

Evolutionair Denken
wat is het & wat kun je er mee?

13 april 2022

Dr. Remko S. Kuipers (MD PharmD PhD)
apotheker en cardioloog gezondheidszorg adviseur /voorzitter

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Programma

- 10.45-11.45 Evolutionair Denken (1)
- 11.45-12.30 Evolutionair Denken (2)
- 12.30-13.15 Lunch
- 13.15-14.00 Oefenen met evolutionair denken
- 14.00-14.45 Lage graad ontsteking en oer-leefstijl
- 14.45-15.00 Pauze
- 15.00-16.00 Micronutriënten en hun invloeden
- 16.00-16.15 Pauze
- 16.15-16.45 Macronutriënten en hun invloeden

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Disclosure belangen spreker

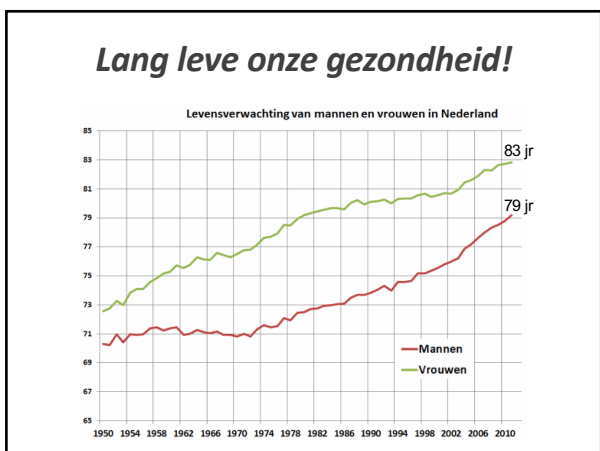
(potentiële) belangenverstrengeling	Zie hieronder
Voor bijeenkomst mogelijk relevante relaties met bedrijven	<i>Speakers honoraria from:</i> ABN-Amro, Academy of Integrative Medicine, Bonusan, Care by Nature, Folia Orthica, Health Benefits 08, Hogeschool NHLStenden, Hormoonfactor, Hormooncommunity, ING, Nationale Nederlanden, Nutriphyt, Facebook, Natura Foundation, Otro Elements, Pro-Osteo, SCEM (Seinen Congres & Events Management), Stichting Education Atrium Innovations
Honorarium of andere (financiële) vergoeding	
<ul style="list-style-type: none"> • Sponsoring of onderzoeksgeld • Aandeelhouder 	-Friesland-Campina - Eigenaar www.remkokuipers.com - Auteur: <i>Oerdieet</i> - Auteur: <i>Oergezond</i>
<ul style="list-style-type: none"> • Andere relatie, namelijk ... 	Supporter and practitioner of a healthy lifestyle

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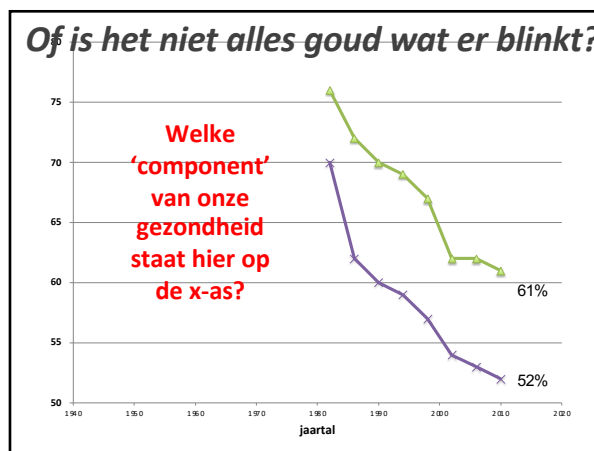
Evolutionair Denken

Introductie

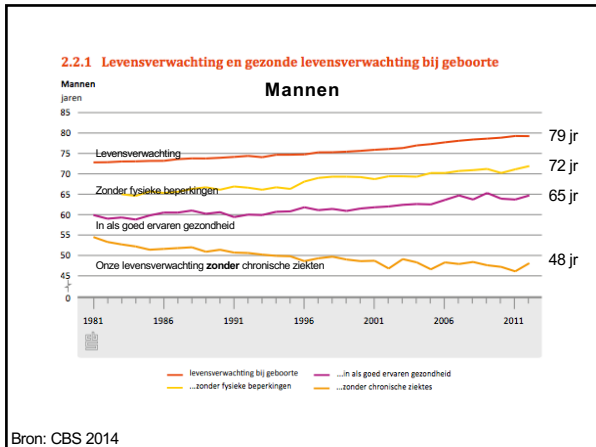
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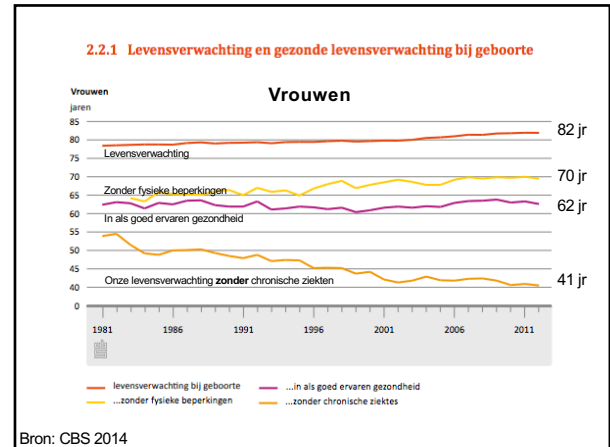
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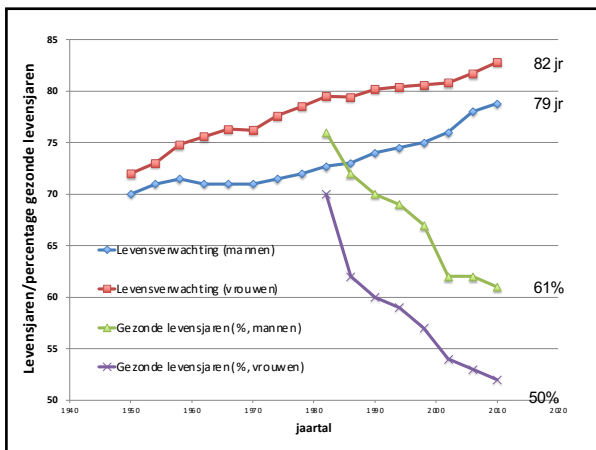
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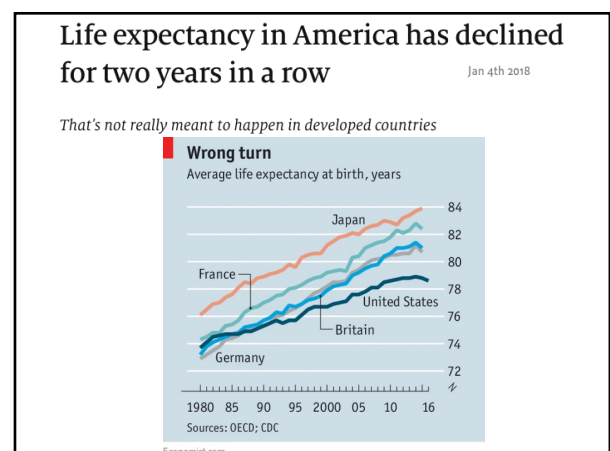
Take home message No. 1:

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

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**We worden steeds ouder?
 Are you sure?**

11



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Take home message No. 2:

We **werden steeds ouder**
en worden nog immer
steeds **jonger ziek**:
dubbel zo lang chronisch ziek

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Hoe kan dit nou?

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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 2-4 years, by region

Region	Sex	1980	(% obese)	2015
Sub-Saharan Africa	Female	3.7 (3.1-4.4)		5.4 (4.5-6.5)
	Male	4.3 (3.4-5.3)		5.8 (4.7-7.1)
South Asia	Female	2.8 (1.5-4.9)		4.0 (2.1-7.1)
	Male	2.4 (1.3-4.2)		4.5 (2.3-8.1)
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	5.0 (3.2-8.0)		9.8 (6.4-14.1)
Middle East and North Africa	Female	4.3 (3.7-5.1)		9.2 (7.6-10.9)
	Male	3.5 (2.9-4.3)		8.8 (7.3-10.7)
Central and Eastern Europe and Central Asia	Female	9.0 (7.3-11.1)		9.3 (7.3-11.3)
	Male	11.5 (9.4-14.1)		12.6 (10.4-15.0)

Di Cesare et al. BMC Medicine. 2109

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The problem continues at school(?)

Percentage of 5-19 year old Obese

Fig. 10 Comparison of obesity prevalence in girls and boys aged 5-19 years in 1975 and 2016. Estimates of obesity in (a) 1975 and (b) 2016 were published by the Non-Communicable Diseases Risk Factor Collaboration (NCD-RisC) using the World Health Organization growth reference [47] (see Table 1).

Di Cesare et al. BMC Medicine. 2109

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Test je zelf – kennis...

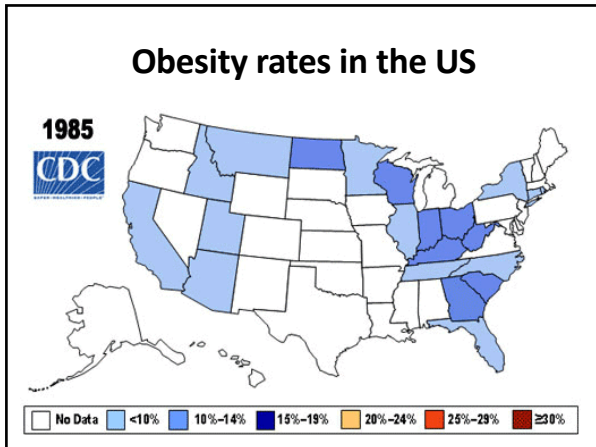
Vanaf welk nummer hebben bovenstaande vrouwen **overgewicht**?

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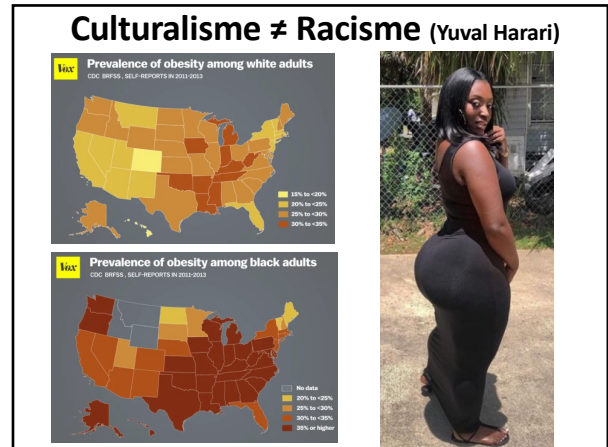
Test je zelf – kennis...

Vanaf welk nummer hebben bovenstaande vrouwen **overgewicht**?

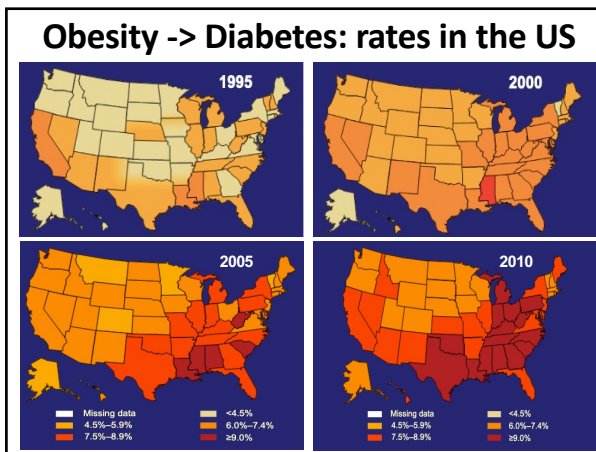
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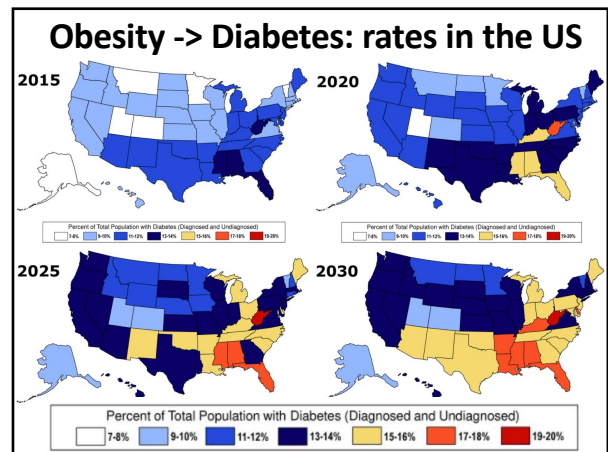
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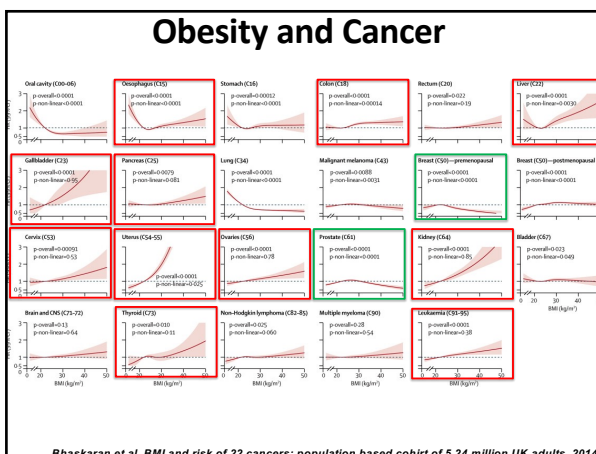
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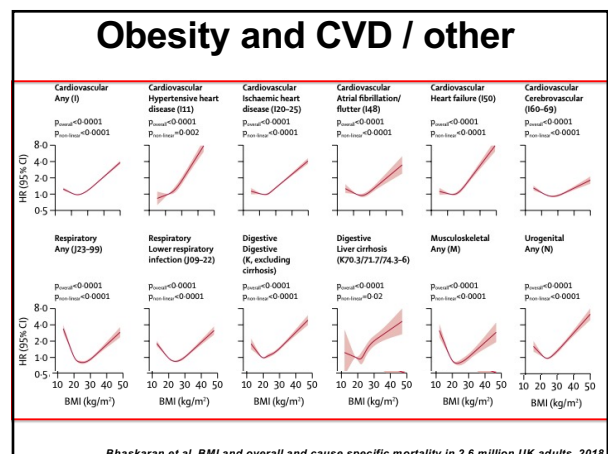
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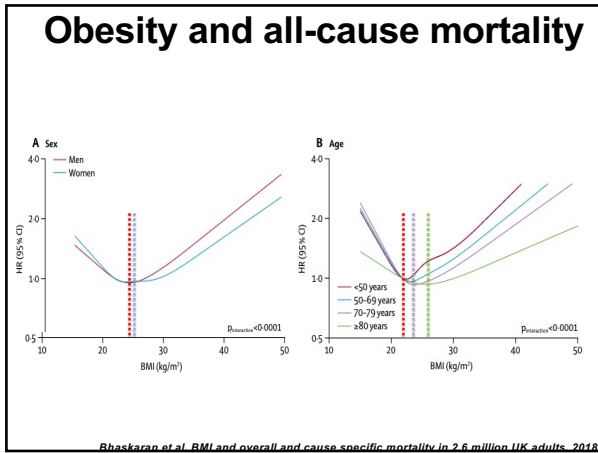
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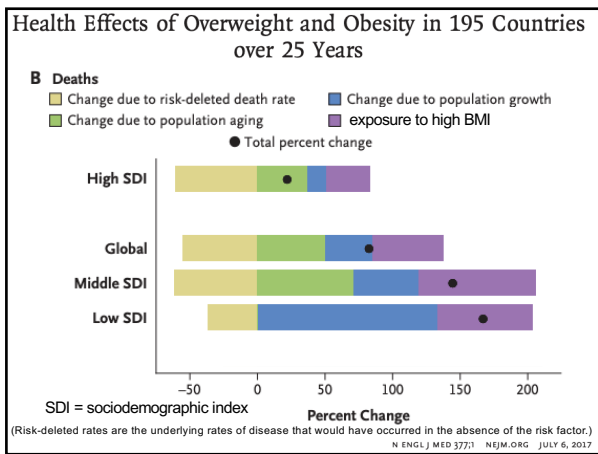


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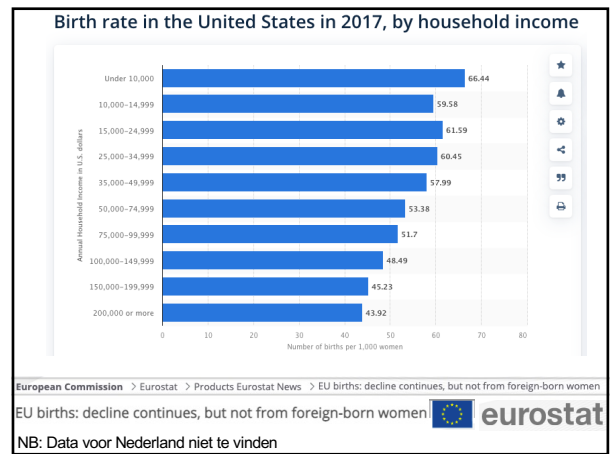
Take home message No. 3:

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

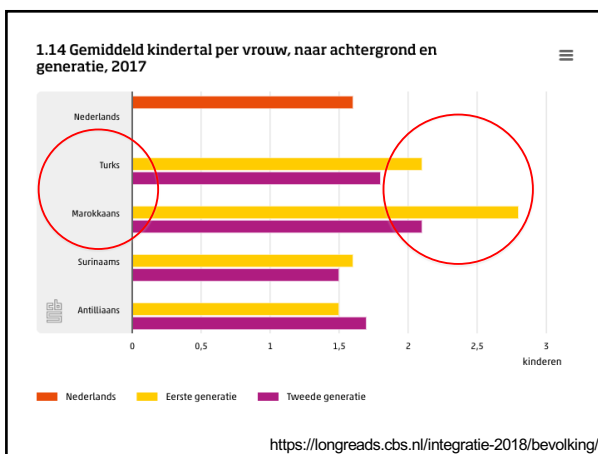
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Take home message No. 4:

Oorzaken obesitas pandemie:

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

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The REAL world we live in...

- En hoe bereik je als H-SEC de L-SEC???

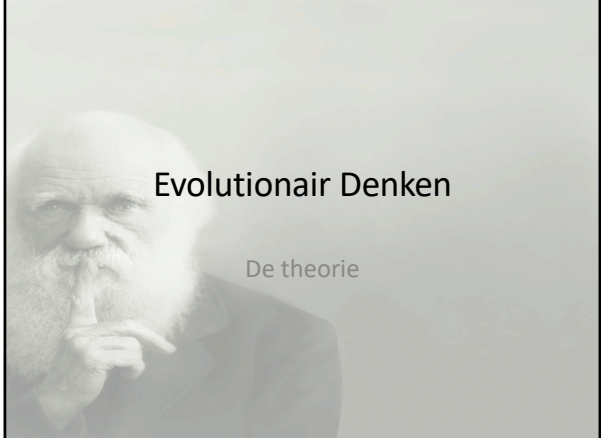


Survival of the fittest = not strongest / smartest ... but: most reproductive

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Evolutionair Denken

De theorie



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Wat ging en gaat er mis?



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De huidige generatie artsen heeft niet geleerd om *evolutionair* te denken!

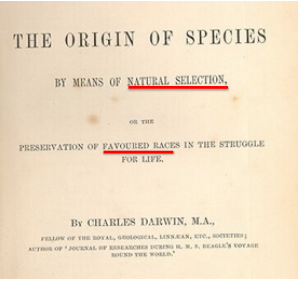




En dit niet?

Waarom is dit grappig?

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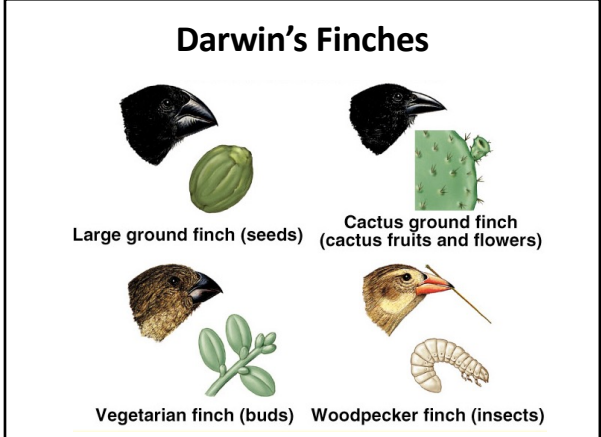
Charles Darwin: Survival of the Fittest

Herbert Spencer

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Darwin's Finches



Large ground finch (seeds)

Cactus ground finch (cactus fruits and flowers)

Vegetarian finch (buds)

Woodpecker finch (insects)

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(Un)natural selection - veredeling

A selection of fancy pigeon breeds that Darwin studied

Brassica oleracea

Selection for terminal buds
Cabbage

Selection for lateral buds
Brussels sprouts

Selection for stem
Kohlrabi

Selection for leaves
Kale

Selection for stems and flowers
Broccoli

Selection for flower clusters
Cauliflower

wolf

bulldog collie dachshund

Teosinte

Intermediates

Modern corn

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Sexual Selection

<https://www.youtube.com/watch?v=YTR21os8gTA>

https://www.youtube.com/watch?v=el_quJRRGxk

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Charles Darwin: Survival of the Fittest

THE ORIGIN OF SPECIES
BY MEANS OF NATURAL SELECTION,
OR THE
PRESERVATION OF FAVOURED RACES IN THE STRUGGLE
FOR LIFE.
By CHARLES DARWIN, M.A.,
FELLOW OF THE ROYAL GEOLOGICAL SURVEY, ETC., SOCIETIES;
AUTHOR OF "JOURNAL OF RESEARCHES INTO THE HISTORY AND GEOGRAPHY OF THE MANICOUSSI MOUNTAINS"

Law 1. Conditions of existence
Law 2. Natural selection

Herbert Spencer

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Opdrachten Evolutionair denken

Het dierenrijk

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

De mens

- Bipedalisme
- Witte huidskleur
- Menopauze

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Evolution has no way back

<https://www.youtube.com/watch?v=cO1a1Ek-HD0>

Vertebrate

Octopus

1. Retina
2. Zenuwuiteinden
3. Nervus opticus
4. Blinde vlek

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Bipedalism & Body hair

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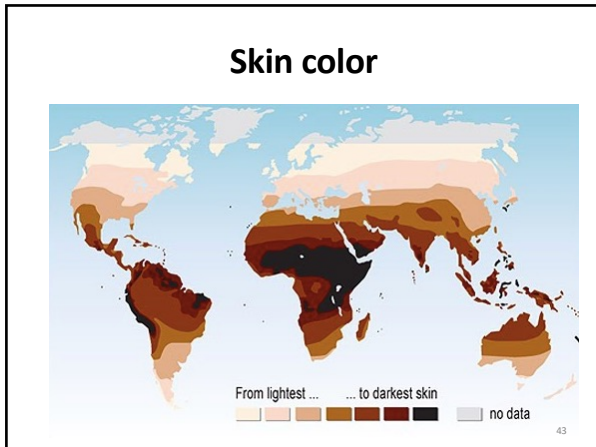
Chimpanzee

- Skull attaches posteriorly
- Spine slightly curved
- Arms longer than legs and also used for walking
- Long, narrow pelvis
- Femur angled out

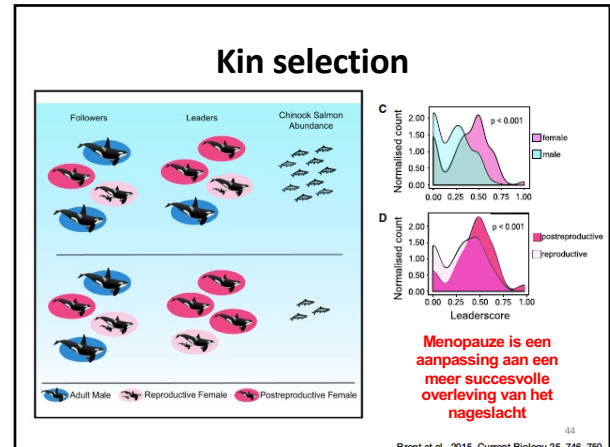
Australopithecine

- Skull attaches inferiorly
- Spine S-shaped
- Arms shorter than legs and not used for walking
- Bowl-shaped pelvis
- Femur angled in

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Theodosius Dobshansky

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

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Evolutionary Medicine

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

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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

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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

Why We Get Sick

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

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Voorbeeld 1: Koorts

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

Oorzaak?

↓

Gevolg

↓

Oplossing

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Gezondheidszorg 1.0 versus 2.0

Evolutionaire benadering
 ↓
 Oorzaak

↓

'Proximale benadering'
 ↓
 Gevolg

↓

Oplossing

Waarom? Hoe?

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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 Scarin², Camila Menezes Souza Pessoa², Leonardo Lima Rocha² *emsten*. 2014;12(4):518-23

Study or subgroup	Antipyresis Events	Antipyresis Total	No antipyresis Events	No antipyresis Total	Weight	M-H, Random, 95% CI	Risk ratio
Gozzoli V, 2001	2	18	3	20	23.6%	0.70 [0.14, 3.94]	2001
Schilman CI, 2005	7	44	1	38	17.9%	6.06 [0.78, 46.86]	2005
Schongem F, 2012	35	101	43	99	58.5%	0.89 [0.56, 1.13]	2012
Total (95% CI)	44	163	47	157	100.0%	1.13 [0.46, 3.15]	
Total events	44		47				
Heterogeneity: Tau ² = 0.44; I ² = 3.90, df = 2 (P=0.14); P = 49%							
Test for overall effect: Z = 0.23 (P=0.82)							

95% CI, 95% of confidence interval.
 Figure 2. Meta-analysis of overall survival for antipyresis or no antipyresis in critically ill patients

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

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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 Scarin², Camila Menezes Souza Pessoa², Leonardo Lima Rocha² *emsten*. 2014;12(4):518-23

Study or subgroup	Antipyresis Mean	Antipyresis SD	Antipyresis Total	No antipyresis Mean	No antipyresis SD	No antipyresis Total	Weight	Std. mean difference IV, Random, 95% CI	Std. mean difference IV, Random, 95% CI
1.&1 ICU length of stay									
Gozzoli V, 2001	11	13	18	9	10	20	6.9%	0.17 [-0.47, 0.81]	2001
Schilman CI, 2005	22	39	44	20	14	38	14.7%	0.08 [-0.35, 0.51]	2005
Schongem F, 2012	17	14	101	16	17	99	38.0%	0.06 [-0.25, 0.24]	2012
Subtotal (95% CI)			163			157	57.4%	0.08 [-0.14, 0.30]	
Heterogeneity: Tau ² = 0.00; I ² = 0.06, df = 2 (P=0.81); P = 0%									
Test for overall effect: Z = 0.73 (P=0.47)									
1.&2 Hospital length of stay									
Gozzoli V, 2001	28	22	18	31	24	20	6.9%	-0.10 [-0.76, 0.51]	2001
Schilman CI, 2005	36	49	101	29	31	99	36.9%	-0.22 [-0.56, 0.12]	2005
Schongem F, 2012	119	119	119	119	119	119	42.8%	-0.17 [-0.29, 0.42]	2012
Subtotal (95% CI)			298			298	86.6%	-0.12 [-0.25, 0.02]	
Heterogeneity: Tau ² = 0.00; I ² = 0.07, df = 1 (P=0.53); P = 0%									
Test for overall effect: Z = 1.28 (P=0.20)									
Total (95% CI)			461			457	100.0%	-0.12 [-0.05, 0.28]	
Heterogeneity: Tau ² = 0.00; I ² = 1.31, df = 4 (P=0.88); P = 0%									
Test for overall effect: Z = 1.30 (P=0.17)									
Test for subgroup differences: I ² = 0.25, df = 1 (P=0.62); P = 0%									

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

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Voorbeeld 1: Koorts

Evolutionaire benadering
 ↓
 Oorzaak

↓

'Waarom' gebeurt het?
 ↓
 Gevolg

↓

Evolutionaire benadering
 ↓
 Oplossing = koorts!

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Voorbeeld 2. Kinderreuma

Beta-hemolytische streptococ

Major manifestations: Chorea, Carditis, Erythema marginatum, Polyarthritits, Abdominal pain

Minor manifestations and later findings: Fever, History of recent sore throat, Subcutaneous nodules

Streptococcal pharyngitis → Activation of T cells by streptococcal antigen → Synthesis of antistreptococcal antibodies by B cells → Vegetation → Mitral leaflet Inflammation → Short, thickened chordae tendineae

① Endocarditis: Fibrinoid material, Giant cell

② Myocarditis: Lymphocyte

③ Fibrinous pericarditis

Collateral damage van het ijerige immuunsysteem

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Voorbeeld 3: IJzergebreksanemie

Daily Diet contains 10-20 mg iron

Absorb 1-2 mg iron/day

TRANSFERRIN (transports iron)

Lose 1-2 mg iron/day from desquamation of epithelia

75% → Hemoglobin/ Erythropoiesis

10-20% → FERRITIN (stores iron in liver & heart)

5-15% → Other Processes

No Physiologic Excretion Mechanism

- Een 65 jarige vrouw komt na vakantie in Afrika na bezoek aan de huisarts met een recept voor ferrofumaraat.
- Ze heeft
 - 1. koorts
 - 2. bloedarmoede
 - laag Hb (5.6),
 - laag MCV (72),
 - hoog ferritine (572).
- Wat doe je?

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Proximate vs Evolutionary

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

Michael O. Egan,^{1,2} Michael Boile van Hensbroek,¹ Ernest Nkhomo,² Crispin Musicha,² Sarah A. White,³ Felice O. ter Kuile,^{3,4} and Kamijie S. Phiri^{1*}

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 ^b	Events, No. (%)	Incidence ^b				
All-cause outpatient sick visits								
All events over 6 mo follow-up	133 (88)	350.0	135 (87)	383.0	0.96 (0.8-1.33)	.76	0.98 (0.7-1.43)	.91
Intervention period (0-3 mo)	63 (27)	275.4	47 (28)	206.6	1.36 (0.85-2.19)	.22	1.48 (0.81-2.68)	.20
Postintervention period (3-6 mo)	70 (31)	323.7	88 (41)	400.1	0.79 (0.50-1.26)	.32	0.83 (0.51-1.35)	.45
All-cause hospital admissions								
All events over 6 mo follow-up	14 (14)	28.6	20 (19)	42.3	0.61 (0.31-1.20)	.15	0.62 (0.27-1.42)	.26
Intervention period (0-3 mo)	8 (8)	31.6	6 (8)	23.8	1.43 (0.6-3.78)	.47	1.56 (0.8-8.09)	.46
Postintervention period (3-6 mo)	6 (6)	24.2	14 (13)	61.9	0.40 (0.16-1.00)	.06	0.26 (0.11-1.14)	.08
Malaria								
All events over 6 mo follow-up	52 (27)	120.2	33 (24)	71.7	1.73 (1.04-2.88)	.03	1.81 (1.04-3.16)	.04
Intervention period (0-3 mo)	20 (10)	78.1	13 (8)	28.0	2.39 (1.09-5.26)	.03	2.49 (1.04-6.03)	.03
Postintervention period (3-6 mo)	32 (22)	140.7	24 (16)	107.9	1.25 (0.8-2.31)	.47	1.44 (0.73-2.84)	.29
Respiratory infections								
All events over 6 mo follow-up	21 (17)	43.3	36 (28)	75.1	0.59 (0.3-1.09)	.09	0.59 (0.29-1.22)	.16
Intervention period (0-3 mo)	14 (12)	56.6	13 (11)	52.8	1.16 (0.6-2.44)	.70	1.42 (0.6-3.60)	.46

Het middel is erger dan de kwaal...

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Voorbeeld 4. Sikkelcelanemie

Genetic inheritance: No sickle cell genes, One sickle cell gene (carrier), One sickle cell gene (carrier), Pair of sickle cell genes (sickle cell disease)

Childhood Survival for SCD

Region	Survival (%)
Africa	10%
Jamaica	84%
USA	94%
UK	99%

Normal Red Blood Cells: compact and flexible, enabling them to squeeze through small capillaries

Sickled Red Blood Cells: stiff and angular, causing them to become stuck in small capillaries

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Correlation between Sickle Cell Allele and Malaria

Sickle cell allele in Africa: 1-5%, 5-10%, 10-20%

Falciparum malaria in Africa

Evolutie is een optelsom van + en -

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Verkeerd leren denken

Geneeskunde snap je pas als je het begrijpt

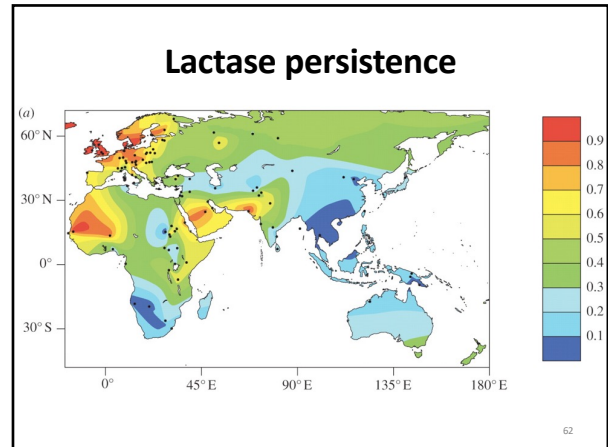
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Opdrachten

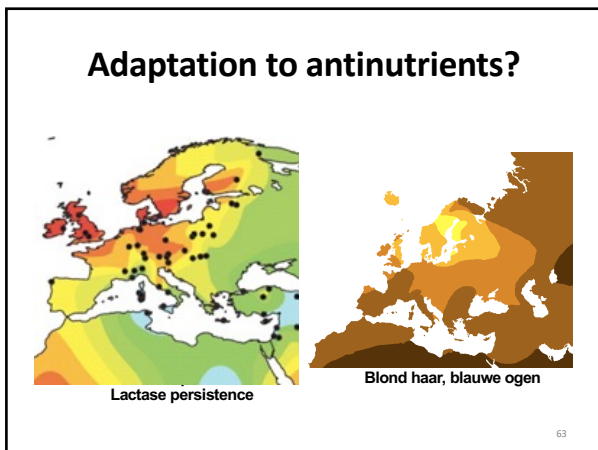
Evolutionair denken

- Lactase persistentie
- Bilirubine
- High amylase copy numbers
- Urinezuur
- Familiaire hypercholesterolaemie

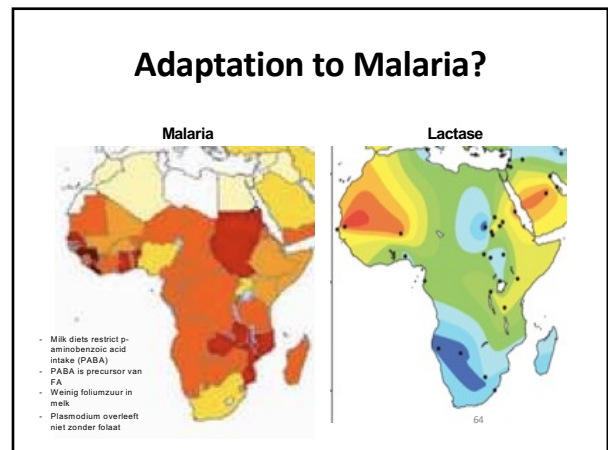
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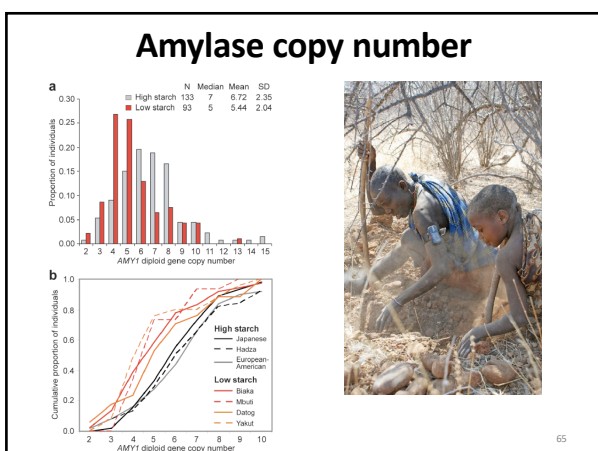
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Lactase & amylase: a bigger picture

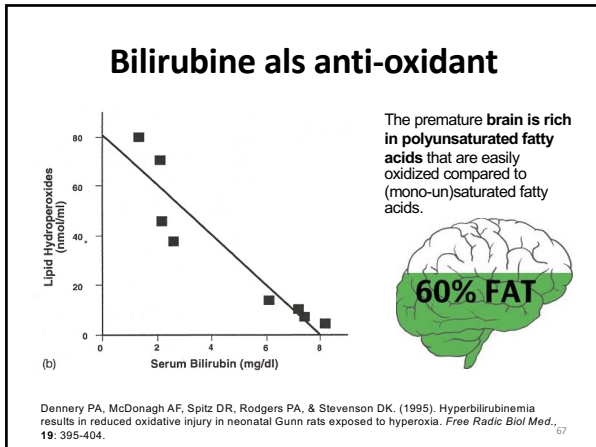
Lactase persistence and augmented salivary alpha-amylase gene copy numbers might have been selected by the combined toxic effects of gluten and (food born) pathogens

Leo Pruimboom^{a,*}, Tom Fox^a, Frits A.J. Muskiet^b

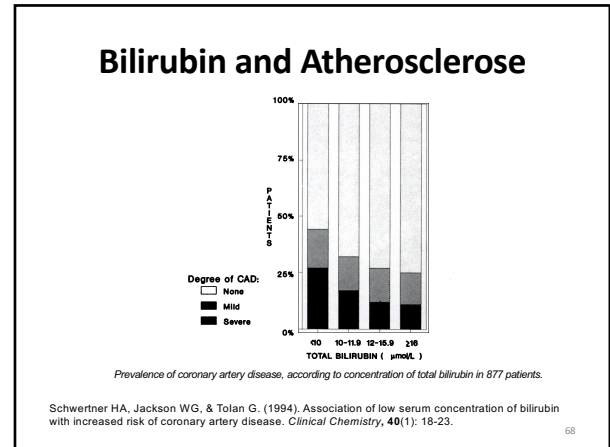
- Gevolgen van lactose intolerantie
 - Diarrhoea
 - Rickets
 - Energy deficiency
 - Calcium deficiency
- Gevolgen van laag amylase copy number
 - Intestinal malaise
 - Energy / water deficiency
 - Gluten / osmotic pressure
 - Diarrhoea
 - Dehydration

66

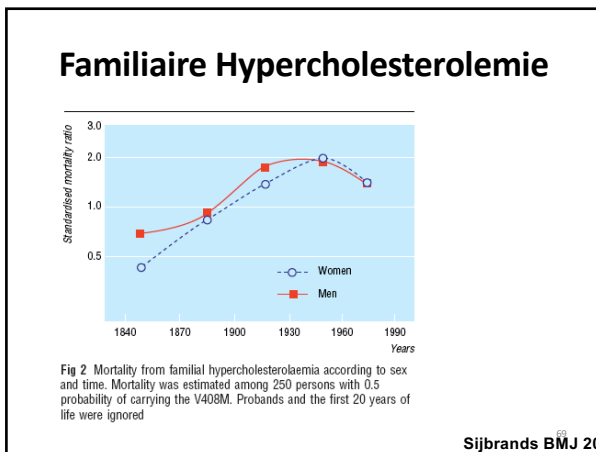
66



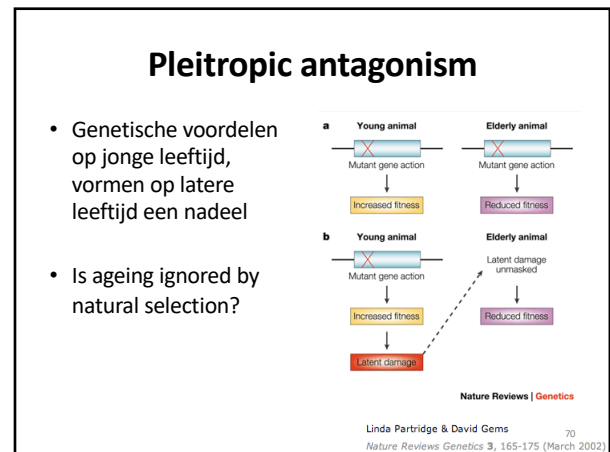
67



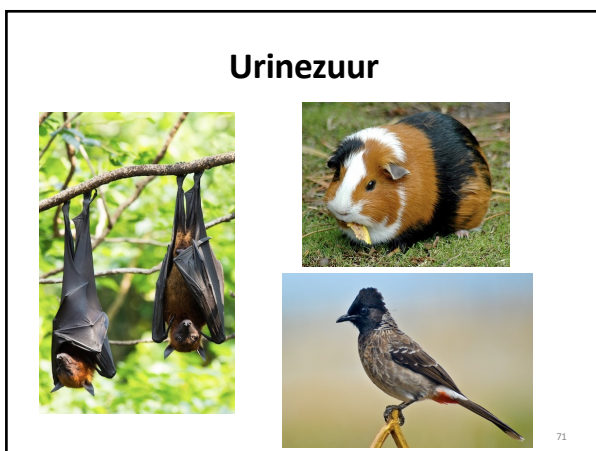
68



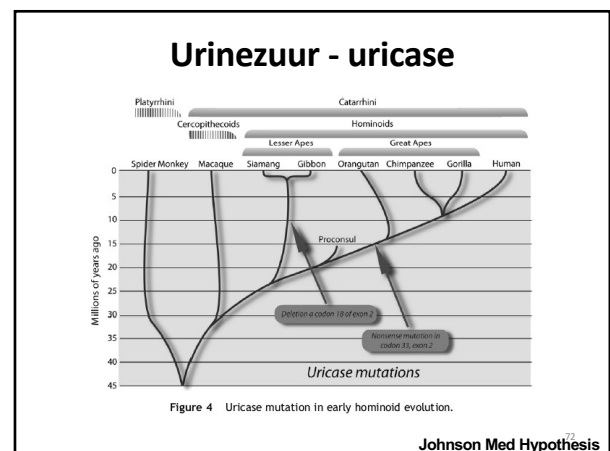
69



70



71



72

Urinezuur Hypothese

The diagram illustrates the metabolic pathway of fructose. Fructose is converted to Fructose-1-phosphato by Fructokinase, a process that consumes ATP and leads to phosphate depletion. Fructose-1-phosphato is then converted to AMP by AMP deaminase. AMP is further processed by 5-Nucleotidase to Adenosine, which is then converted to Inosine by Adenosine deaminase. Inosine is converted to Hypoxanthine by Purine nucleoside phosphorylase. Hypoxanthine is converted to Xanthine by Xanthine oxidase, and finally to Uric acid by another Xanthine oxidase. Uric acid is shown to inhibit Nitric oxide production. The text 'Glycogeen en adipose tissue' is also present, suggesting a link to energy storage.

73

Vitamin C – Uricase -> Bipedalism

The figure consists of two bar charts and an illustration. The first chart shows 'Femoral VC (mmol)' for 'proop' and 'oleo' groups at 'Baseline' and 'Vitamin C' levels. The second chart shows 'Serum uric acid (mg/dl)' for 'Normal' and 'Hypertension' groups at 'Overall' and 'NO-effect' levels. The illustration shows a human and a chimpanzee, with the text 'Blood pressure to the brain' and 'Pleiotropic antagonism'.

Jablonsk J Applied Physiol 2007
Kubawara Hypert Res 2014

74

Urinezuur in Evolutionaire context

Table 2 All-cause mortality risks by sUA levels and by physical activity status

sUA (mg/dL)	n	%	Inactive			Fully active		
			Deaths	HR*	95% CI	Deaths	HR*	95% CI
Male + female								
<4.0	41 222	(8.8)	403	1.08	(0.96 to 1.23)	199	0.88	(0.75 to 1.04)
4.0-4.9	95 910	(20.5)	915	0.99	(0.90 to 1.09)	504	0.84	(0.75 to 0.94)†
5.0-5.9	113 185	(24.2)	1409	1.00	—	827	0.81	(0.74 to 0.89)†
6.0-6.9	97 674	(20.9)	1436	1.09	(1.00 to 1.19)†	854	0.77	(0.70 to 0.85)†
7.0-7.9	65 257	(13.9)	1010	1.11	(1.01 to 1.21)†	606	0.76	(0.68 to 0.84)†
8.0-8.9	33 035	(7.1)	635	1.29	(1.16 to 1.44)†	357	0.81	(0.71 to 0.92)†
9.0-9.9	13 919	(3.0)	351	1.57	(1.38 to 1.79)†	197	1.01	(0.86 to 1.18)
≥10.0	7774	(1.7)	264	1.85	(1.59 to 2.15)†	129	0.95	(0.78 to 1.15)
≥7.0	119 985	(25.6)	2260	1.27	(1.17 to 1.37)†	1289	0.81	(0.75 to 0.89)†

Chen et al. Ann Rheumatic Disease, V 74, iss 11, 2014

75

THE QUARTERLY REVIEW of BIOLOGY

VOLUME 66, No. 1 MARCH 1991

THE DAWN OF DARWINIAN MEDICINE

GEORGE C. WILLIAMS RANDOLPH M. NESSE

- Defense-mechanism
- Trade-offs/Conflicts
- Constraints
- **Mismatch**
- Genetics

Why We Get Sick

Kuipers, Luxwolda, Muskiet. Medisch Contact 2010

76

Evolutionary Mismatch

The image shows a rhinoceros, a dolphin, and a cow, with the text 'En dit niet?' (Not this, right?). Below is a woman sitting at a table with a large amount of fast food, with the text 'Waarom is dit grappig?' (Why is this funny?).

77

Charles Darwin: Survival of the Fittest

THE ORIGIN OF SPECIES BY MEANS OF NATURAL SELECTION, OR THE PRESERVATION OF FAVOURED RACES IN THE STRUGGLE FOR LIFE. BY CHARLES DARWIN, M.A.

Law 1. Conditions of existence
Law 2. Natural selection

Herbert Spencer

78

Evolutionair onweerstaanbaar

the thrifty-gene hypothesis – hongerwinter epigenetics

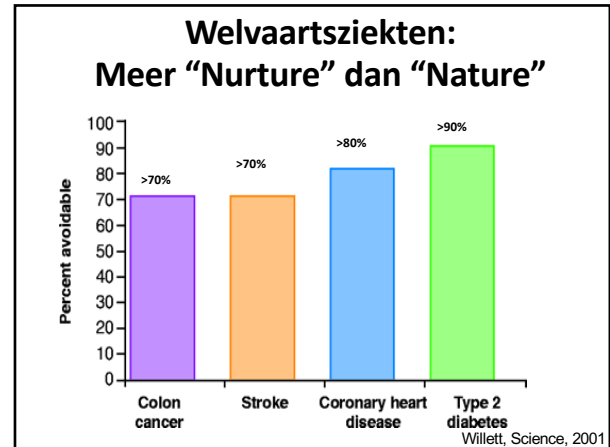
- Zoet ->
- Vet ->
- Zout ->
- Vers ->




KFC
so good™

SUPERSTIMULI

79



80



**“DON'T EAT ANYTHING
your GREAT-GREAT
GRANDMOTHER
WOULDN'T RECOGNIZE
as FOOD.”**

MICHAEL POLLAN

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

81

Welkom in absurdistan

VGZ zet succesproject huisartsen op pauze

Sytse Wilman 11 december 2019, 17:47 9141 keer gelezen

Een succesvolle pilot waarbij Limburgse huisartsen meer tijd aan hun patiënten besteden, mag van zorgverzekeraar VGZ voorlopig niet uitbreiden. De reden? Het aantal patiënten dat naar het Maasziekenhuis Pantein in Boxmeer doorverwezen wordt, neemt af en dat heeft financiële gevolgen.

82

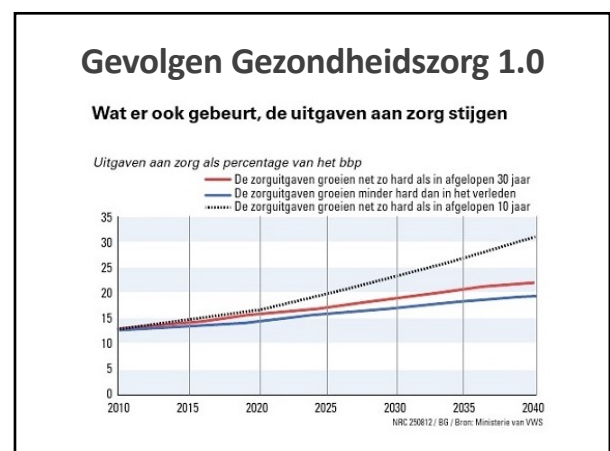
Marktwerving in de zorg...

(wie verdient er niet aan?)



Anthekeer Arts
Big Pharma Politiek

83



84



85

Take home message No. 3:

Gezondheidszorg 2.0
=
preventie
=
jouw eigen
verantwoordelijkheid

86



87

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

88

Maar wat komt het meeste voor?

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

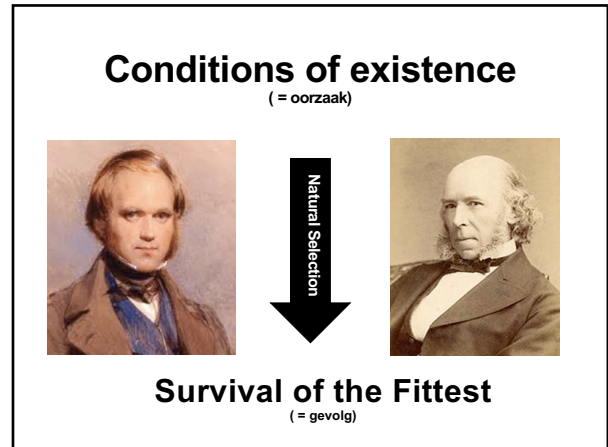
89



90



91

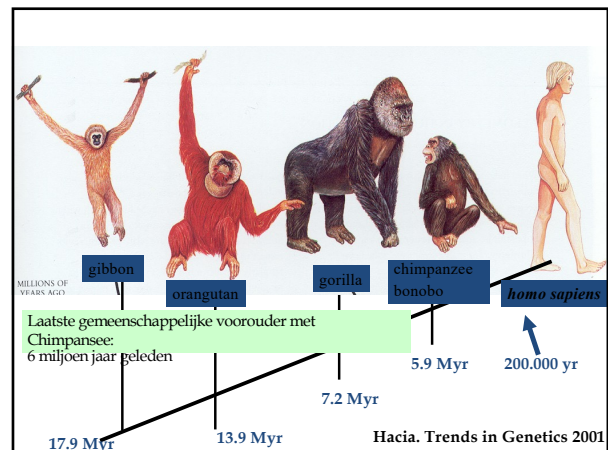


92

Take home message No. 4:

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

93



94

Onze 'Conditions of Existence'

- Laaste gemeenschappelijke voorouder met de chimpansee: 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

95



96



97



98



99



100



101



102



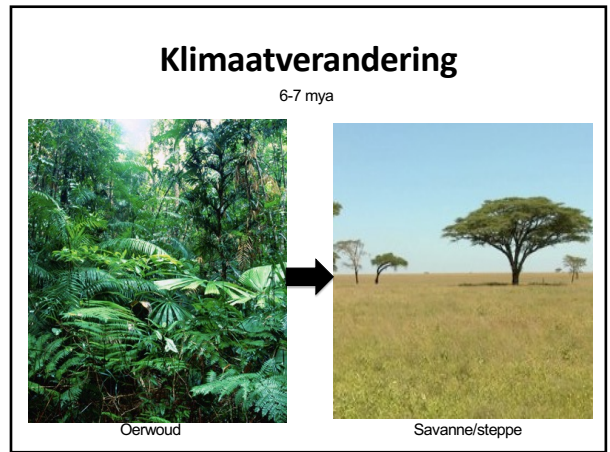
103



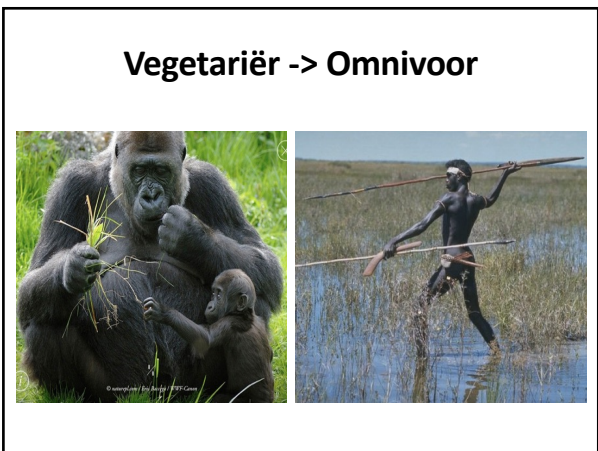
104



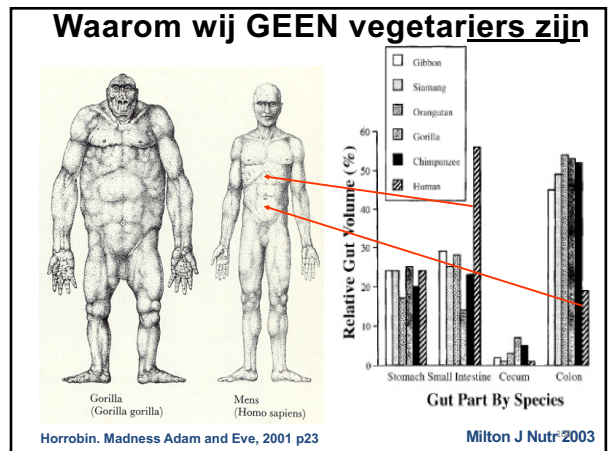
105



106



107



108



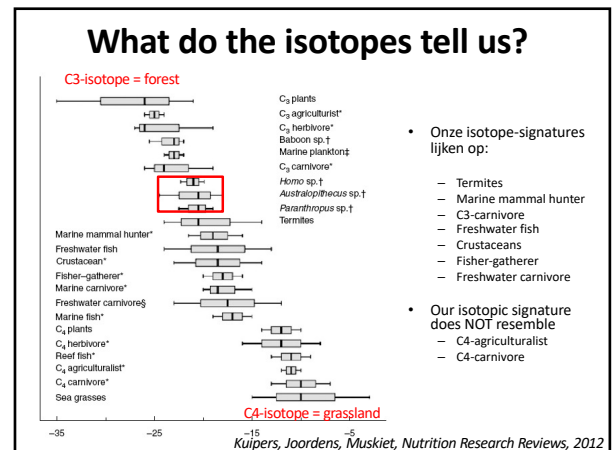
109



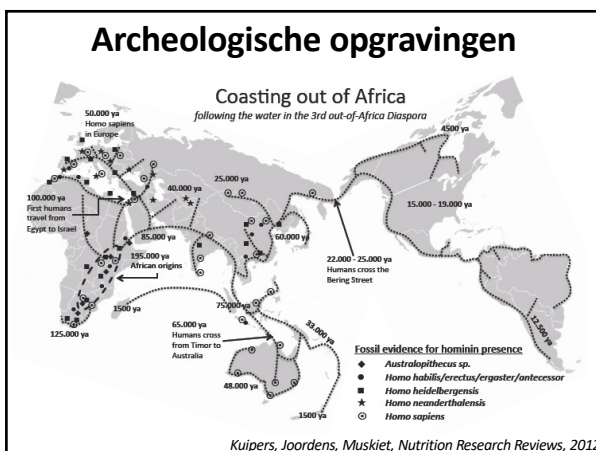
110



111



112



113

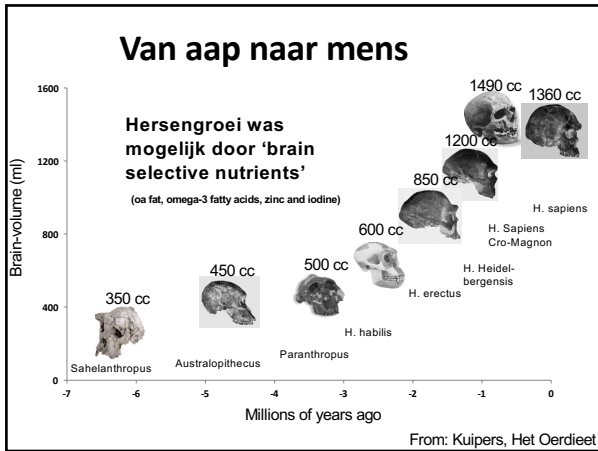
Het water-land ecosysteem:

- Een rijke bron van
 - Jodium
 - Chroom
 - IJzer
 - Zink
 - Vitamine A and D
 - ω3-visvetzuren
 - DHA en EPA

hersensbouwstenen

114

114



115

Deficiencies from different food sources

The adequate daily intake, calculated for those with the highest daily needs (mostly pregnant or lactating women)

Food group	Amount/day (g)	Most limiting nutrient
Shellfish	900	Copper
Eggs	2500	Copper
Fish	3500	Iron
Pulses	3700	Iodine
Cereals	4800	Copper
Meat	5000	Selenium
Nuts	5500	Selenium
Vegetables	8700	Zinc
Fruits	9300	Zinc
Cow's milk	47,000	Zinc

AI Copper = 1.7 mg/day

RDI Selenium = 75 µg/day

RDI Iron = 27 mg/day

RDI Zinc = 14 mg/day

RDI Iodine = 270 µg/day

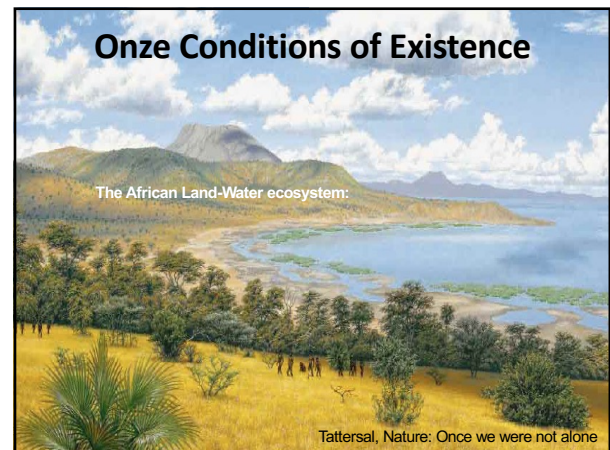
Brain
 AA=8.9%
 DHA=4.1%

Cunnane, S.C. 2005a. Survival of the Fattest. Hackensack, NJ: World Scientific
 AI and RDI's from the Australian Ministry of Health website: nrv.gov.au/nutrients

116



117



118

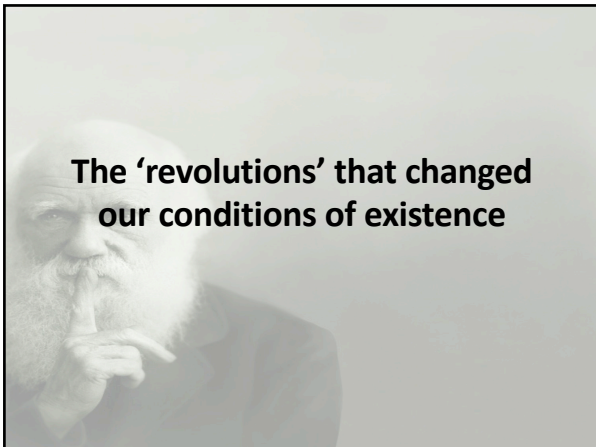


119

Take home message No. 5:

Onze
'conditions of existence'
 =
land-water ecosystem

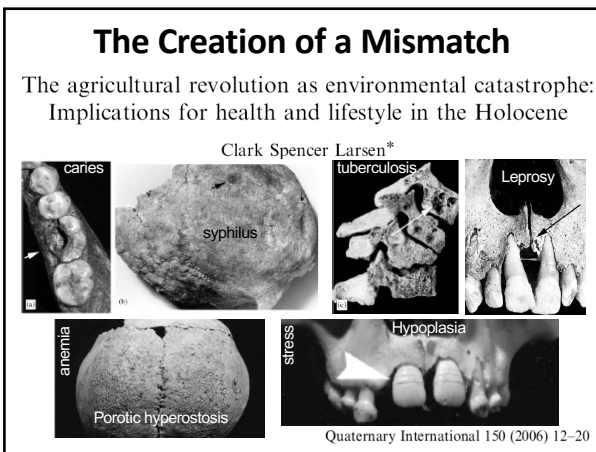
120



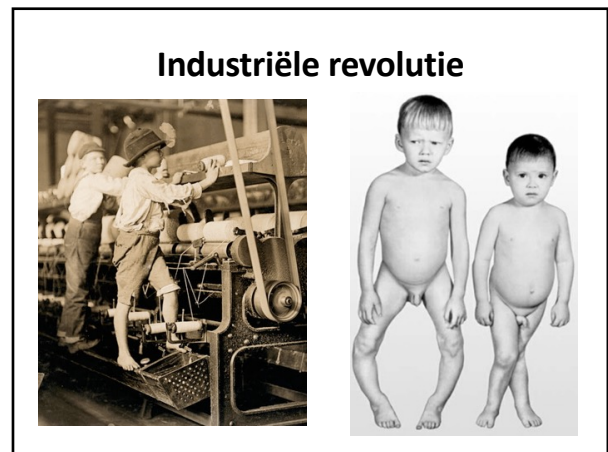
121



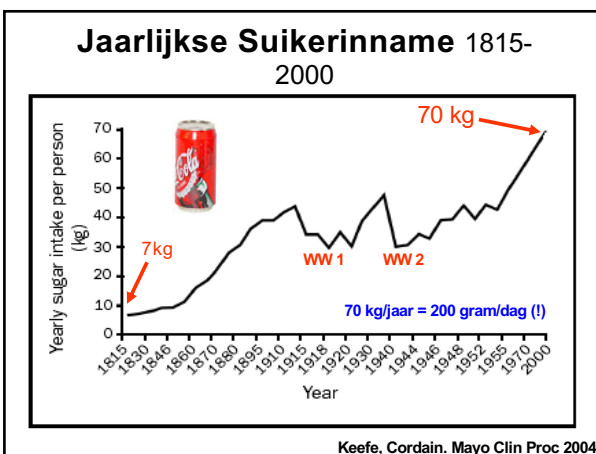
122



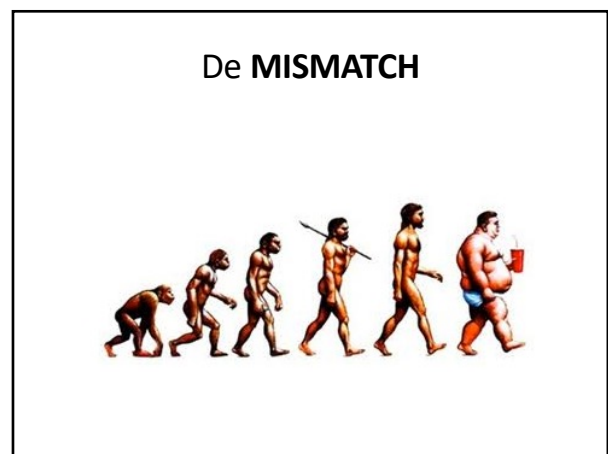
123



124



125



126

Take home message No. 6:

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





127

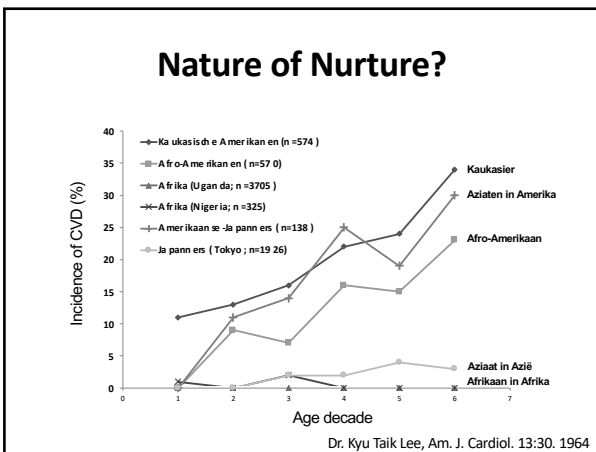
Zijn chronische ziekten een welvaartsverschijnsel?

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

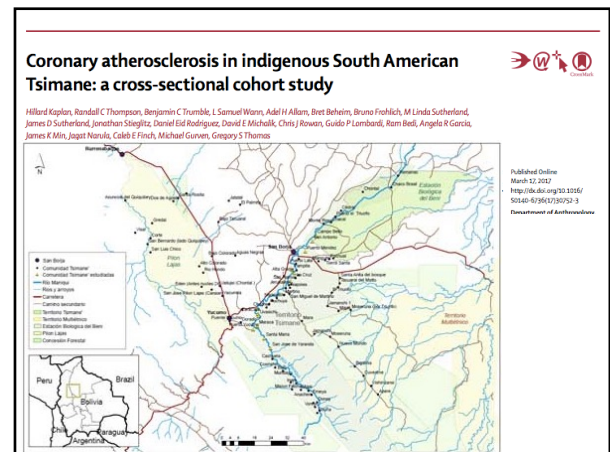


Interpretation Atherosclerosis was common in four preindustrial populations including preagricultural hunter-gatherers. Although commonly assumed to be a modern disease, the presence of atherosclerosis in premodern human beings raises the possibility of a more basic predisposition to the disease.

128



129



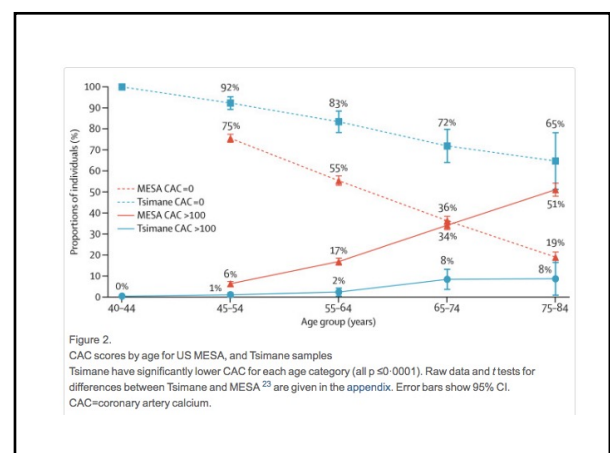
130

Coronary atherosclerosis in indigenous South American Tsimane: a cross-sectional cohort study



Dr. J.
<http://dx.doi.org/10.1155/2012/1475070-3>
 Download of Atherosclerosis

131



132

Take home message No. 7:

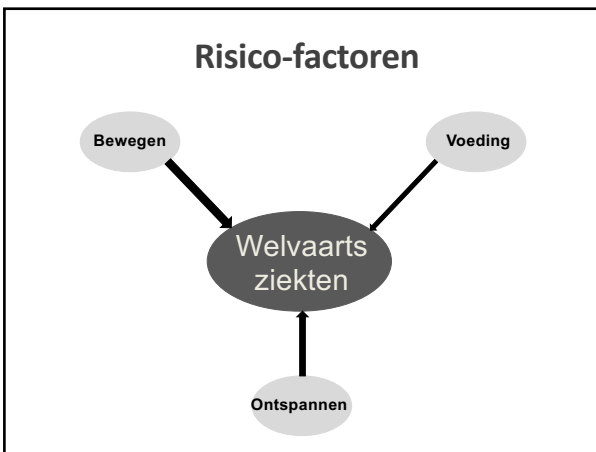
Welvaartsziekten
 zijn op steeds jongere leeftijd optredende
ouderdomsziekten
 veroorzaakt door langdurige blootstelling aan
 risicofactoren en daarmee
lage graad ontsteking

133

Take home message No. 8:

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

134



135

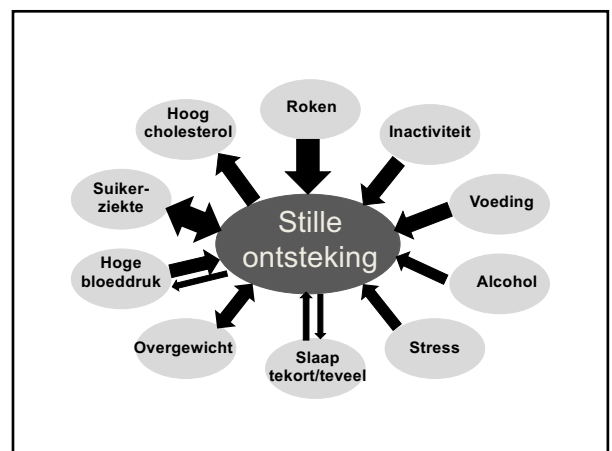
Evolutionair Denken

Lage graad ontsteking
 en
 een oerleefstijl

136



137



138



139

The NEW ENGLAND JOURNAL of MEDICINE
ESTABLISHED IN 1812 NOVEMBER 20, 2008 VOL. 359 NO. 21

JUPITER Trial
 Rosuvastatin to Prevent Vascular Events in Men and Women with Elevated C-Reactive Protein

Paul M. Ridker, M.D., Eleanor Danielson, M.I.A., Francisco A.H. Fonseca, M.D., Jacques Genest, M.D., Antonio M. Gotto, Jr., M.D., John J.P. Kastlein, M.D., Wolfgang Koenig, M.D., Peter Libby, M.D., Alberto J. Lovrenco, M.D., Jean G. MacFadyen, B.A., Sergio G. Niderstgaard, M.D., James Shepherd, M.D., James T. Willerson, M.D., and Robert J. Glynn, Sc.D., for the JUPITER Study Group*

High-sensitivity C-reactive protein — mg/liter		4.2	4.3
Median		2.8–7.1	2.8–7.2
Interquartile range			
LDL cholesterol — mg/dl		108	108
Median		94–119	94–119
Interquartile range			

CONCLUSIONS
 In this trial of apparently healthy persons without hyperlipidemia but with elevated high-sensitivity C-reactive protein levels, rosuvastatin significantly reduced the incidence of major cardiovascular events.

140

The NEW ENGLAND JOURNAL of MEDICINE
ESTABLISHED IN 1812 SEPTEMBER 21, 2017 VOL. 377 NO. 12

interleukin-1 β
 Antiinflammatory Therapy with Canakinumab for Atherosclerotic Disease

P.M. Ridker, B.M. Everett, T. Thuren, J.G. MacFadyen, W.H. Chang, C. Ballantyne, F. Fonseca, J. Nicolau, W. Koenig, S.D. Anker, J.J.P. Kastlein, J.H. Cornel, P. Pais, D. Pella, J. Genest, R. Cifkova, A. Lorenzatti, T. Forster, Z. Kobalava, L. Vida-Simiti, M. Flather, H. Shimokawa, H. Ogawa, M. Dellborg, P.R.F. Rossi, R.P.T. Troquay, P. Libby, and R.J. Glynn, for the CANTOS Trial Group*

A High-Sensitivity C-Reactive Protein Level

C Primary End Point with Canakinumab, 300 mg, vs. Placebo

141

CLINICAL RESEARCH Clinical Trial

Low-Dose Colchicine for Secondary Prevention of Cardiovascular Disease

Stefan M. Nidorf, MD, MBBS,* John W. Eikelboom, MBBS,† Charley A. Budgeon, BSc (Hons),‡ Peter L. Thompson, MD§
 Perth, Australia; and Hamilton, Ontario, Canada

Freedom from All ACS

142

ORIGINAL ARTICLE

Colchicine in Patients with Chronic Coronary Disease

S.M. Nidorf, A.T.L. Fiolet, A. Mosterd, J.W. Eikelboom, A. Schut, T.S.J. Opstal, S.H.K. The, X.-F. Xu, M.A. Ireland, T. Lenderink, D. Latchem, P. Hoogslag, A. Jerzewski, P. Nierop, A. Whelan, R. Hendriks, H. Swart, J. Schaap, A.F.M. Kuijper, M.W.J. van Hesse, P. Saklani, I. Tan, A.G. Thompson, A. Morton, C. Judkins, W.A. Bax, M. Dirksen, M. Alings, G.J. Hankey, C.A. Budgeon, J.G.P. Tijssen, J.H. Cornel, and P.L. Thompson, for the LoDoCo2 Trial Investigators*

A Primary End Point

143

ARTICLE Immunology & Inflammation

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

Haematologica 2016 Volume 101(11):1434-1441
 Marialaura Bonaccio, Augusto Di Castelnuovo, George Pounis, Amalia De Curtis, Simona Costanzo, Mariarosaria Persichillo, Chiara Cerletti, Maria Benedetta Donati, Giovanni de Gaetano, and Licia Iacoviello on behalf of the Moli-sani Study Investigators*

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

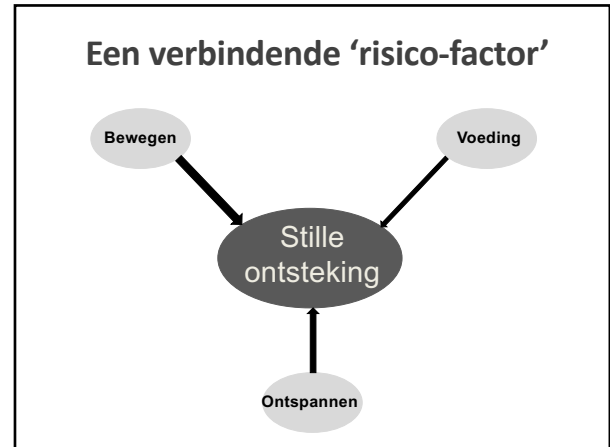
N of deaths/ N of subjects	Quartiles of low-grade inflammation			
	1 st	2 nd	3 rd	4 th
Hazard ratio (95%CI)	1.00 (ref)	1.16 (0.93-1.44)	1.55 (1.26-1.89)	1.65 (1.35-2.02)
Age/sex adjusted	1.00 (ref)	1.11 (0.90-1.39)	1.44 (1.17-1.77)	1.44 (1.17-1.77)
Multivariable model*	1.00 (ref)	1.10 (0.90-1.36)	1.30 (1.07-1.58)	1.39 (1.14-1.69)
INFLA-score minus CRP*	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 CVI ratio*	1.00 (ref)	1.18 (0.96-1.45)	1.30 (1.07-1.57)	1.41 (1.15-1.73)

144

LGI in de praktijk

<p>Point measures</p> <ul style="list-style-type: none"> • Age • Sexe • Education • Smoking • Waist-to-hip ratio • Leisure Time • Hypertension • High TG/HDL ratio • Glucose-intolerance • Vegetable/fruit intake 	<p>Only in sequence</p> <ul style="list-style-type: none"> • hsCRP • Leukocytes • Trombocytes <p style="text-align: center;">INFLAMMATION</p> 
--	--

145



146

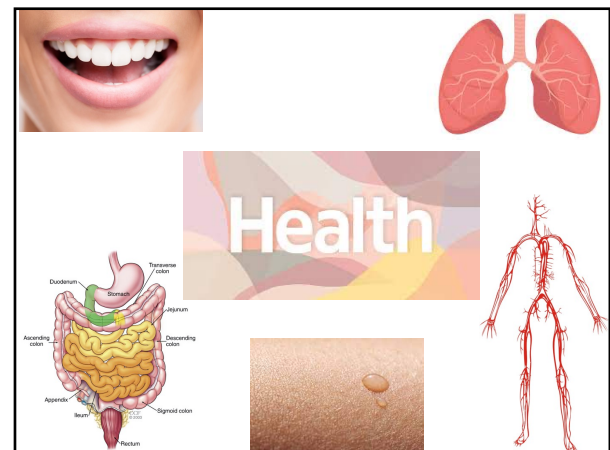
Lage graad ontsteking

Low-grade inflammation (LGI)

- Hoe moet ik me dit voorstellen?



147



148

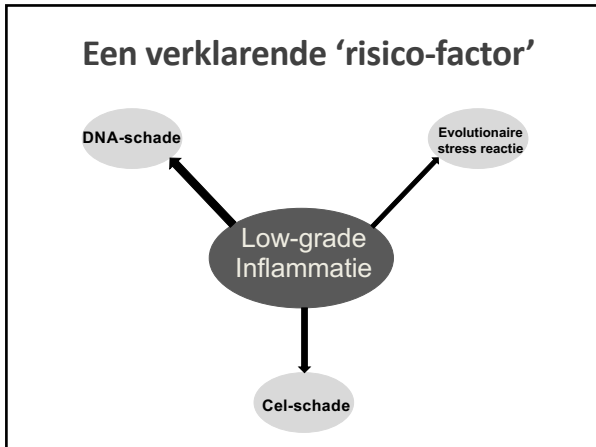


149

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

150

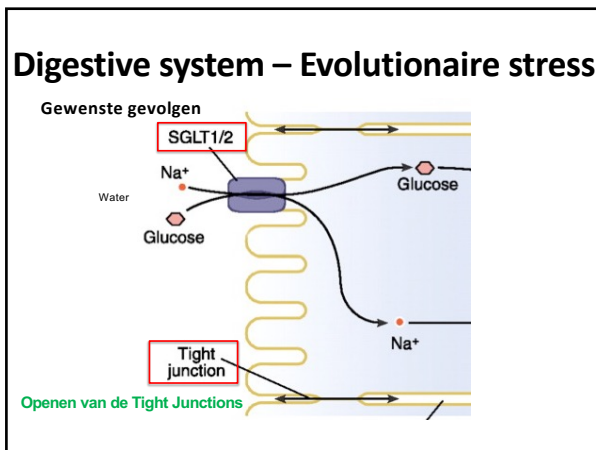


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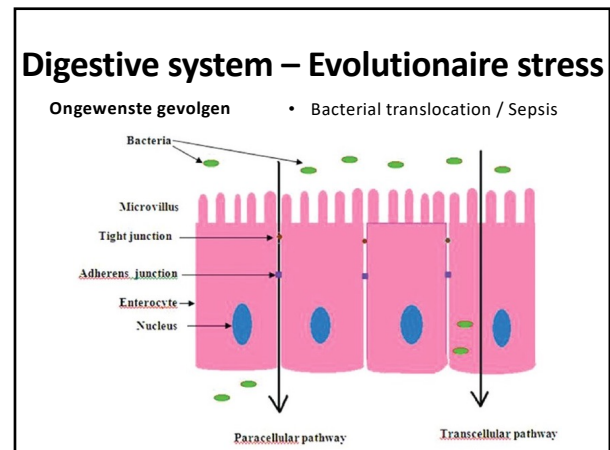
It's all about 'barrières'

- 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

152



153

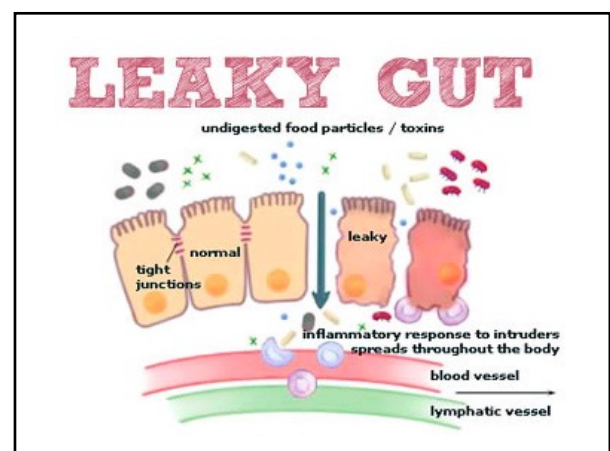


154

In case of no lactase / amylase

- Risk of IBD
- Risk of energy loss
- Risk of dehydration
- Risk of infection with
 - Fungi
 - E. Coli
 - Salmonella
 - Campylobacter
 - Clostridium
 - Rota virus

155



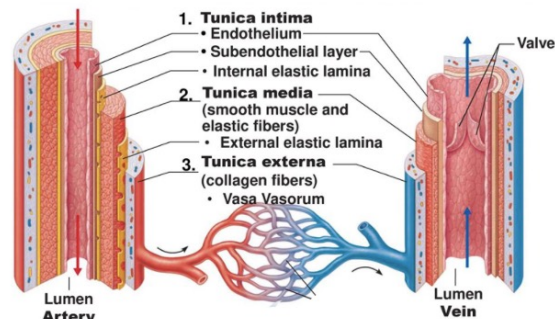
156

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

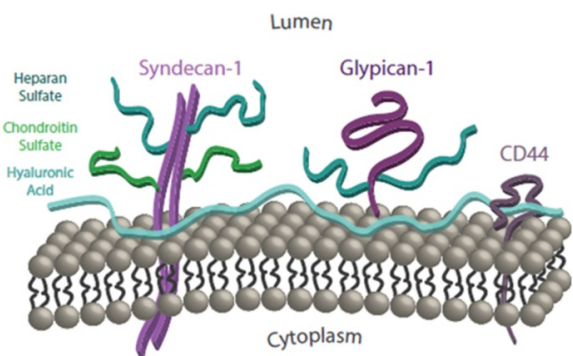
157

The blood vessel wall



158

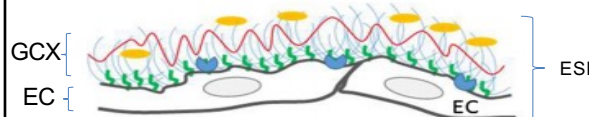
Glycocalyx: the forgotten layer.....



159

Biology of the glycocalyx

- Multilayer structure
- Covers most of the surface of the endothelium
- Reduces the access of cellular and macromolecular components of the blood to the surface of the endothelium

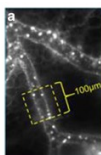


GCX = glycocalyx; EC = endothelial cell; ESL = endothelial surface layer

160

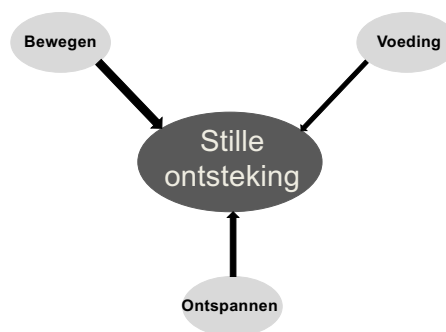
Physiological functions of the ESL

- **Regulatie vasculaire permeabiliteit**
 - Macromoleculaire zeef (maximaal 70 kDa)
 - Afstotende werking op witte/rodebloedcellen en plaatjes, maar ook op negatief geladen moleculen
- **Mechanotransductie**
 - Transmissie van shearstress van GCX op EC
 - Gevolg → NO release → regulatie vasomotortonus
- **Vascular protection**
 - Inhibition of coagulation
 - Inhibition of leucocyte adhesion



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Een verbindende 'risico-factor'



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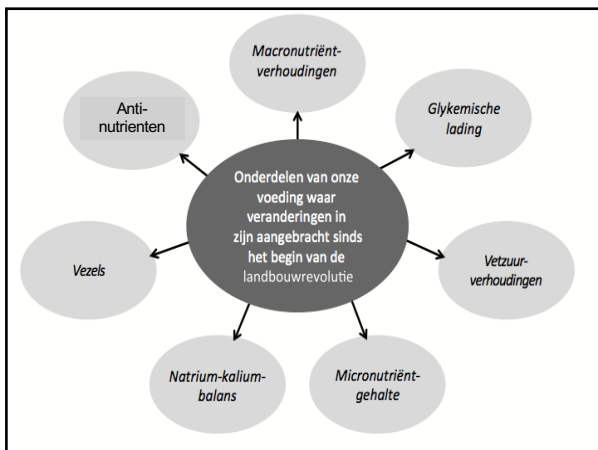
TABLE 1
Food and food types found in Western diets generally unavailable to preagricultural hominins¹

Food or food group	Value
Dairy products	
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	
Salad, cooking oils	8.8
Shortening	6.6
Margarine	2.2
Total	17.6
Alcohol	1.4
Total energy	77.1
Added salt, as sodium chloride	9.6 ²

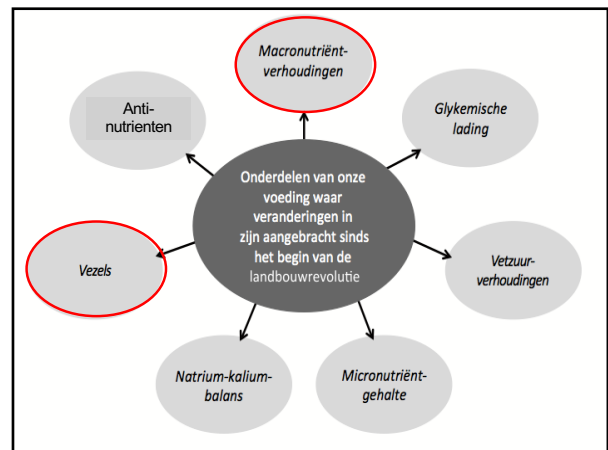
Onze huidige voeding bestaat voor 72% uit 'onbekend' voedsel

Cordain et al, AJCN 2005

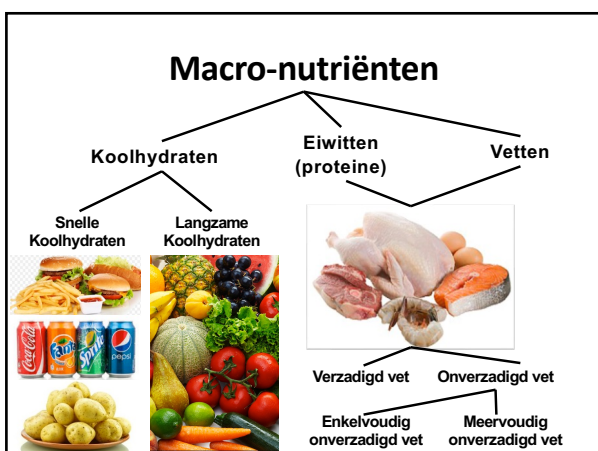
164



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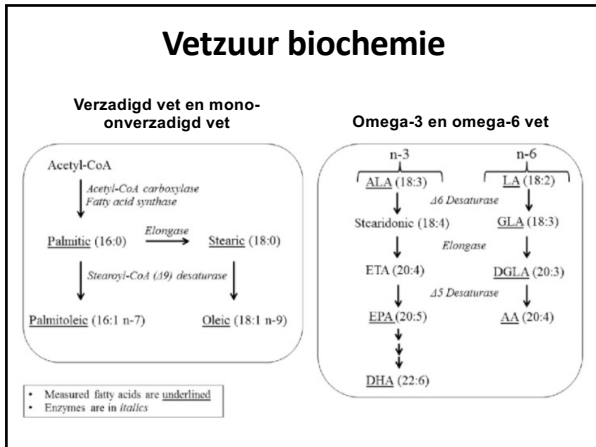


167

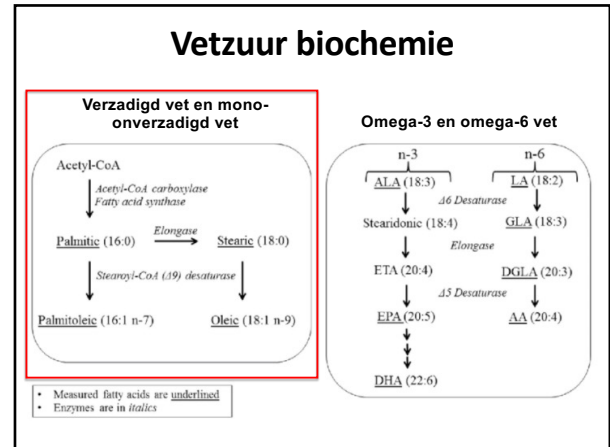
Vetten

- In onze voeding:**
 - > 95% in de vorm van Triglyceriden
 - De rest is
 - Fosfolipiden
 - Vrije vetzuren (unesterified fatty acids)
 - Cholesterol (85-90% cholesterol)
 - Cholesterol esters (10-15%)

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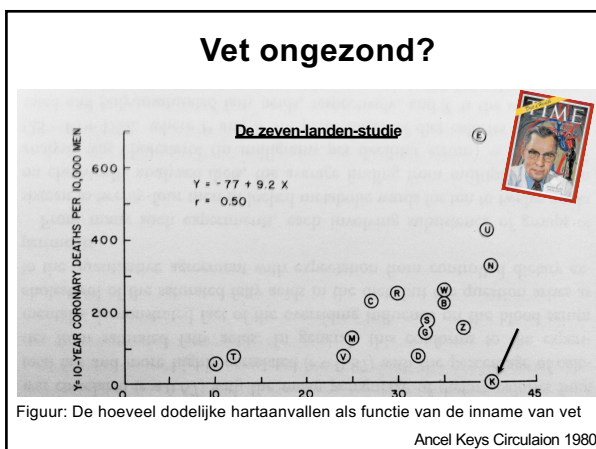
177

Meer eiwit, meer vet?

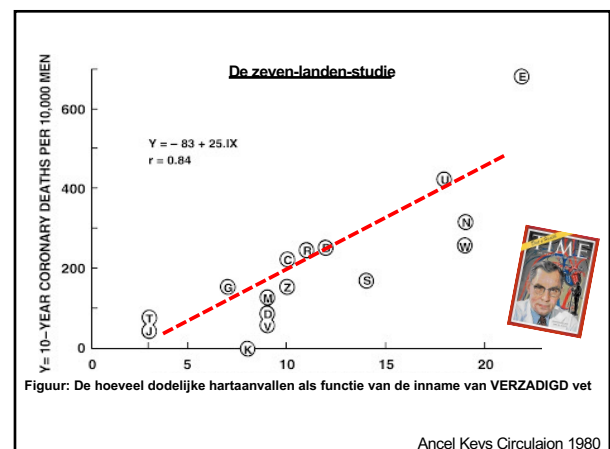
- Eet minder vet:
- LET op VET
- Verzadigd = Verkeerd

- Tussen 1987 en 1997 zijn Nederlanders minder vet en verzadigd vet gaan eten

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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 Heitmann, Mark A Pereira, Katarina Bälter, Gary E Fraser, Uri Goldbourt, Göran Hallmans, Paul Knekt, Simin Liu, Pirjo Pietinen, Donna Spiegelman, Jane Stevens, Jarmo Virtamo, Walter C Willett, and Alberto Ascherio





Vervangen van verzadigd vet door koolhydraten geeft een
7% hogere kans op HVZ

Jakobsen AJCN 2009

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Koolhydraten

Enkele Suikers (monosachariden)

Glucose (druivensuiker) C(C1OC(O)C(O)C1O)O Direct verteerbaar (hoge glycemische index)

Fructose (fruitsuiker) C(C1OC(O)C(CO)O1)O

Tweevoudige suikers (disachariden)

Sucrose (tafelsuiker) C(C1OC(O)C(O)C1O)C(C2OC(O)C(O)C2O)O Enzymatisch verteerbaar (medium glycemische index)

Meervoudige suikers (polysachariden)

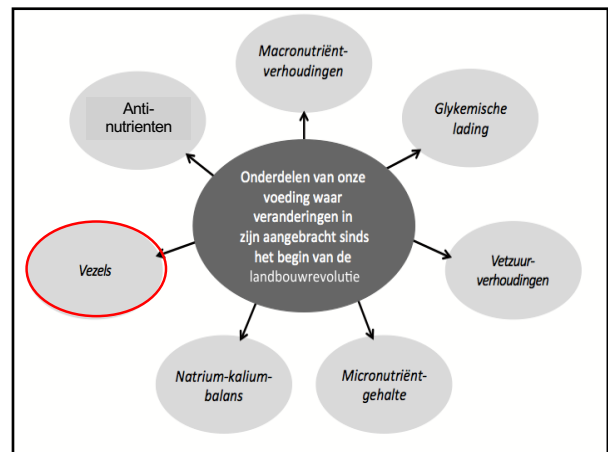
Zetmeel (brood, rijst, pasta, aardappelen) C(C1OC(O)C(O)C1O)C(C2OC(O)C(O)C2O)C(C3OC(O)C(O)C3O)O Enzymatisch verteerbaar (lage glycemische index)

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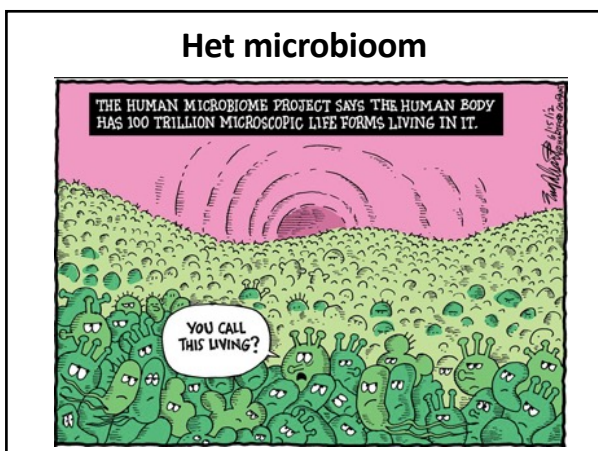
SCHEIKUNDIGE INDELING VAN DE KOOLHYDRATEN

KOOLHYDRATEN			
ENKELVOUDIGE KH OF SUIKERS		MEERVOUDIGE KH OF SUIKERS	
Monosachariden (1 molecule) - Glucose - Fructose - Galactose	Disachariden (2 moleculen) - Sucrose of sacharose (glucose + fructose) - Lactose (glucose + galactose) - Maltose (glucose + glucose)	Oligosachariden (3-9 moleculen) vb. fructo-oligosachariden, raffinose, maltodextrine	Polysachariden (> 10 moleculen) Plantendig - Zetmeel (amylose, amylopectine) - Voedingsvezels of non-starch PS, vb. cellulose, pectine, β-glucanen Dierlijk - Glycogeen
Polyolen vb. Sorbitol, xylitol, lactitol		Voedingsvezels: meestal onverteerbaar, maar sommige zijn oplosbaar door bacteriële fermentatie	

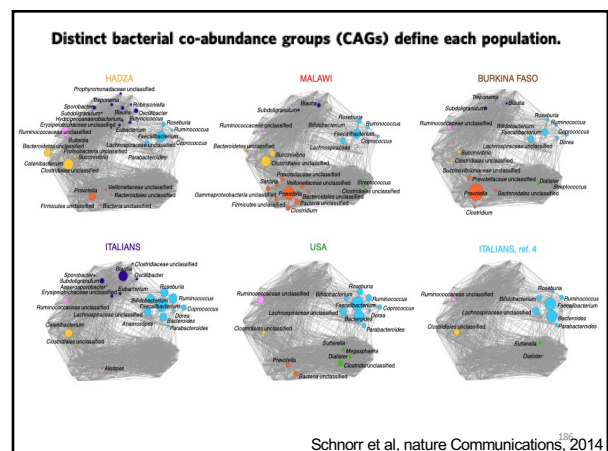
183



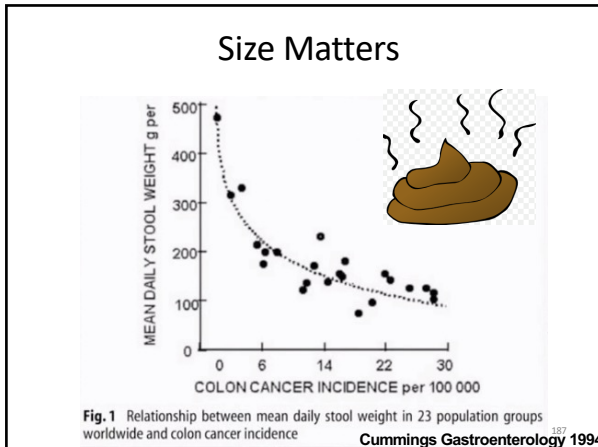
184



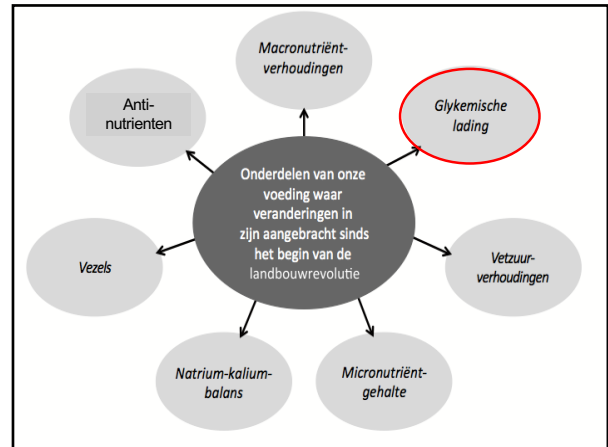
185



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Glycemische index (GI) vs lading (GL)

	Glycemische Index (GI)	Koolhydraten per 100 gram	Glycemische Lading (GL)
Glucose	100	100	100
Aardappels	95	14,8	14,1
Wortelen	85	4,8	4,1
Maïs	75	15,8	11,9
Honing	75	81	60,8
Watermeloen	70	8,3	6
Roggebrood	55	45,7	25,1

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Food Values: Glycemic Index/Glycemic Load

	Low GI	Med GI	High GI
Low GL	All-bran cereal (8,42) Apples (6,39) Carrots (3,47) Peanuts (1,14) Strawberries (1,40) Sweet Corn (9,54)	Beets (5,64) Cantaloupe (4,85) Pineapple (7,59) Sucrose, i.e. table sugar (7,68)	Popcorn (8,72) Watermelon (4,72) Whole wheat flour bread (9,71)
Med GL	Apple juice (11,40) Bananas (12,52) Fettucine (18,40) Orange juice (12,50) Sourdough wheat bread (15,54)	Life Cereal (16,66) New potatoes (12,57) Wild rice (18,57)	Cheerios (15,74) Shredded wheat (15,75)
High GL	Linguine (23,52) Macaroni (23,47) Spaghetti (20,42)	Couscous (23,85) White rice (23,64)	Baked Russet potatoes (26,85) 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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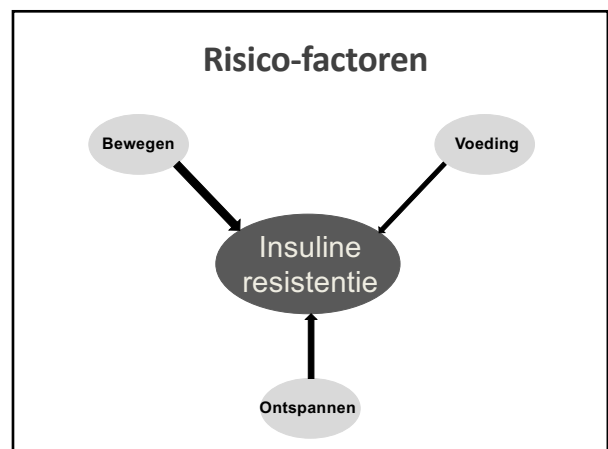
Type koolhydraten?

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

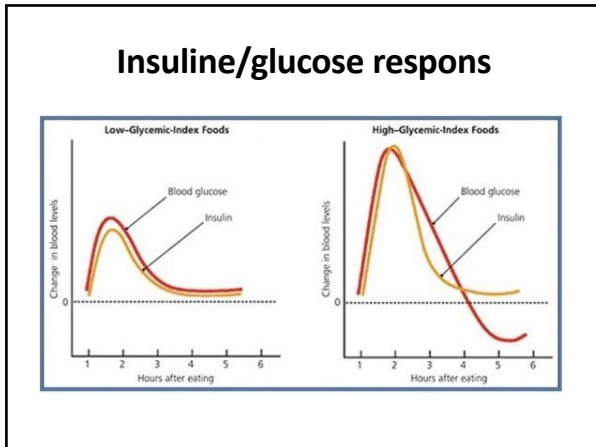
Marianne U Jakobsen, Claus Dehnelisen, Albert M Joensen, Jakob Stegger, Anne Tjømeland, Erik B Schmidt, and Kim Overvad

- Lage glycemische index: **niet sign. 12% verlaagd** HVZ risico
- Hoge glycemische index: **33% verhoogd** HVZ risico

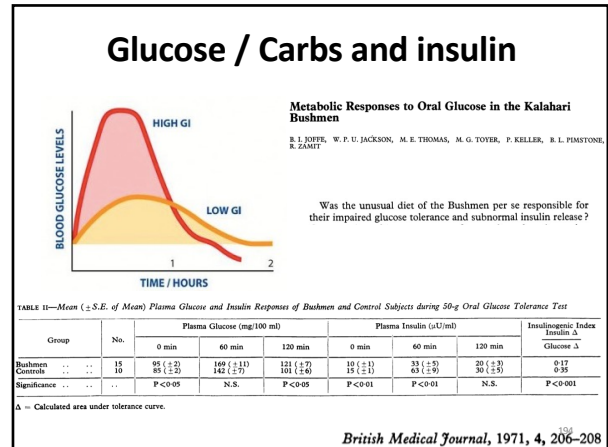
191



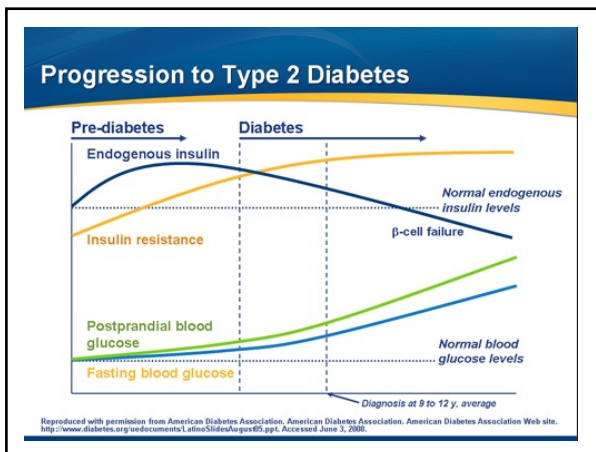
192



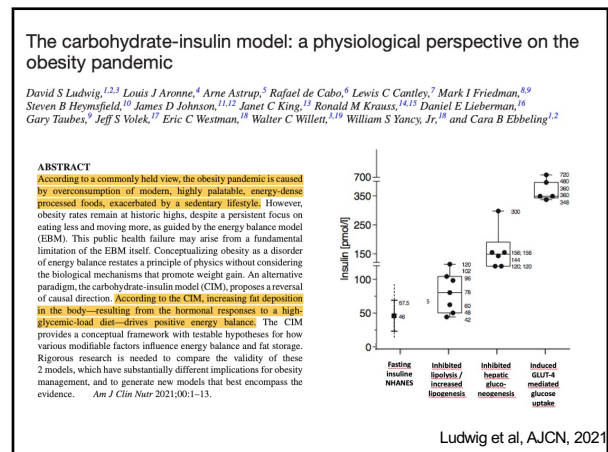
193



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Diabetes testen

- Glucose

Tabel 1 Referentiewaarden voor het stellen van de diagnose diabetes mellitus, gestoord nuchtere glucose en gestoorde glucosetolerantie; gestoord nuchtere glucose en gestoorde glucosetolerantie kunnen gecombineerd voorkomen*

		Veneus plasma
Normaal	Glucose nuchter (mmol/l)	< 6,1
	Glucose niet nuchter (mmol/l)	< 7,8
Gestoord nuchtere glucose	Glucose nuchter (mmol/l)	≥ 6,1 en < 7,0 én
	Glucose niet nuchter (mmol/l)	< 7,8
Gestoorde glucosetolerantie	Glucose nuchter (mmol/l)	< 6,1 én
	Glucose niet nuchter (mmol/l)	≥ 7,8 en < 11,1
Diabetes mellitus	Glucose nuchter (mmol/l)	≥ 7,0
	Glucose niet nuchter (mmol/l)	≥ 11,1

* World Health Organisation/International Diabetes Federation, 2006.

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Diabetes testen

- HbA_{1c}
- Het HbA_{1c} geeft informatie over de instelling van de patiënt in de voorafgaande acht tot twaalf weken.

DIAGNOSTIC CRITERIA FOR DIABETES AND PREDIABETES

NORMAL	PREDIABETES	DIABETES
HbA _{1c} : < 42	HbA _{1c} : 42-47	HbA _{1c} : > 47
HbA _{1c} : < 6.0	HbA _{1c} : 6.0-6.4	HbA _{1c} : > 6.4

1. HbA_{1c}-streefwaarde ≤ 53 mmol/mol: alle patiënten jonger dan 70 jaar, evenals patiënten van 70 jaar en ouder met alleen behandeld met leefstijladviesing of metformine monotherapie (onafhankelijk van ziekte duur).

2. HbA_{1c}-streefwaarde 54-58 mmol/mol: patiënten van 70 jaar en ouder met een ziekte duur korter dan 10 jaar vanaf behandelstap 2 (tabel 5).

3. HbA_{1c}-streefwaarde 54-64 mmol/mol: patiënten van 70 jaar en ouder met een ziekte duur van 10 jaar of langer, vanaf behandelstap 2 (tabel 5).

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Diabetes testen

- **HOMA-IR** (Homeostatic Model Assessment for Insuline Resistance)
 - Bevat insuline & glucose waarden

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

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

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

199

Acne Vulgaris

Arch Dermatol. 2002;138:1584-1590

A Disease of Western Civilization

Loren Cordain, PhD; Staffan Lindeberg, MD, PhD; Magdalena Hurtado, PhD; Kim Hill, PhD; S. Boyd Eaton, MD; Jennie Brand-Miller, PhD

Insuline/IGF

+

Ovaries

Progesteron
Estrogenen
Testosteron

+


sebum

+

Liver

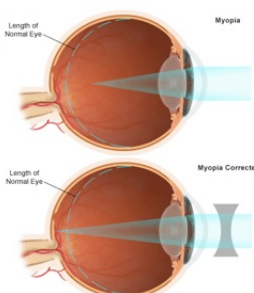
SHBG

-



200

Myopie



- 25-35% US population has myopia; in South East Asia 90%
- In HG: 0,4-1,2% myopia
- In illiterate urban fisherman 18,4%
- In illiterate rural < 5%

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Myopie

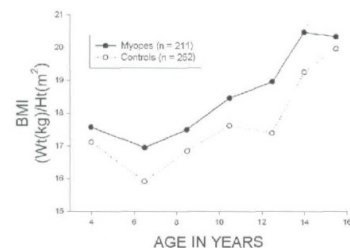


Fig. 4. Body mass index (BMI) from ages 3-16 years in myopes (myopia developed at any age) and non-myopic controls. Adapted from Gardiner (1954).

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Myopie

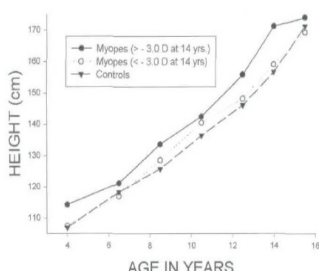


Fig. 3. Height from ages 3-16 years in myopes (> -3.0 D at age 14 years; $n = 74$), myopes (< -3.0 D at age 14 years; $n = 98$) and non-myopic controls ($n = 277$). Adapted from Gardiner (1954).

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Sarcopenie & diabetes

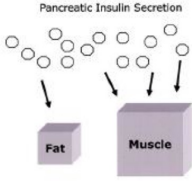
Carbohydrate Consumption

↓

Blood Glucose Elevation

↓

Pancreatic Insulin Secretion



Fat **Muscle**

Adequate Glucose Clearance

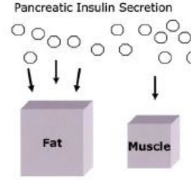
Carbohydrate Consumption

↓

Blood Glucose Elevation

↓

Pancreatic Insulin Secretion

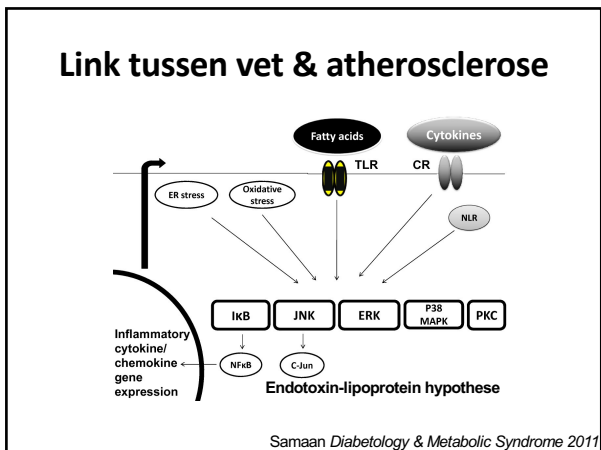


Fat **Muscle**

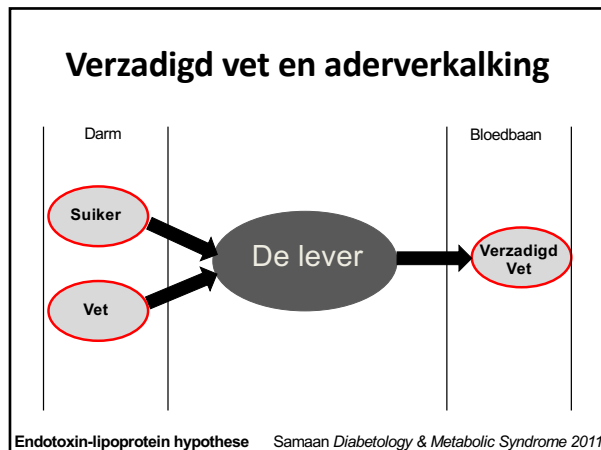
Inadequate Glucose Clearance
- More Insulin Required

Eaton, Cordain, Preventive Medicine, 2009

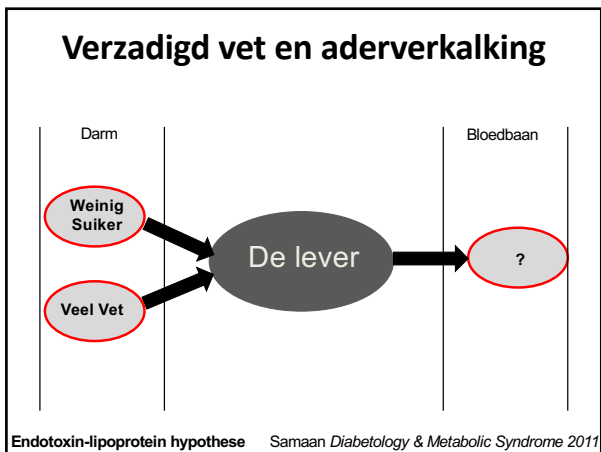
204



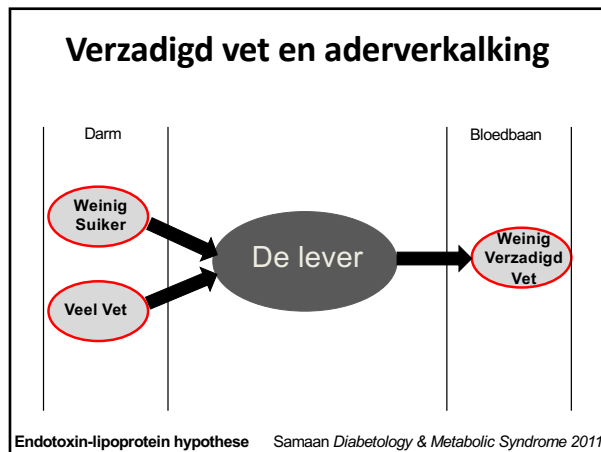
205



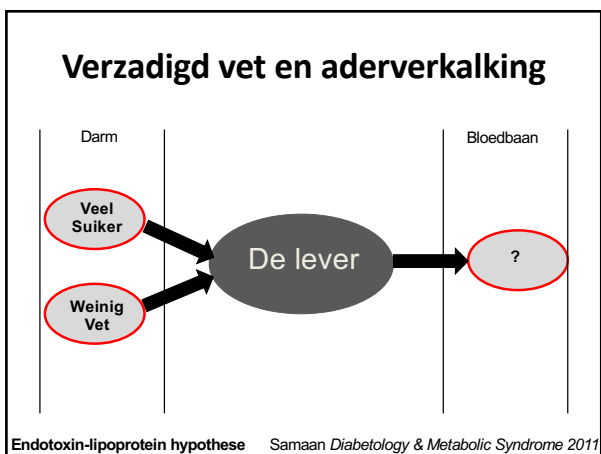
206



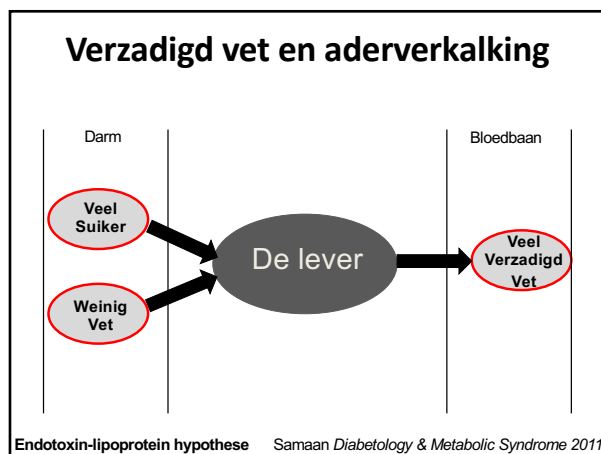
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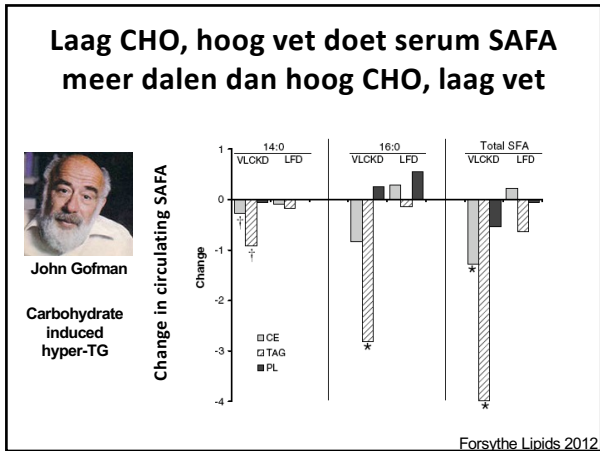
208



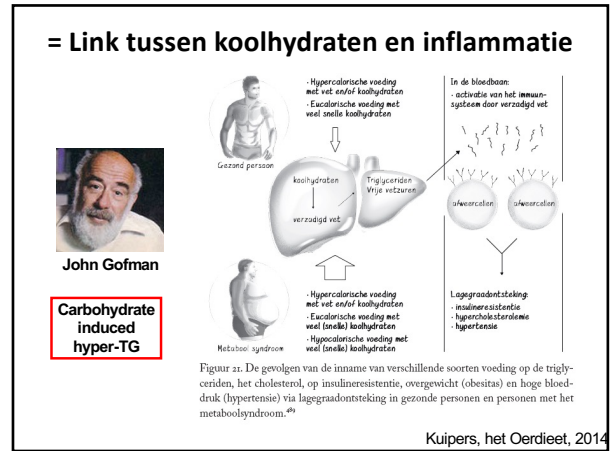
209



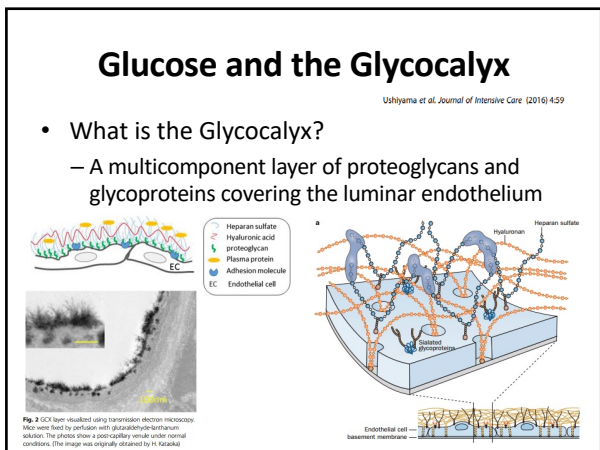
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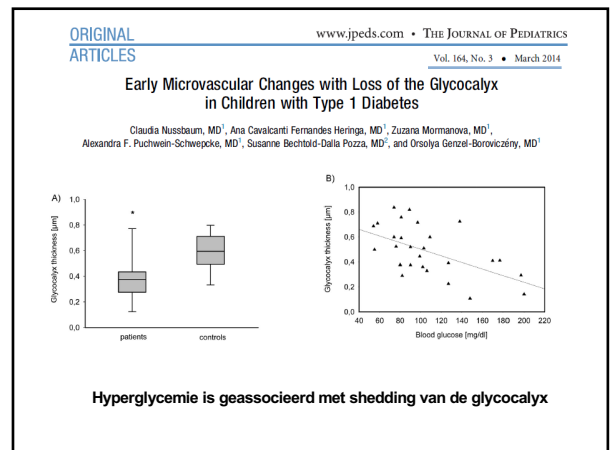
211



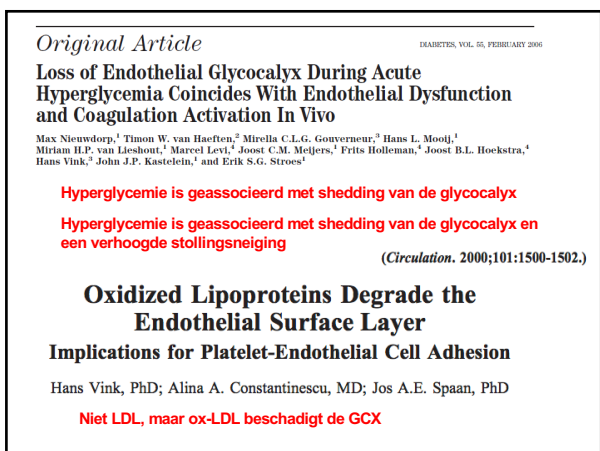
212



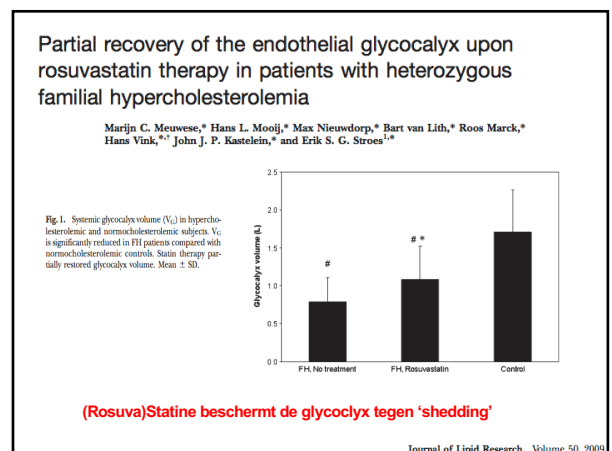
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3. Gezonde eiwitten (vnl plant)



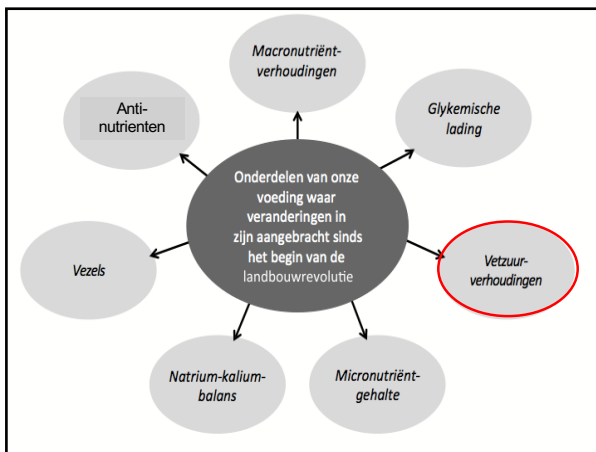
- Eiwitrijke diëten zijn gezond omdat
 - Verzadigend, ondanks negatieve energiebalans
 - Persistent energiek, ondanks gewichtsverlies
 - Behouden van spiermassa bij afvallen

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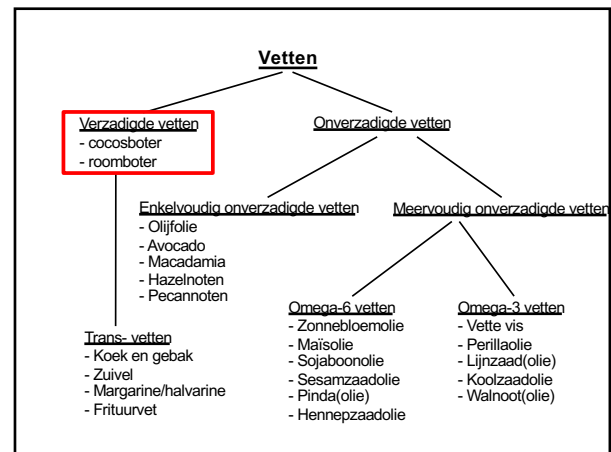
Take home message No. 11:

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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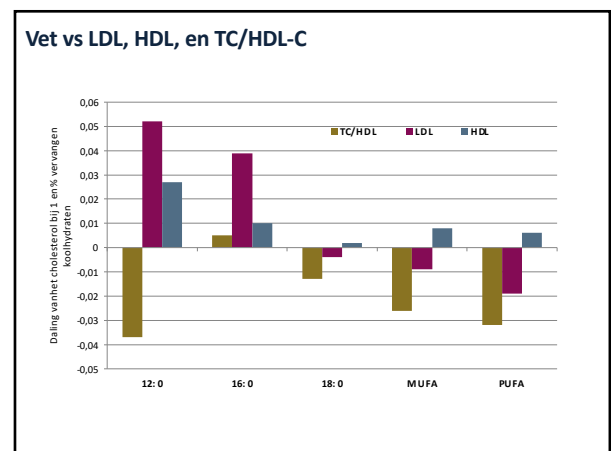
219



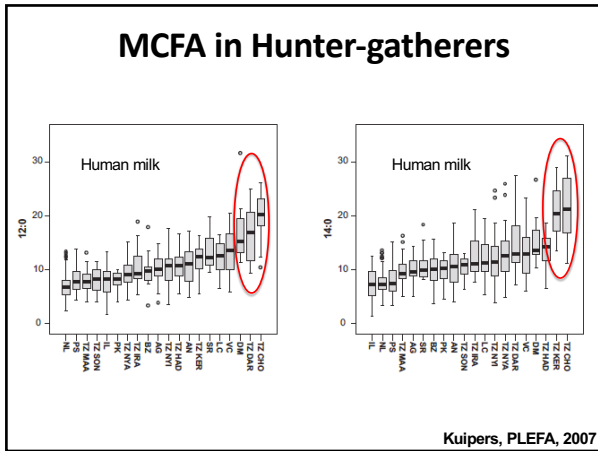
220



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Jager-verzamelaar studies

Cholesterol, coconuts, and diet on Polynesian atolls: a natural experiment: the Pukapuka and Tokelau Island studies¹⁻³

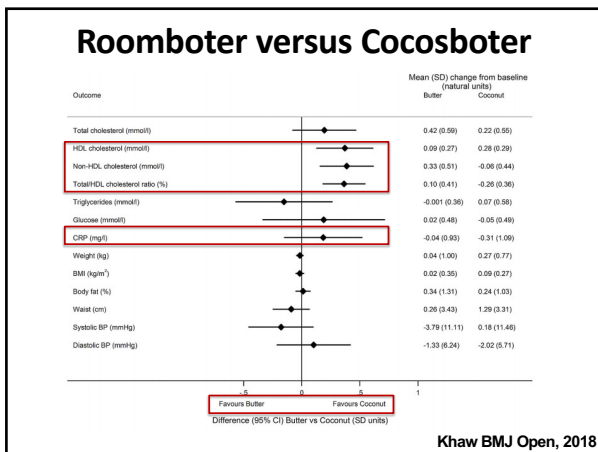
Ian A. Prior, M.D., F.R.C.P., F.R.A.C.P., Flora Davidson,⁴ B.H.Sc.,
 Clare E. Salmond,⁵ M.Sc., and Z. Czochanska,⁶ D.P. AG.

TABLE 2
 Cholesterol levels in the Pukapuka and Tokelau 1968 groups*

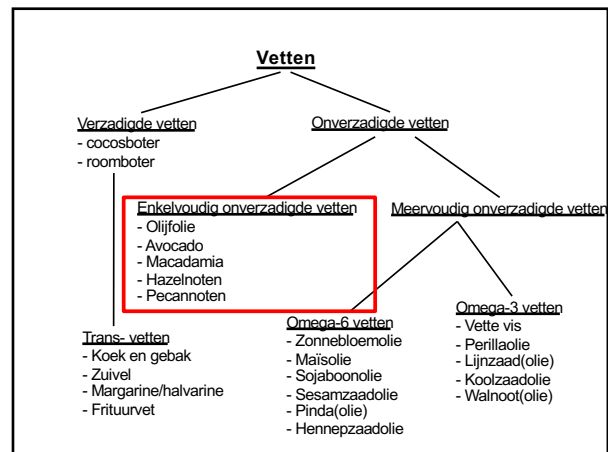
Variable	Sex	Age	Pukapuka		Tokelau 1968		p†		
			Mean	SE	Mean	SE			
Cholesterol (mg/100 ml)	M	15-19	148.9	4.8	27	184.5	6.4	40	<0.0005
		20-24	155.0	3.8	27	195.9	12.0	13	<0.01
		25-34	167.1	4.4	39	209.5	6.2	35	<0.0005
		35-44	181.8	5.2	37	215.7	6.1	48	<0.0005
		45-54	178.0	5.5	39	220.2	5.4	46	<0.0005
		55-64	180.5	5.7	30	217.1	5.1	24	<0.0005
F	15-19	170.5	7.9	17	197.3	4.1	42	<0.01	
	20-24	161.2	5.5	23	176.1	4.0	18	<0.05	
	25-34	170.9	4.2	52	213.8	8.0	44	<0.0001†	
	35-44	168.1	5.2	32	222.5	6.0	53	<0.0001†	
	45-54	190.5	6.6	25	220.6	5.1	50	<0.0005†	
	55-64	194.2	7.5	31	245.4	7.2	38	<0.0001†	

† lauric (12:0) and myristic (14:0) content. Vascular disease is uncommon in both populations and there is no evidence of the high saturated fat intake having a harmful effect in these populations. *Am. J. Clin. Nutr.* 34: 1552-1561, 1981.

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THE NEW ENGLAND JOURNAL OF MEDICINE

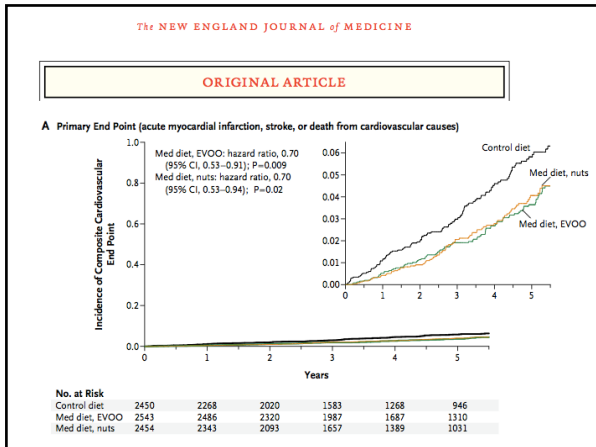
ORIGINAL ARTICLE

Primary Prevention of Cardiovascular Disease with a Mediterranean Diet

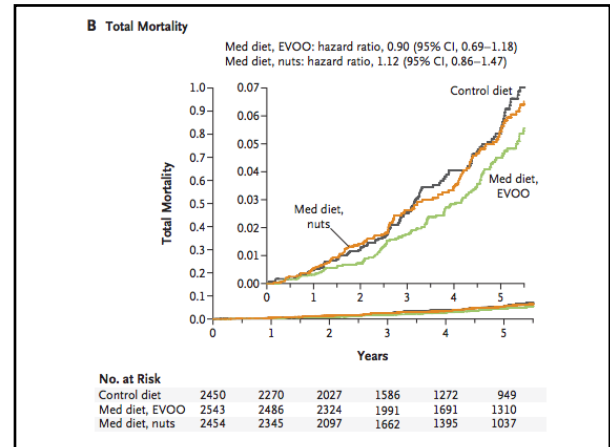
Ramón Estruch, M.D., Ph.D., Emilio Ros, M.D., Ph.D., Jordi Salas-Salvado, M.D., Ph.D., Maria-Isabel Covas, D.Pharm., Ph.D., Dolores Corella, D.Pharm., Ph.D., Fernando Arós, M.D., Ph.D., Enrique Gómez-Gracia, M.D., Ph.D., Valentina Ruiz-Gutiérrez, Ph.D., Miquel Fiol, M.D., Ph.D., José Lapetra, M.D., Ph.D., Rosa María Lamuela-Raventós, D.Pharm., Ph.D., Lluís Serra-Majem, M.D., Ph.D., Xavier Pintó, M.D., Ph.D., Josep Bassora, M.D., Ph.D., Miguel Ángel Muñoz, M.D., Ph.D., José V. Sorlí, M.D., Ph.D., José Alfredo Martínez, D.Pharm., M.D., Ph.D., and Miguel Ángel Martínez-González, M.D., Ph.D., for the PREDIMED Study Investigators*

Food	Goal
Mediterranean diet	Recommended
Olive oil*	≥4 tbsp/day
Tree nuts and peanuts†	≥3 servings/wk
Fresh fruits	≥3 servings/day
Vegetables	≥2 servings/day
Fish (especially fatty fish), seafood	≥3 servings/wk
Legumes	≥3 servings/wk
Sofrito‡	≥2 servings/wk
White meat	Instead of red meat
Wine with meals (optionally, only for habitual drinkers)	≥7 glasses/wk

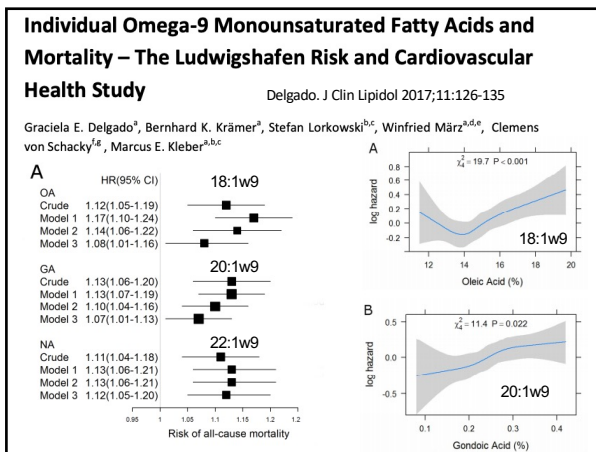
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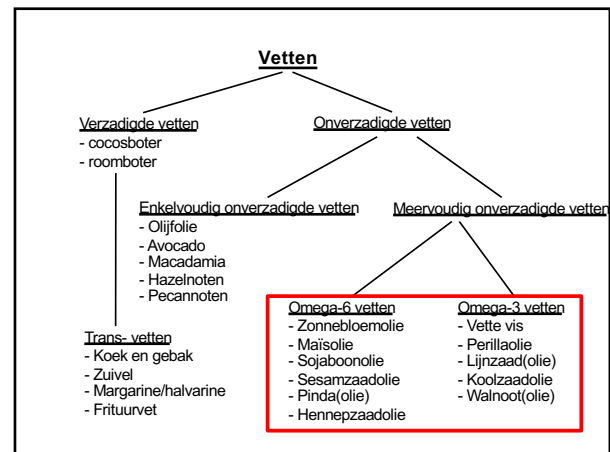
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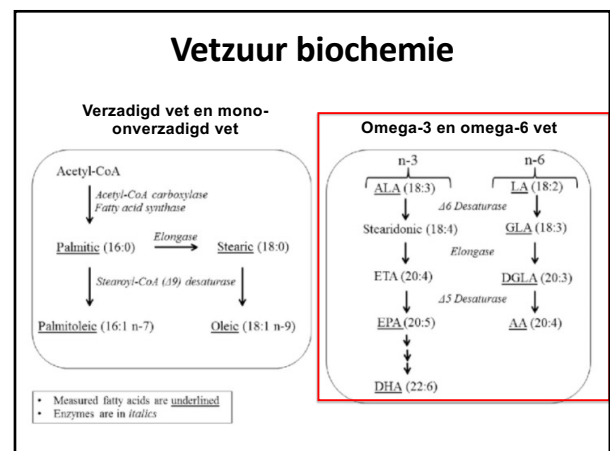
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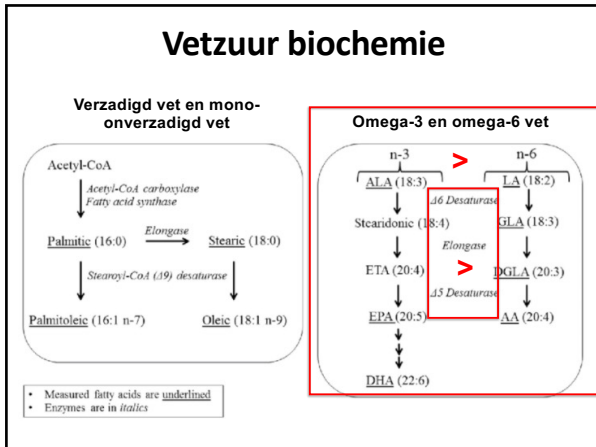
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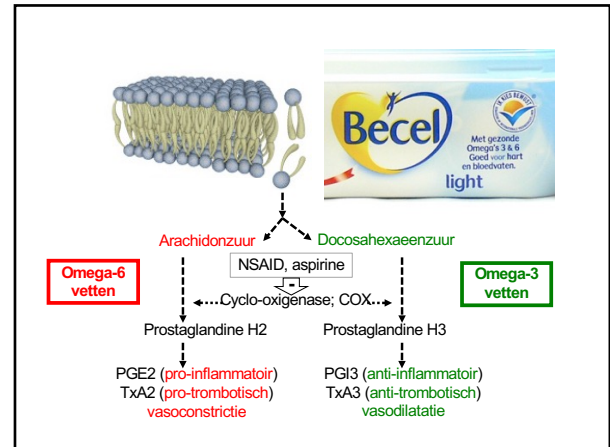
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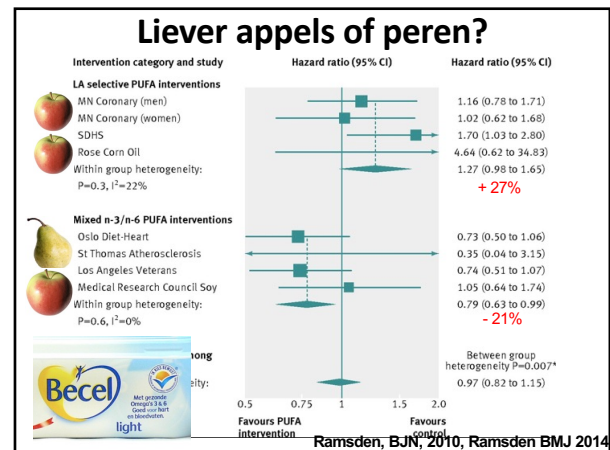
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Advies American Heart Association

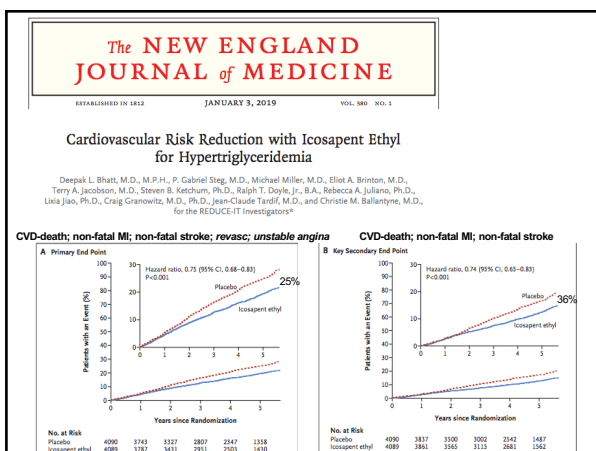
- "The consumption of at least 5-10% of energy from omega-6 PUFA reduces the risk of CHD
- Advise is based on:
 - Studies that consist of trials in which SAFA were replaced by PUFA (almost entirely omega-6*)
 - *: PUFA also consisted of omega-3 fatty acids from omega-3 oils and fish/coil liver oil

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

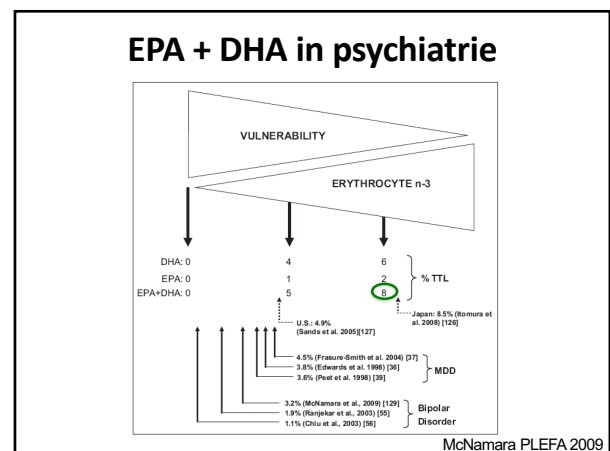
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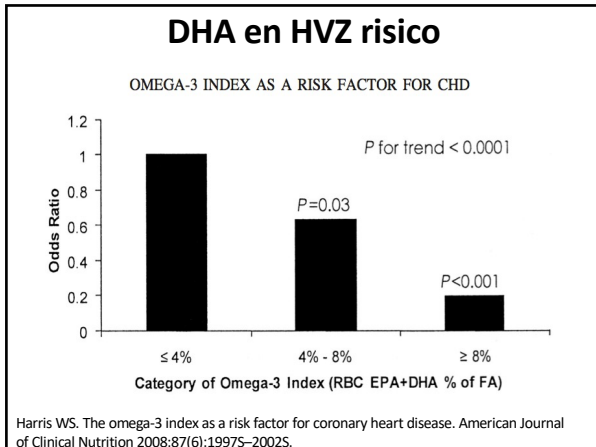
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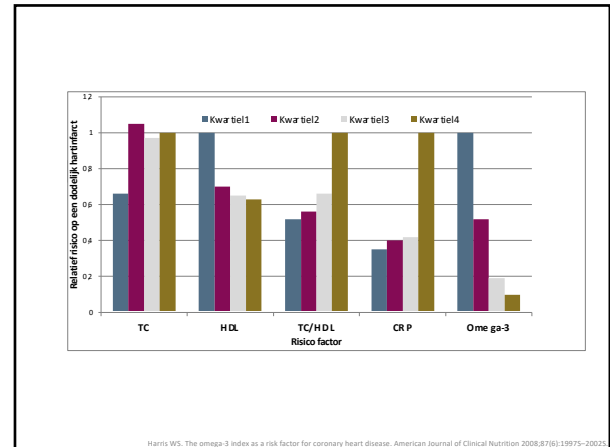
239



240



241



242

Maar... geen vergoeding...

HS-Omega-3 Index test
€ 49,99
NewDay Supplements
Gratis verzenden...
Van Google

Omega-3 Index Test
€ 89,99
LiveHelfi
Gratis verzenden...
Van Producthero

243

Dus: minder van dit

Linolzuurplas

Sesamolie, Becel light, Princes Tonijnmoot

244

En meer van dit

(vooral dit)

ALA

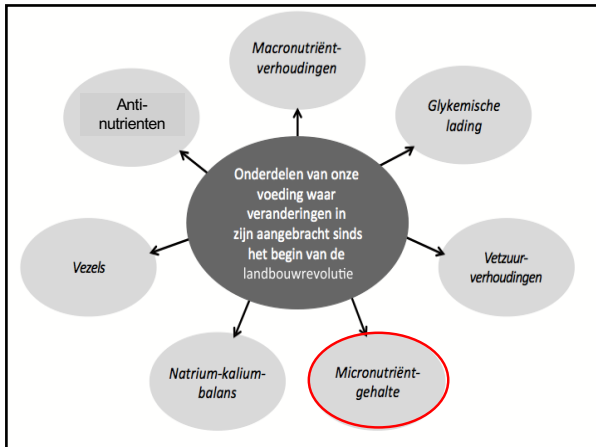
EPA/DHA

245

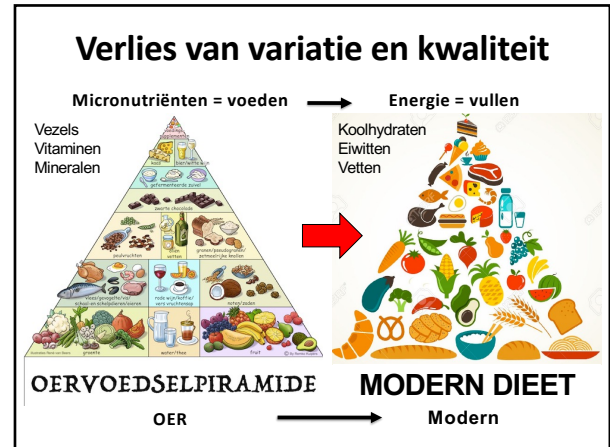
Take home message No. 13:

Vervang
omega-6 vetten (zonnebloemolie)
door omega-3 vet (vis)

246



247



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Tabel 6: Micronutriënten in het oerdiët en onze huidige voeding.

	Oerdiët	Huidige voeding	ADH	UL
Vitaminen				
Energie (kcal)	2.500	770	700-1000	3000
Vitamine A (RAE)	2400	99		
Beta-caroteen (µg)	3583	99		
Vit. B1; thiamine (mg)	1,9	1,3	1.1-1.5	ND
Vit. B2; riboflavine (mg)	2,7	1,7	1.5-1.7	ND
Vit. B3.; nicotinezuur (mg)	56,2	13	17-20	35
Vit. B5; panthotheenzuur (mg)	11,5	2,0	5-10	ND
Vit. B6; pyridoxine (mg)	5,9	2,2	1.5-2.0	100
Vit. B8; biotine (µg)	113	13	30-50	ND
Vit. B9 of B11; folaat (µg)	911	272	300-400	1000
Vit. B12; cobalamine (µg)	10,3	4,8	6.0	ND
Vitamine C (mg)	559	96	60-90	2000
Vitamine D (µg, per os)	-	3,5	2.5-15	100
Vitamine D (IU, cutaan)	4000	-	400	4000
Vitamine E (mg)	22,6	15,1	11.8-15	300
Vitamine K (µg)	945	59	90-120	ND
Mineralen				
Natrium (mg)	546	2943	1500-2400	2400
Kalium (mg)	6333	3676	4700	ND
Calcium (mg)	972	1080	1000-1300	2000
Fosfor (mg)	2289	1735	700-1400	4000
Magnesium (mg)	742	371	300-400	ND
IJzer (mg)	33,1	11,4	9-18	45
Zink (mg)	14,2	11,7	10-15	40
Koper (mg)	6	1,3	1.5-3.5	10
Mangaan (mg)	7,3	0,9	2	11
Selenium (µg)	147	51	50-150	400
Vezels (g)	47	8	25-38	ND

ADH: aanbevolen dagelijkse hoeveelheid.

249

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250

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Vit. B6; pyridoxine (mg)	5,9	2,2	1.5-2.0	100
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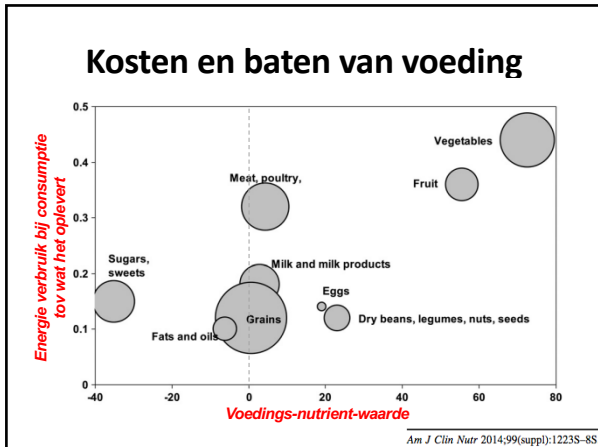
Wat eten mensen gemiddeld?

Tabel 18: Percentage Westelingen dat aan ADH voldoet

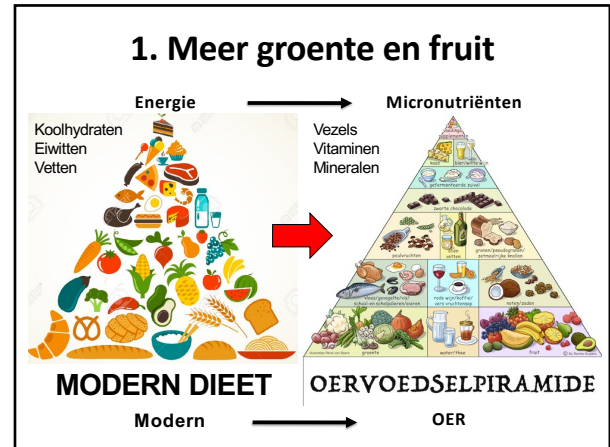
Nutriënt	Aanbeveling	Percentage
Natrium	2400 mg	100
Selenium	70 µg	91
Riboflavine	1.7 mg	89
IJzer	18 mg	89
Niacine	20 mg	87
Fosfor	1000 mg	87
Koper	2 mg	84
Thiamine	1.5 mg	82
Vitamine B12	6 µg	80
Pyridoxine	2 mg	74
Zink	15 mg	71
Foliumzuur	400 µg	60
Vitamine C	60 mg	53
Vitamine A	900 µg	46
Magnesium	400 mg	43
Vitamine E	30 IU	14
Jodium	150 µg	<10*
Kalium	4700 mg	8

* Indien het gebruik van gejodeerd zout (o.a. in brood) niet wordt meegerekend

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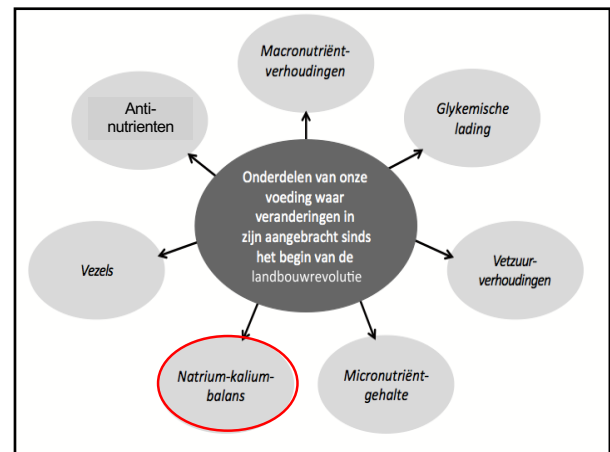


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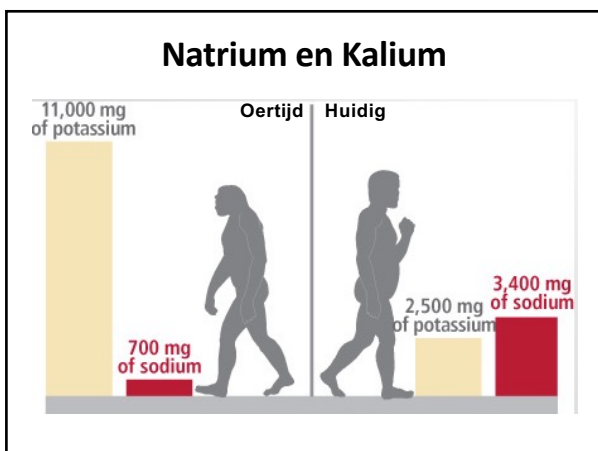
Take home message No. 9:

Eet meer groente & fruit

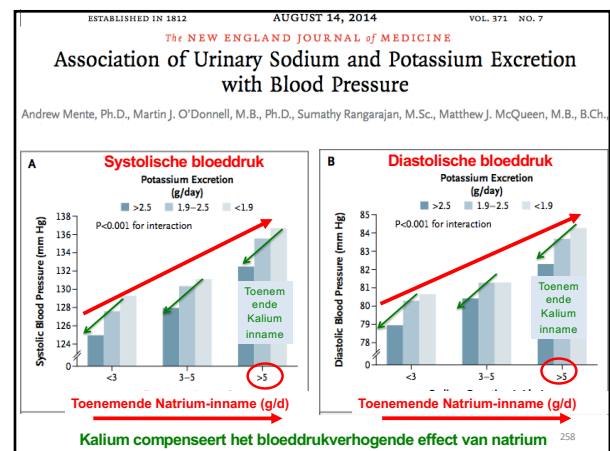
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256



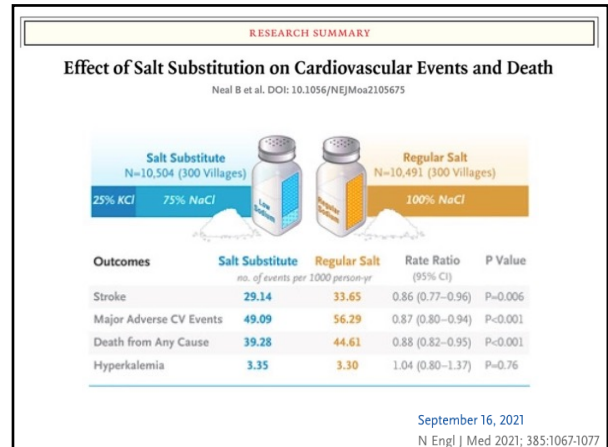
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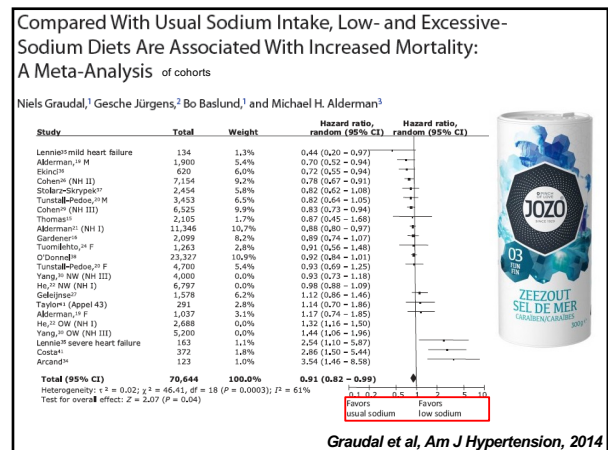
260

Zout – minder, minder, minder?

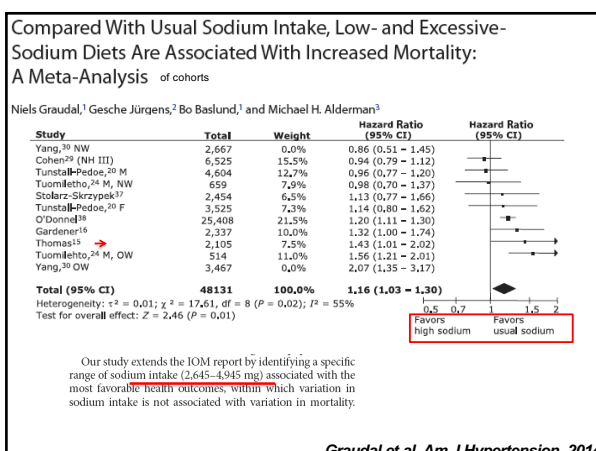
Table 1. Guideline recommendations for sodium restriction in the general population.

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 [11]	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

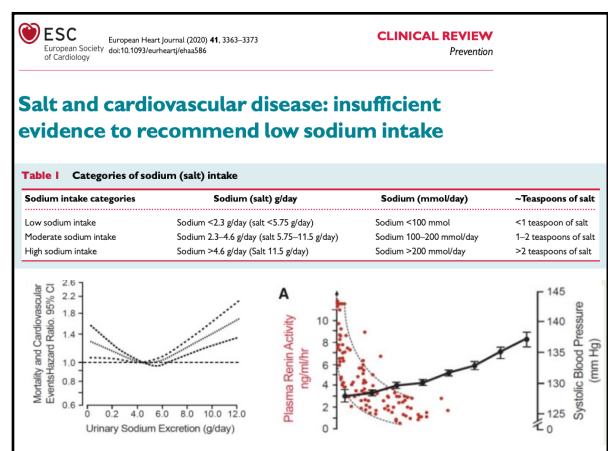
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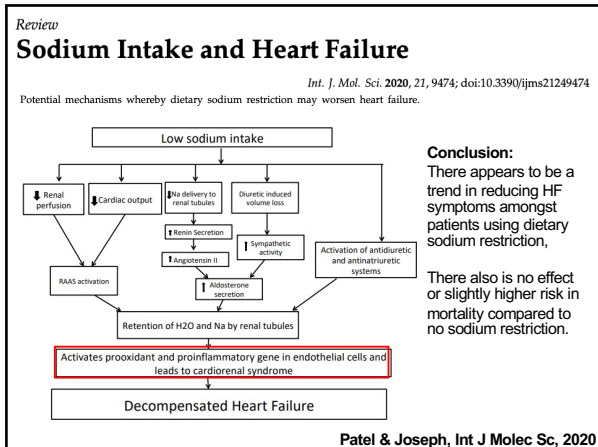
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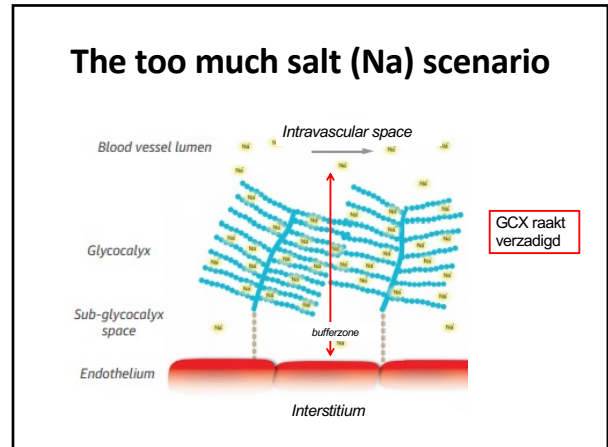
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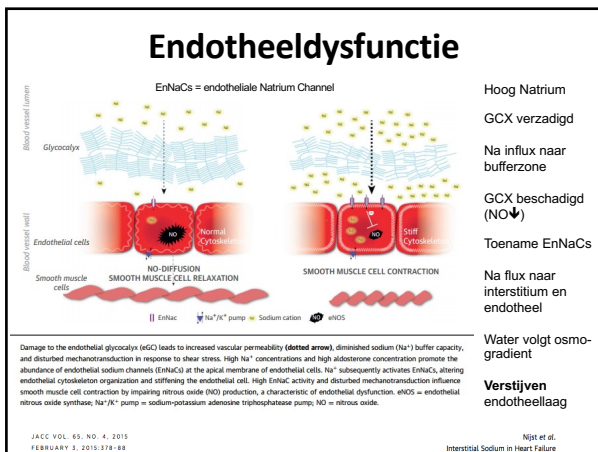
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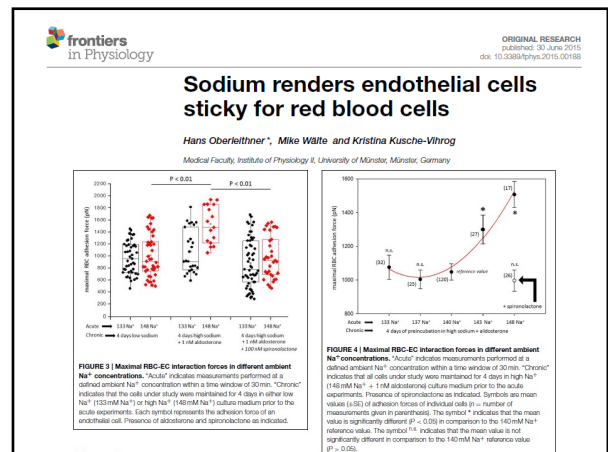
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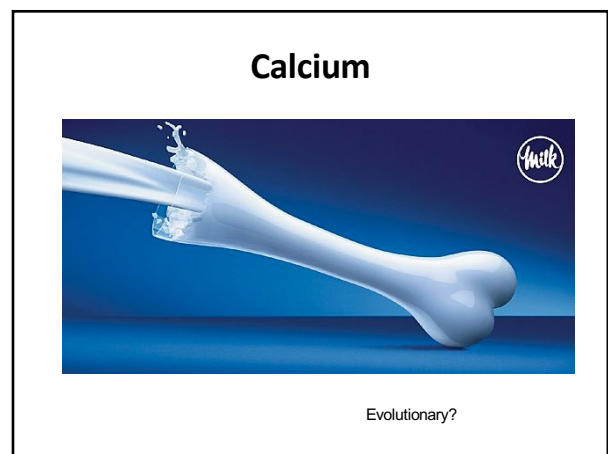
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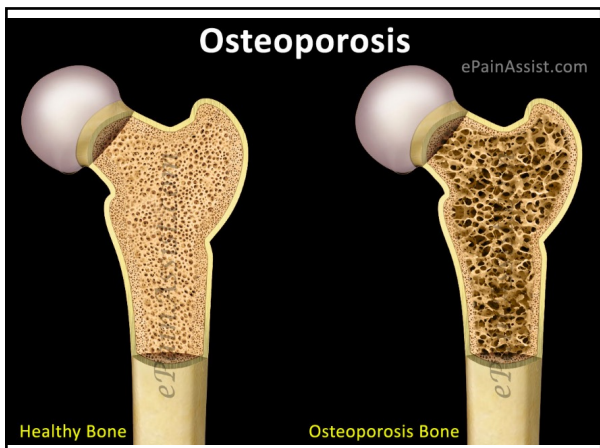
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Effect of calcium supplements on risk of myocardial infarction and cardiovascular events: meta-analysis **BMJ** 2010

Mark J Bolland, senior research fellow,¹ Alison Avenell, clinical senior lecturer,² John A Baron, professor,³ Andrew Grey, associate professor,¹ Graeme S MacLennan, senior research fellow,² Greg D Gamble, research fellow,¹ Ian R Reid, professor¹

- Het geven van calciumtabletten gedurende 5 jaar aan 1000 mensen leidde tot 26 *minder* gevallen van botbreuken

273

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274

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- Het geven van calciumtabletten gedurende 5 jaar aan 1000 mensen leidde tot 26 *minder* gevallen van botbreuken
- Het geven van calciumtabletten gedurende 5 jaar aan 1000 mensen leidde tot 24 *meer* gevallen van hartinfarcten.
- Hierdoor *overleden* 13 mensen *meer* in de calciumgroep!

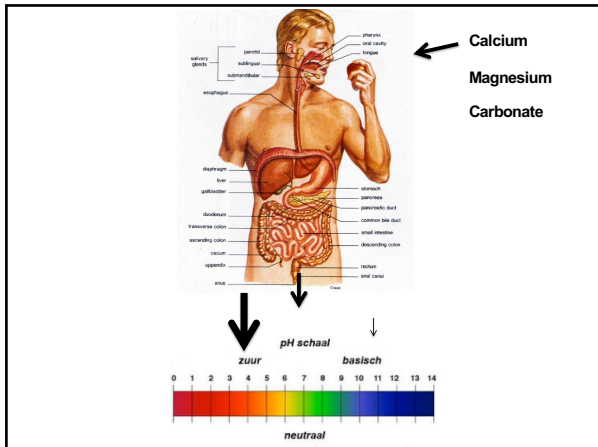
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Use it or lose it!
(osteoporose)

Walking/Hiking
Make it more fun, get a buddy or join a club.

Gezond bot Botontkalking (osteoporose)

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← Calcium
Magnesium
Carbonate

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Uit de oude doos...

1776 THE NEW ENGLAND JOURNAL OF MEDICINE June 23, 1994

IMPROVED MINERAL BALANCE AND SKELETAL METABOLISM IN POSTMENOPAUSAL WOMEN TREATED WITH POTASSIUM BICARBONATE

ANTHONY SEBASTIAN, M.D., STEVEN T. HARRIS, M.D., JOAN H. OTTAWAY, M.A., KAREN M. TODD, M.S., R.D., AND R. CURTIS MORRIS, JR., M.D.

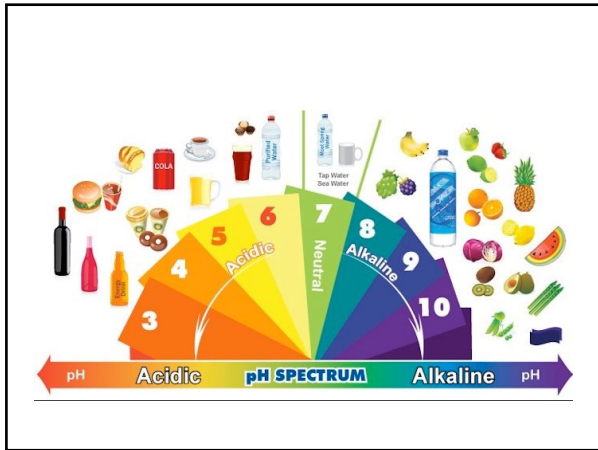
Abstract Background: In normal subjects, a low level of metabolic acidosis and positive acid balance (the production of more acid than is excreted) are typically present and correlate in degree with the amount of endogenous acid produced by the metabolism of foods in ordinary diets abundant in protein. Over a lifetime, the counteraction of retained endogenous acid by base mobilized from the skeleton may contribute to the decrease in bone mass that occurs normally with aging.

Methods: To test that possibility, we administered potassium bicarbonate to 18 postmenopausal women who were given a constant diet (852 mg [18 mmol] of calcium and 96 g of protein per 60 kg of body weight). The potassium bicarbonate was given orally for 18 days in doses (80 to 120 mmol per day) that nearly completely neutralized the endogenous acid.

Results: During the administration of potassium bicarbonate, the calcium and phosphorus balance became less negative or more positive — that is, less was excreted in comparison with the amount ingested (mean [±SD] change in calcium balance, +56±76 mg [1.4±1.9 mmol] per day per 60 kg; P = 0.009; change in phosphorus balance, +47±54 mg [1.5±2.1 mmol] per day per 60 kg; P = 0.007) because of reductions in urinary calcium and phosphorus excretion. The changes in calcium and phosphorus balance were positively correlated (P<0.001). Serum osteocalcin concentrations increased from 5.5±2.8 to 6.1±2.8 ng per milliliter (P<0.001), and urinary hydroxyproline excretion decreased from 28.9±12.3 to 26.7±10.8 mg per day (220±94 to 204±82 μmol per day; P = 0.05). Net renal acid excretion decreased from 70.9±10.1 to 12±21.8 mmol per day, indicating nearly complete neutralization of endogenous acid.

Conclusions: In postmenopausal women, the oral administration of potassium bicarbonate at a dose sufficient to neutralize endogenous acid improves calcium and phosphorus balance, reduces bone resorption, and increases the rate of bone formation. (N Engl J Med 1994; 330:1776-81.)

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Vitamine D

Hijab Meest getragen hoofddeksel	Chador Lichaam bedekt, gezicht is zichtbaar	Nikab Alleen de ogen zijn zichtbaar	Boerka Volledige gezichtsbedekking
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De Vitamine D status in NL

- Advies Gezondheidsraad
 - 30 nmol/l for women under 50 and men under 70
 - 50 nmol/l for women over 50 and men over 70
- Institute of Medicine: 50 nmol/l
- Gemiddelde autochtone Nederlander 50-60 nmol/l
- Gemiddelde allochtone Nederlander 15-36 nmol/l

LITERATUUR
1 Grootjans-Geerts I. Hypovitaminose D: een verstuierde diagnose. Ned Tijdschr Geneeskd 2007; 152:2062-69.

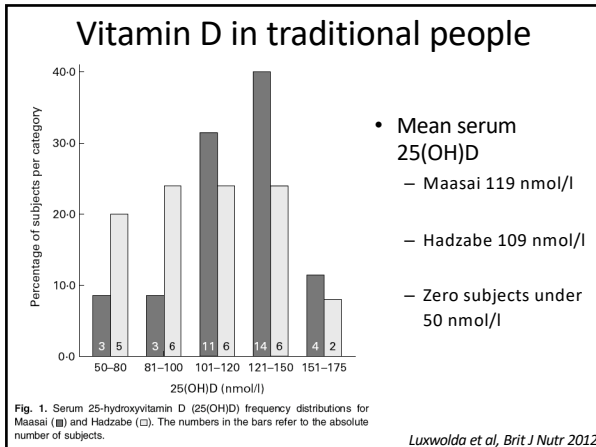
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Vitamin D in traditional people

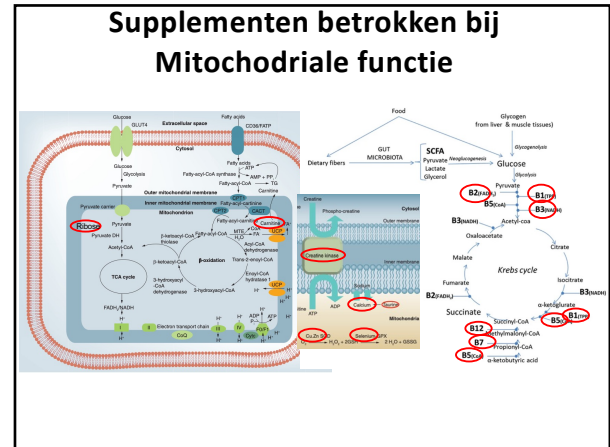
25 Hadzabe

35 Maasai

282



283



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> Biomed Res Int. 2019 Nov 17;2019:4352905. doi:10.1155/2019/4352905. eCollection 2019.

Expression Profile Analysis of Selenium-Related Genes in Peripheral Blood Mononuclear Cells of Patients with Keshan Disease

Xiaojuan Liu¹, Shulan He¹, Juanxia Peng¹, Xiong Guo^{2,3}, Wuhong Tan^{2,3}

Affiliations + expand
 PMID: 31828104 PMCID: PMC6885826 DOI: 10.1155/2019/4352905
 Free PMC article

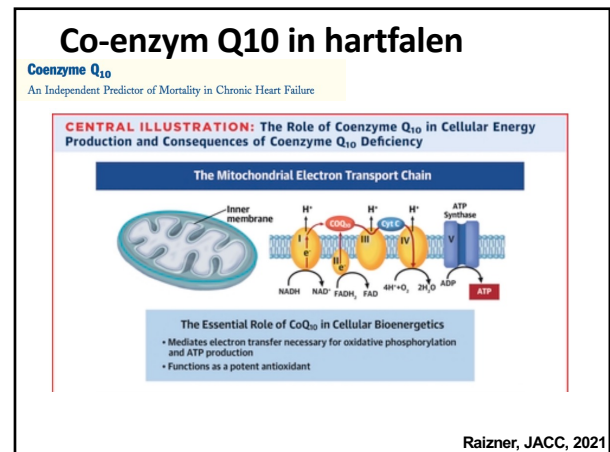
Abstract

Keshan disease (KD) is an endemic cardiomyopathy, which mainly occurs in China. Selenium deficiency is believed to play an important role in the pathogenesis of KD, but the molecular mechanism of selenium-induced damage remains unclear.

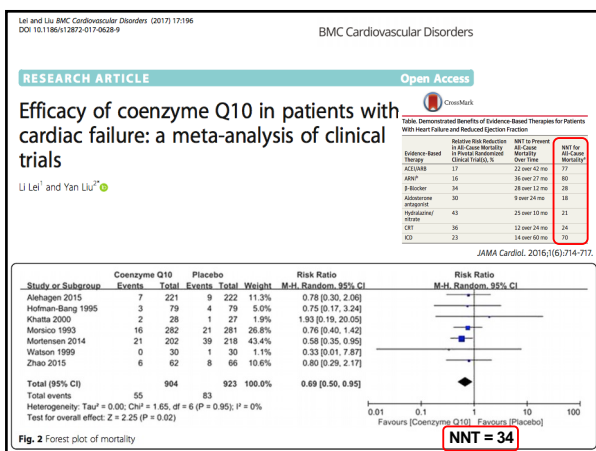
Based on our results, we suggest that selenium might contribute to the development of KD through dysfunction of selenium-related genes involved in apoptosis, metabolism, ion transport, and growth and development in the myocardium.

Selenium content in most parts of Europe is considerably poorer than in the United States. The average intake of selenium in Eastern Europe is lower than in Western Europe. [8] At one time, Finland had the lowest intake of selenium, but they fortified their fertilizers with selenium and have since changed the equation. Brazil nuts and kidney are the mainstay sources of selenium in these countries. Crab, liver, other shellfish, and fish provide moderate sources,

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European Heart Journal (2005) 26, 2238–2244
 doi:10.1093/eurheartj/ehi164

Clinical research

Proof of principle

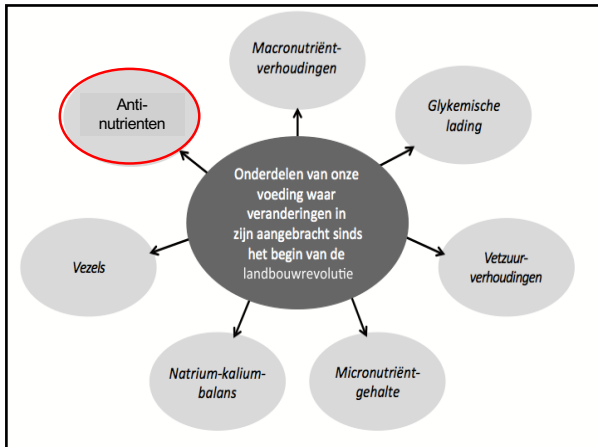
The effect of micronutrient supplementation on quality-of-life and left ventricular function in elderly patients with chronic heart failure

Klaus K.A. Witte^{1*}, Nikolay P. Nikitin¹, Anita C. Parker¹, Stephan von Haehling², Hans-Dieter Volk³, Stefan D. Anker⁴, Andrew L. Clark¹, and John G.F. Cleland¹

Methods and results Thirty CHF patients [age 75.4 (0.7), mean (SEM), LV ejection fraction (LVEF) ≤ 35%] were randomized to receive capsules containing a combination of high-dose micronutrients (calcium, magnesium, zinc, copper, selenium, vitamin A, thiamine, riboflavin, vitamin B₆, folate, vitamin B₁₂, vitamin C, vitamin E, vitamin D, and Coenzyme Q10) or placebo for 9 months in a double-blind fashion. All subjects were on stable optimal medical therapy for at least 3 months before enrolment.

Conclusion Long-term multiple micronutrient supplementation can improve LV volumes and LVEF and QoL scores in elderly patients with heart failure due to LV systolic dysfunction.

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Nieuwe bronnen van macronutrienten

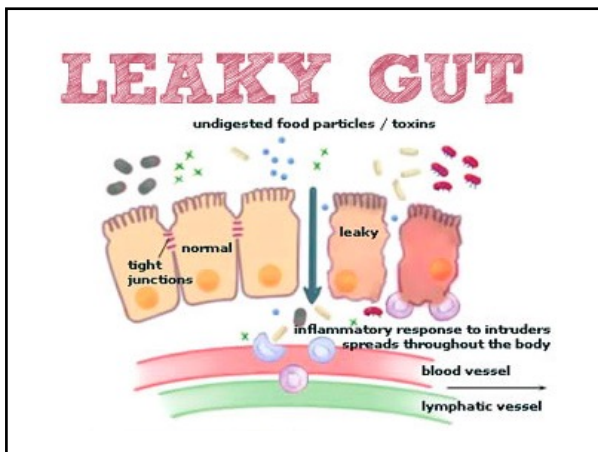
Granen

Lectines
Wheat globulines
Gliadines

Zuivel?

Caseine

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Coeliakie, een link tussen granen en zuivel

NUTRITION
ELSEVIER
Nutrition 25 (2009) 715-716
Research letter
www.nutritionj.com

Bovine milk intolerance in celiac disease is related to IgA reactivity to α - and β -caseins

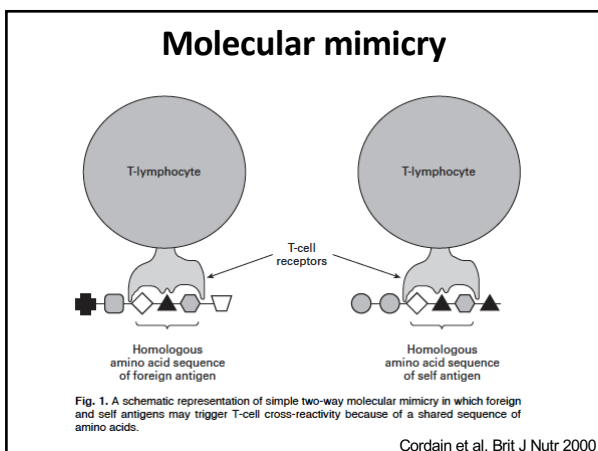
Francisco Cabrera-Chávez, M.Sc., and Ana María Calderón de la Barca, Ph.D.*

Gliadine

Caseine

Molecular mimicry tussen gliadine en caseine

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Mutiple Sclerosis

Structural Homology

Myelin Basic protein	f	s	w	g	a	e	g
<i>Escherichia coli</i>	f	g	w	g	a	e	l

*, aminozuren

Cordain et al. Brit J Nutr 2000

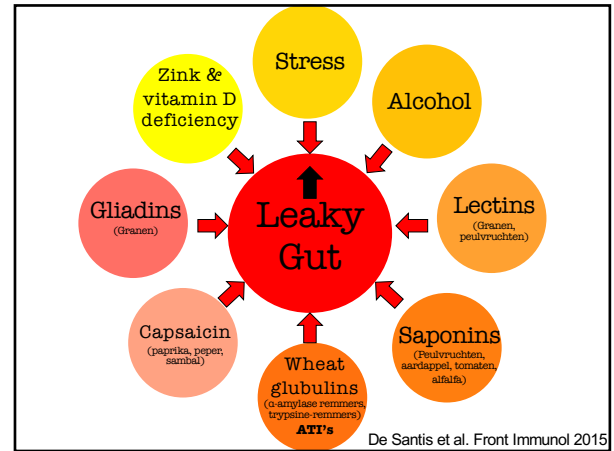
294

Barrierefunctie related disease

Disease	Reference
Ankylosing spondilitis	Valle JH et al. J Rheumatol 1999;26:128-35
Autoimmune gastritis	Greenwood DL et al. Eur J Pediatr 2009;187:917-25
Autoimmune hepatitis	Terjung B Clin Rev Allergy Immunol 2009;36:40-51
Behcet's syndrome	Fresko I et al. Ann Rheum Dis 2001;60:65-6
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	Yacshym B et al. Dig Dis Sci 1996;41:2493-98
Psoriasis	Hamilton et al. Q J Med 1985;56:569-67
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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Take home message No. 12:

Matig(er) met granen en zuivel

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Dank voor uw aandacht

En wie meer wil weten:

Oerdieet €25

Oergezond €20

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