

June 10 15.00-17.00



Health of animal- and plant-based foods

Dr. Ir. Annet Roodenburg (HAS University of Applied Sciences)

- **HOW (UN) HEALTHY IS MEAT?**

Dr. Ir. Fred van de Velde (HAS University of Applied Sciences, NIZO)

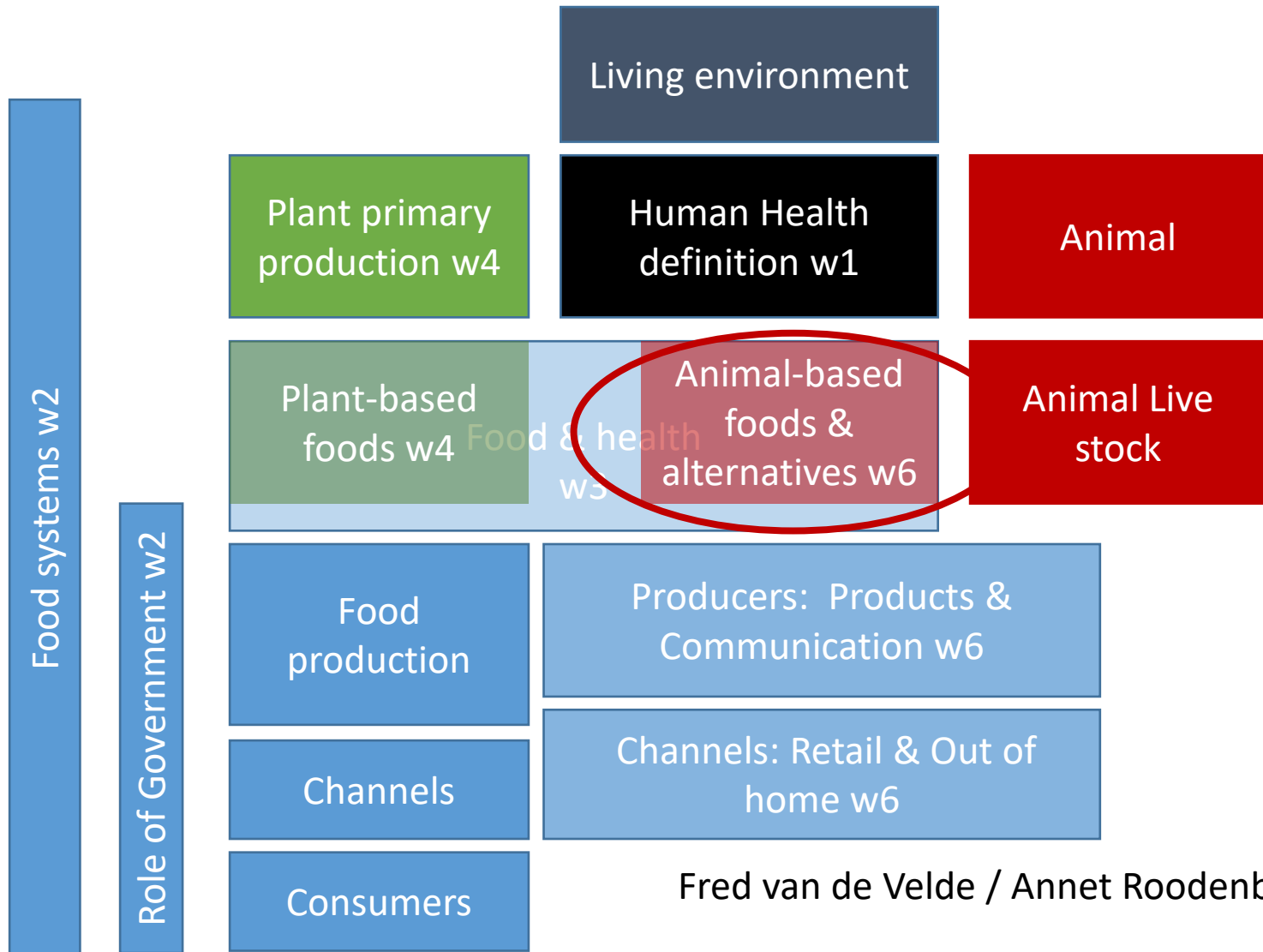
- **PROTEIN TRANSITION – FROM ANIMAL TO PLANT-BASED FOODS**

Food Trend lecture

Organized by

- HAS University of Applied Sciences for the Minor Towards a healthy society
- &
- Lectoren Platform Voedsel & Gezondheid

Minor Towards a healthy society Food (week 6)



Fred van de Velde / Annet Roodenburg

June 10 15.00-17.00



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- **HOW (UN) HEALTHY IS MEAT?**

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- **PROTEIN TRANSITION – FROM ANIMAL TO PLANT-BASED FOODS**

How (un)healthy is meat?

10 June 2021 Minor Towards a healthy society

Lectorenplatform Voedsel & gezondheid

Annet Roodenburg

This lecture:

- Meat is healthy, because:
 - ...
- Meat is unhealthy, because:
 - ...
- It is healthier to eat less meat, because:
 - ...
- Dairy is also (un)healthy, because:
 - ...



Volkskrant.nl

First a question

Which option applies best to you?

1. I am a meat eater
2. I am a flexitarian
3. I am a vegetarian
4. I am a vegan
5. Other...

How (un)healthy is meat?

Healthy

- Protein
- Iron
- Vitamin B12

Unhealthy

- Saturated fat
- Salt (processed)

How healthy is meat:

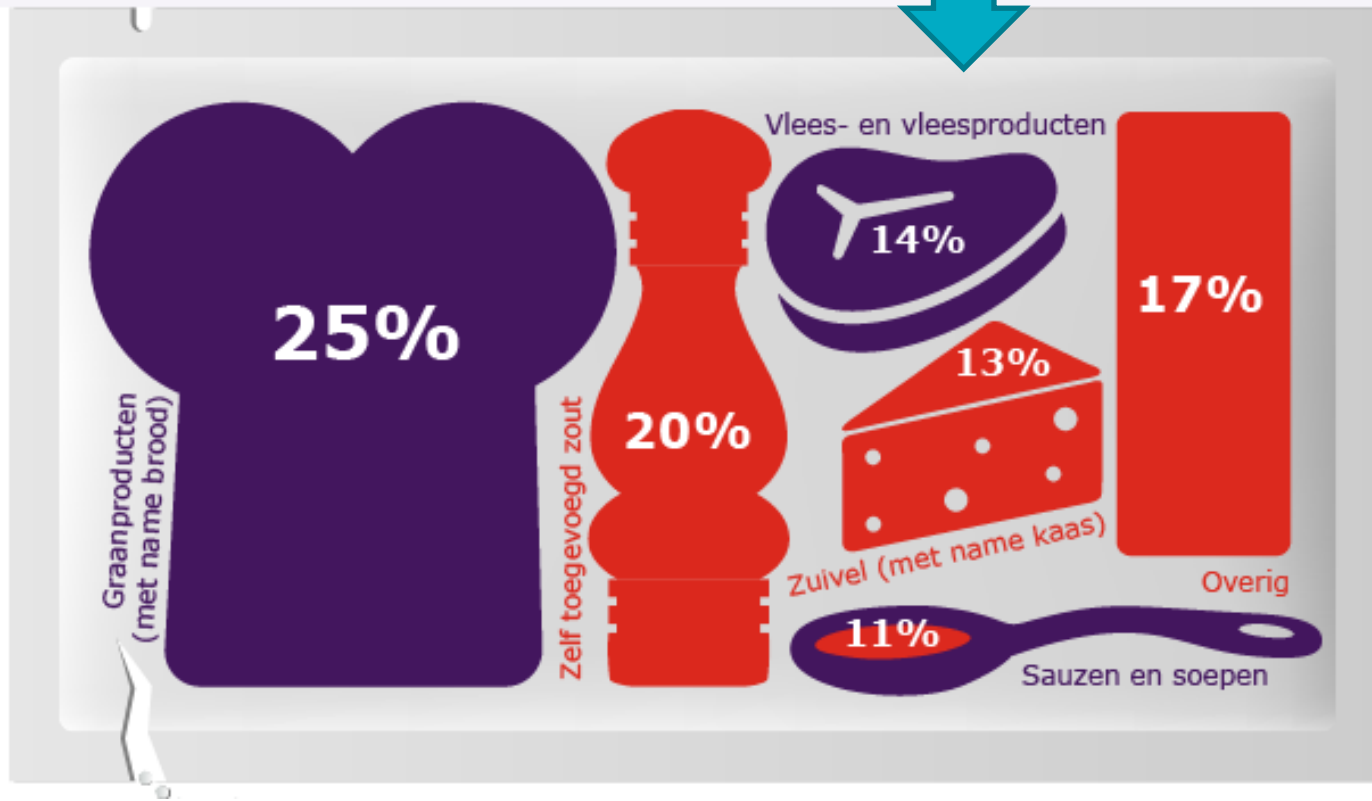
Salt, iron, ...

WHAT IS IN IT?

Salt

Recommended: max per day 6 gram salt, we eat: 9 gram: 50% too much

Bijdrage van voedingsmiddelengroepen aan de zoutconsumptie



Source: Food consumption survey 2007-2010; 3819 participants (7-69j)

Why is too much salt (sodium) unhealthy?

Why less salt?:

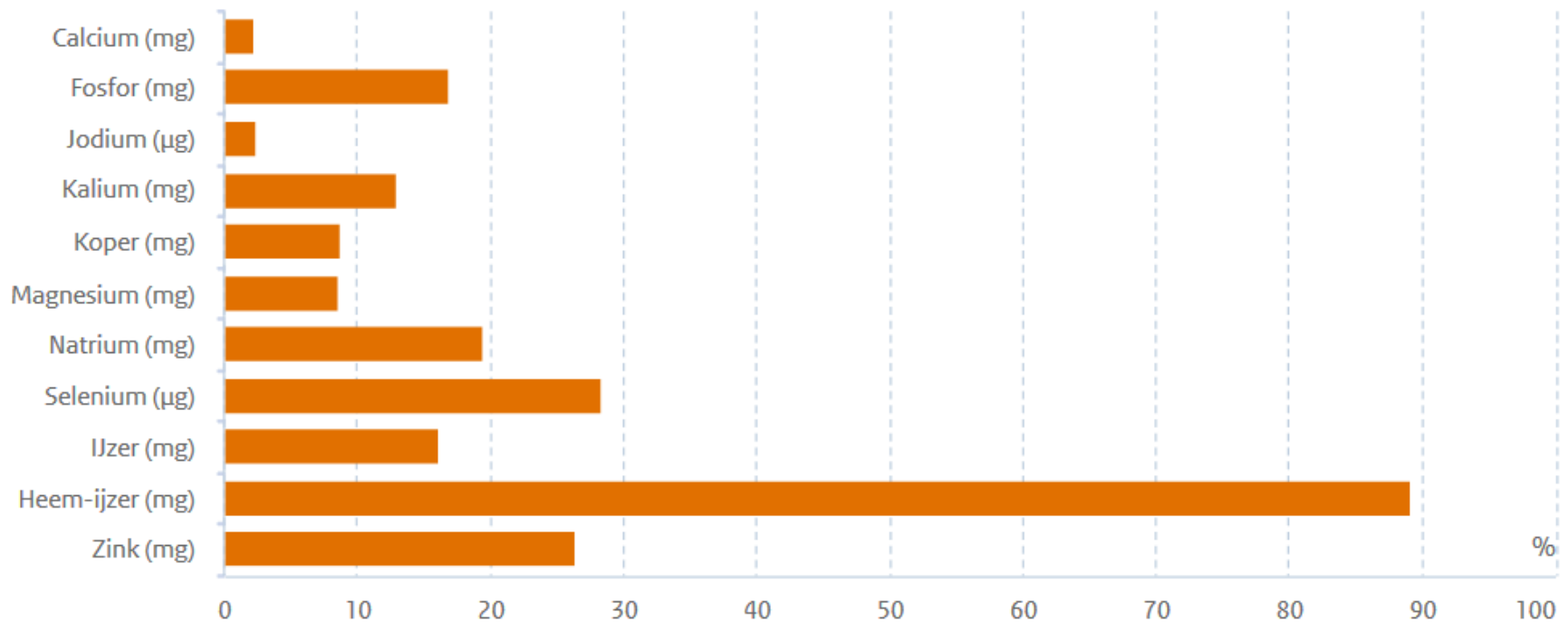
- Lowering blood pressure -> less cardiovascular diseases
- Especially in people with increased blood pressure



Source: Dutch Health Council, 2015

Contribution of meat to intake of minerals: IRON

Sources of minerals
VCP 2012-2016, 1-79-jarigen

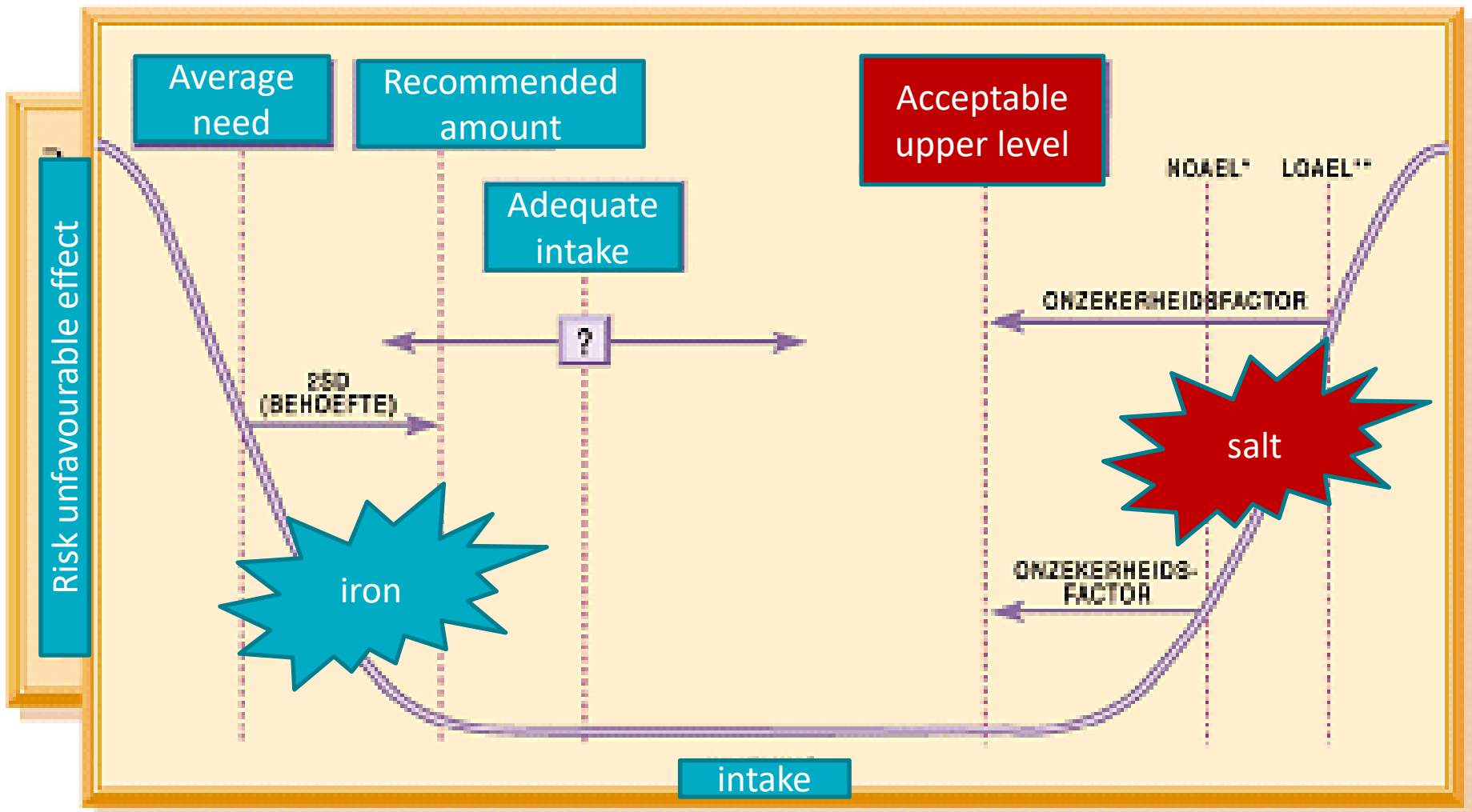


Iron

- Iron is important for e.g oxygen transport
- Iron from meat is better available
 - So Popye was wrong



Per nutrient: intake & health effects

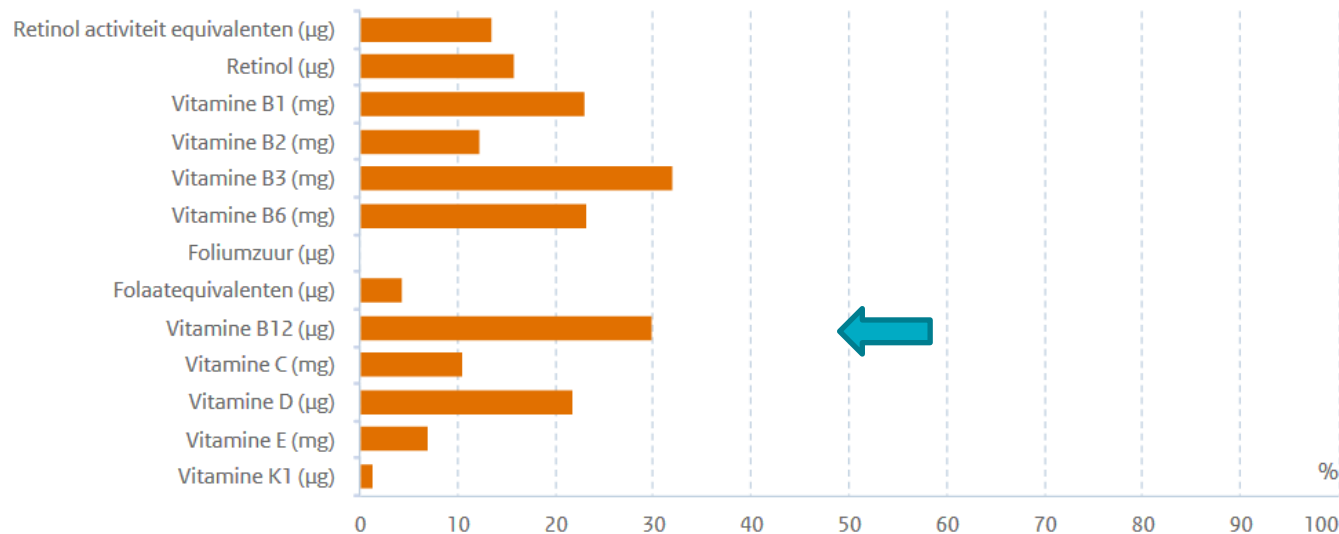


NOAEL/ LOAEL = No/Low Adverse Effect Level

Contribution of meat to intake of vitamins

Sources of vitamins

VCP 2012-2016, 1-79-jarigen



- | | |
|--|---|
| <input type="checkbox"/> Aardappelen | <input type="checkbox"/> Groente |
| <input type="checkbox"/> Peulvruchten | <input type="checkbox"/> Fruit, noten en olijven |
| <input type="checkbox"/> Zuivel | <input type="checkbox"/> Brood, granen, rijst, pasta |
| <input checked="" type="checkbox"/> Vlees(producten) | <input type="checkbox"/> Vis, schaal- en schelpdieren |
| <input type="checkbox"/> Eieren | <input type="checkbox"/> Vetten en oliën |
| <input type="checkbox"/> Suiker en snoepgoed | <input type="checkbox"/> Koek en gebak |
| <input type="checkbox"/> Niet-alcoholische dranken | <input type="checkbox"/> Alcoholische dranken |
| <input type="checkbox"/> Sauzen en smaakmakers | <input type="checkbox"/> Bouillon |
| <input type="checkbox"/> Diversen | <input type="checkbox"/> Hartige snacks |

Vitamin B12

Only in
animal-based
foods

eerlijk over eten
Voedingscentrum



Vitamine B12 (cobalamine)

Vitamine B12 (cobalamine) is nodig voor de aanmaak van rode bloedcellen. Rode bloedcellen zijn nodig om zuurstof in je bloed te vervoeren. Daarnaast is vitamine B12 nodig voor een goede werking van het zenuwstelsel.

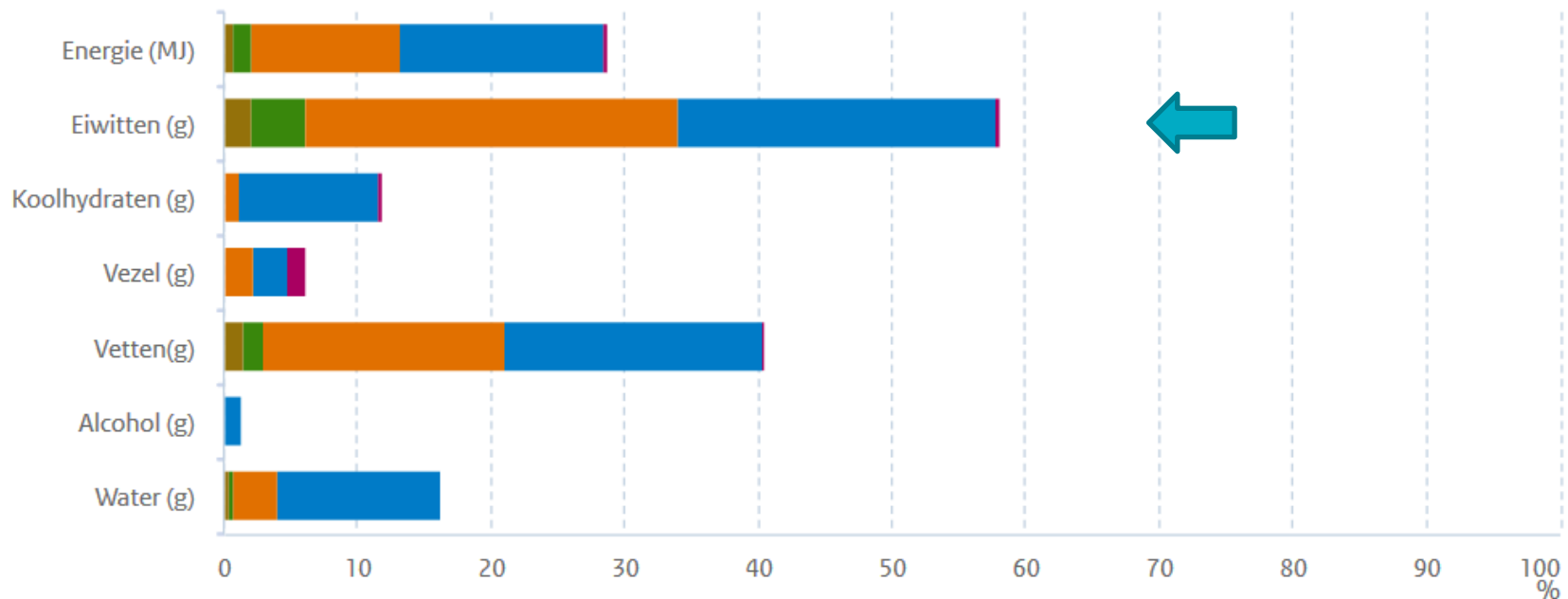
Vitamine B12 zit alleen in dierlijke producten, zoals melk, melkproducten, vlees, vleeswaren, vis en eieren.

Veganisten wordt aangeraden een vitamine B12-supplement te slikken of producten te gebruiken met toegevoegd vitamine B12.

Contribution of animal-based foods (& pulses) to intake of macronutrients

Sources of macronutrients

VCP 2012-2016, 1-79-jarigen



- ☐ Aardappelen
- ☒ Peulvruchten
- ☒ Zuivel
- ☒ Vlees(producten)
- ☒ Eieren
- ☐ Groente

- ☐ Groente
- ☐ Fruit, noten en olijven
- ☐ Brood, granen, rijst, pasta
- ☒ Vis, schaal- en schelpdieren
- ☐ Vetten en oliën
- ☐ Keukengebruik

Protein

- Protein is an important building block for e.g. muscles, enzymes, etc
- Protein quality of animal-based protein is better than plant-based protein

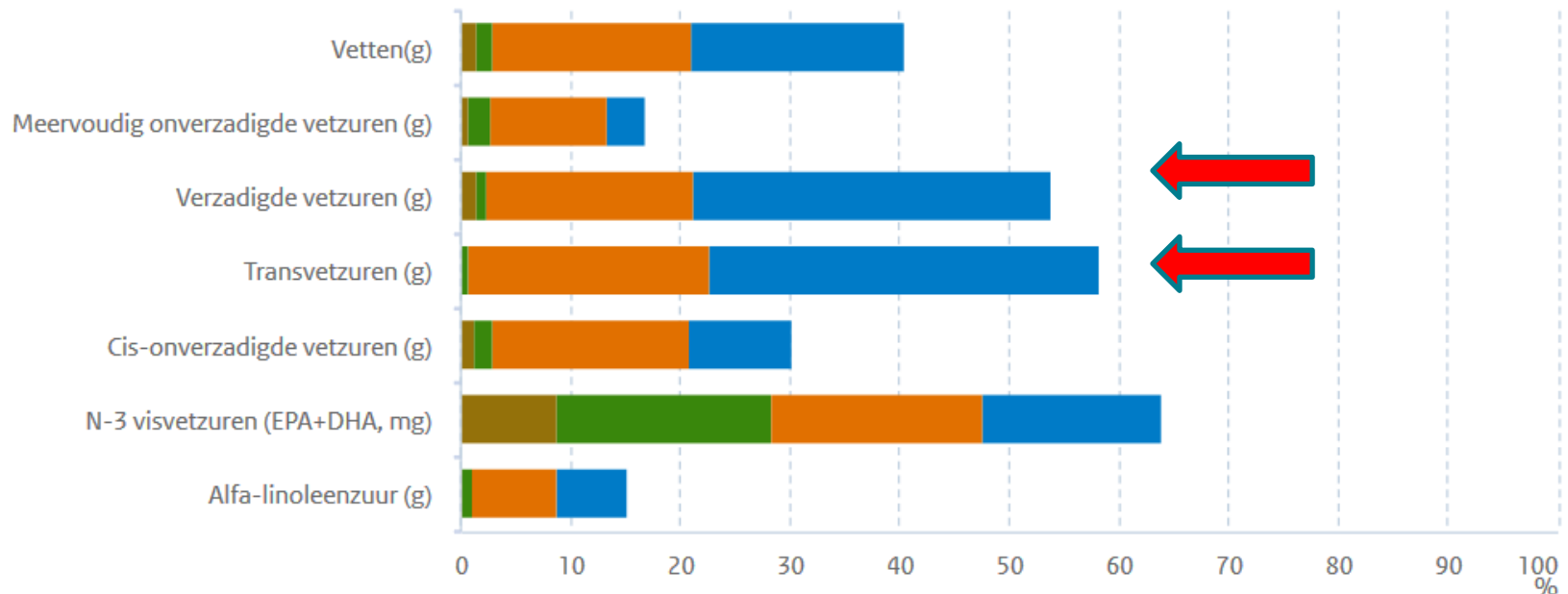


<https://www.consumerenbond.nl/gezond-eten/extra-wit-extra-gezond>

Contribution of animal-based foods to intake of fats

Sources of fats 1-79-jarigen

VCP 2012-2016



- ☐ Aardappelen
- ☐ Peulvruchten
- ☒ Zuivel
- ☒ Vlees(producten)
- ☒ Eieren
- ☐ Suiker en snoetgoed

- ☐ Groente
- ☐ Fruit, noten en olijven
- ☐ Brood, granen, rijst, pasta
- ☒ Vis, schaal- en schelpdieren
- ☐ Vetten en oliën
- ☐ Koek en gebak

Why is saturated fat unhealthy?

- Cholesterol increasing ->
- Higher risk of cardiovascular diseases
- Unsaturated fat is **cholesterol lowering**, thus favourable for health



Source: Dutch Health Council, 2015

Dutch dietary guidelines

Recommended food consumption

Follow a dietary pattern that involves eating more plant-based and less animal-based food, as recommended in the guidelines

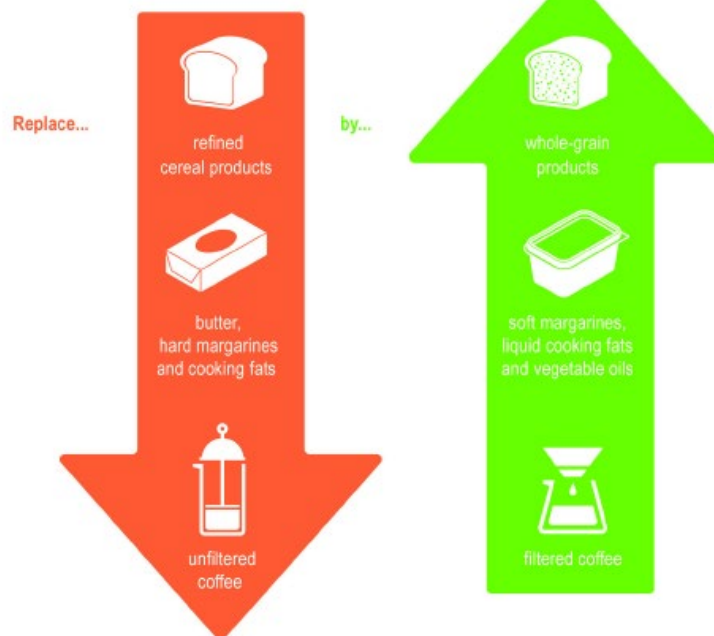
Higher consumption recommended:



Maintenance of current consumption recommended:



Replacement recommended:



Limitation recommended:

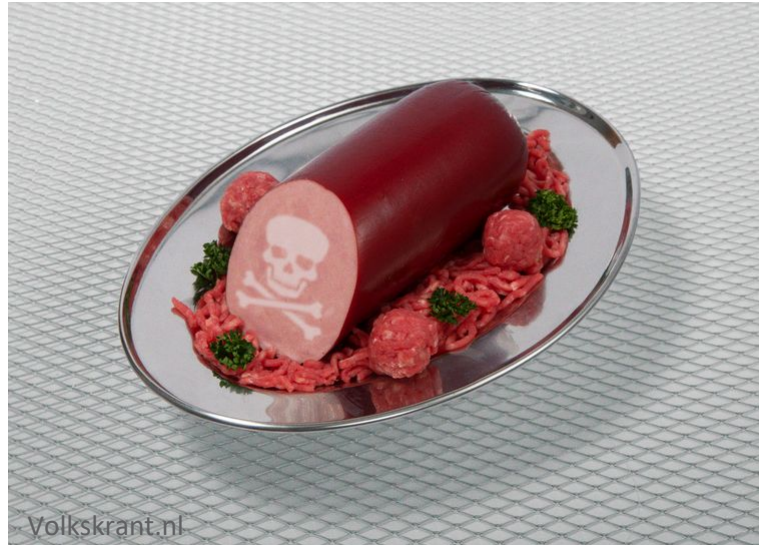


* except for specific groups for which supplementation applies

Source: Dutch Health Council, 2015

Why is too much meat unhealthy?

- Higher meat consumption leads to 10-20% higher risk of chronic diseases:
 - stroke, diabetes, intestinal cancer, lung cancer
- Especially red and processed meat



Source: Dutch Health Council, 2015

Food based dietary guidelines (Schijf van Vijf)



Meat

Health:

- No processed meat
- Less meat
- Source of iron, vitamin B12, vitamin B1 & protein



Sustainability:

- LESS!!
- No distinction between different (fatter) types of meat, to avoid more food waste



Vlees**

Max 500 g/wk
100 g/keer

** not more than 5x pw, max 3x red meat

19-50 jaar man

	Groente	250 g/d	
	Fruit	200 g/d	
	Brood	6-8 snee/d 210-280 g/d	
	Graanproducten en aardappelen*	4-5 porties/d 240-300 g/d	
	Vis	1 keer per wk 100 g/wk	←
	Peulvruchten	2-3 opscheplepels/wk 135 g/wk	←
	Vlees*	Max 500 g/wk 100 g/keer	←
	Ei	2-3 eieren/wk 100-150 g/wk	
	Noten	25 g/d	←
	Melk en melkproducten	2-3 porties/d 300-450 g/d	
	Kaas	40 g/d	
	Smeer- en bereidingsvetten	65 g/d	

Vrouw

Man

51

Jaar

Maak je eigen dagmenu met:

-  250 gram groente
-  2 porties fruit
-  3-4 bruine / volkoren boterhammen
-  3-4 opscheplepels volkoren graanproducten of 3-4 aardappelen 
-  1 portie vis / peulvruchten / vlees 
-  15 gram ongezouten noten
-  3-4 porties zuivel
-  40 gram kaas
-  40 gram smeer- en bereidingsvetten
-  1,5-2 liter vocht 

Hoeveel is dat nou, zo'n portie?

Fish

Health

- 1x per week (was 2x pw)
- All fish (also processed, minimal 70% fish in product)

Sustainability

- Fish instead of meat is better
- 1x is better than 2x pw



Vis

1 keer per wk
50 g/wk

More plant-based: nuts and pulses

Health & Sustainability

- Pulses now marked as protein source
- Nuts (unsalted) also new in Sv5



	Peulvruchten	2-3 opscheplepels/wk 135 g/wk
	Noten	25 g/d

Eat pulses
weekly

A hand of
nuts per
day

Meat-replacers, healthy?

Salt: 1,1 g/100g

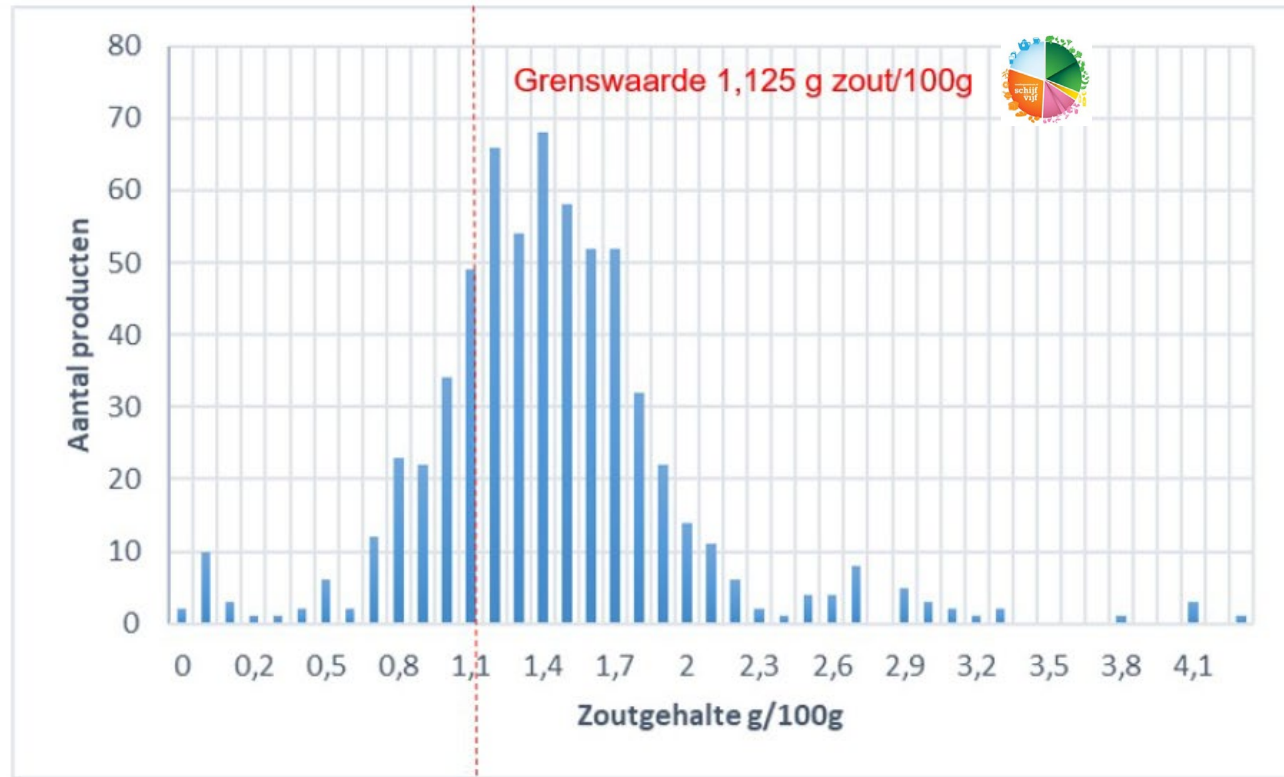


Salt: 3 g/100g



Salt in meat replacers

(n=640, data from KiesikGezondApp)



Afbeelding: Zoutgehaltes in 640 vleesvervangers in de 'Kies-ik-gezond?'-app. Grenswaarde 1.125g zout per 100g als Schijfcriterium voor kant-en-klare vleesvervangers (4).

WHAT ABOUT DAIRY?

How (un)healthy is dairy?

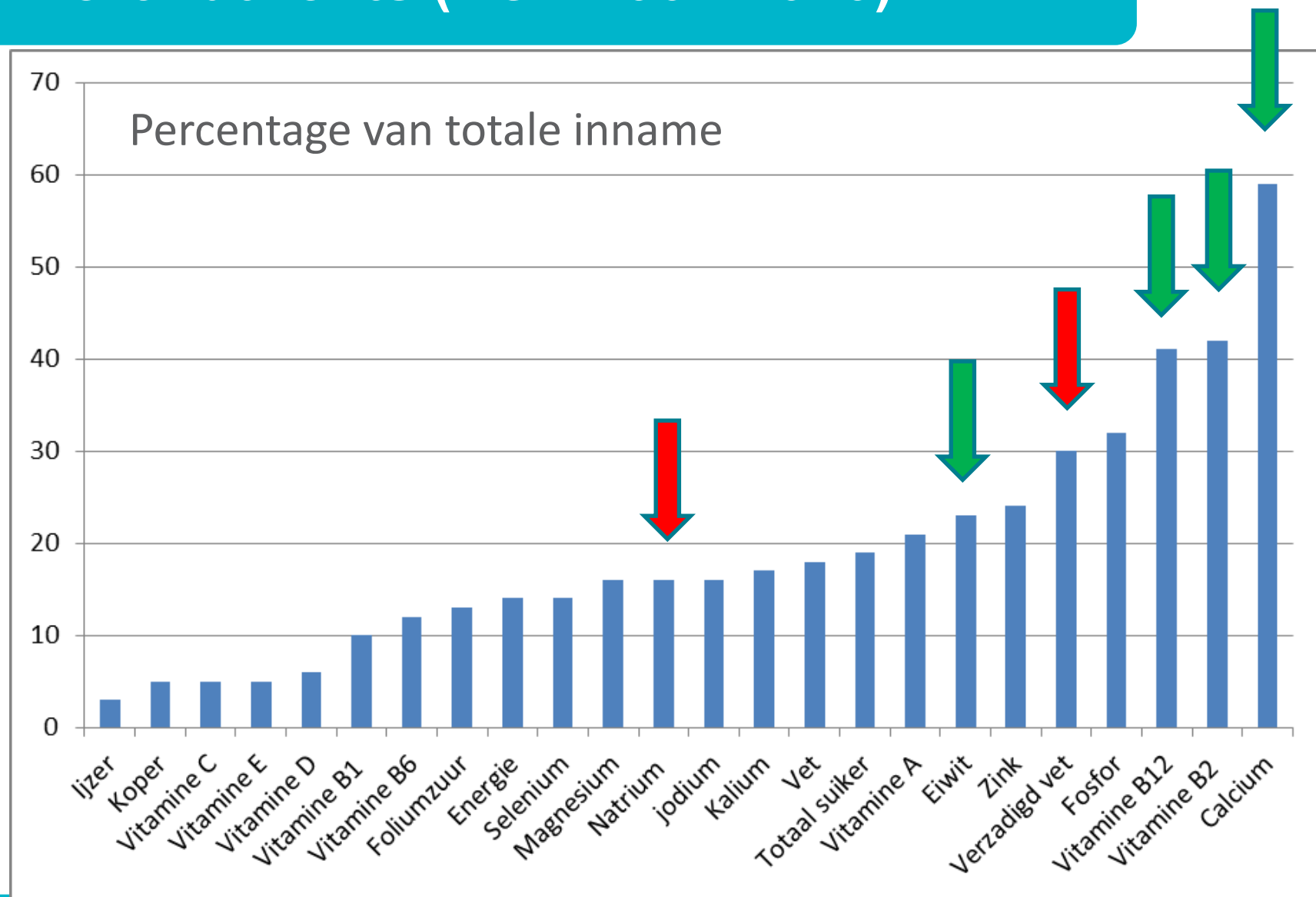
Healthy

- Protein
- Calcium
- Vitamin B12
- Vitamin B2

Unhealthy

- Saturated fat
- Salt (cheese)

Contribution of dairy to intake of micronutrients (VCP 2007-2010)



Calcium

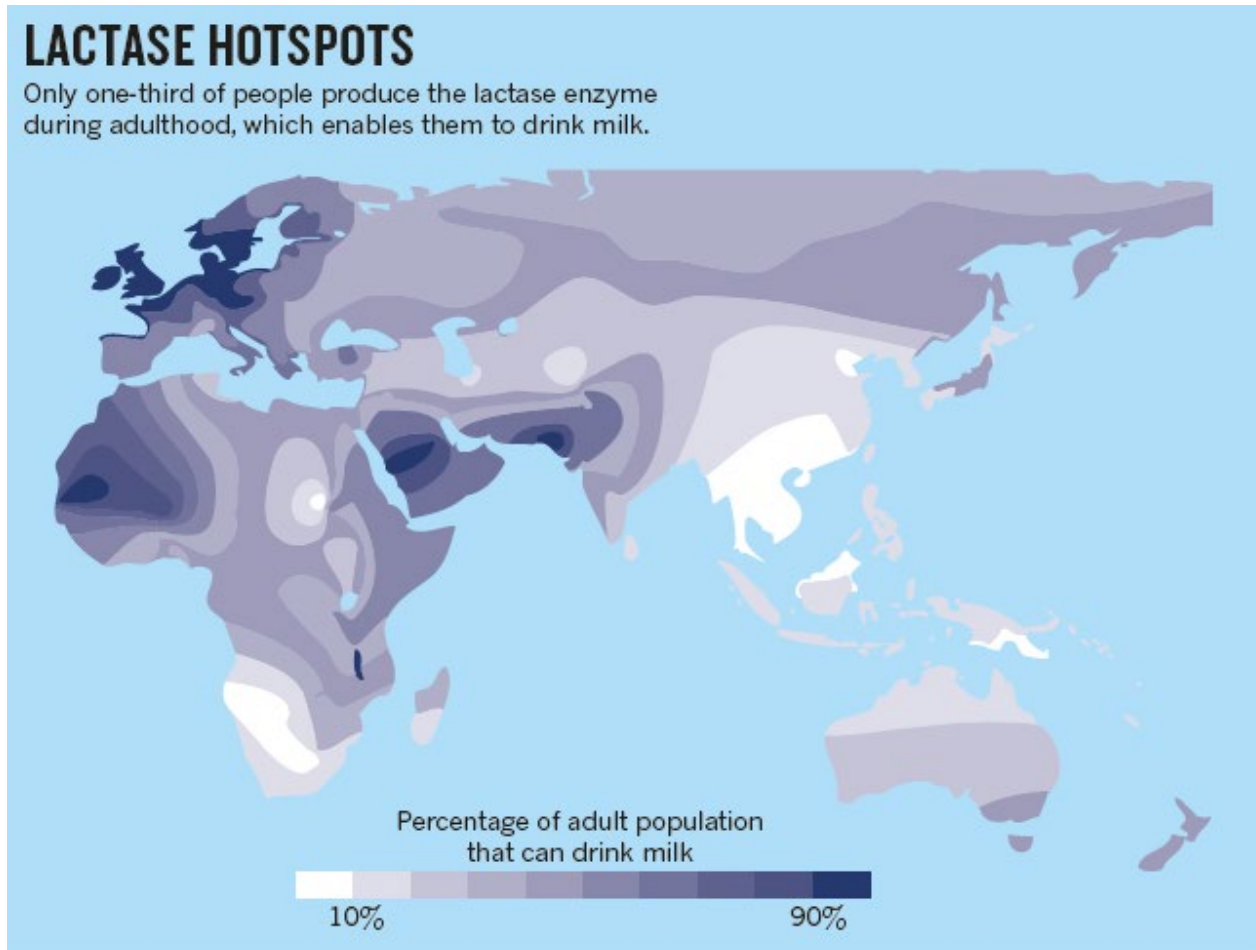
- Dairy is an important source of calcium



35% of the world population is able to digest lactose

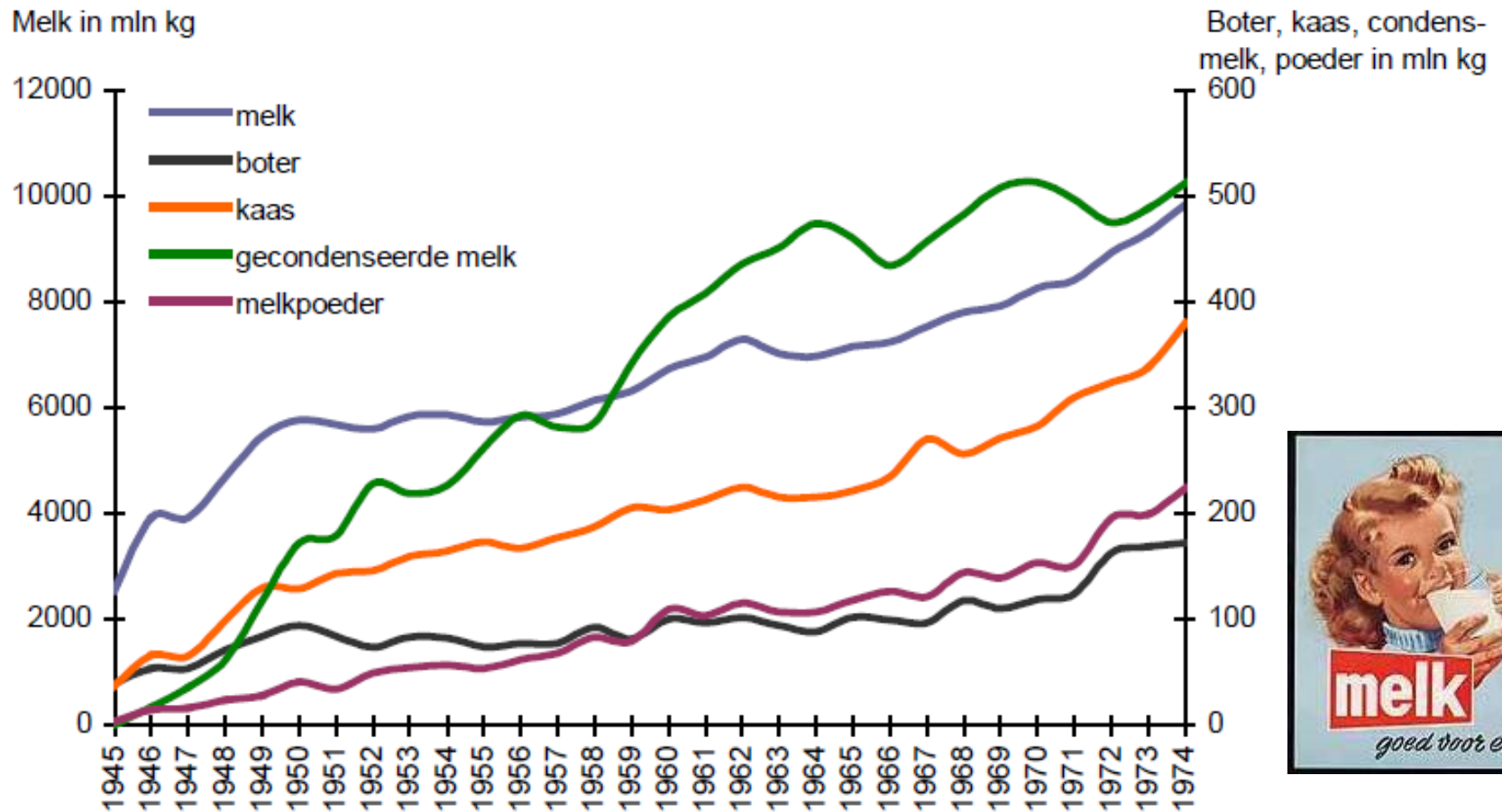
LACTASE HOTSPOTS

Only one-third of people produce the lactase enzyme during adulthood, which enables them to drink milk.



TRENDS

Total production of milk & milkproducts in miljons kg, 1945-1974



Bron: www.cbs.nl/statline (Nederland in tijdreeksen 1899-1999)

Schoolmilk

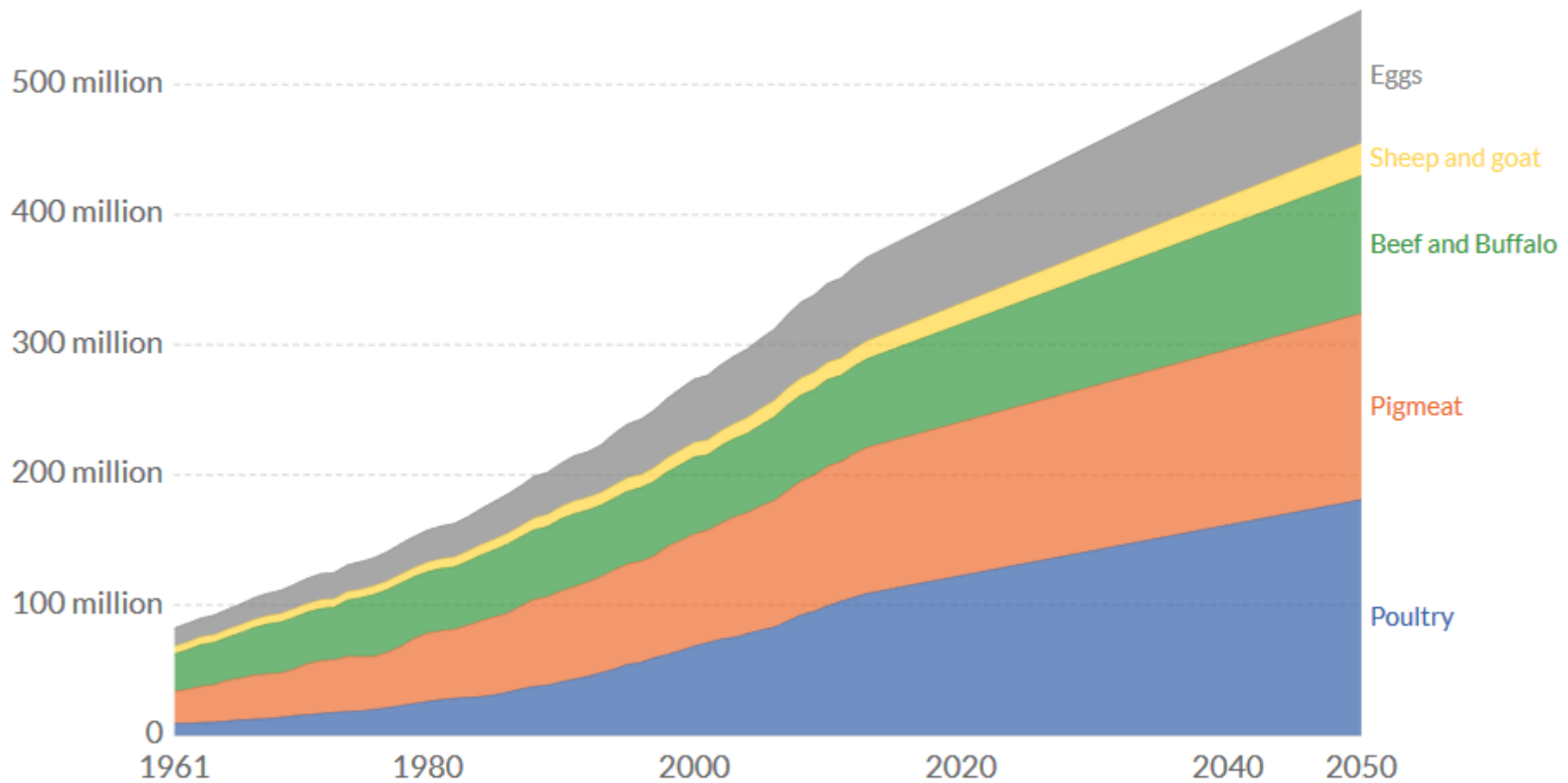
Until the seventies



Foto: <http://www.schoolmelk.be/alg-info/info-melk-geschiedenis.htm>

Global meat projections to 2050

Global meat production projections, as published by the UN Food and Agriculture Organization (FAO) based on future population projections and expected impacts of regional and national economic growth trends on meat consumption. Data from 1961-2013 is based on published FAO estimates; from 2013-2050 based on FAO projections.



Source: UN Food and Agriculture Organization (FAO)

CC BY

☐ Relative

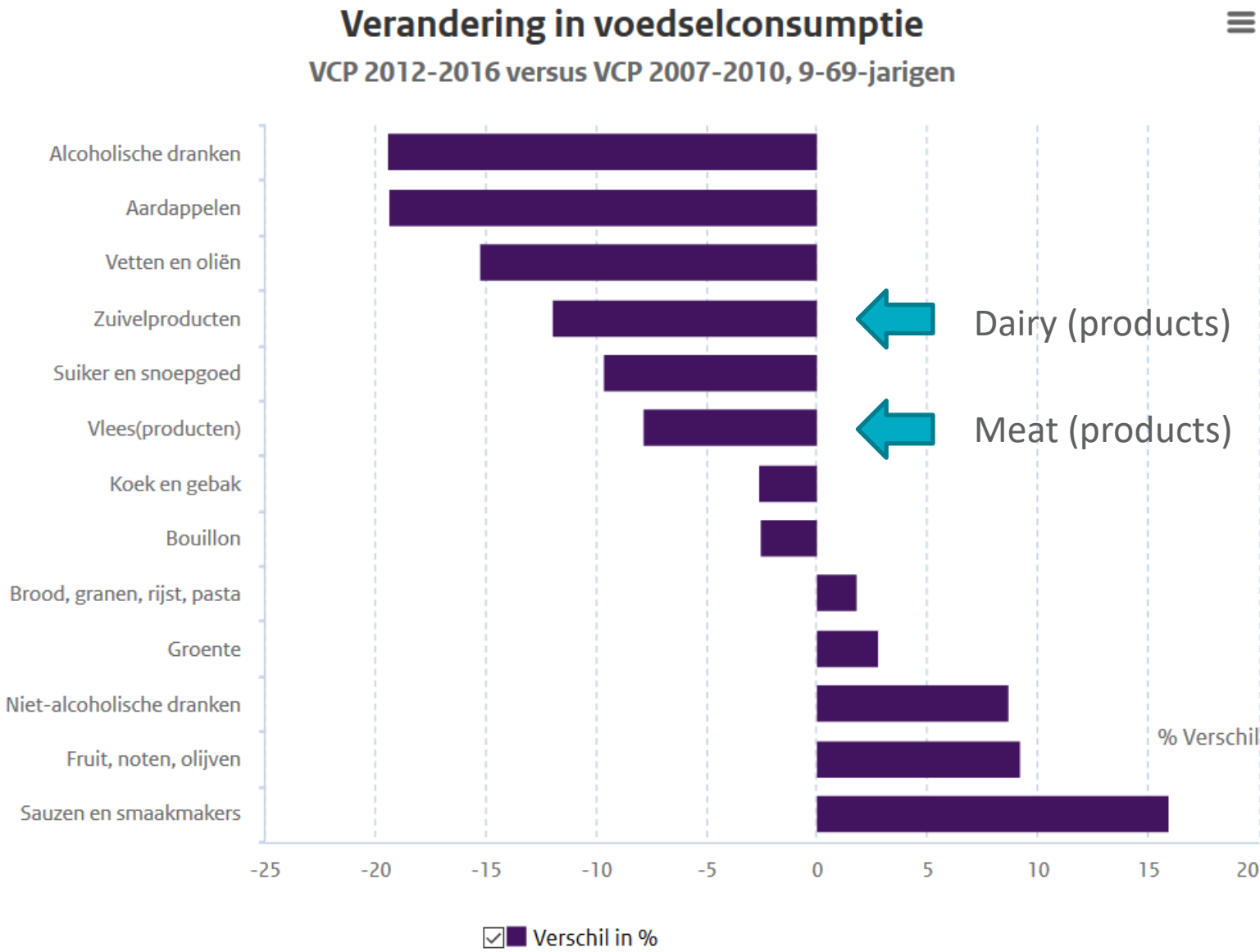
CHART

DATA

SOURCES



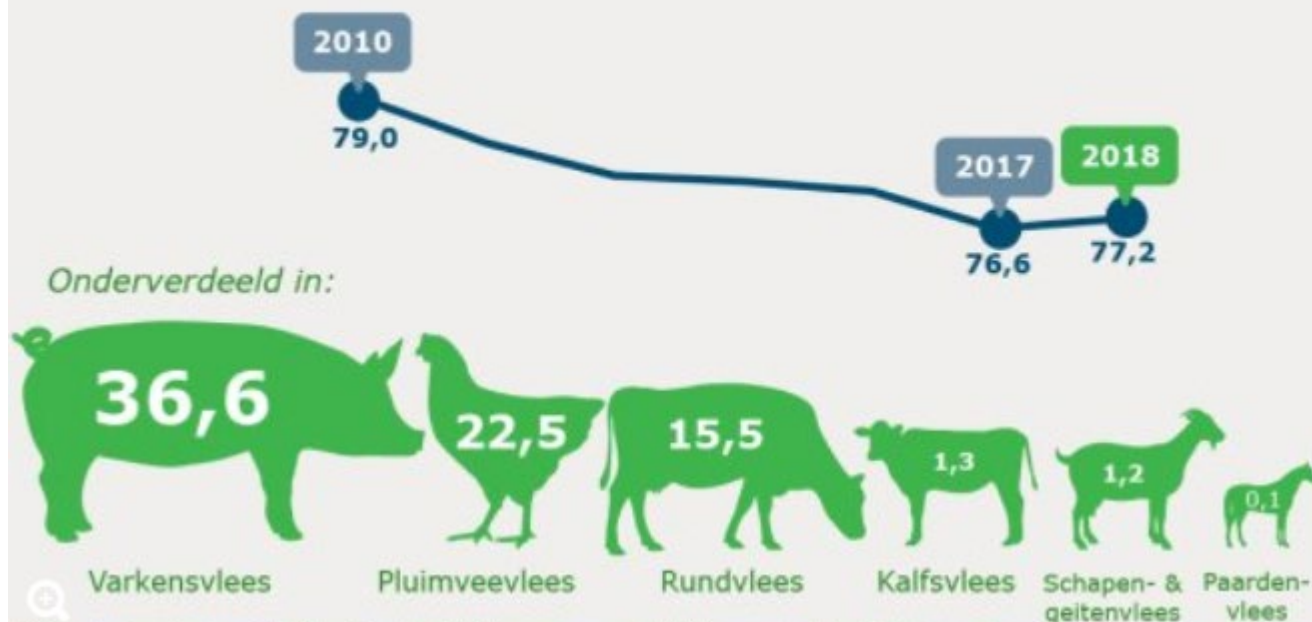
9-69-jarigen - grafiek



..?

Hoeveel vlees heeft de consument afgelopen jaar gegeten?

Totale vleesverbruik (in kg op basis van karkasgewicht) per persoon in Nederland per jaar:



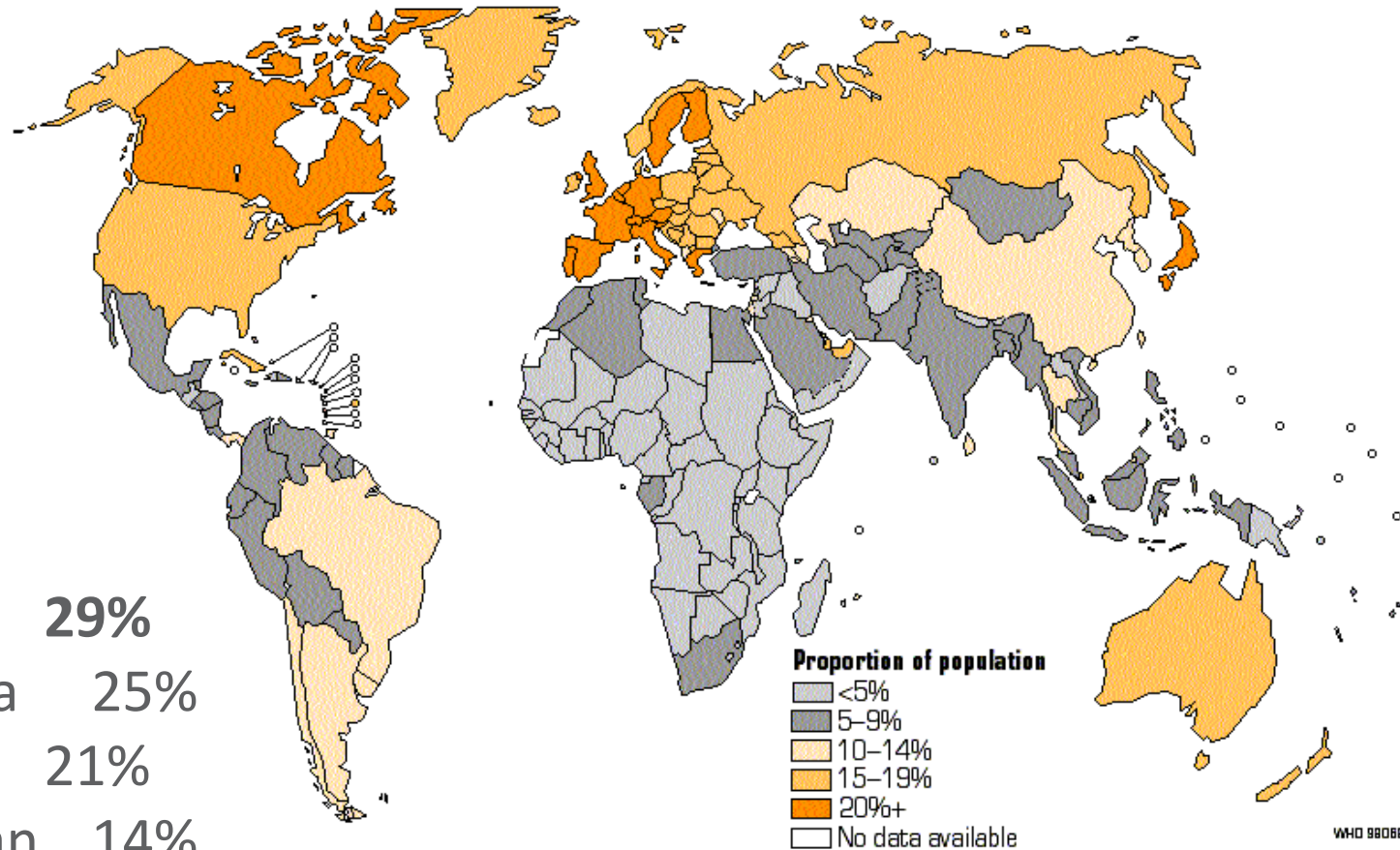
Cijfers op basis van karkasgewicht. Als vuistregel geldt dat daarvan ongeveer de helft geconsumeerd wordt als vlees en vleeswaren.

Trend: meat consumption

- Average in Netherlands: 100g/day
- Trend in Netherlands: less meat?
- International trend: more meat
- Worldchampion Australië: 300 g/day

We become older

B. Population aged 65 and above, 2025



Europe	29%
North America	25%
Eastern Asia	21%
LA & Caribbean	14%
SE & CE Asia	11%

Undernutrition in elderly

- Hospitals: 25-40%
- Nursing homes: 20-25%
- Assistance at home: 15-25%
- At home w/o assistance: 7%
- Vitamin D, B12, energy & protein



Overweight & obesity lead to cardiovascular disease, diabetesT2, cancer

British men second biggest 'couch potatoes'

12:30pm 28th July 2004

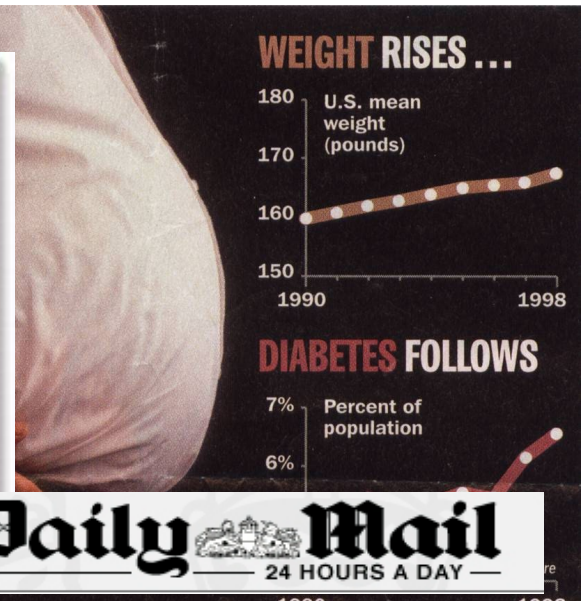


British men spend half their free time watching TV

British men spend free time glued to second to only H European survey

The average Brit of their leisure time the average Hun

Those who watch Germans at 34% 35%.



BBC NEWS

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Briefings
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Entertainment
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In Depth
AudioVideo

You are in: **Health**

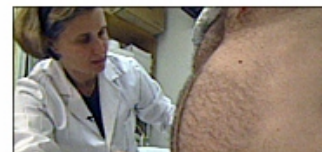
Tuesday, 16 April, 2002, 16:40 GMT 17:40 UK
Syndrome X the 'silent killer'



The syndrome is linked to obesity

There is a new and deadly condition thought to afflict five million people in the UK - Syndrome X.

abc WORLDNEWS
TONIGHT
WITH PETER JENNINGS



Metabolic Syndrome Predicts Heart Failure
Cocktail of Woes From Stomach Fat to Cholesterol Can Be Deadly

nogeschool

BBC SPORT

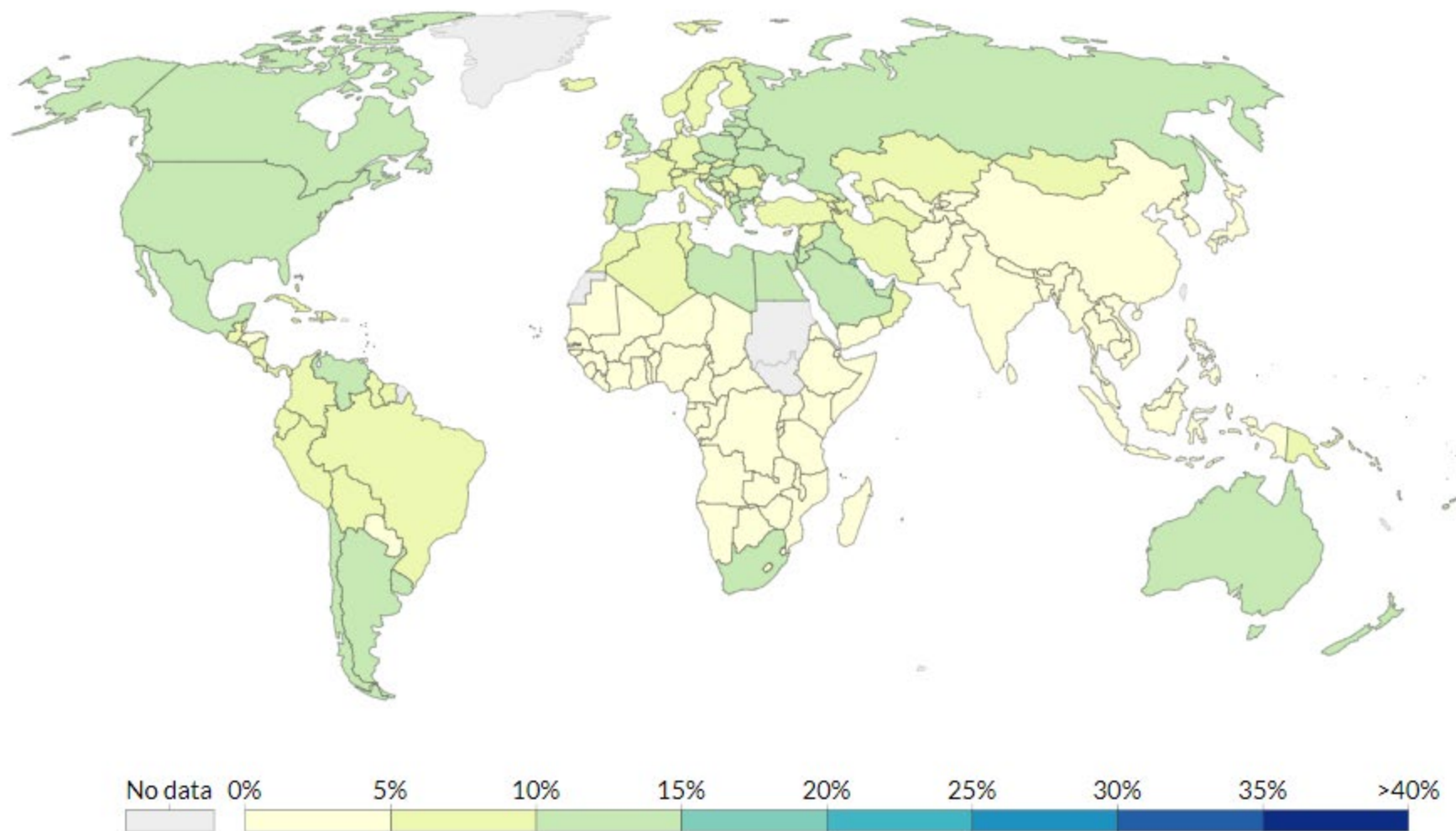
BBC Weather

SERVICES

Daily E-mail

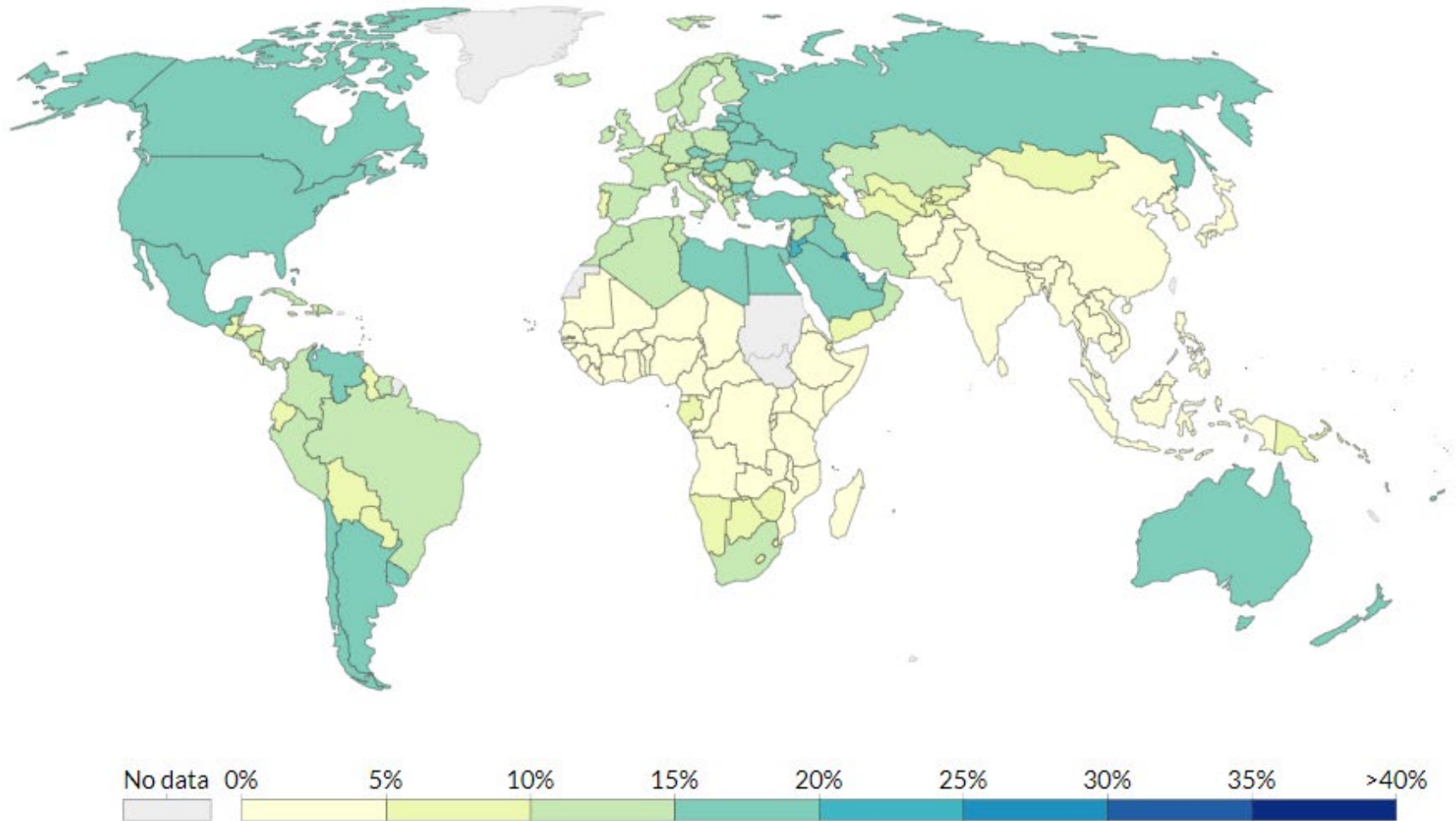
Share of adults that are obese, 1978

Obesity is defined as having a body-mass index (BMI) equal to or greater than 30. BMI is a person's weight in kilograms divided by his or her height in metres squared.



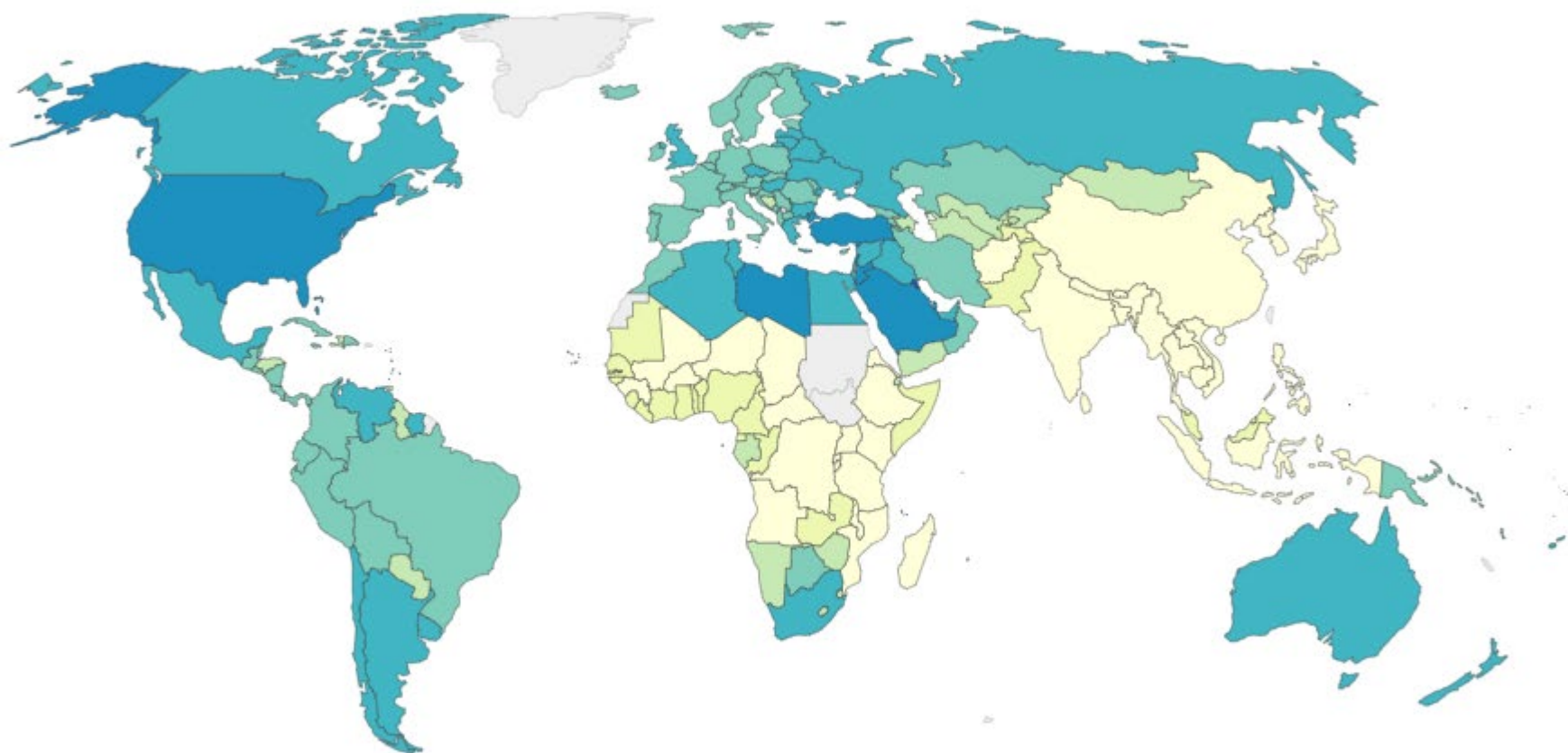
Share of adults that are obese, 1990

Obesity is defined as having a body-mass index (BMI) equal to or greater than 30. BMI is a person's weight in kilograms divided by his or her height in metres squared.



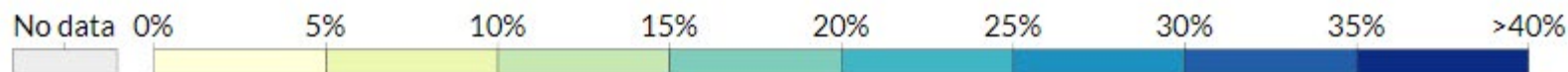
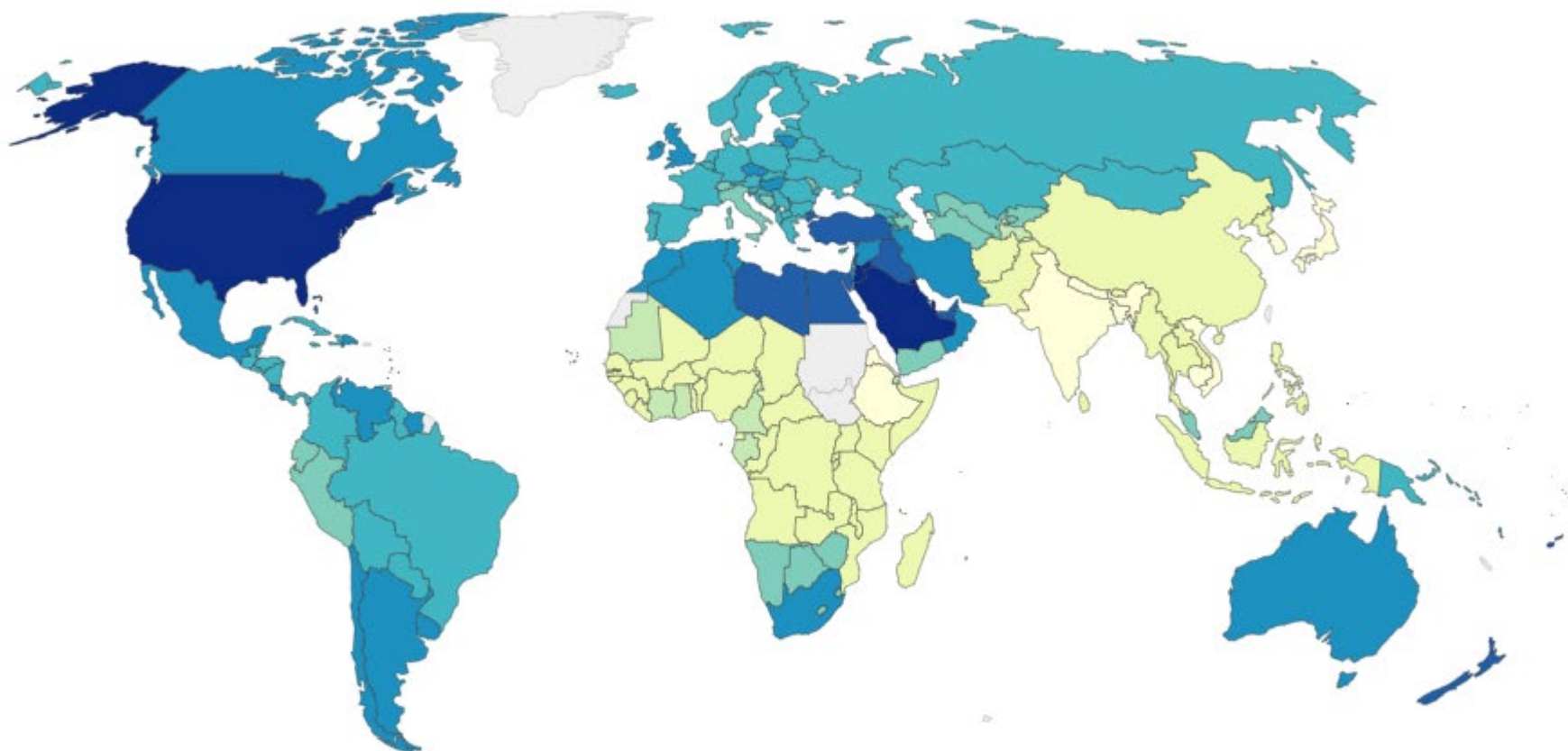
Share of adults that are obese, 2005

Obesity is defined as having a body-mass index (BMI) equal to or greater than 30. BMI is a person's weight in kilograms divided by his or her height in metres squared.



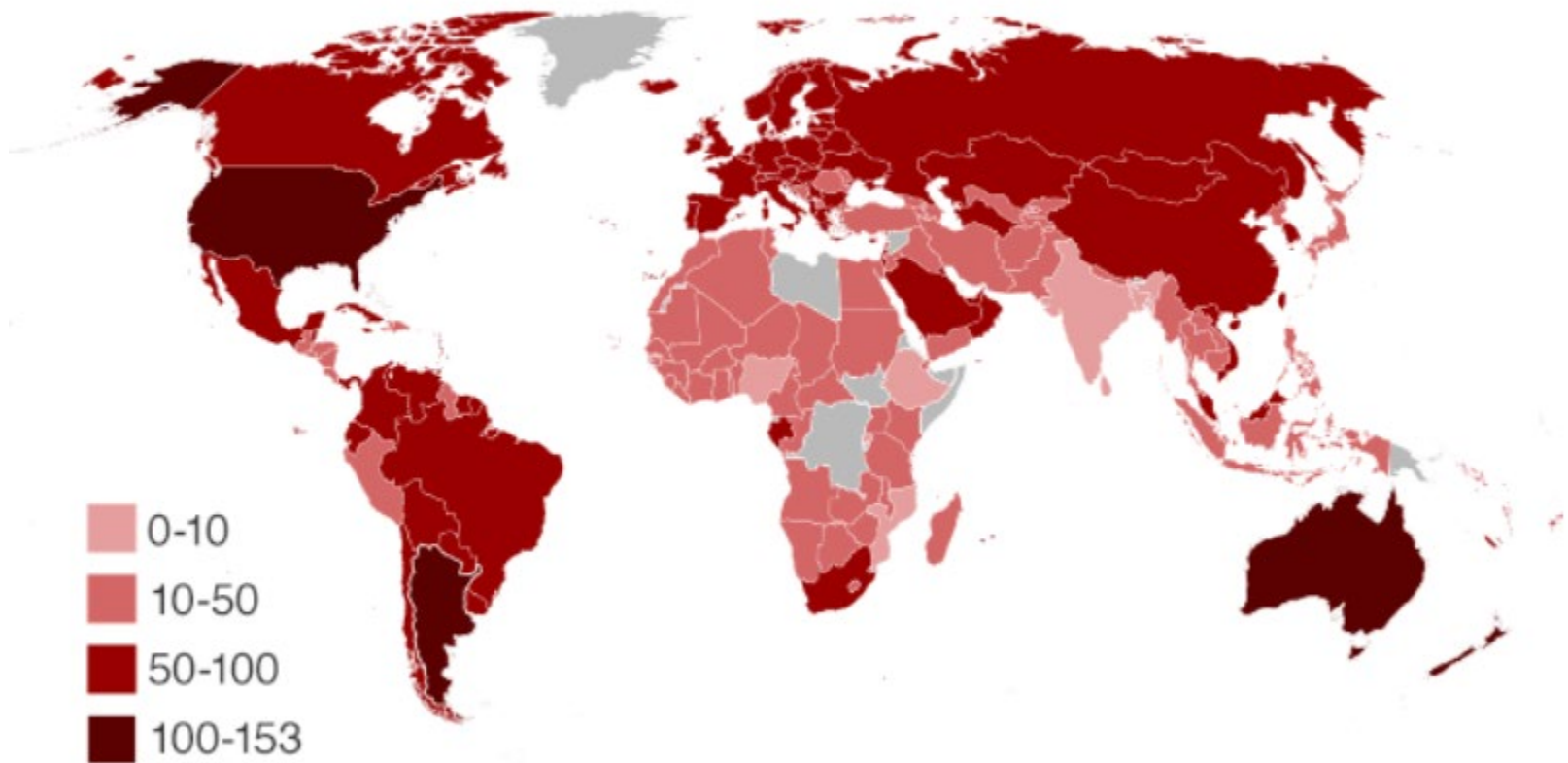
Share of adults that are obese, 2016

Obesity is defined as having a body-mass index (BMI) equal to or greater than 30. BMI is a person's weight in kilograms divided by his or her height in metres squared.



Who eats the most meat?

Meat consumption (kg per person per year)



Source: UN Food and Agriculture Organization / Our World in Data

BBC

has
hogeschool

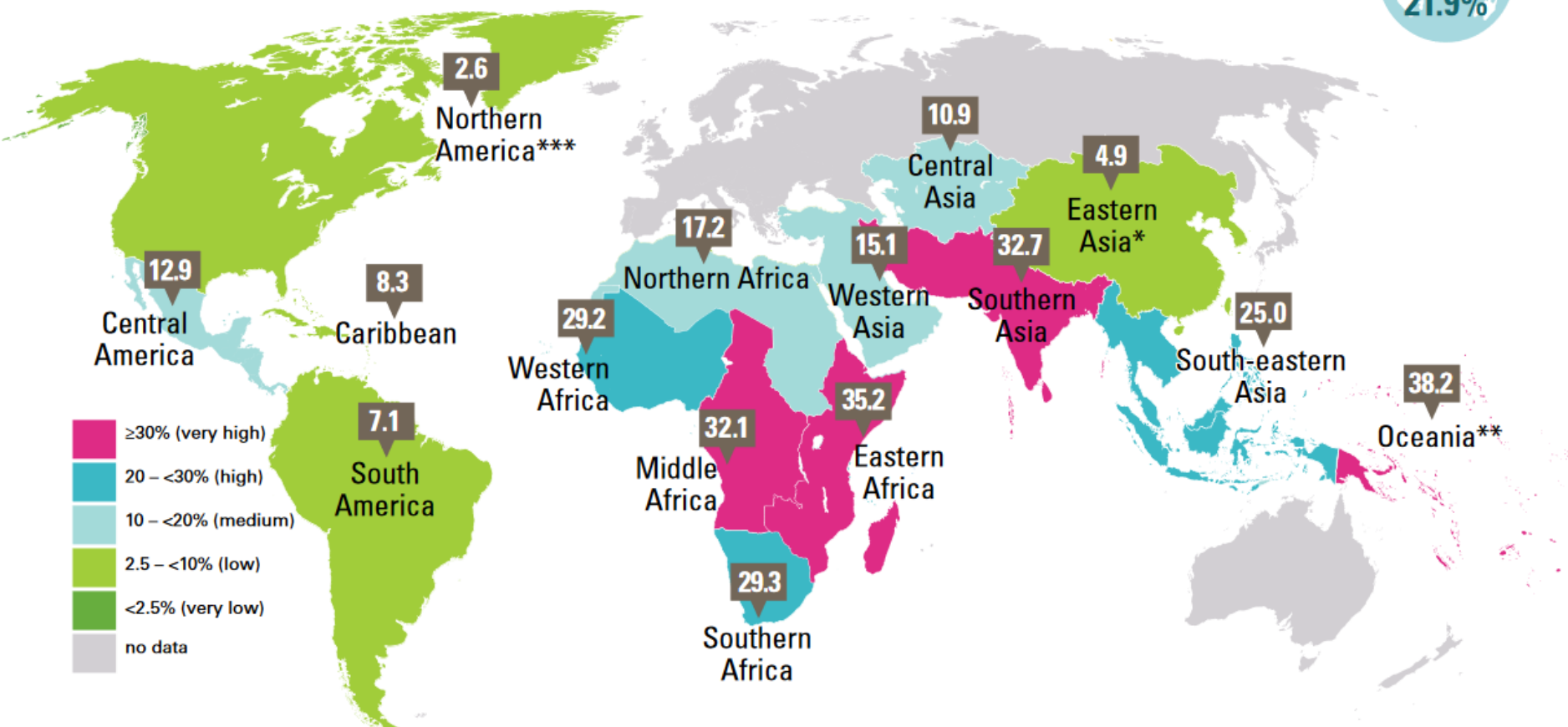


Stunting

PREVALENCE

In 7 sub-regions, at least one in every four children under 5 is stunted

Percentage of stunted children under 5, by United Nations sub-region, 2018



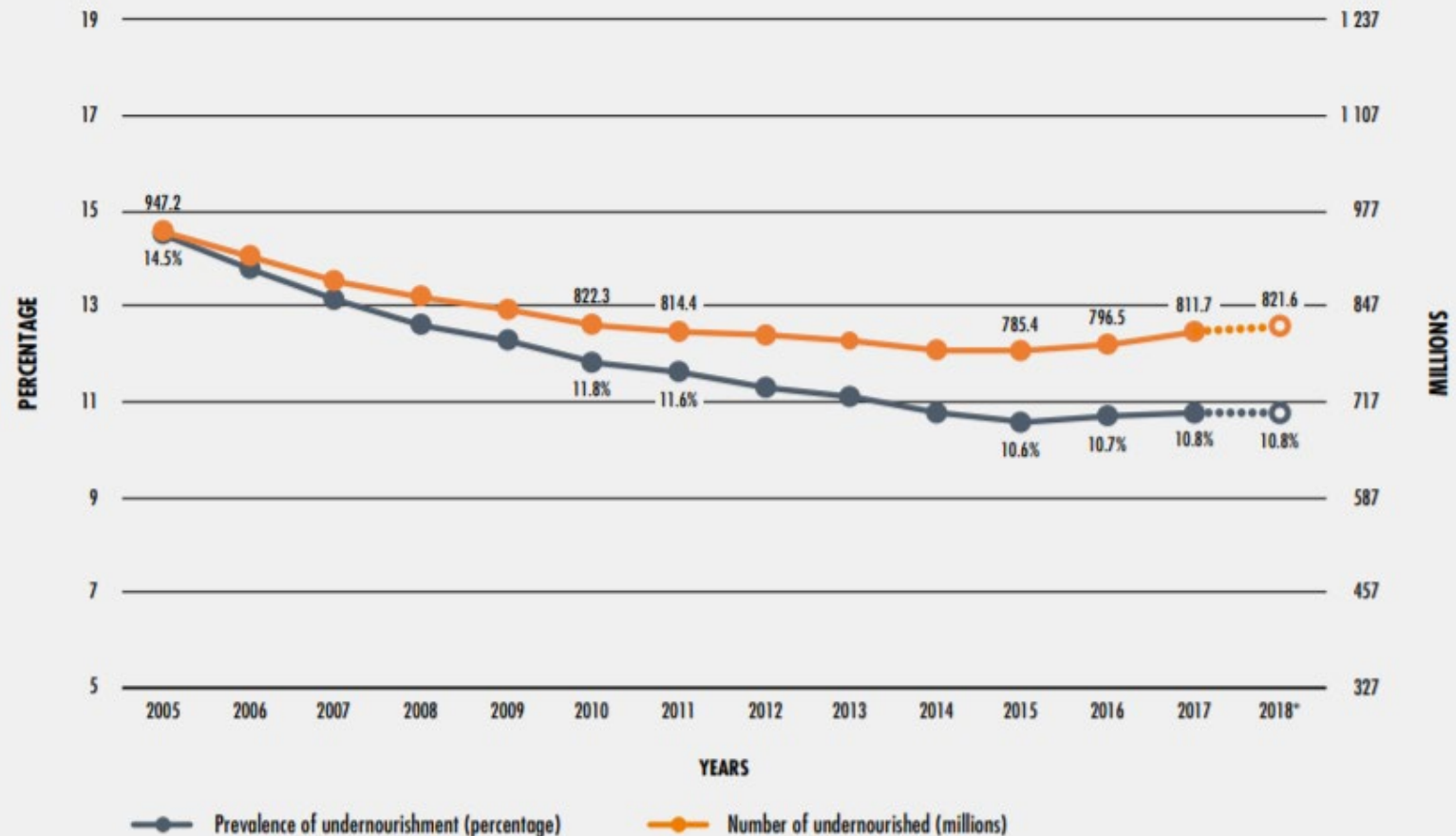
Source: UNICEF, WHO, World Bank Group joint malnutrition estimates, 2019 edition. Note: *Eastern Asia excluding Japan; **Oceania excluding Australia and New Zealand; ***Northern America sub-regional average based on United States data. There is no estimate available for the sub-regions of Europe or Australia and New Zealand due to insufficient population coverage. These maps are stylized and not to scale and do not reflect a position by UNICEF, WHO or World Bank Group on the legal status of any country or territory or the delimitation of any frontiers.

Undernutrition

- Vitamin A
- Iron
- Zink
- Iodine
- Folic acid
- Protein
- Energy



FIGURE 1
THE NUMBER OF UNDERNOURISHED PEOPLE IN THE WORLD HAS BEEN ON THE RISE SINCE 2015, AND IS BACK TO LEVELS SEEN IN 2010–2011



NOTES: * Values for 2018 are projections as illustrated by dotted lines and empty circles. The entire series was carefully revised to reflect new information made available since the publication of the last edition of the report; it replaces all series published previously. See Box 2.

SOURCE: FAO.

Thus, with respect to health...

- Meat is healthy, because:
 - Important source of good bioavailable iron, vitamins (B12!), high quality protein
- Meat is unhealthy, because:
 - Important source of saturated fat and salt
 - High meat consumption is related to increased risk of diabetes, stroke, intestinal cancer, lung cancer
- Therefore it is better to eat less meat here in The Netherlands.
- Dairy is also (un)healthy
 - Healthy: calcium, high quality protein, vitamin B1
 - Unhealthy: saturated fat, salt
 - Our dairy consumption is OK (Dutch health Council)
- But there is more to it...

Role of animal source foods in healthy sustainable and equitable food systems

		Animal-Source Foods					
		Dairy	Eggs	Fish and Seafood	Meat		
					Unprocessed red	Processed red	White
Health outcomes	Iron-deficiency Anaemia	Neutral	Slightly reduces	Slightly reduces	Strongly reduces	??	Slightly reduces
	Micronutrient deficiencies	Reduces	Reduces	Reduces	Reduces	??	Reduces
	Stunting	Reduces	Reduces	Reduces	Reduces	??	Reduces
	Diabetes, cancer, heart disease	Likely reduces or neutral, but contested	Likely reduces or neutral, but contested	Reduces	Likely increases, but contested	Increases	Likely neutral
Environmental outcomes	GHG emissions	Moderate	Moderate	Moderate (with wide range)	High, but highly variant by setting/system	High, but highly variant by setting/system	Moderate
	Other environmental factors	Moderate to high	Moderate	?? (highly variant)	High, but highly variant by setting/system	High, but highly variant by setting/system	Moderate to high
Livelihoods	Poverty reduction, economic development	Important	Less important (production more industrialised)	Important but geographically concentrated	Important	??	Less important (production more industrialised)

Figure 6. Summary of the health, environmental, and livelihood dimensions of ASF production and consumption. Source: authors' interpretation of the literature cited in this paper.

<https://www.gainhealth.org/sites/default/files/publications/documents/gain-discussion-paper-series-5-the-role-of-animal-source-foods-in-healthy-sustainable-and-equitable-food-systems.pdf>

Questions?

