:

Om gezond te blijven
moeten we onze
'conditions of existence'
of OER-omgeving
(onder)kennen

62

Onze 'Conditions of Existence'

- Laaste gemeenschappelijke voorouder met de chimpanzee: 6 miljoen jaar geleden
- 3rd Out of Africa Diaspora: 100.000 jaar geleden
- $100.000 / 6.000.000 \Rightarrow 0.02 = 2\% \Rightarrow 98\%$ van de menselijke evolutie vond plaats in Oost Afrika

Cradle of Mankind: Africa

A map of Africa with a heart symbol in the eastern part, indicating the 'Cradle of Mankind'.

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65



67



66



68



69



71



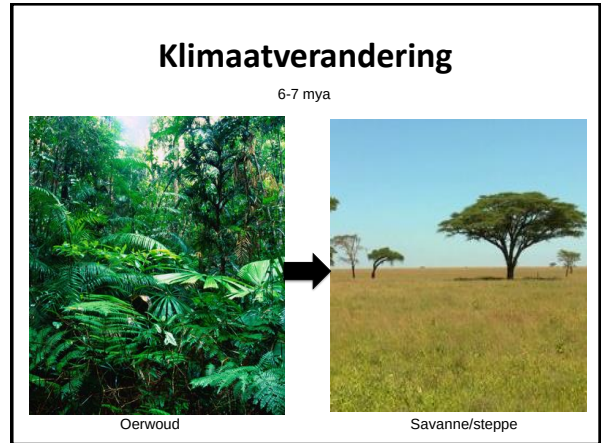
70



72



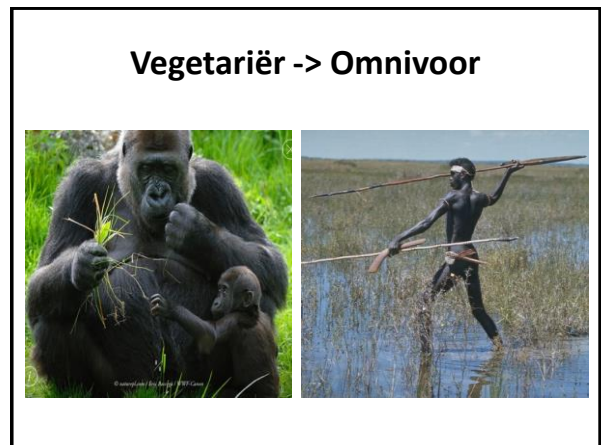
73



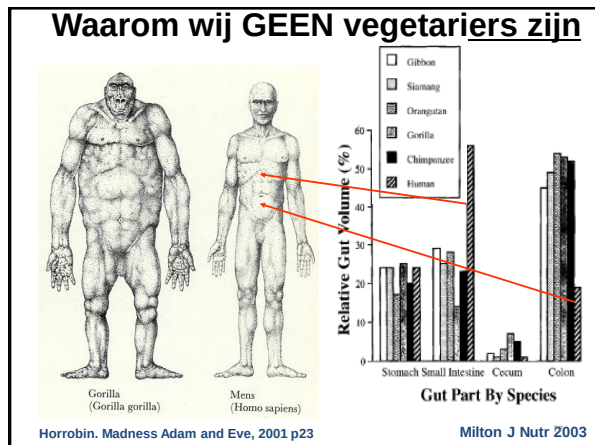
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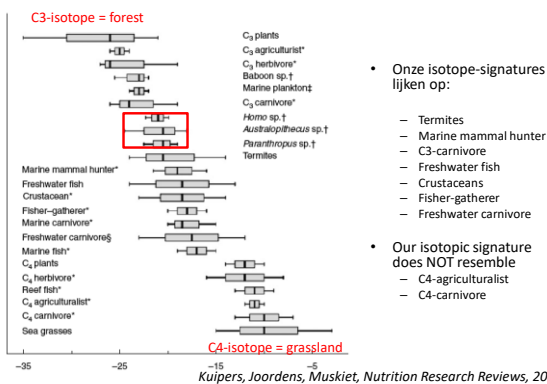


78



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What do the isotopes tell us?

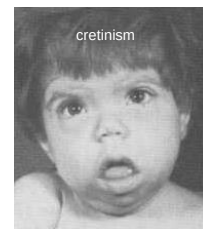


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Het water-land ecosysteem:

– Een rijke bron van

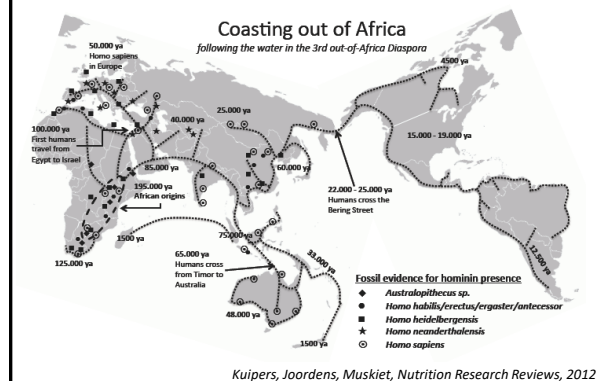
- Jodium
- Chroom
- IJzer
- Zink
- Vitamine A and D
- ω 3-visvetzuren
 - DHA en EPA



hersensbouwstenen

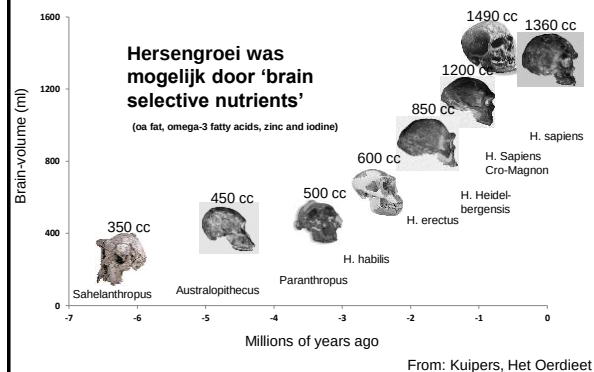
83

Archeologische opgravingen

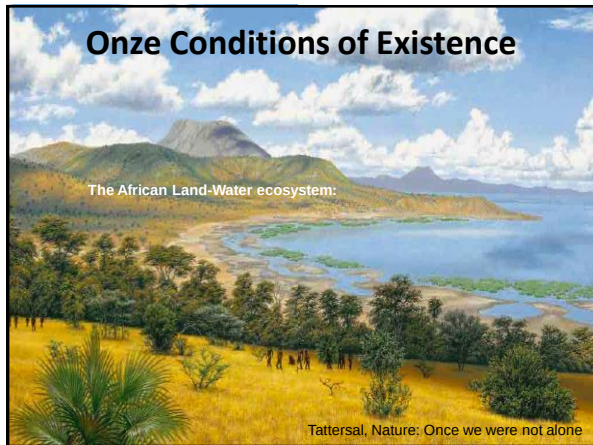


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Van aap naar mens



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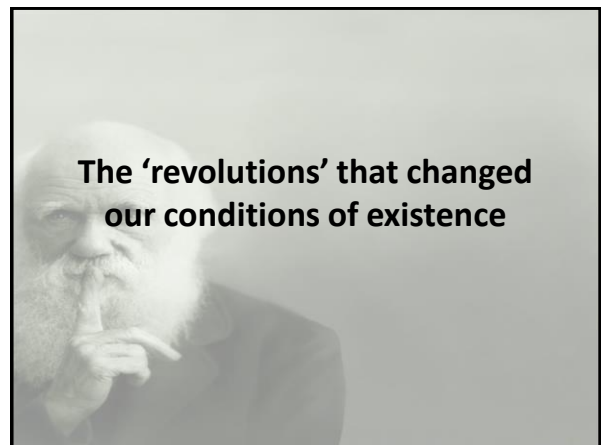
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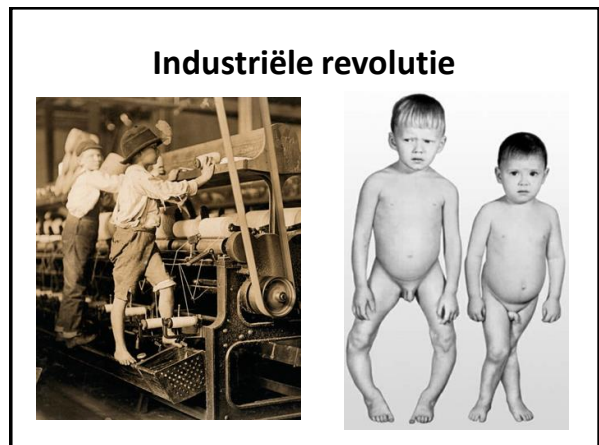
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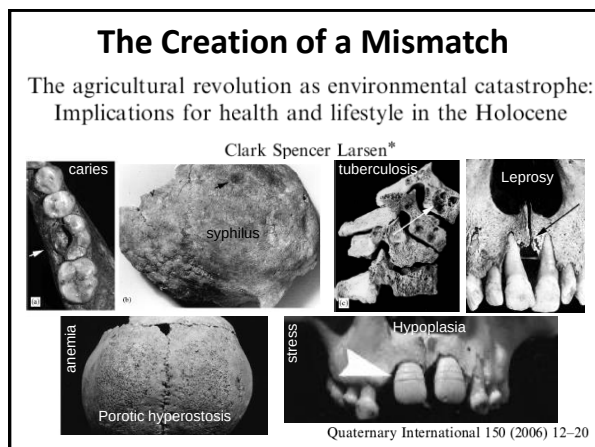
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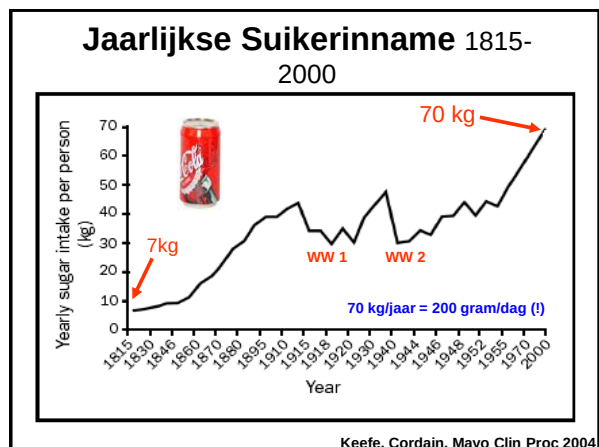
89



91



90



92

What went Wrong?

Increasing loss of physical activity, loss of realistic reference



Digital Revolution: 10 years ago

93

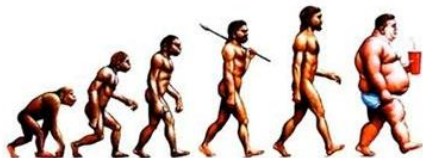
Take home message No. 6:

Onze **genen** leven nog in de **Steentijd**



95

De MISMATCH



94

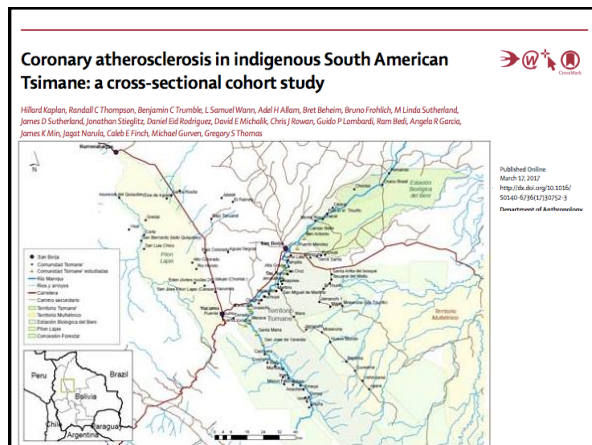
Zijn chronische ziekten een welvaartsverschijnsel?

Atherosclerosis across 4000 years of human history: the Horus study of four ancient populations

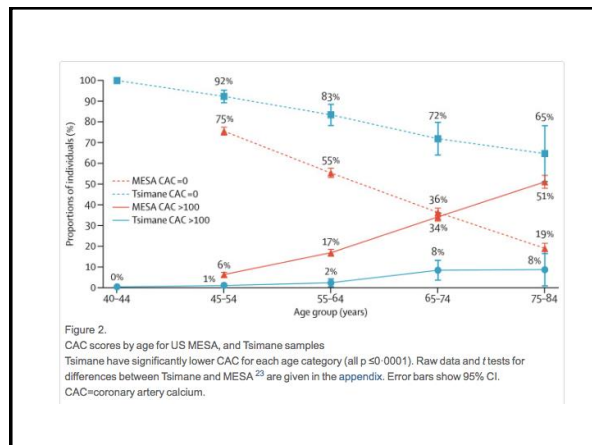


Interpretation Atherosclerosis was common in four preindustrial populations including preagricultural hunter-gatherers. Although commonly assumed to be a modern disease, the presence of atherosclerosis in premodern human beings raises the possibility of a more basic predisposition to the disease.

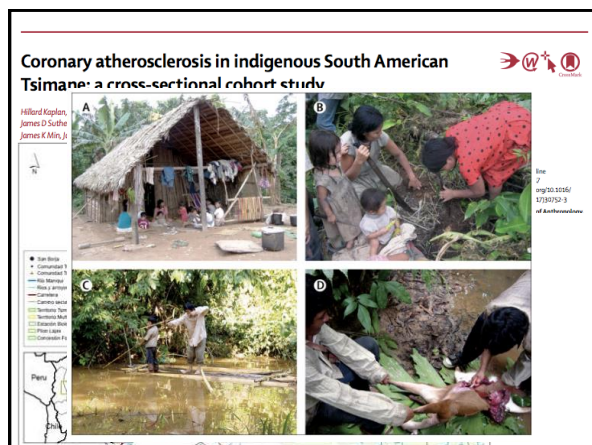
96



97



99



98

Take home message No. 7:

Welvaartsziekten
zijn op steeds jongere leeftijd optredende
ouderdomsziekten
veroorzaakt door langdurige blootstelling aan
risicofactoren en daarmee
lage graad ontstekings

100



Take home message No. 8:

Om gezond te blijven
moeten we terug naar onze
'conditions of existence'
of OER-omgeving





101



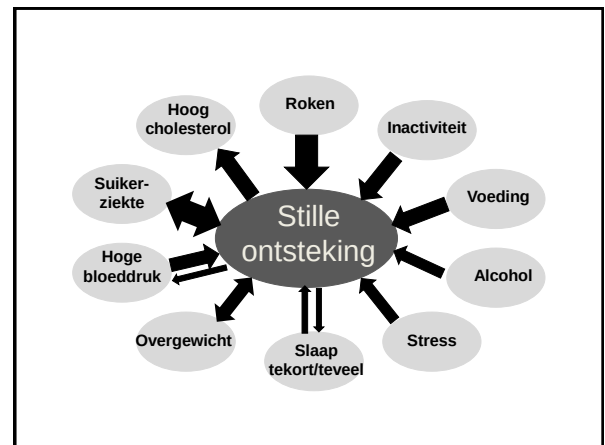
103



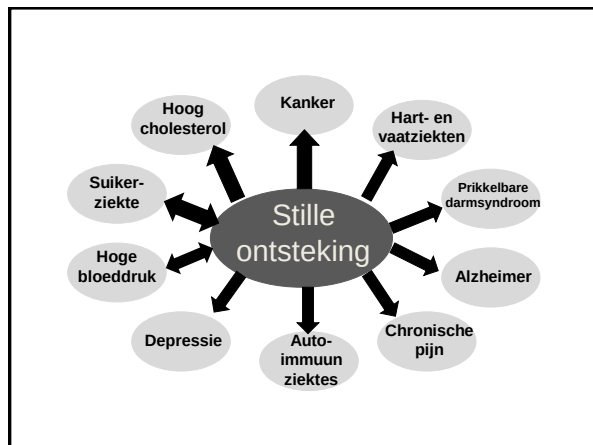
Evolutionair Denken

Lage graad ontsteking
en
een oerleefstijl

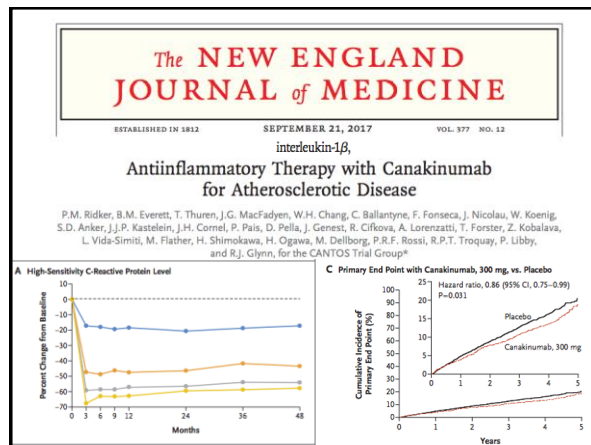
102



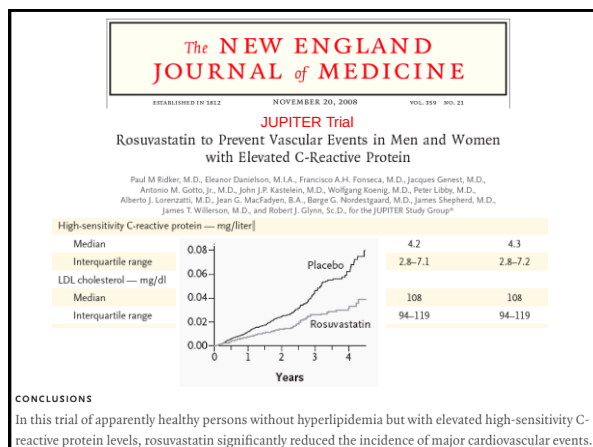
104



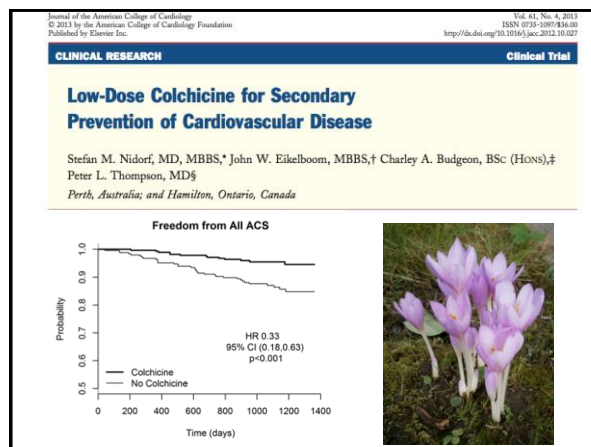
105



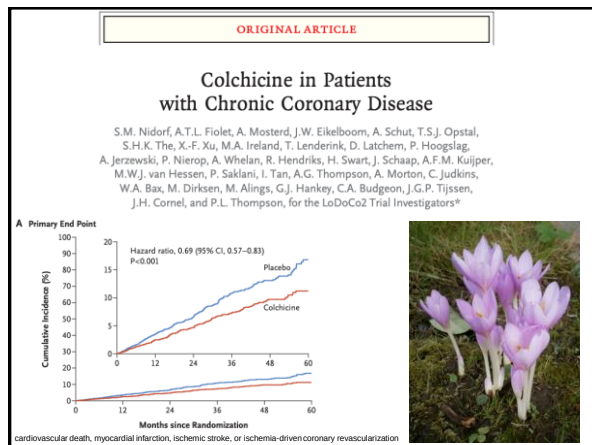
107



106



108



109

LGI in de praktijk

Point measures

- Age
- Sexe
- Education
- Location of living (Urban/n)
- Smoking
- Waist-to-hip ratio
- Leisure Time
- Hypertension
- High TG/HDL ratio
- Glucose-intolerance
- Vegetable/fruit intake

Only in sequence

- hsCRP
- Leukocytes
- Trombocytes
- Ferritine

INFLAMMATION

111

ARTICLE Immunology & Inflammation

A score of low-grade inflammation and risk of mortality: prospective findings from the Moli-sani study

Maria Laura Bonaccio, Augusto Di Castelnuovo, George Pounis, Amalia De Curtis, Simona Costanzo, Mariarosaria Persichillo, Chiara Cerletti, Maria Benedetta Donati, Giovanni de Gaetano, and Licia Iacovello on behalf of the Moli-sani Study Investigators*

Haematologica 2016
Volume 101(11):1434-1441

The low-grade inflammation (INFLA) score

Low-grade inflammation is a condition not yet consistently defined or measured. A number of plasmatic (e.g. C-reactive protein) or cellular biomarkers (e.g. white blood cell and platelet counts) have been proposed as reliable indicators of such a condition.^{1,2}

Risk of all-cause mortality associated with quartiles of low-grade inflammation

	Quartiles of low-grade inflammation			
	1*	2*	3*	4*
N of deaths/N of subjects	148/5054	180/5079	247/5001	262/5203
Hazard ratio (95%CI)				
Age/sex adjusted	1.00 (ref)	1.16 (0.93-1.44)	1.55 (1.26-1.89)	1.65 (1.35-2.02)
Multivariable model*	1.00 (ref)	1.11 (0.90-1.39)	1.44 (1.17-1.77)	1.44 (1.17-1.77)
INFLA-score minus CRP*	1.00 (ref)	1.10 (0.90-1.36)	1.30 (1.07-1.58)	1.39 (1.14-1.69)
INFLA-score minus WBC*	1.00 (ref)	1.09 (0.87-1.35)	1.30 (1.06-1.60)	1.43 (1.17-1.74)
INFLA-score minus Platelet*	1.00 (ref)	1.16 (0.92-1.47)	1.28 (1.04-1.59)	1.52 (1.23-1.87)
INFLA-score minus CV ratio*	1.00 (ref)	1.18 (0.96-1.45)	1.30 (1.07-1.57)	1.41 (1.15-1.73)

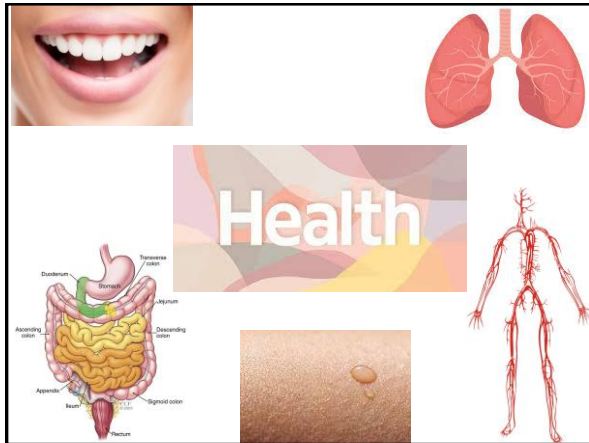
110

Lage graad ontsteking

Low-grade inflammation (LGI)

- Hoe moet ik me dit voorstellen?

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It's all about 'barrières'

- Oral Cavity and skin
 - Microbial translocation
- Lungs
 - Inflammatory particles (rook, fijnstof)
- Digestive system
 - Translocation of microbes and pro-inflam particles
- Blood vessels
 - Disruption of the endothelial barrier / glycocalyx

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114

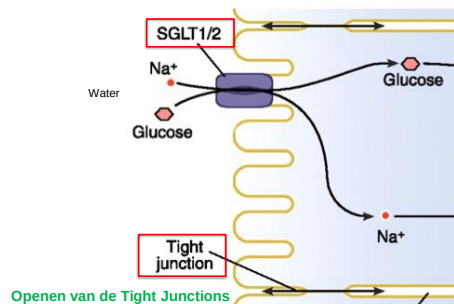
It's all about 'barrières'

- Oral Cavity and skin
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116

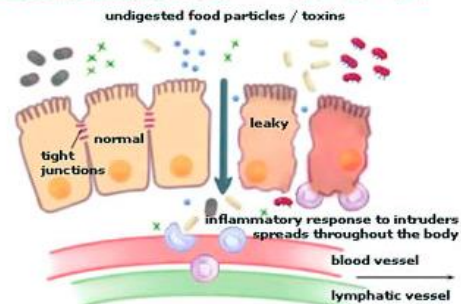
Digestive system – Evolutionaire stress

Wenselijke gevolgen: conservering van water / zout / suiker



117

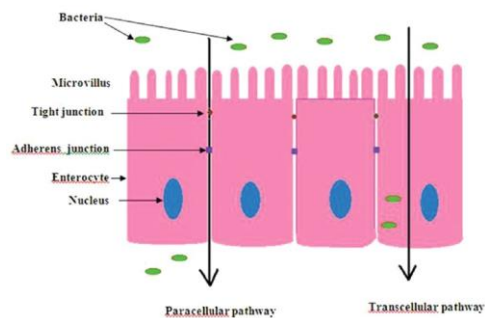
LEAKY GUT



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Digestive system – Evolutionaire stress

Ongewenste gevolgen • *Bacterial translocation / Sepsis*

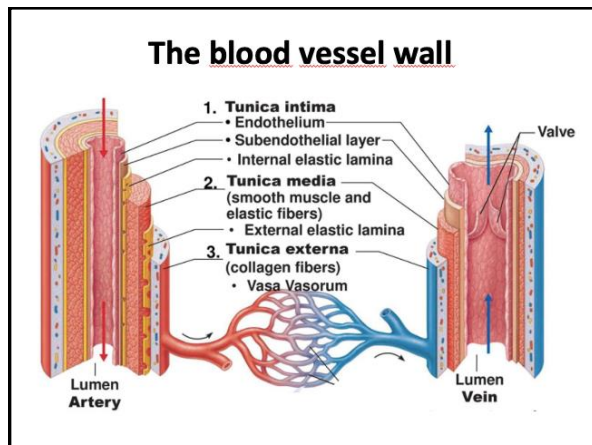


118

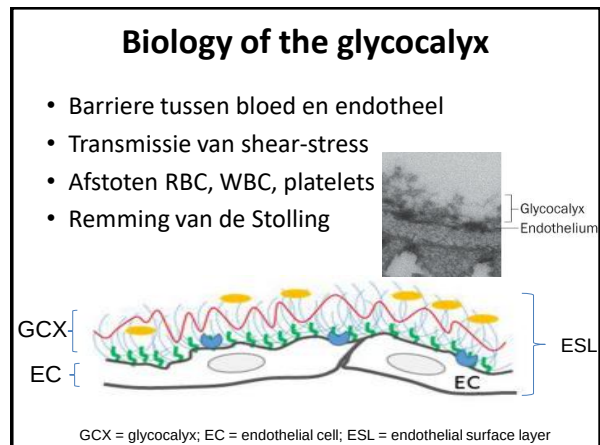
It's all about 'barrières'

- Oral Cavity and skin
 - Microbial translocation
- Lungs
 - Inflammatory particles (rook, fijnstof)
- **Digestive system**
 - Translocation of microbes and pro-inflam particles
- **Blood vessels**
 - Disruption of the endothelial barrier / glycocalyx

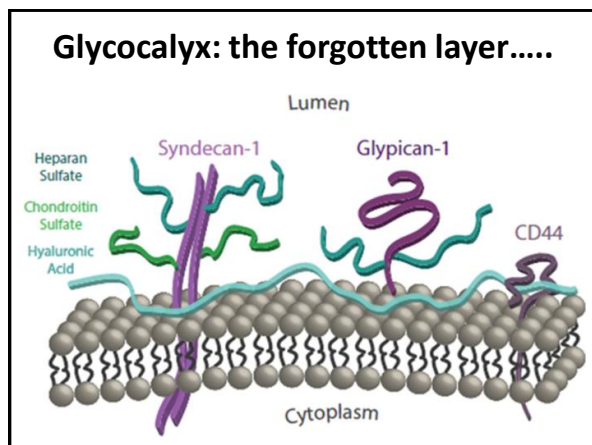
120



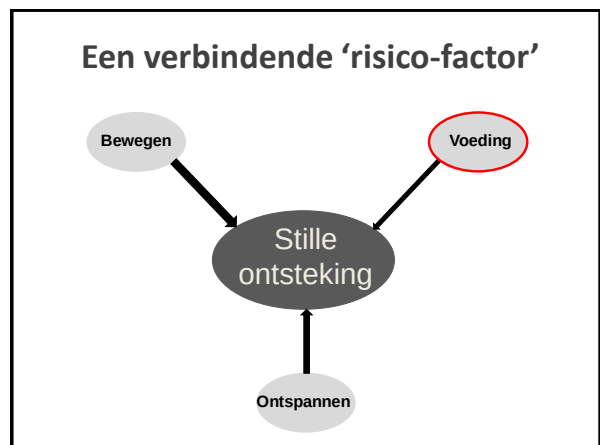
121



123



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124

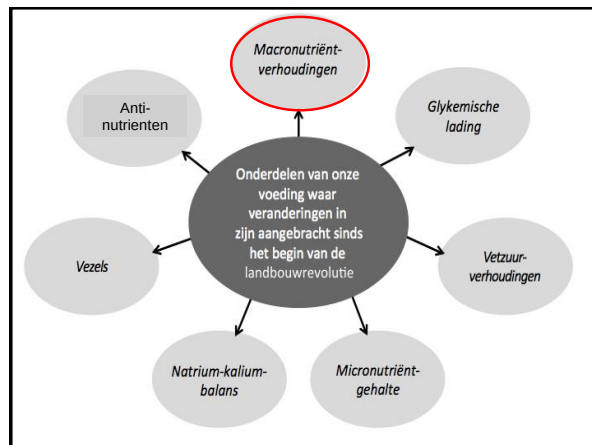
TABLE 1
Food and food types found in Western diets generally unavailable to preagricultural hominins¹

Food or food group	Value
Dairy products	% of energy ²
Whole milk	1.6
Low-fat milk	2.1
Cheese	3.2
Butter	1.1
Other	2.6
Total	10.6
Cereal grains	
Whole grains	3.5
Refined grains	20.4
Total	23.9
Refined sugars	
Sucrose	8.0
High-fructose corn syrup	7.8
Glucose	2.6
Syrups	0.1
Other	0.1
Total	18.6
Refined vegetable oils	
Solid cooking oils	8.8
Shortening	6.6
Margarine	2.2
Total	17.6
Alcohol	1.4
Total energy	72.1
Added salt, as sodium chloride	9.6 ³

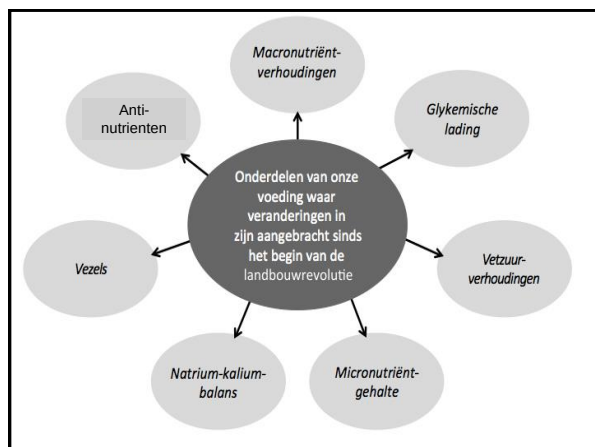
Onze huidige voeding bestaat voor 72% uit 'onbekend' voedsel

Cordain et al, AJCN 2005

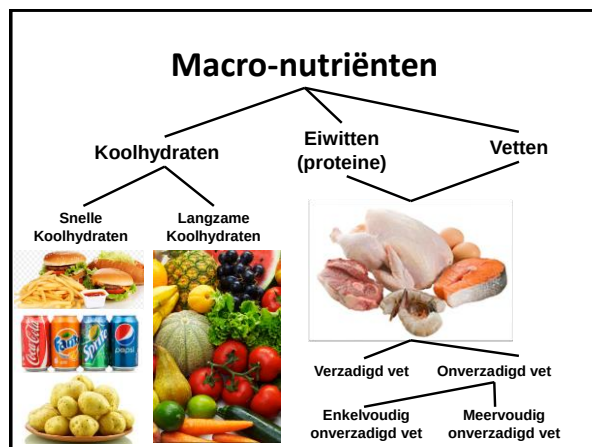
125



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Gezonde eiwitten (vnl plant)



- Eiwitrijke diëten zijn gezond omdat
 - Verzadigend, ondanks negatieve energiebalans
 - Persisterend energiek, ondanks gewichtsverlies
 - Behouden van spiermassa bij afvallen

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Fatty acids - Vetzuren

Verzadigd & enkelvoudig onverzadigd

Meervoudig onverzadigd

Capric acid C10:0

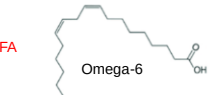


Lauric acid C12:0



SCFA, MCFA en SAFA

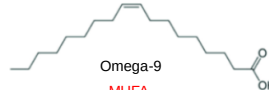
Linoleic acid



Omega-6

PUFA en LCP

Oleic acid



Omega-9

MUFA

α-Linolenic acid



Omega-3

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Vetten

Verzadigde vetten

- cocosboter
- roomboter

Onverzadigde vetten

Enkelvoudig onverzadigde vetten

- Olijfolie
- Avocado
- Macadamia
- Hazelnoten
- Pecannoten

Meervoudig onverzadigde vetten

- Omega-6 vetten**
- Zonnebloemolie
 - Maïsolie
 - Sojaboonolie
 - Sesamzaadolie
 - Pinda(olie)
 - Hennepzaadolie

Omega-3 vetten

- Vette vis
- Perillaolie
- Lijnzaad(olie)
- Koolzaadolie
- Walnoot(olie)

Trans- vetten

- Koek en gebak
- Zuivel
- Margarine/halvarine
- Frituurvet

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Why are we so afraid of fat?



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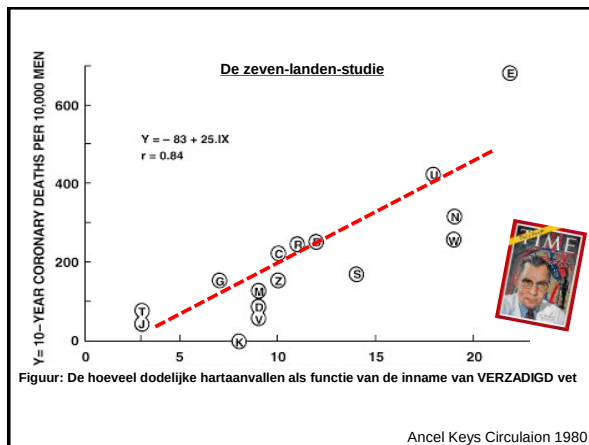
Meer eiwit, meer vet?



- Eet minder vet:
- LET op VET
- Verzadigd = Verkeerd
- Tussen 1987 en 1997 zijn Nederlanders minder vet en verzadigd vet gaan eten

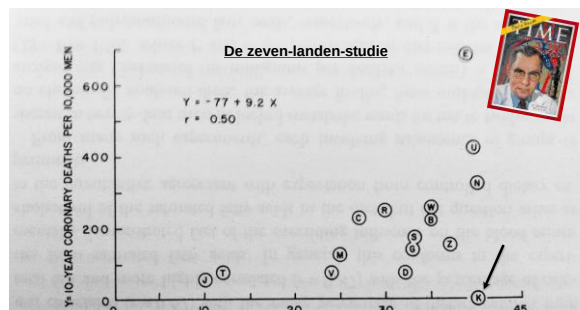
Nederlandse Hartstichting

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Vet ongezond?



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Verzadigd vet vervangen door koolhydraten

Major types of dietary fat and risk of coronary heart disease: a pooled analysis of 11 cohort studies¹⁻³

Marianne U Jakobsen, Ellis J O'Reilly, Berit L Heimann, Mark A Pereira, Katarina Bälter, Gary E Fraser, Uri Goldbourt, Göran Hallmans, Paul Knott, Simin Liu, Pirjo Pietinen, Donna Spiegelman, Jane Stevens, Jarmo Virtamo, Walter C Willett, and Alberto Ascherio

During 4-10 y of follow-up, 5249 coronary events and 2155 coronary deaths occurred among 344,696 persons



Vervangen van verzadigd vet door koolhydraten geeft een

7% hogere kans op HVZ

Jakobsen AJCN 2009

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Type koolhydraten?

Intake of carbohydrates compared with intake of saturated fatty acids and risk of myocardial infarction: importance of the glycemic index¹⁻³

Marianne U Jakobsen, Claus Dethlefsen, Albert M Joensen, Jakob Stegger, Anne Tjømeland, Erik B Schmidt, and Kim Overvad

prospective cohort study included 53,644 women and men



- Lage glycemische index: **niet** sign. 12% verlaagd HVZ risico

- Hoge glycemische index: **33%** verhoogd HVZ risico

Jakobsen AJCN 2010

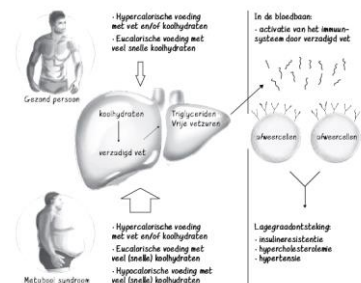
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De link tussen koolhydraten en inflammatie



John Gofman

Carbohydrate induced hyper-TG

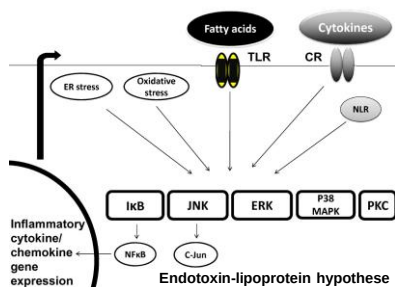


Figuur 21. De gevolgen van de inname van verschillende soorten voeding op de triglyceriden, het cholesterol, op insulineresistentie, overgewicht (obesitas) en hoge bloeddruk (hypertensie) via lagegraadontsteking in gezonde personen en personen met het metabool syndroom.⁴⁹⁾

Kuipers, het Oerdielt, 2014

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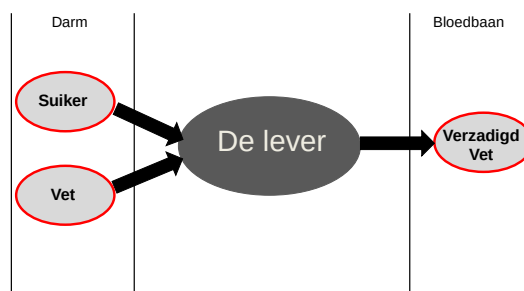
Link tussen vet & atherosclerose



Samaan *Diabetology & Metabolic Syndrome* 2011

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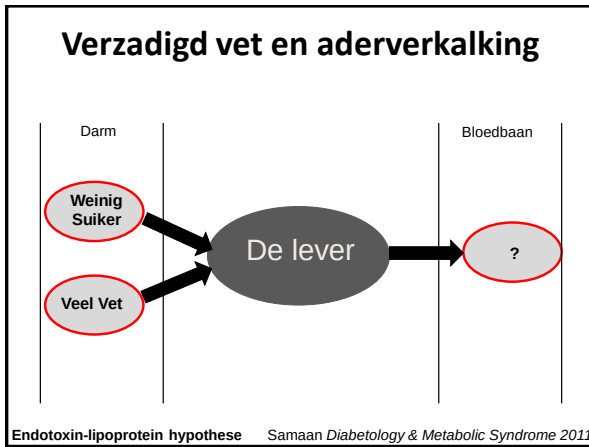
Verzadigd vet en aderverkalking



Endotoxin-lipoprotein hypothese Samaan *Diabetology & Metabolic Syndrome* 2011

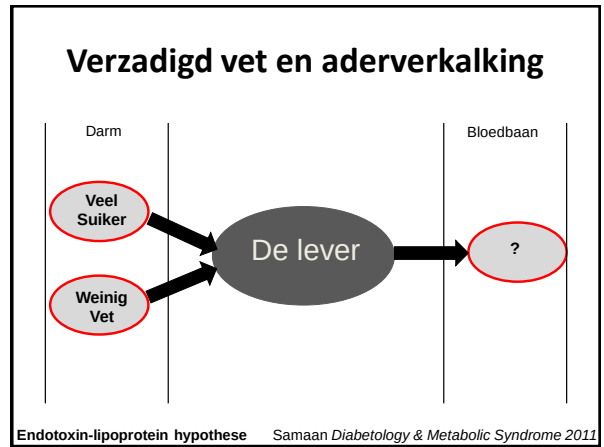
140

Verzadigd vet en aderverkalking



141

Verzadigd vet en aderverkalking



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Verzadigd vet en aderverkalking



142

Verzadigd vet en aderverkalking



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Take home message No. 11:

Vervang
ongezonde (snelle) koolhydraten (fastfood en frisdrank) en verzadigd vet (rood vlees)
door
door langzame koolhydraten (groente en fruit) en noten, peulvruchten, gevogelte en vis



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Koolhydraten

Enkele Suikers (monosachariden)

Glucose (druivensuiker)

C1C(C(C(C(C1O)O)O)O)O

Fructose (fruitsuiker)

C1C(C(C(C(C1O)O)O)O)O

Tweevoudige suikers (disachariden)

Sucrose (tafelsuiker)

C1C(C(C(C(C1O)O)O)O)O

Meervoudige suikers (polysachariden)

Zetmeel (brood, rijst, pasta, aardappelen)

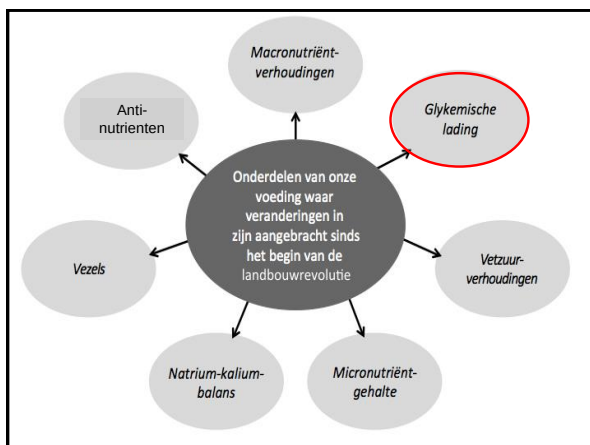
C1C(C(C(C(C1O)O)O)O)O

Direct verteerbaar (hoge glycemische index)

Enzymatisch verteerbaar (medium glycemische index)

Enzymatisch verteerbaar (lage glycemische index)

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Glycemische index (GI) vs lading (GL)



Totale hoeveelheid suiker =

Glycemische index =

Glycemische lading =

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Glycemische index (GI) vs lading (GL)



Totake hoeveelheid suiker = 40 gr 8 gr

Glycemische index =

Glycemische lading =

150

Glycemische index (GI) vs lading (GL)



Totake hoeveelheid suiker = 40 gr 8 gr

Glycemische index = 62 70

Glycemische lading = 25 6

152

Glycemische index (GI) vs lading (GL)



Totake hoeveelheid suiker = 40 gr 8 gr

Glycemische index = 62 70

Glycemische lading =

151

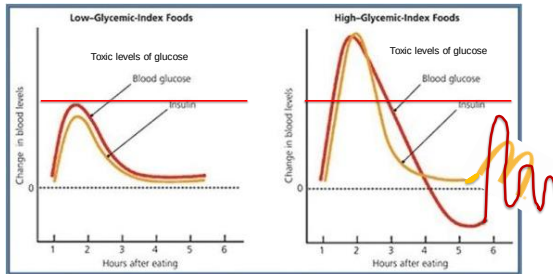
Food Values: Glycemic Index/Glycemic Load

	Low GI	Med GI	High GI
Low GL	All-bran cereal (8,42) Apples (6,38) Carrots (3,47) Peanuts (1,14) Strawberries (1,40) Sweet Corn (1,54)	Beets (5,64) Cantaloupe (4,65) Pineapple (7,59) Sucrose, i.e. table sugar (7,68)	Popcorn (8,72) Watermelon (4,72) Whole wheat flour bread (7,1)
Med GL	Apple juice (11,40) Bananas (12,52) Celery (18,40) Orange juice (12,50) Sourdough wheat bread (15,54)	Life Cereal (16,6) New potatoes (12,5) Wild rice (18,5)	Cheerios (15,74) Shredded wheat (15,75)
High GL	Linguine (23,52) Macaroni (23,47) Spaghetti (23,47)	Couscous (23,65) White rice (23,64)	Baked Russet potatoes (26,86) Cornflakes (21,81)

Source: Revised International Table of Glycemic Index (GI) and Glycemic Load (GL). *The American Journal of Clinical Nutrition*, July 2002

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Insuline/glucose respons



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Testen op diabetes

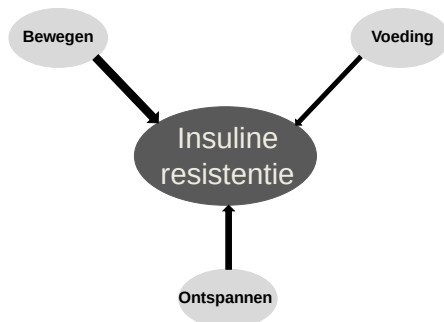
- Glucose
 - Normaal $n < 6.1$ mmol/L
 - Diabetes
 - Nuchter > 6.9 (2x)
 - Niet nuchter > 11.0
- HOMA-IR (Homeostatic Model Assessment for Insulin Resistance)
 - HOMA-Index
 - kleiner dan ≤ 1.0 normaal
 - groter dan > 2.0 is een indicatie voor een insuline resistentie
 - groter dan > 2.5 insuline resistentie heel waarschijnlijk
 - groter dan > 5.0 bij type-2 diabetici
- HbA1c
 - Normaal < 42
 - Diabetes > 47

$\text{HOMA-IR} = \frac{\text{Glucose} \times \text{Insulin}}{22.5}$	$\text{HOMA-IR} = \frac{\text{Glucose} \times \text{Insulin}}{405}$
$\text{HOMA-}\beta = \frac{20 \times \text{Insulin}}{\text{Glucose} - 3.5} \%$	$\text{HOMA-}\beta = \frac{360 \times \text{Insulin}}{\text{Glucose} - 63} \%$
Glucose in Molar Units mmol/L	Glucose in mass units mg/dL

Matthews, Homeostasis model assessment: insulin resistance and beta-cell function from fasting glucose and insulin concentrations in man. *Diabetologia*, 1985

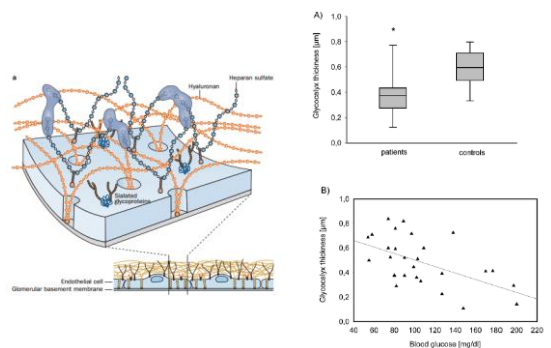
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Risico-factoren

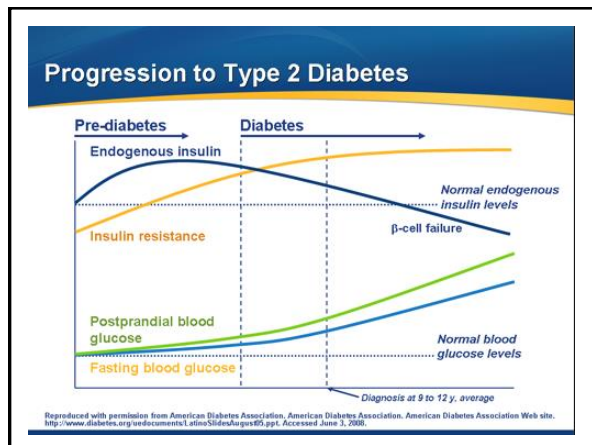


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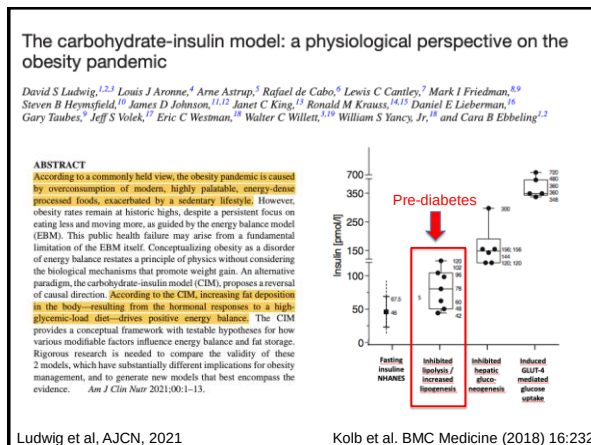
Diabetes en LGI



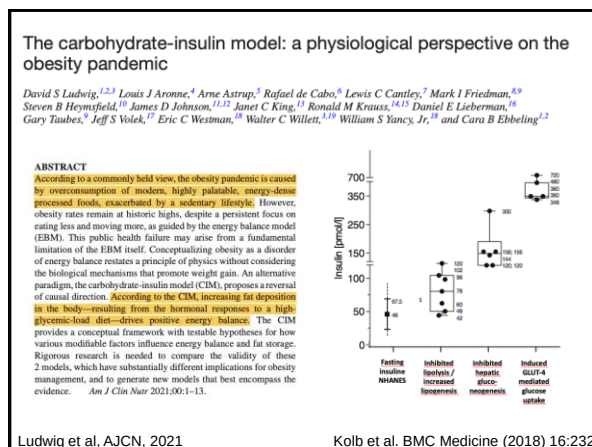
157



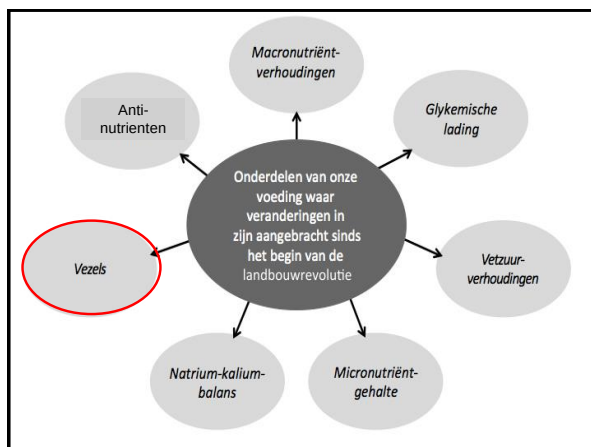
158



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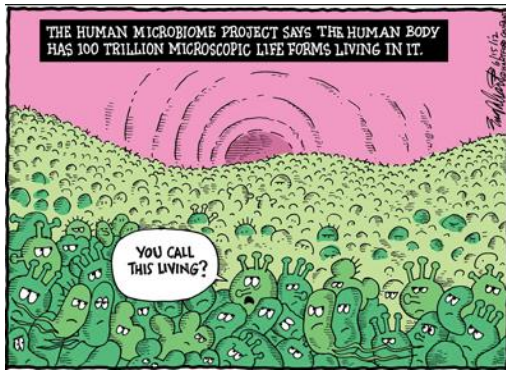


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Vezels voeden ons microbioom



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Size Matters

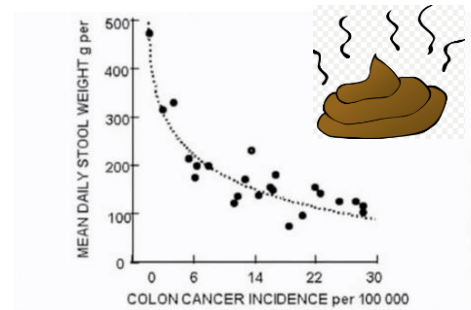
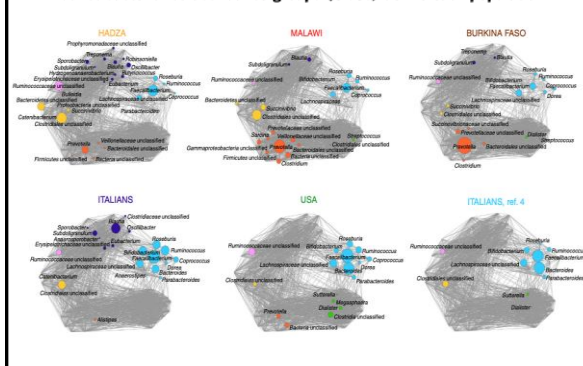


Fig. 1 Relationship between mean daily stool weight in 23 population groups worldwide and colon cancer incidence
Cummings Gastroenterology 1994

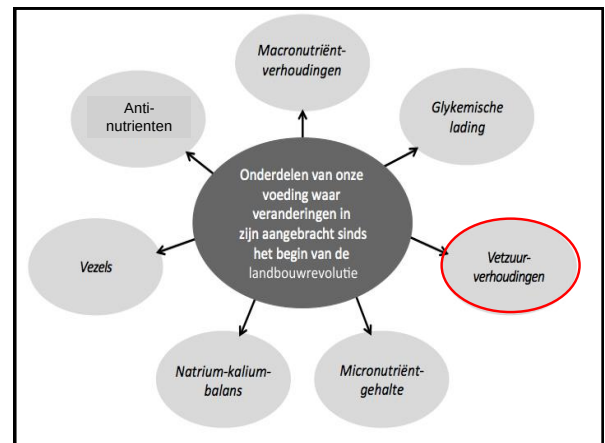
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Distinct bacterial co-abundance groups (CAGs) define each population.

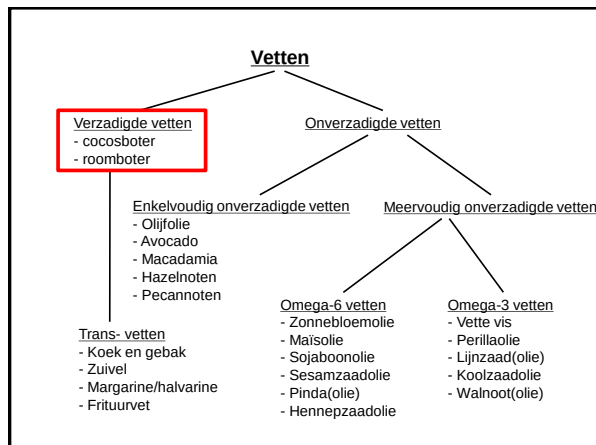


Schnorr et al, nature Communications, 2014

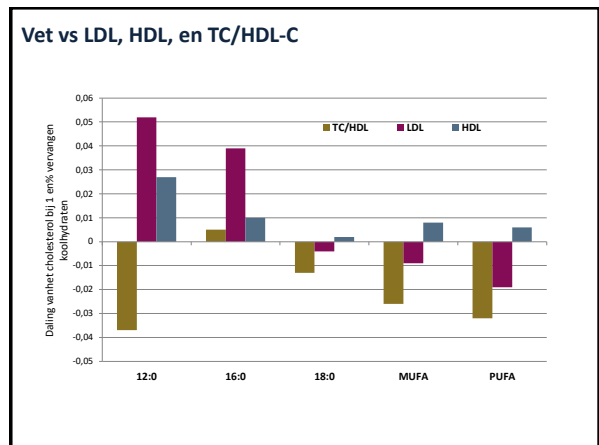
163



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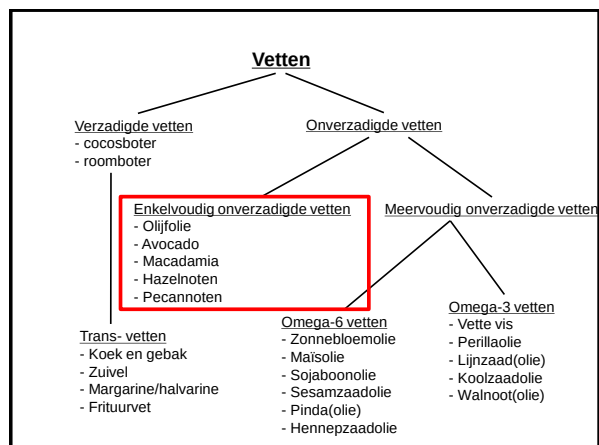
166



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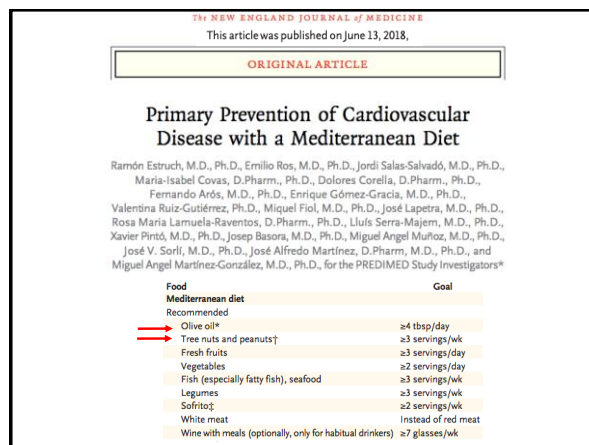
167



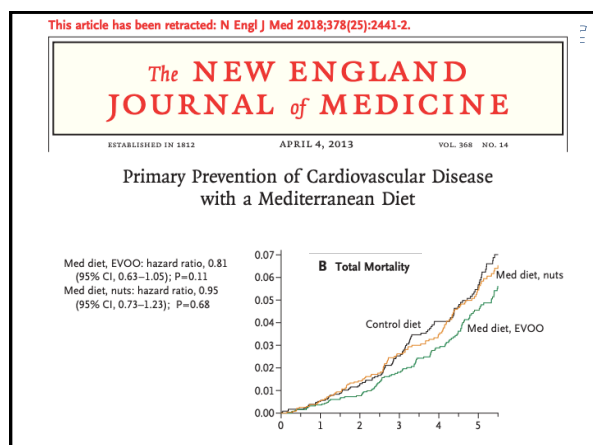
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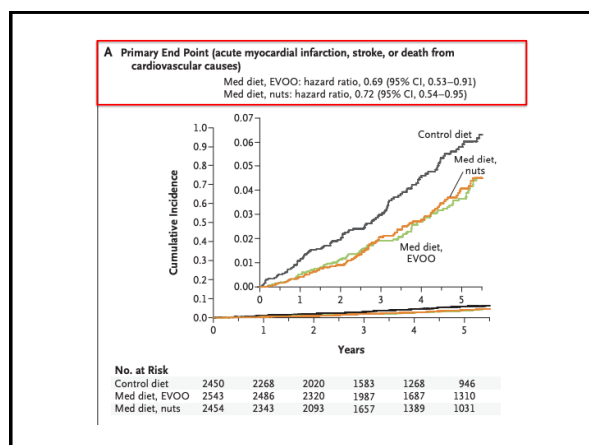
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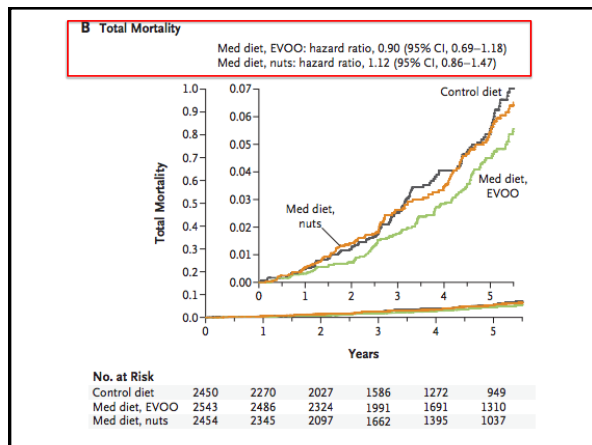
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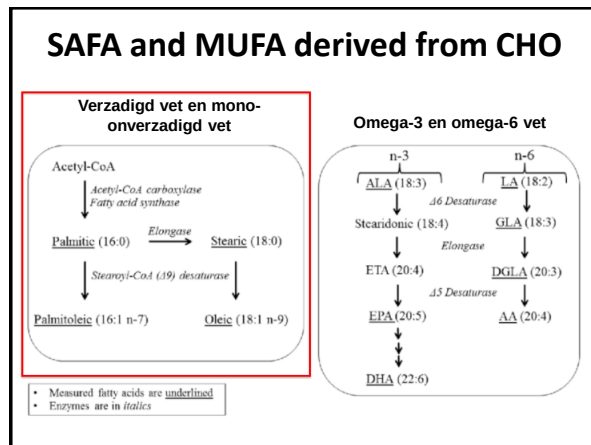
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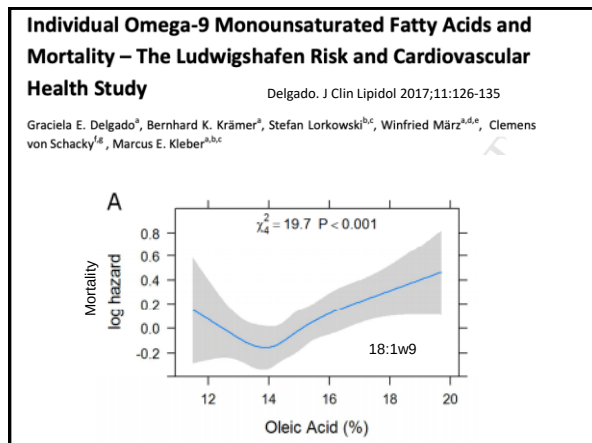
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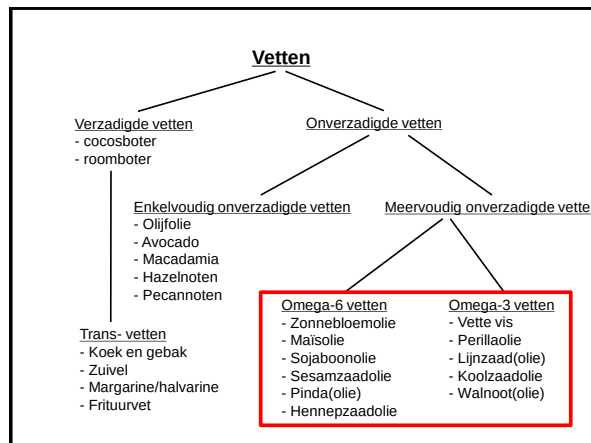
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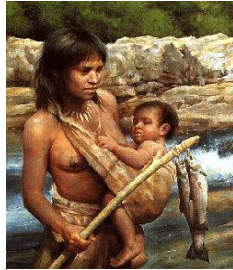
Waar zitten ze in?

Omega-6
vetten



Land-vetten

Omega-3
vetten



Water-vetten

180

En meer van dit

(vooral dit)



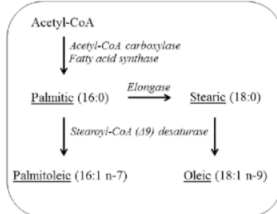
ALA

EPA/DHA

182

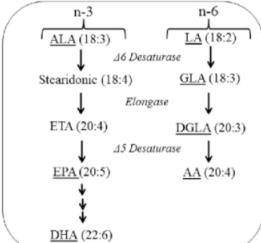
Vetzuur biochemie

Verzadigd vet en mono-onverzadigd vet

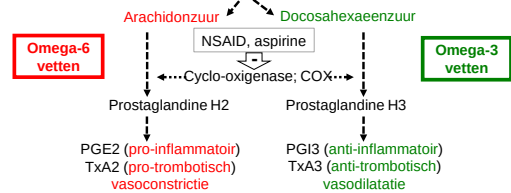


- Measured fatty acids are underlined
- Enzymes are in *italics*

Omega-3 en omega-6 vet



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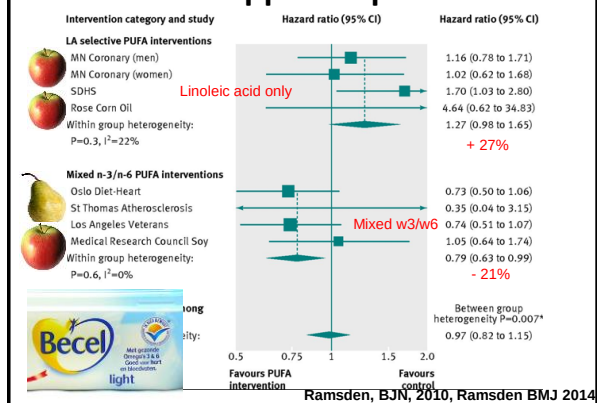
Advies American Heart Association

- "The consumption of at least 5-10% of energy from omega-6 PUFA reduces the risk of CHD
- Advice is based on:
 - Studies that consist of trials in which SAFA were replaced by PUFA (almost entirely omega-6*)
 - *: PUFA also consisted of omega-3 fatty acids from omega-3 oils and fish/cod liver oil

(Circulation. 2009;119:902-907.)

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Liever appels of peren?

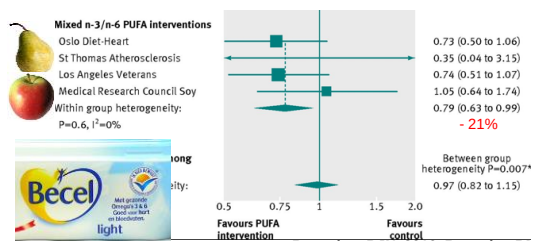


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Advies AHA

Intervention category and study Hazard ratio (95% CI) Hazard ratio (95% CI)

- Advice is based on:
 - Studies that consist of trials in which SAFA were replaced by PUFA (almost entirely omega-6*)
 - *: PUFA also consisted of omega-3 fatty acids from omega-3 oils and fish/cod liver oil



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The NEW ENGLAND JOURNAL of MEDICINE

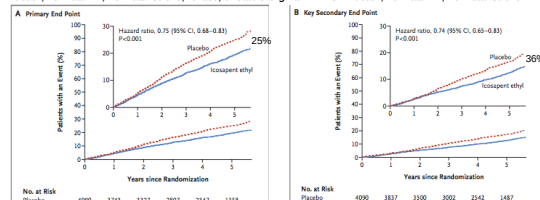
ESTABLISHED IN 1812 JANUARY 3, 2019 VOL. 380 NO. 1

Cardiovascular Risk Reduction with Icosapent Ethyl for Hypertriglyceridemia

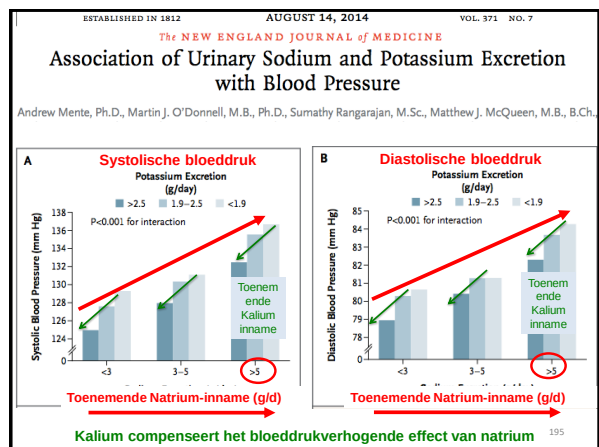
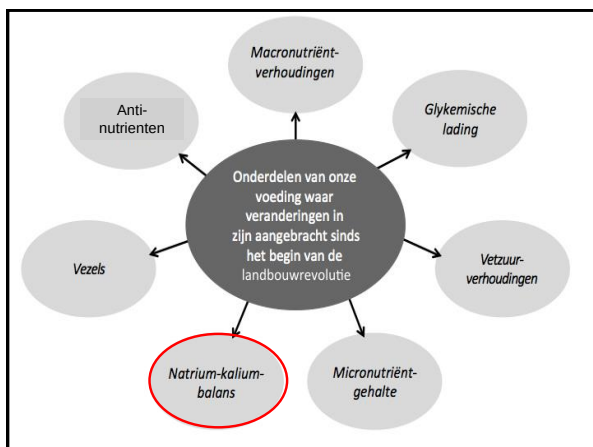
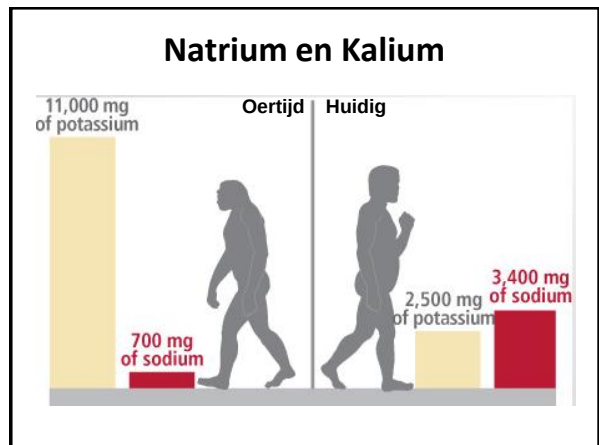
Deepak L. Bhatt, M.D., M.P.H., P. Gabriel Steg, M.D., Michael Miller, M.D., Elliot A. Brinton, M.D., Terry A. Jacobson, M.D., Steven B. Ketchum, Ph.D., Ralph T. Doyle, Jr., B.A., Rebecca A. Juliano, Ph.D., Lixia Jiao, Ph.D., Craig Grannowitz, M.D., Ph.D., Jean-Claude Tardif, M.D., and Christie M. Ballantyne, M.D., for the REDUCE-IT Investigators*

CVD-death; non-fatal MI; non-fatal stroke; revasc; unstable angina

CVD-death; non-fatal MI; non-fatal stroke



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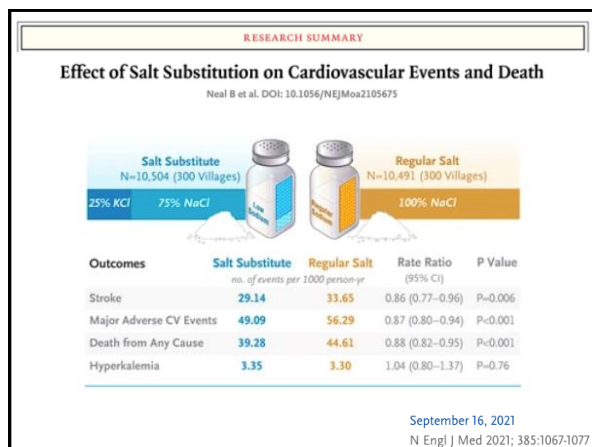
196

Zout – minder, minder, minder?

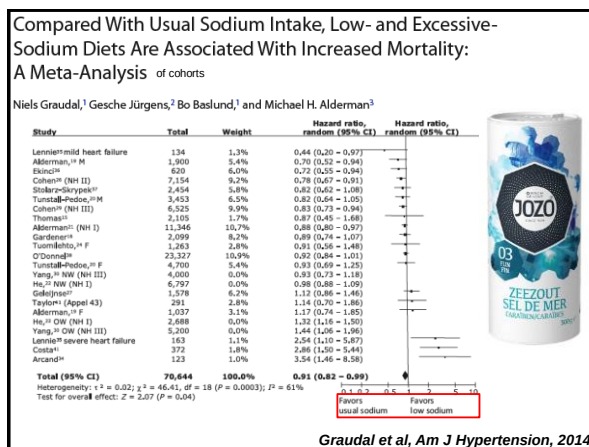
Table 1. Guideline recommendations for sodium restriction in the general population.

Year, Name of Guideline	Sodium Restriction
2010, Dietary Guidelines for Americans [4]	<2.3 g/d in all adults <1.5 g/d in adults aged more than 50 years who are African American or with hypertension, diabetes, or chronic kidney disease
2013, World Health Organization [5]	<2 g/d in all adults
2020, American Heart Association [6]	<1.5 g/d in all adults
2010, Heart Failure Society of America [1]	2–3 g/d in all heart failure patients <2 g/d in patients with moderate to severe heart failure
2019, American Diabetic Association [7]	<2.3 g/d in patients with diabetes <1.5 g/d in patients with diabetes and hypertension
2016, European Society of Cardiology [8]	<5 g/d in all adults
2017, Canadian Cardiovascular Society [9]	<2 g/d in all adults
2015–2020 Dietary Guidelines for Americans [10]	2.3 g/d in all adults
2012, The Kidney disease: Improving Global Outcomes (KDIGO) [11]	<2 g/d in all patients with chronic disease not on dialysis

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Compared With Usual Sodium Intake, Low- and Excessive-Sodium Diets Are Associated With Increased Mortality:

A Meta-Analysis of cohorts

Niels Graudal,¹ Gesche Jürgens,² Bo Baslund,¹ and Michael H. Alderman³

Study	Total	Weight	Hazard Ratio (95% CI)	Hazard Ratio (95% CI)
Yang, ²⁰ NW	2,667	0.0%	0.86 (0.51 – 1.45)	
Cohen ²¹ (NH III)	6,525	15.5%	0.94 (0.79 – 1.12)	
Tunstall-Pedoe, ²⁰ M	4,604	12.7%	0.96 (0.77 – 1.20)	
Tuomilehto, ²⁴ M, NW	659	7.9%	0.98 (0.70 – 1.37)	
Stolarz-Skrzypek ¹⁷	2,454	6.5%	1.13 (0.77 – 1.66)	
Tunstall-Pedoe, ²⁰ F	3,525	7.3%	1.14 (0.80 – 1.62)	
O'Donnell ¹⁸	25,408	21.5%	1.20 (1.11 – 1.30)	
Gardener ¹⁶	2,337	10.0%	1.32 (1.00 – 1.74)	
Thomas ¹⁵ →	2,105	7.5%	1.43 (1.01 – 2.02)	
Tuomilehto, ²⁴ M, OW	514	11.0%	1.56 (1.21 – 2.01)	
Yang, ²⁰ OW	3,467	0.0%	2.07 (1.35 – 3.17)	
Total (95% CI)	48131	100.0%	1.16 (1.03 – 1.30)	

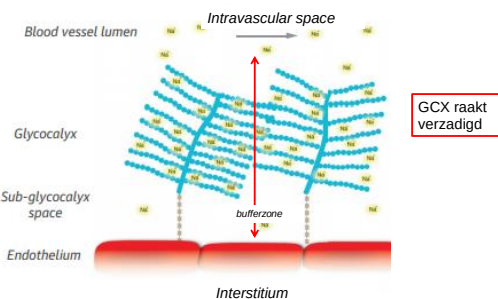
Heterogeneity: $\tau^2 = 0.01$; $\chi^2 = 17.61$, $df = 8$ ($P = 0.02$); $I^2 = 55\%$
Test for overall effect: $Z = 2.46$ ($P = 0.01$)

Our study extends the IOM report by identifying a specific range of sodium intake (2,645–4,945 mg) associated with the most favorable health outcomes, within which variation in sodium intake is not associated with variation in mortality.

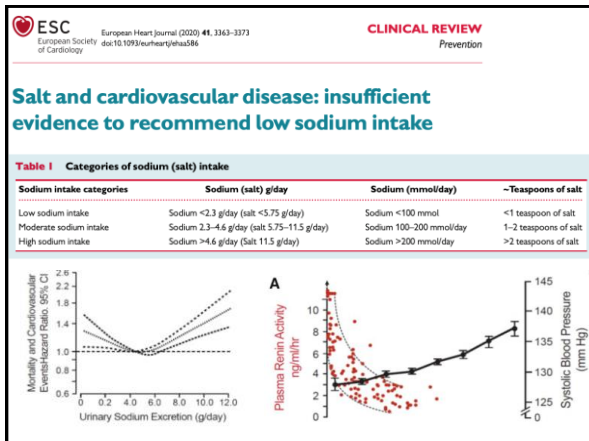
Graudal et al, Am J Hypertension, 2014

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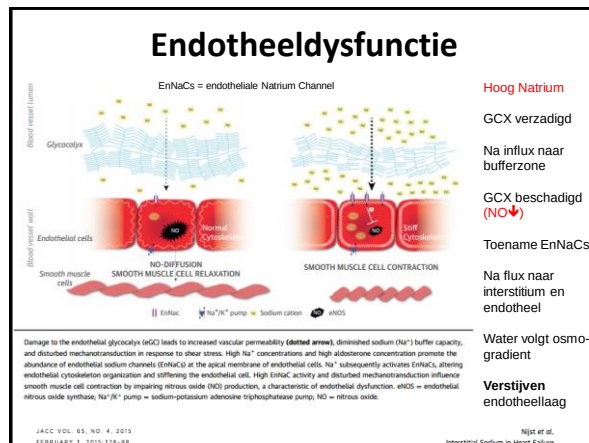
The too much salt (Na) scenario



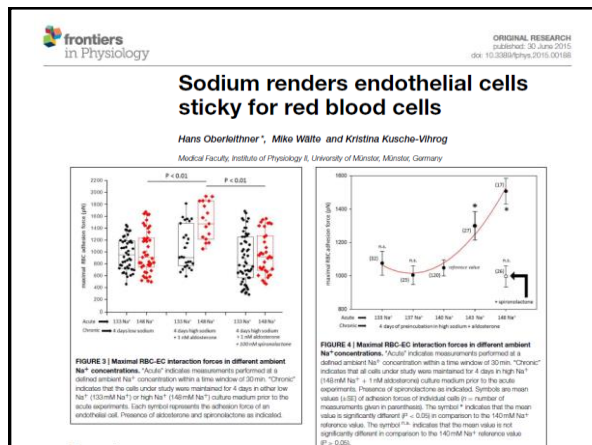
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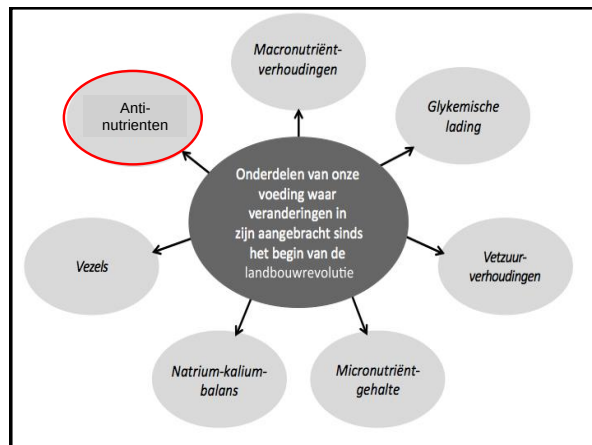
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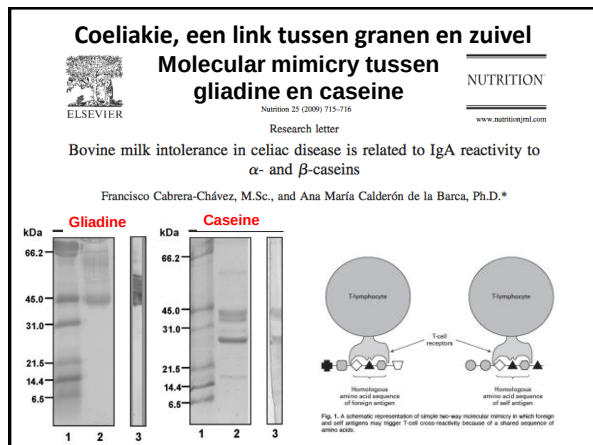
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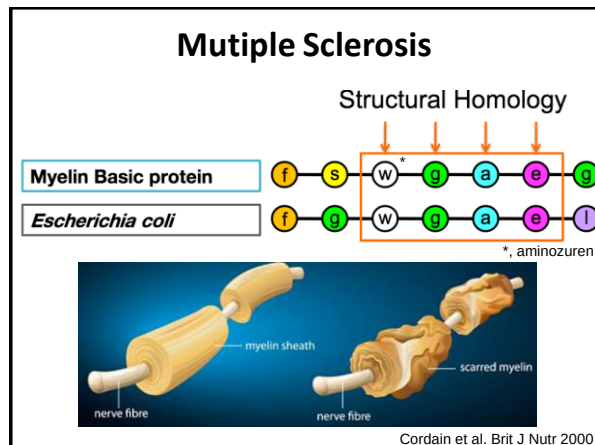
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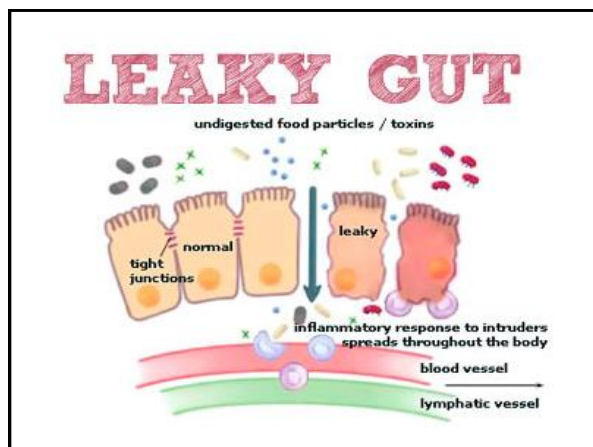
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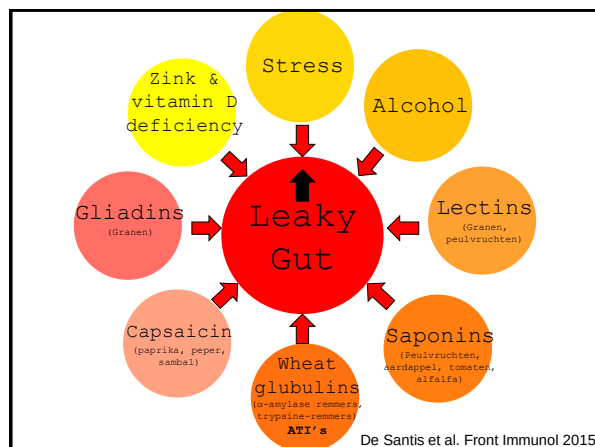
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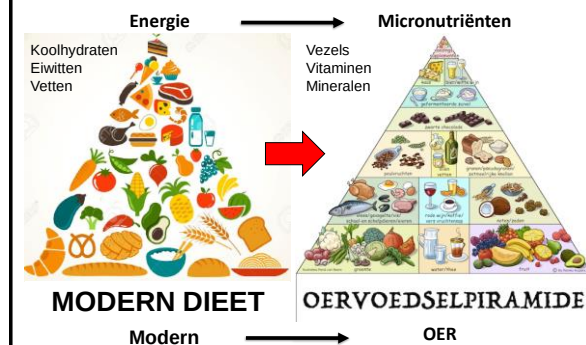
Barrierefunctie related disease

Disease	Reference
Ankylosing spondylitis	Valle JH et al. J Rheumatol 1999;26:128-35
Autoimmune gastritis	Greenwood DL et al. Eur J Pediatr 2008;167:917-25
Autoimmune hepatitis	Terjung B. Clin Rev Allergy Immunol 2009;36:40-51
Behcet's syndrome	Fresko I et al. Ann Rheum Dis 2001;50:65-6
Celiac disease	Schulzke JD et al. Pediatric Res 1998;43:435-41
Crohn's disease	Caradonna L et al. J Endotoxin Res 2000;6:205-14
Dermatitis herpetiformis	Kieffer M et al. Br J Dermatol 1983;108:673-8
Diabetes type 1	Sapone A et al. Diabetes 2006;55:1443-49
Hashimoto Thyroiditis	Sasso FC et al. Gut 2004;53:1678-80
Juvenil Arthritis	Picco P et al. Clin Exp Rheumatol 2000;18:773-8
Lupus	Apperloo HZ et al. Epidemiol Infect 1994;112:367-73
Multiple Sclerosis	Yacyshyn B et al. Dig Dis Sci 1996;41:2493-98
Psoriasis	Hamilton et al. Q J Med 1985;56:559-67
Rheumatoid Arthritis	Smith MD et al. J Rheumatol 1985;12:299-305
Ulcerative Colitis	Caradonna L et al. J Endotoxin Res 2000;6:205-14
Uveitis	Benitez JM et al. Eye 2000 14(pt 3A):340-3

Reference: presentation Pedro Bastos, Grosetto, november 2014

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Terug naar ons blauwdrukdieet



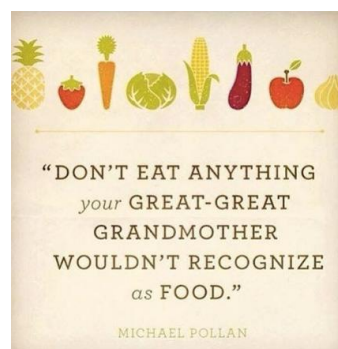
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Take home message No. 12:

Matig(er) met granen en zuivel

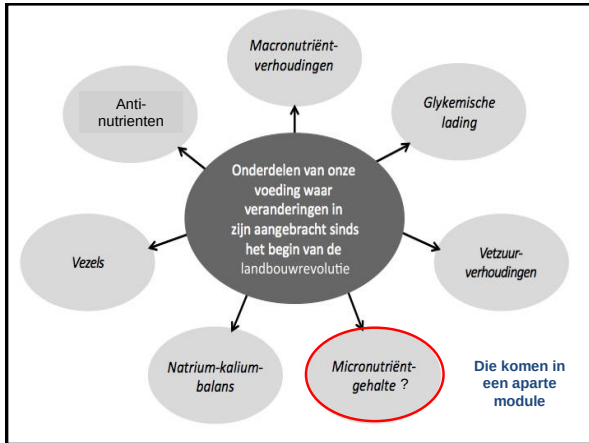


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Het lijkt
zooooo
simpel, maar
waarom
'werkt het
dan niet'

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Dank voor uw aandacht

Oerdieet €25 En wie meer wil weten: Oergezond €20

OER DIEET
DE MANIER OM OERGEZOND OUD TE WORDEN

OER GEZOND
WORD EN BLIJF GEZOND MET DE OERLEEFSTIJL

Beide boeken voor €40

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