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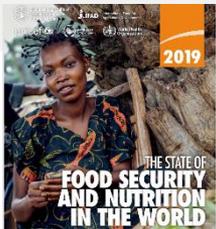
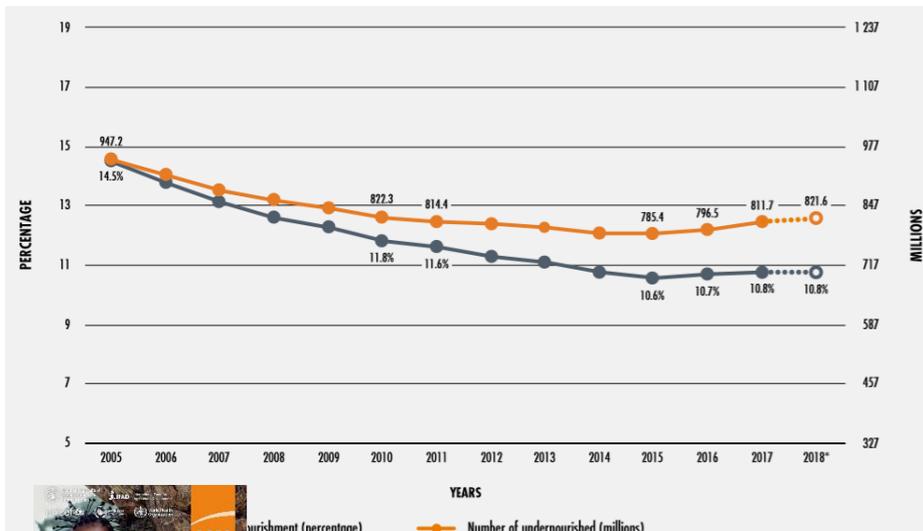
PART 1: NUTRITION - MAJOR CHALLENGES + TRENDS

PART 2: FOOD-BASED DIETARY GUIDELINES

<http://hyg.lf1.cuni.cz/> Materials to download

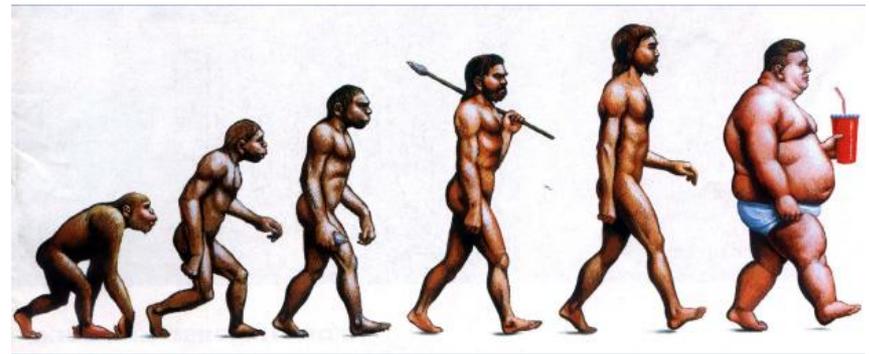
Nutrition – the most important external factor influencing human health

FAO: Hunger in the World 2019 >820 million



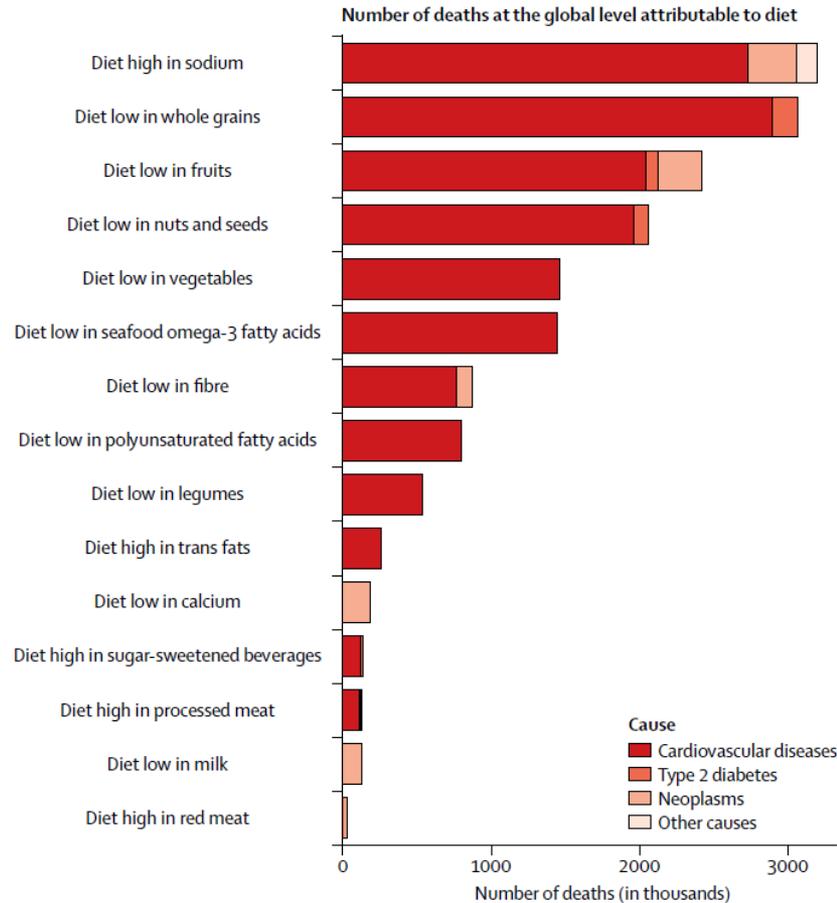
WHO Fact sheet 311 (2021) adults >18 years:

- 1.9 billion (39%) overweight
- 650 million (13%) obesity



70 % morbidity +mortality in the World

Number of deaths at the global level attributable to diet



Our health is more influenced by what we do not eat than by what we eat

Nutrition: Challenges + needs

Challenges

1. Unhealthy diets increase the burden of obesity and diet-related noncommunicable diseases
2. Food production contributes to environmental degradation
3. Growth of global population

Needs

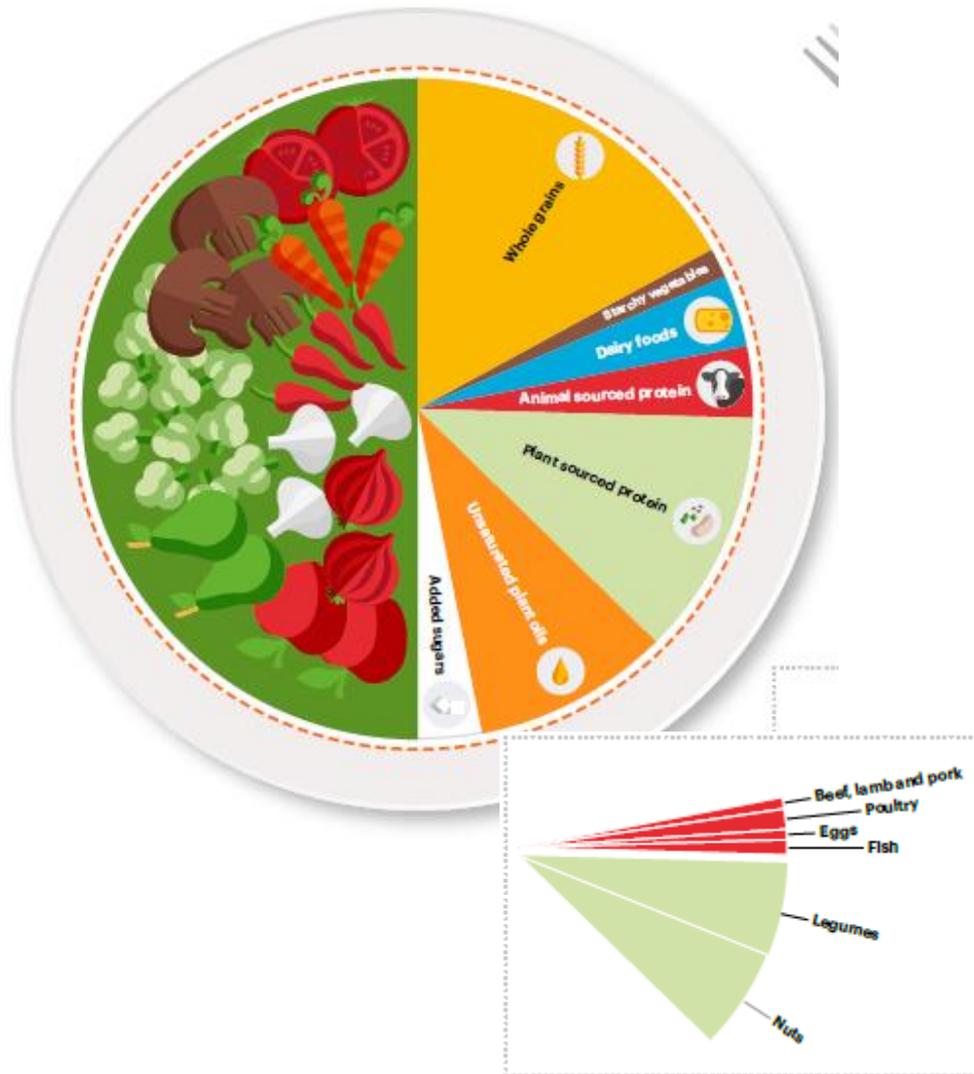
Global transformation of the food system:

1. Healthy diet
2. Sustainable food systems
3. 10 billion people to feed in 2050

Global transformation of the food system requires

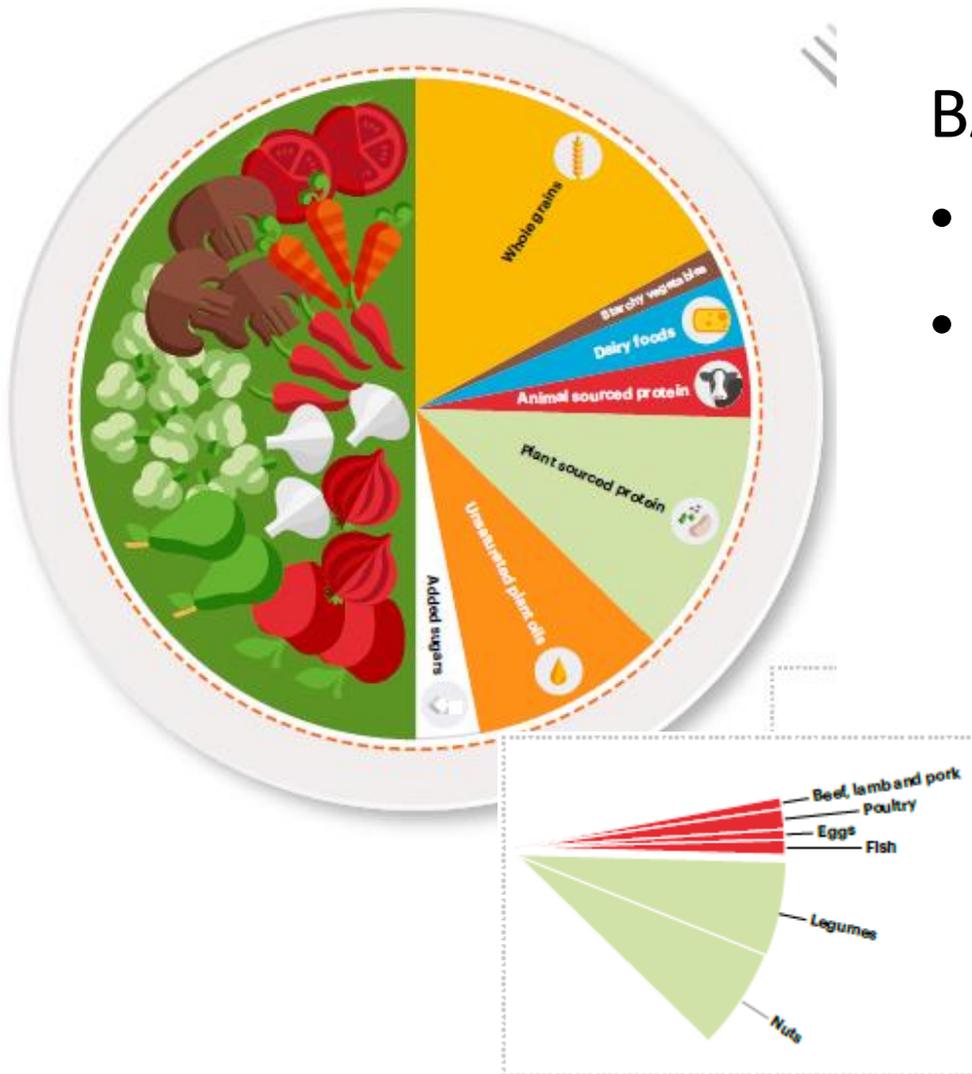
- Substantial **dietary shifts**, including
 - > 50% reduction in global consumption of unhealthy foods, such as red meat and sugar
 - > 100% increase in consumption of healthy foods, such as nuts, fruits, vegetables, and legumes.
 - The changes needed differ greatly by region
- **Transformation could avert about 11 million deaths per year** (19.0–23.6% reduction)
- Large **reductions in food losses and waste**
- Major **improvements in food production practices**

EAT + Lancet commission



- EAT (science-based global platform for food system transformation) + Lancet: commission of 37 experts from different fields
- 2019 Reference diet based on the best evidence for
 - healthy diet
 - from sustainable food systems

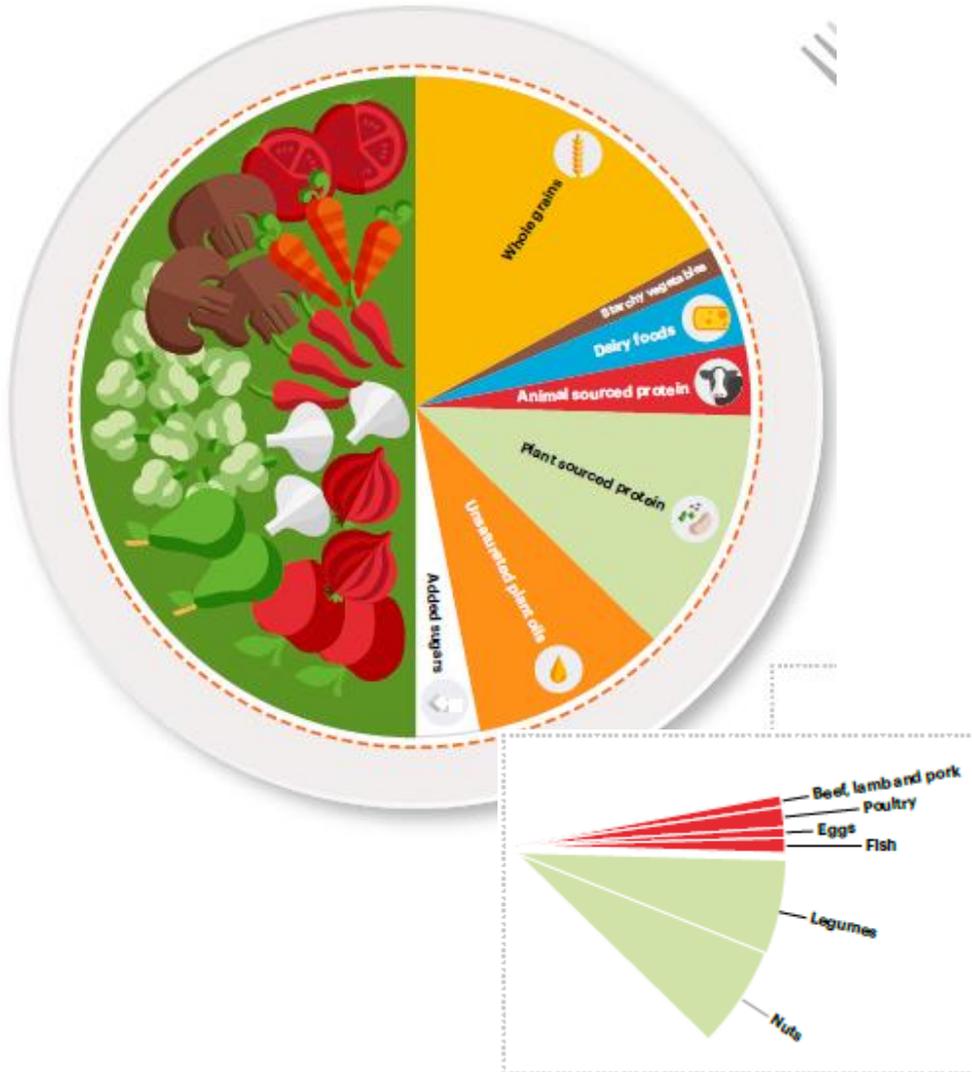
EAT 2019: Global reference diet



BASED ON:

- ½ vegetables and fruits
- ½ (by % of energy)
 - whole grain foods,
 - plant protein sources,
 - unsaturated vegetable oils

EAT 2019: Global reference diet



LITTLE

- Animal protein sources
- Refined cereals
- Saturated fat
- Ultra - processed foods
- Added sugar

EAT 2019: Global reference diet

	Macronutrient intake grams per day (possible range)	Caloric intake kcal per day
 Whole grains Rice, wheat, corn and other	232	811
 Tubers or starchy vegetables Potatoes and cassava	50 (0-100)	39
 Vegetables All vegetables	300 (200-600)	78
 Fruits All fruits	200 (100-300)	126
 Dairy foods Whole milk or equivalents	250 (0-500)	153
Protein sources		
 Beef, lamb and pork	14 (0-28)	30
 Chicken and other poultry	29 (0-58)	62
 Eggs	13 (0-25)	19
 Fish	28 (0-100)	40
 Legumes	75 (0-100)	284
 Nuts	50 (0-75)	291
Added fats		
 Unsaturated oils	40 (20-80)	354
Saturated oils	11.8 (0-11.8)	96
Added sugars		
All sugars	31 (0-31)	120

- Does not mean that everyone should eat the same
- Intake ranges of foods provided
- Local adaptation required

**THE SHIFT TOWARDS PLANT-BASED
DIETS IN EU IS ACCELERATING**

What are plant-based diets?

- Diverse range of dietary patterns that emphasize foods derived from plant sources coupled with **lower consumption or exclusion of animal products**
 - Vegetarian diets form a subset of plant-based diets - exclude the consumption of some or all animal foods

Vegetarian diets

- **Vegan**
 - omit all animal products, including meat, dairy, fish, eggs and (usually) honey
- **Lacto-vegetarian**
 - exclude meat, fish, poultry and eggs, but include dairy products such as milk, cheese, yoghurt and butter.
- **Lacto-ovo vegetarian**
 - include eggs and dairy, but not meat or fish.
- **Ovo-vegetarian**
 - exclude meat, poultry, seafood and dairy products, but allow eggs.
- **Pesco-vegetarian (or pescatarian)**
 - include fish, dairy and eggs, but not meat
- **Semi-vegetarian (or flexitarian)**
 - primarily vegetarian but include meat, dairy, eggs, poultry and fish on occasion, or in small quantities

Details in presentation Alternative diets

Plant based diets - Not all are healthy

- **Strict plant-based diets:** concerns about micronutrient deficiencies
- **Food selection**
 - **Healthy plant food groups:** whole grains, fruits, vegetables, nuts, legumes, vegetable oils, and tea/coffee
 - **Less healthy plant food groups:** fruit juices, sugar-sweetened beverages, refined grains, potatoes, and sweets/desserts
- **Food processing**
 - **Ultraprocessed foods (UPF)**

Food Processing

- Nutrients, food groups are important

... BUT

New dimension is emerging:

- Degree of industrial food processing



NOVA food classification system

first proposed by Monteiro et al. in 2009

NOVA food classification according to the degree of industrial food processing (Monteiro CA et al)

- **Group 1. Unprocessed or minimally processed food**
 - Edible parts of plants or of animals after separation from nature.
 - Allowed: drying, crushing, grinding, fractioning, filtering, roasting, boiling, non-alcoholic fermentation, pasteurization, refrigeration, chilling, freezing, placing in containers and vacuum-packaging
- **Group 2. Processed culinary ingredients and ingredients**
 - E.g. oils, butter, sugar and salt
- **Group 3. Processed food**
 - E.g. **preserved** vegetables, fish, compotes, cheeses and **freshly prepared pastries**; they may contain additives used to preserve their original properties or inhibit the growth of microbes (antioxidants, preservatives and stabilizers).

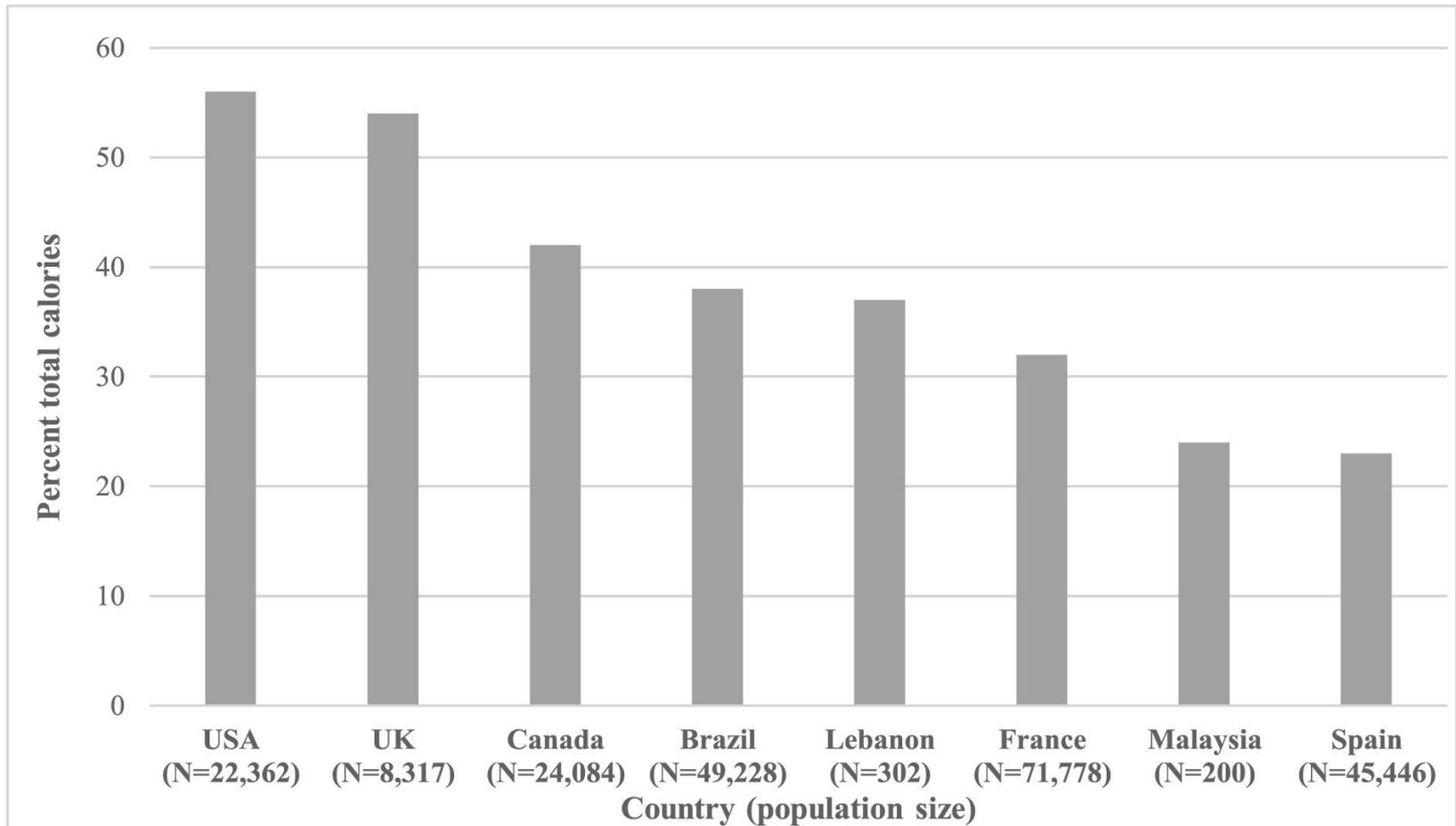
NOVA food classification according to the degree of industrial food processing (Monteiro CA et al)



Group 4. Ultraprocessed foods (UPF)

- Formulations of substances derived from foods, such as starches, sugars, fats, and protein isolates, with **little, if any, whole food**
- **Typically ≥ 5 ingredients**; often additives other than antioxidants, preservatives and stabilizers - often flavours, colours, emulsifiers, and other cosmetic additives
- The processing also includes **processes that are not used for cooking at home** (hydrogenation, hydrolysis, extrusion, pre-frying)
- Usually **convenient to use, attractively packed and intensively promoted**
- Tend to have **high energy density, and to be high in sodium, saturated fat and free sugars**
- **Lacking in dietary fiber and in vitamins and minerals** found in unprocessed foods and minimally processed plant-based foods

The average intake of ultraprocessed food (% calories) by country



Obesity Reviews, Volume: 22, Issue: 3, First published: 09 November 2020, DOI: (10.1111/obr.13146)

Lane MM, et al. Ultraprocessed food and chronic noncommunicable diseases: A systematic review and meta-analysis of 43 observational studies.

UPF and health: review (Elisabeth 2020)

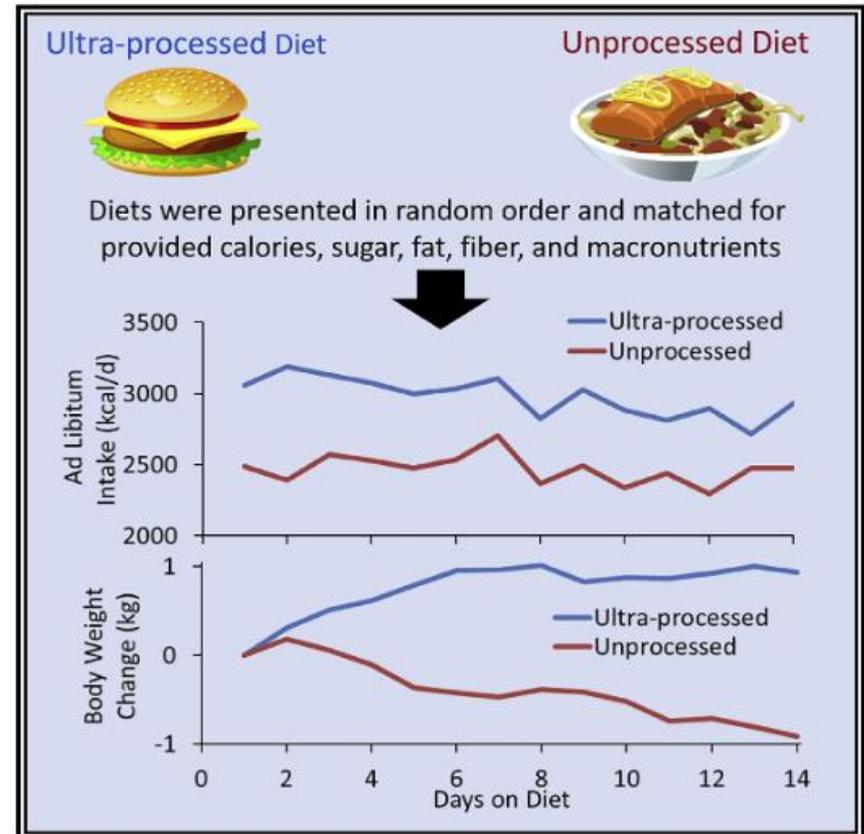
- Of 43 studies reviewed, 37 found dietary UPF exposure associated with **at least one adverse health outcome:**
 - overweight, obesity and cardio-metabolic risks;
 - cancer, type-2 diabetes and cardiovascular diseases;
 - irritable bowel syndrome,
 - depression and frailty conditions;
 - all-cause mortality.
- No study reported an association between UPF and beneficial health outcomes.

UPF and health: Causality

- Most findings derived from observational studies.
- Evidence still needs to be strengthened to establish a causal link
- Long term randomized controlled trials (RCT) are not feasible for ethical reasons
- Associations between UPF and health outcomes were observed even when overall poorer nutritional quality of UPF was fully accounted for in the models, suggesting that other factors probably play a role.
- The concept of ultra-processed foods (UPF) recognised as a descriptor of unhealthy diets.

2 week RCT: UPF diet led to increased energy intake and weight gain compared with an unprocessed diet

- An Inpatient Randomized Controlled Trial of Ad Libitum Food Intake
- 20 inpatient adults received ultra-processed and unprocessed diets for 14 days each
- Ad libitum **intake was approx. 500 kcal/day more on the ultra-processed versus unprocessed diet**
- Body weight changes were highly correlated with diet differences in energy intake



Hall KD et al. Ultra-Processed Diets Cause Excess Calorie Intake and Weight Gain: An Inpatient Randomized Controlled Trial of Ad Libitum Food Intake. *Cell Metab.* 2019 Jul 2;30(1):226.

Apps Open Food Facts List of NOVA groups

4 - Ultra processed food and drink products

NOVA group : 4 - Ultra processed food and drink products

↳ 446,981 products

⌵ Recently modified products

🔍 Explore products by...

Classify the 100 products below according to your preferences

👤 Edit your food preferences

The screenshot displays a grid of 20 food products, each with a product image, name, weight, and a NOVA group 4 label. The products are:

- Zitrone kuchen - Dr.Oetker - 350g
- Fromage Au Chèvre - Maredsous - 200 g
- Céréales Trésor Kellogg's Chocoroulette - 620 g
- Rôti de porc - Casino - 150 g
- Guacamole - Hacendado - 200g
- Dessert végétal soja vanille
- Zwiebak - Burger - 225g
- Capuccino - Tizio - 250ml 263g
- Ail & Ciboulette - F - 175 ml
- Biscuit Assortement - Papagena Fine Bakeries - 200 g
- Вафлен десерт с какао и Фъстъци - Pobeda - 75 гр
- Creme douche nourrissante - L'Arbre Vert
- Naturel dressing - 250 ml

- <https://world.openfoodfacts.org/nova-groups>

NOVA group	Products	*
4 - Ultra processed food and drink products	446981	
Unknown	174131	*
3 - Processed foods	134538	
1 - Unprocessed or minimally processed foods	74631	
2 - Processed culinary ingredients	33928	

Plant based diets and UPF

Instead of unprocessed or minimally processed plant-based foods



... plant-based substitutes



- **Not all** plant-based meat and dairy substitutes can be classified as **UPFs** but **many are**
- Higher intake of plant-based UPF **might reduce or cancel their potential health benefits** described in studies

Recommended reading

- **Plant-based diets and their impact on health, sustainability and the environment: a review of the evidence:** WHO European Office for the Prevention and Control of Noncommunicable Diseases. Copenhagen: WHO Regional Office for Europe; 2021
- [WHO-EURO-2021-4007-43766-61591-eng.pdf](#)

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FOOD-BASED DIETARY GUIDELINES

Advise on foods, food groups
and dietary patterns

- to provide the required nutrients to the general public
- to promote overall health + prevent chronic diseases

<http://hyg.lf1.cuni.cz/> Materials to download

Food-based dietary guidelines

- WHO: Healthy diet

<http://www.who.int/news-room/fact-sheets/detail/healthy-diet>

- WHO EURO: 12 steps to healthy eating

<http://www.euro.who.int/en/health-topics/disease-prevention/nutrition/a-healthy-lifestyle>

WHO: A healthy diet sustainably produced

<https://www.who.int/publications/i/item/WHO-NMH-NHD-18.12>

Food-based dietary guidelines

- > 100 countries have dietary guidelines developed by authoritative bodies
 - based on systematic reviews
 - adapted to their nutrition situation, food availability, culinary cultures and eating habits
 - wide range of dietary patterns are consistent with a healthy diet
- Available at <http://www.fao.org/nutrition/education/food-dietary-guidelines/en/>
- **Consistently advise:**
 - limit intake of saturated fat in favour of monounsaturated and polyunsaturated fats,
 - limit sugar and highly refined carbohydrates in favour of wholegrains, fresh fruit, and vegetables

DIETARY GUIDELINES Czech Rep.

Healthy 13 (2006, updated 2021)

[Zdravá třináctka – stručná výživová doporučení pro obyvatelstvo – Společnost pro výživu \(vyzivaspol.cz\)](#)

The Czech Society for Nutrition

The Czech Society for Nutrition (CSN) was established in 1945 as an association of professionals and workers in the field of human nutrition

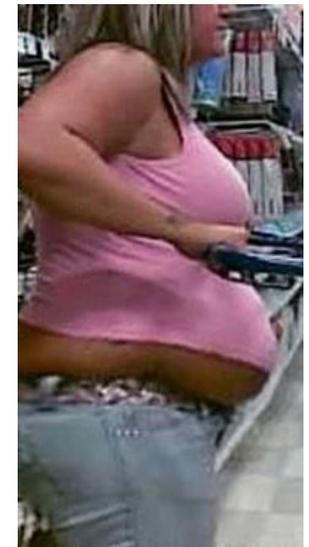
Healthy 13

- 1. Maintain **an adequate body weight**
 - BMI 18.5-25.0 kg/m²
 - waist circumference men < 94 cm women < 80 cm.



	Increased risk	High risk
Men	> 94 cm	> 102 cm
Women	> 80 cm	> 88 cm

- **Apple > risk of heart disease than pear**



BMI is OK

- Using body scans from 2,840 young people aged 10 and 18 in Bristol's Children of the 90s population study, researchers examined BMI findings against more detailed measures of fat.
- They studied the effects of total fat, along with fat in the trunk, arms and legs, on 230 different traits relevant to metabolism and future heart disease risk, such as cholesterol and blood pressure. These effects were compared with those seen when using BMI as a measure.
- BMI gives very similar answers to more detailed measures.

Healthy 13

- 2. **Move** daily at least 30 minutes e.g.
 - Fast walk
 - Exercise

???



Even walking only ↓ mortality

- USA: at least 2.5 hrs of moderate or 75 min. of vigorous-intensity physical activity per week
- Data from nearly 140,000 participants Cancer Prevention Study II Nutrition Cohort:
 - Walking-only < 2 hrs/week ↓ all-cause mortality compared to no activity
 - **Walking-only 2.5-5 hrs/week ↓ 20% mortality**
 - respiratory disease 35%
 - CVD 20%
 - cancer 9%



Healthy 13

3. Eat a **variety of food** divided into **3-5 daily meals**, do not skip breakfast



Food groups

Vegetable food

- Grains
- Roots & tubers
- Pulses
- Vegetables
- Fruits

Animal food

- Milk & products
- Meat & products
- Fish, seafood & products
- Eggs



Food variety



UK: Eatwell Guide

Eatwell Guide

Check the label on packaged foods

Each serving (150g) contains

Energy	Fat	Saturates	Sugars	Salt
1046kJ 250kcal	3.0g	1.3g	34g	0.9g
	LOW	LOW	HIGH	MED
13%	4%	7%	38%	15%

of an adult's reference intake
Typical values (as sold) per 100g: 697kJ/167kcal

Choose foods lower in fat, salt and sugars

Use the Eatwell Guide to help you get a balance of healthier and more sustainable food. It shows how much of what you eat overall should come from each food group.



Water, lower fat milk, sugar-free drinks including tea and coffee all count.

Limit fruit juice and/or smoothies to a total of 150ml a day.

Eat at least 5 portions of a variety of fruit and vegetables every day



Choose wholegrain or higher fibre versions with less added fat, salt and sugar



Beans, pulses, fish, eggs, meat and other proteins
Eat more sourced beans and pulses, 2 portions of sustainably sourced fish per week, one of which is oily. Eat less red and processed meat



Dairy and alternatives
Choose lower fat and lower sugar options



Eat less often and in small amounts



Choose unsaturated oils and use in small amounts

Per day 2000kcal 2500kcal = ALL FOOD + ALL DRINKS

Skipping breakfast: higher risk

St-Onge et al. 2017 A Scientific Statement From the American Heart Association

- **BMI, obesity**
 - Many studies; whole world
- **DM2**
 - Prospective study US health workers (29 205 men, 40–75 year at the beginning): ↑ by 21 % (Mekary RA et al. 2012)
 - Prospective study US nurses (n=46 289; mean age at beginning 64,7 let): skipping breakfast even once a week: ↑ by 28 % (Mekary RA et al. 2013)
- **CVD**
 - Prospective study US health workers (26 902 men 45-82 years) ↑ by 27 % (Cahill et al. 2013)

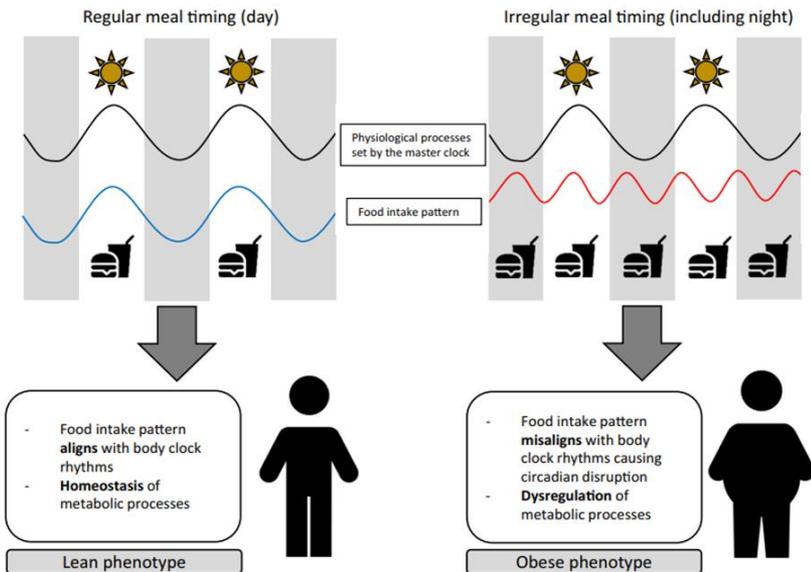
Meal frequency

St-Onge et al. 2017 A Scientific Statement From the American Heart Association

- **Obesity**
 - Outcomes of studies inconsistent
- **KVO, DM**
 - Lower risk in people who eat more frequently (but risk increases if ≥ 6 times/24 hrs)

Meal Timing and Obesity

- Meal timing outside of the regular daytime hours can contribute to circadian
 - disruption of the efficiency of metabolism across the day
 - dysregulation of appetite hormone and gut microbiota
- Eating at night increases the risk of weight gain over time
- Further research needed to determine optimal patterns



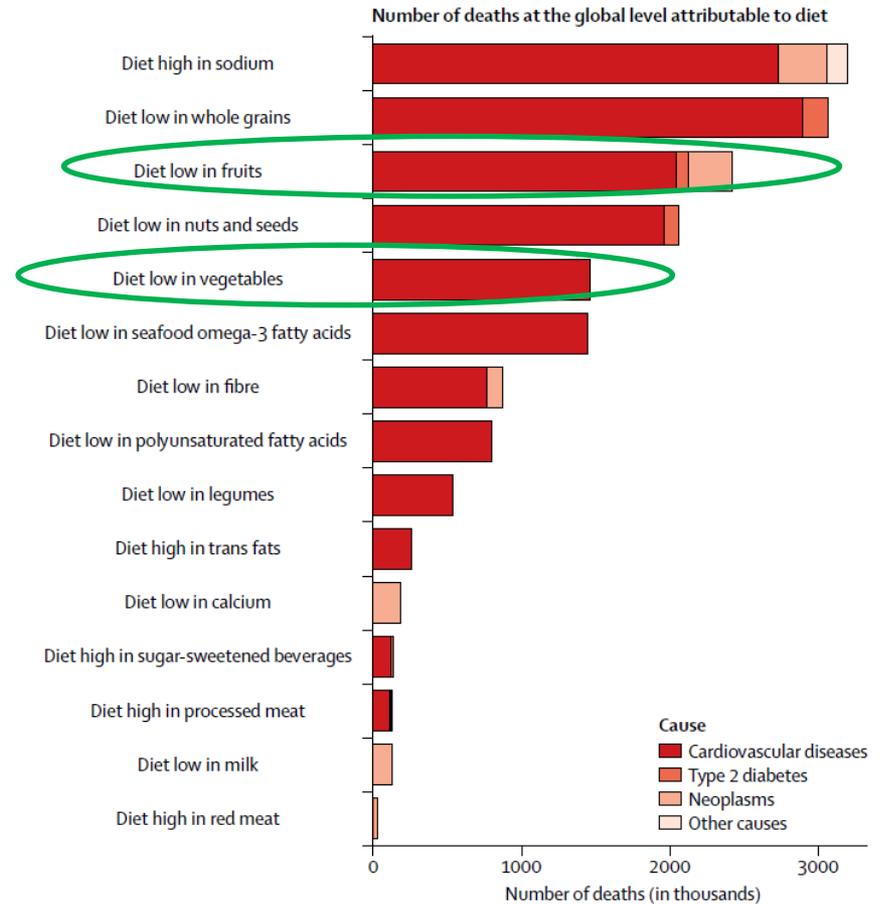
Healthy 13

- 4. Eat adequate quantities of **vegetables** (raw & cooked) and **fruits**:
 - At least 400 g daily
 - Veggies twice more than fruits
 - Divided into several portions
 - Eat smallish amounts of **nuts**

WHO: Potatoes, sweet potatoes, cassava and other starchy roots are **not** classified as fruits or vegetables.



Why should we eat vegetables and fruits?



Fruits & vegetables

- Source of **vitamins, minerals, fiber**
- Except for offal & a little amount in milk, **vitamin C** is only found in vegs & fruits
- Large volume, low energy content, minimum fat
 - Energy: mono-, di-, polysaccharides
- Protective role of substances not included among nutrients
 - Salicylates
 - Lykopen
 - Phytoestrogens
 - Alginates
 - Carotenoids
 - Polyphenols
 - Flavonoids
 - Other....
- Mixture of vitamins, phytochemicals, fiber, and other nutrients in whole fruits and vegetables probably act synergistically to deliver health benefits

Protective role of vegetables & fruits

- Diet rich in fruits and vegetables may:
 - reduce risk for **stroke** and perhaps **other CV diseases**
 - reduce risk for **type 2 diabetes**.
 - protect against certain **cancers** (mouth, stomach, colon-rectum)
- Rich in potassium may reduce the risk of developing **kidney stones** and may help to decrease **bone loss**.
- Low in calories instead of some other higher-calorie food may be useful in helping to **lower energy intake**.

DO YOU EAT 400 G OF VEGS & FRUITS A DAY?



How much is about 400 g of fruits and vegetables?



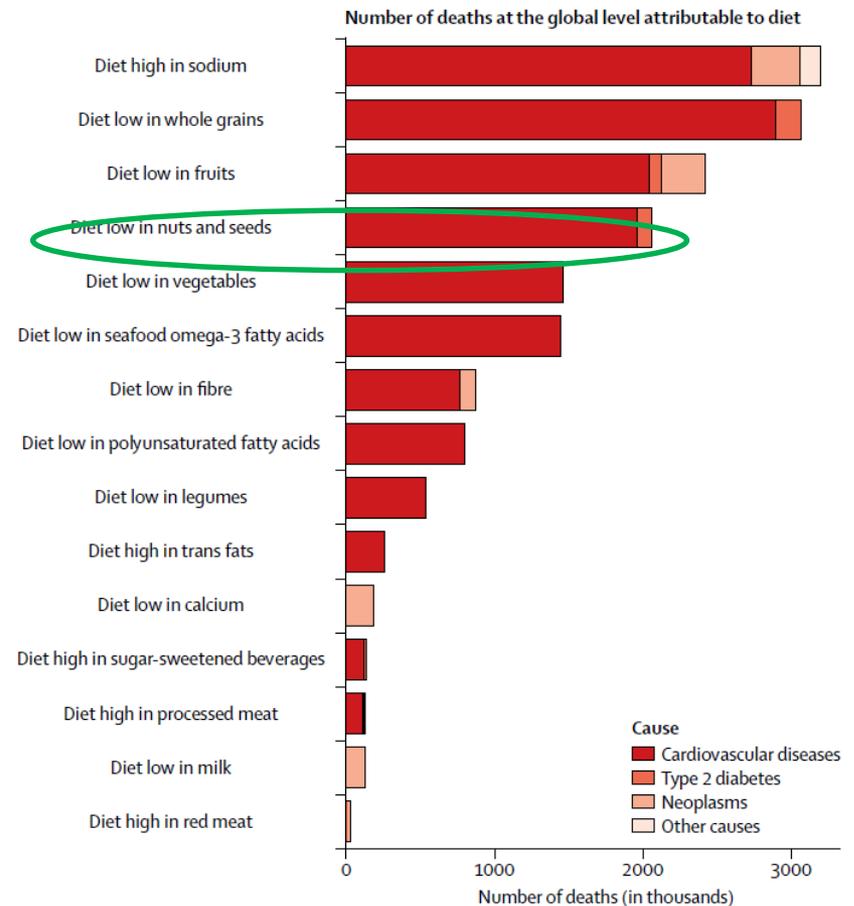
- 2 medium tomatoes 160 g
- 2 medium apples 260 g
- **Total** 420 g

Tree nuts (walnuts, pistachios, macadamia nuts, pecans, cashews, almonds, hazelnuts, and Brazil nuts)

- Lower total cholesterol, LDL cholesterol, ApoB, and triglycerides.
- The major determinant of cholesterol lowering appears to be **nut dose rather than nut type.**

[Am J Clin Nutr.](#) 2015 Dec;102(6):1347-56. doi: 10.3945/ajcn.115.110965.
Effects of tree nuts on blood lipids, apolipoproteins, and blood pressure: **systematic review, meta-analysis, and dose-response of 61 controlled intervention trials.**

[Del Gobbo LC](#)¹, [Falk MC](#)², [Feldman R](#)², [Lewis K](#)², [Mozaffarian D](#)³.



Health effects of dietary risks in 195 countries, 1990–2017;
Lancet Open access 2019 DOI:[https://doi.org/10.1016/S0140-6736\(19\)30041-8](https://doi.org/10.1016/S0140-6736(19)30041-8)

5. Healthy 13

- From cereals, prefer **whole grain** products and don't forget **legumes** (at least once a week).



WHO: A healthy diet contains fruits, vegetables, **legumes** (e.g. lentils, beans), **nuts** and **whole grains** (e.g. unprocessed maize, millet, oats, wheat, brown rice).

Grain products

- Source of energy – **carbohydrates (polysaccharides)** up to 75g/100g
- **Protein** (7-14 %): up to 30 % of daily intake
 - Little LYS, some little TRY
- Fat only 1 – 5 %
- Content of other nutrients varies by processing



The effect of cereal processing on health



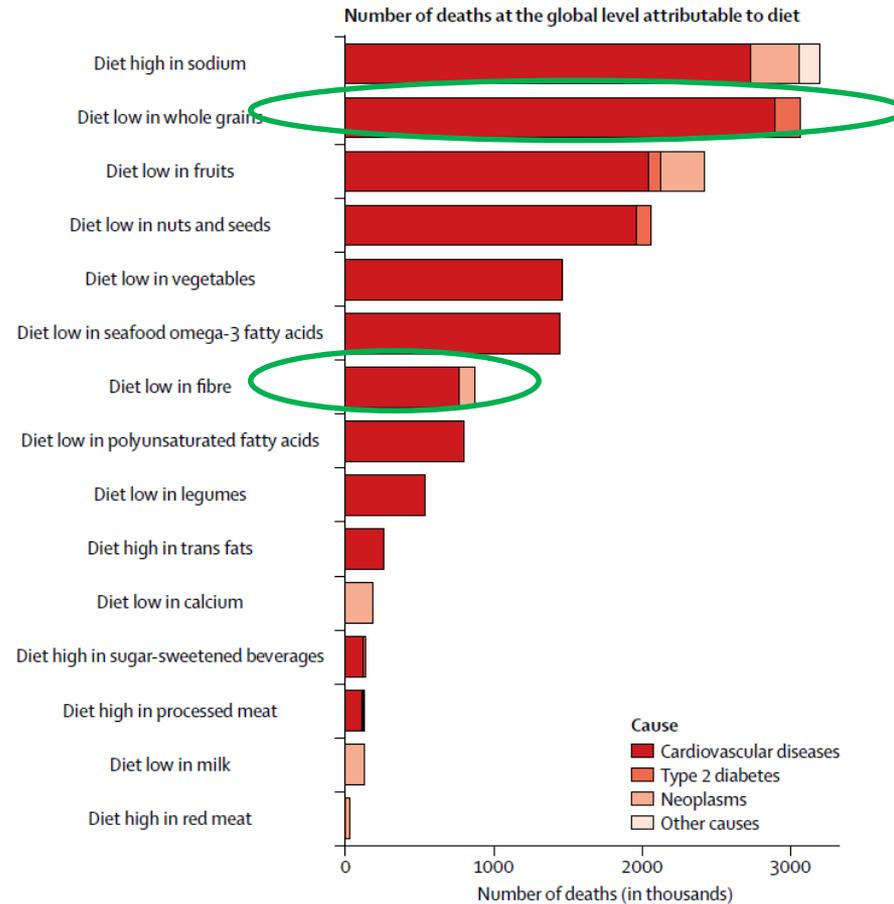
Refined cereals:

- Low nutritional value
- High glycemic load → unhealthy fluctuations in postprandial glucose and insulin levels → hunger, inflammatory reaction, insulin resistance, dyslipidemia

Minimally processed cereals and other sources of fiber

- Source of micronutrients, antioxidants with + effect on health
- Improve the above
- Effect on microbiome: ↓ production of secondary bile acids and ↑ production of butyrate and other short-chain FAs that reduce inflammation ↓ cell proliferation and ↑ expression of genes with antineoplastic effect

.... Preferably wholegrain



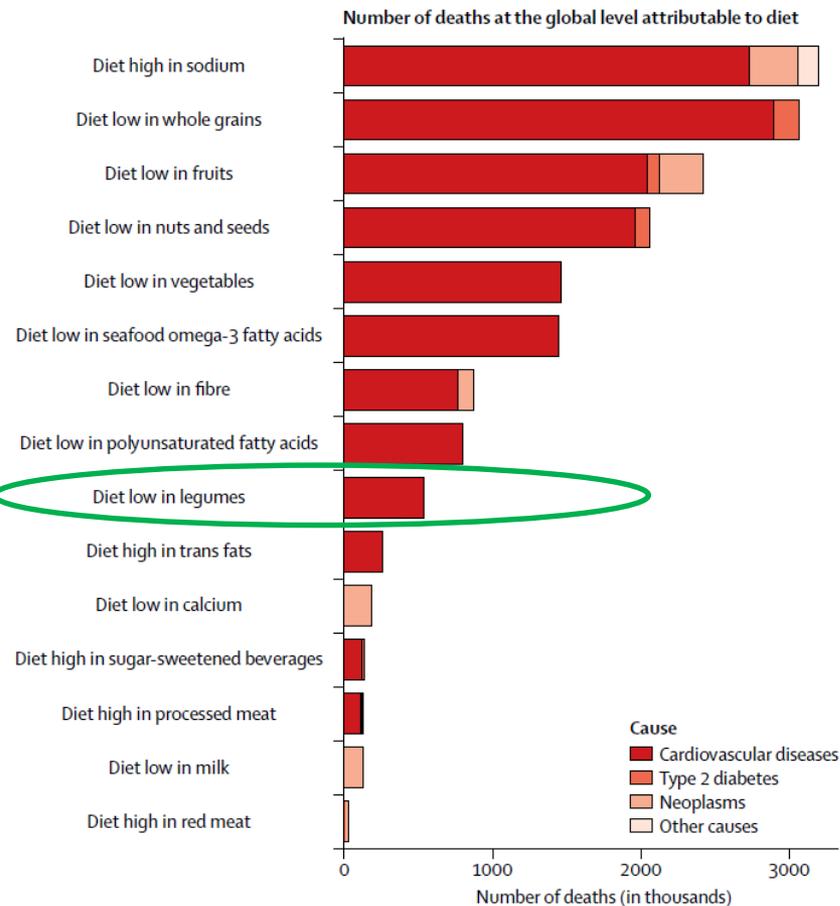
Health effects of dietary risks in 195 countries, 1990–2017; Lancet Open access 2019 DOI:[https://doi.org/10.1016/S0140-6736\(19\)30041-8](https://doi.org/10.1016/S0140-6736(19)30041-8)

Carbohydrates – desirable main source of energy

- Acceptable macronutrient distribution ranges (proportion of energy from food)
 - Protein 8-15 %
 - Fat 20-30 % (discussed)
 - Carbohydrates 55-60 %
 - Mainly polysaccharides – starch (grains, starchy foods)
 - ≤10 % added/free sugars

None of the official institutions recommends low-carb diet

WHY SHOULD WE EAT LEGUMES (PULSES)?



Health effects of dietary risks in 195 countries, 1990–2017;
Lancet Open access 2019 DOI:[https://doi.org/10.1016/S0140-6736\(19\)30041-8](https://doi.org/10.1016/S0140-6736(19)30041-8)

Legumes (Pulses)



- Good quality **protein**
- **Low fat** (except soya beans)
 - tend to reduce or displace animal foods with saturated fats + fat added to dishes
- Soya beans:
 - Total Fat 37.1 g/100 g **PUFA 20.9** MUFA 8.2 g SFA 5.4 g
- **Fibre**
- Folic acid + other B vitamins, Ca, P, Fe
- Low glycaemic index

Legumes (Pulses)



- **↓ LDL-cholesterol and blood pressure** in controlled feeding studies (Kushi LH et al 1999)
- **↓ Risks of coronary heart disease** than has consumption of red meat in prospective studies (Afshin A et al. 2014; Bernstein AM 2010)

Recommendation EAT–Lancet Commission 2019, Global reference diet:

- 50 g dry weight per day of beans, lentils, and peas, and 25 g/day of soy beans

Healthy 13

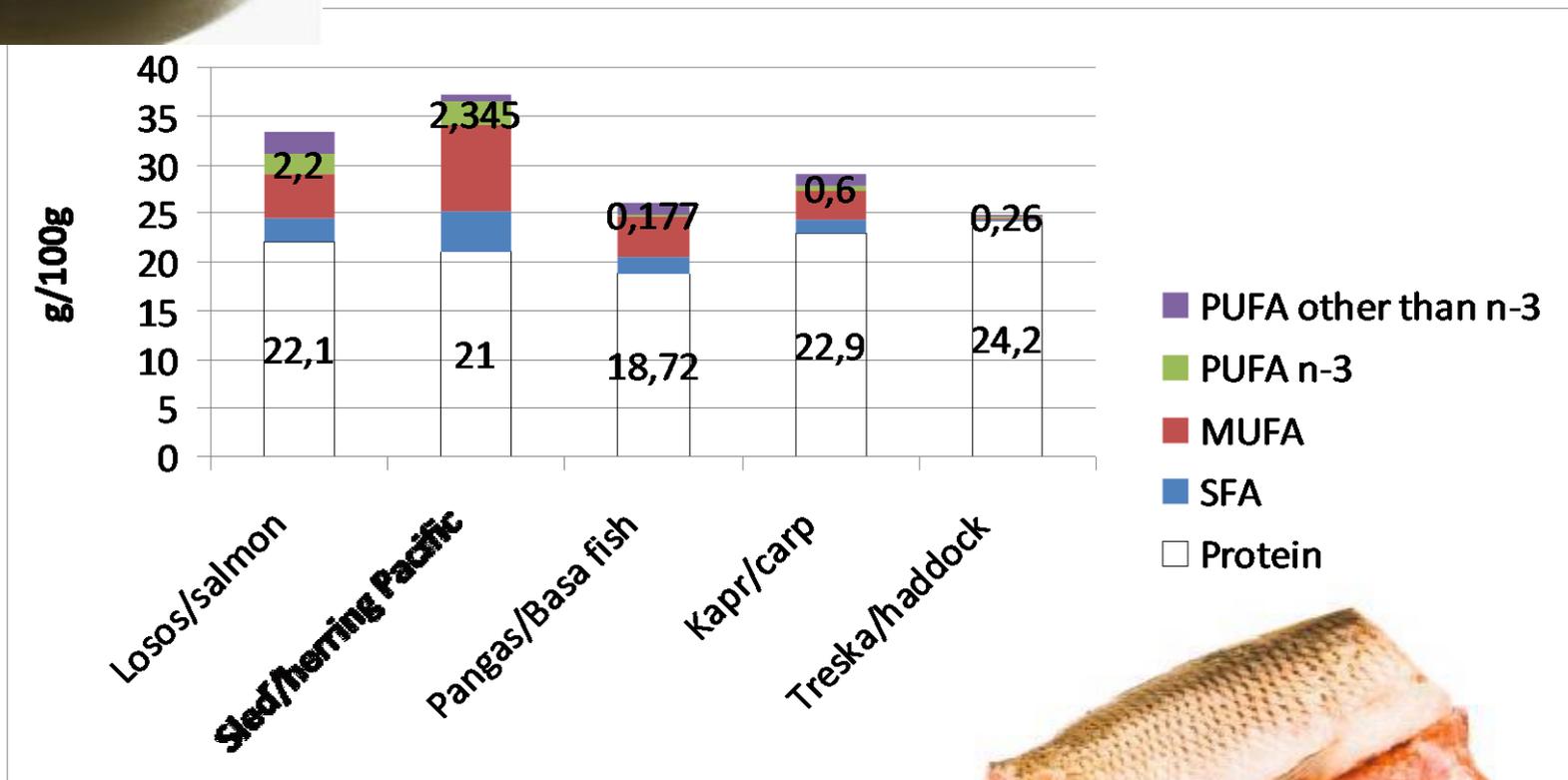
- 6. Eat **fish** and **fish products** at least twice a week





Fish: main nutrients

(g/100 g)



Fish



- Protein
- Sea fish I, F
- Vitamins A, D
- Preserved small fish eaten with bones:
calcium
- Fatty sea fish PUFA n-3



Healthy 13

- 7. Eat daily **milk and milk products**
 - Especially fermented (probiotic microorganisms)
 - Preferably chose medium fat



Milk & milk products



- „Milk“ = product of mammalian mammary gland
- **Protein**
- **Saturated fats**
 - Growing evidence that SFAs in dairy foods have neutral or inverse associations with CVD (Siri-Tarino PW 2015, Marcia C de Oliveira 2018)
- Lactose
- **Calcium**: 60 % of our intake
- P, K, Mg
- Fat & water soluble vitamins, little vit. C

Milk – a controversial food

check reliability of sources!



Author is animal rights activist + founding director of The Vegetarian and Vegan Foundation

<https://www.viva.org.uk/why-you-dont-need-dairy>

- All 28 EU countries that have guidelines on web recommend milk + dairy
- Commonly the advice is to choose fat-free or low-fat dairy options.

Healthy 13

- 8. Control your fat consumption, **limit your fat intake:**
 - **In hidden form** (fat meat, fat meat and milk products, bakery products with high fat content, chips, chocolate),
 - **When preparing meals**

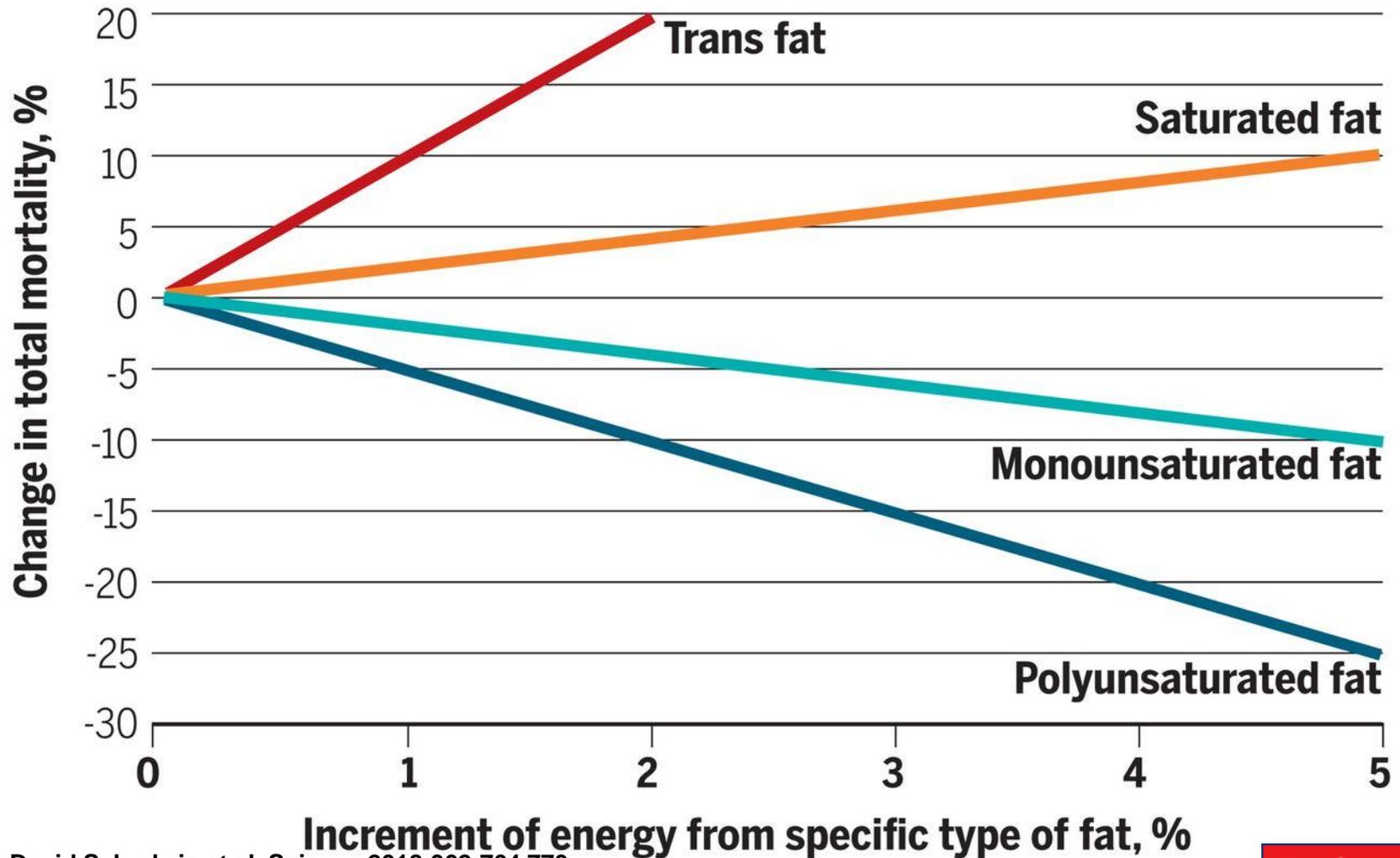
Prefer fats with a low content of saturated fatty acids

WHO: Healthy diet – Fats

- Total fat intake to < 30% of total energy intake to prevent unhealthy weight gain
- Risk of developing NCDs is lowered by:
 - reducing SFA to <10% of total energy intake;
 - reducing *trans*-fats to < 1% of total energy intake;
 - replacing both saturated fats and *trans*-fats with unsaturated fats – in particular, with polyunsaturated fats.

Relation between increasing intakes of trans, saturated, unsaturated, monounsaturated, and polyunsaturated fatty acid (compared isocalorically with carbohydrate) in relation to total mortality.

126,233 men and women followed for up to 32 years, with assessments every 4 years



David S. Ludwig et al. Science 2018;362:764-770



Fats in foods

- **Unsaturated fats**
 - fish, avocado, nuts;
 - sunflower, soybean, canola/rapeseed and olive oils
- **Saturated fats**
 - fatty meat, butter, palm + coconut oil, cream, cheese, ghee, lard
- **Trans-fats – EU Regulation 2019/649: max. 2% fat**
 - Produced mainly by industrial oil processing - baked and fried foods
 - Small amounts in meat and dairy foods from ruminant animals (e.g. cows, sheep, goats, camels)

Plant sources of polyunsaturated n-3 fatty acids

- **Sufficient only alpha-linolenic acid (ALA, 18: 3, n-3)**
 - It forms eicosapentaenoic acid (EPA, 20: 5 n-3) and docosahexaenoic acid (DHA, 22: 6 n-3) - a process that is not very efficient
- **Formation of EPA and DHA from ALA**
 - can be suppressed by a high intake of n-6 linoleic acid (LA), therefore the LA / ALA ratio should not exceed 4:1
 - also affected by the content of a whole range of nutrients in the diet
- **Improvement of n-3 MK supply**
 - consumption of ALA sources (e.g. rapeseed, flax, chia, hemp, walnuts and their oils)
 - limiting the intake of LA sources (e.g. corn and sunflower oil)
 - a varied diet helps the conversion of ALA to EPA and DHA

Healthy 13

- 9. Reduce your **sugar** intake, especially in the form of sugary drinks, sweets, jams, sweetened dairy products and ice cream



WHO: Healthy diet – Free sugars

- In both adults and children reduce to $\leq 10\%$ of total energy intake (50 g for adults), but ideally $\leq 5\%$ for additional health benefits.
- Dental caries
- Excess calories also contribute to unhealthy weight gain
- Influence blood pressure and serum lipids - reduction in free sugars intake reduces risk factors for CVD

Free sugars : added to foods or drinks by the manufacturer, cook or consumer, naturally present in honey, syrups, fruit juices and fruit juice concentrates.

Sugar-sweetened beverages + risk of premature death

- 80 647 women Nurses' Health Study (1980-2014) + 37,716 men Health Professionals Follow-up Study (1986-2014)
 - Completed a questionnaire every 2 years
- **The more SSD, the higher risk of premature death from any cause**
 - Particularly strong link: CVD
 - Modest link cancer
 - Risk higher among women than among men

Added sugar increases fat production

- 80 grams of sugar daily (\pm , 0,8 l of a regular soft drink), **boosts fat production** in the liver.
- The **overactive fat production continues** for a longer period of time, even if no more sugar is consumed.

Geidl-Flueck B et al. Fructose- and sucrose- but not glucose-sweetened beverages promote hepatic de novo lipogenesis: A randomized controlled trial. Journal of Hepatology, 2021; DOI: 10.1016/j.jhep.2021.02.027

Healthy 13



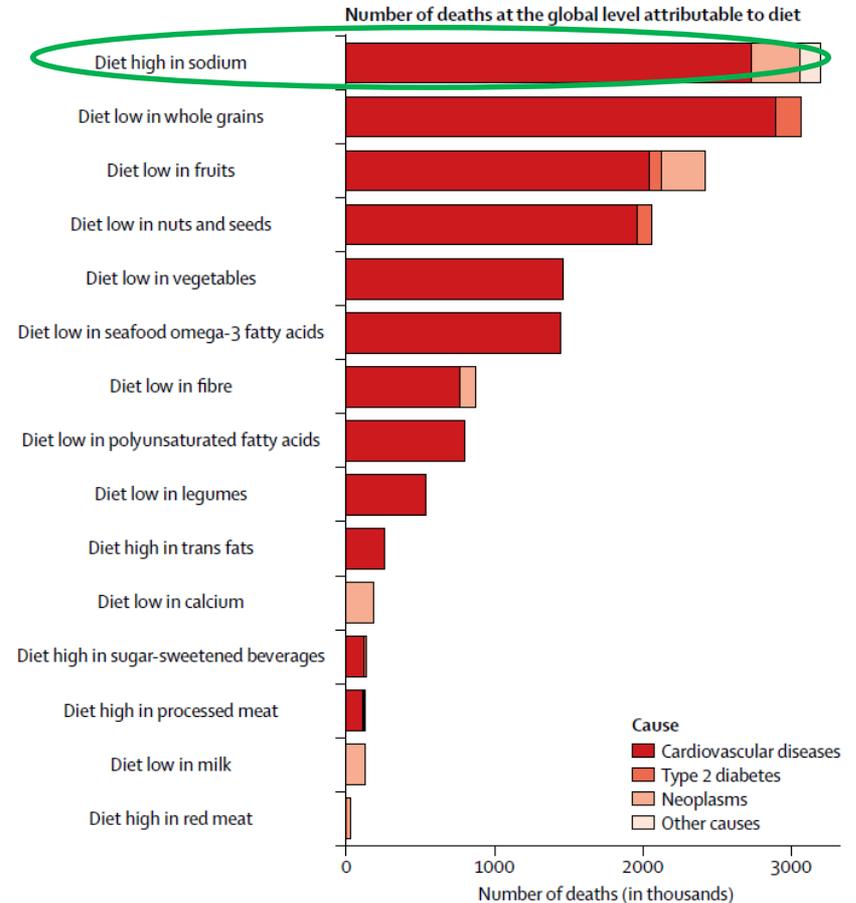
- 10. Limit your **salt** consumption and consumption of salty foods (processed meat + fish, cheese, chips, salted sticks and nuts), do not salt ready meals.
- Do not add salt to meals at the table.



Salt

- Salt **intake < 5 g per day** (± 1 teaspoon) \downarrow the risk of
 - Hypertension
 - Heart disease and stroke
- 1.7 million deaths could be prevented each year

WHO Healthy diet. 2020
<http://www.who.int/news-room/fact-sheets/detail/healthy-diet>



Health effects of dietary risks in 195 countries, 1990–2017;
Lancet Open access 2019 DOI:[https://doi.org/10.1016/S0140-6736\(19\)30041-8](https://doi.org/10.1016/S0140-6736(19)30041-8)

Healthy 13



- **11. Prevent food borne infection & poisoning** - hygienic handling of food during shopping, storing, and meals preparation
(Seminar in epidemiology)
- **Limit frying & grilling food** – formation of polycyclic aromatic hydrocarbons
 - carcinogenic potential,
 - participate in cancerogenesis,
 - increase oxidative stress
 - indicator of exposure: **benzo(a)pyren**
- **Wash you hands** before eating



Healthy 13

- 12. Drink sufficient quantities of **fluids**, at least 1.5 litre
 - Water, mineral water, weak black tea, herbal teas & juices – preferably without sugar.

EFSA 2019

Adults	≥ 18 years	Male	2.5 L/day
Adults	≥ 18 years	Female	2 L/day

Water balance

Intake	ml	Output	ml
Food	1 000	Respiration	550
Beverages	1 500	Skin	600
Metabolism	300	Urine	1 500
		Stool	150
TOTAL	2 800		2 800

Healthy 13



- 13. If you drink **alcoholic beverages**, do not exceed daily intake: men 20 g, women 10 g of alcohol
 - 200 ml wine
 - 0.5 l beer
 - 50 ml spirit
- WHO does not set particular limits for alcohol consumption because the evidence shows that the ideal solution for health is not to drink at all, therefore less is better

SUM Healthy 13

1. Maintain an adequate **body weight**
2. **Move** daily at least 30 minutes e.g. Fast walk
3. Eat a **variety of food; 3-5 daily**, do not skip breakfast
4. Eat at least **400 g vegetables + fruits**, eat smallish amounts of **nuts**
5. **Grain products – prefer wholegrain. Legumes** at least once a week.
6. Eat **fish** and fish products at least twice a week
7. Eat daily **milk + milk products**, especially fermented; preferably chose medium fat
8. Control your **fat** consumption, prefer unsaturated fats
9. Limit your **sugar** consumption
10. Limit your **salt** consumption
11. **Prevent food borne infection & poisoning**
12. Drink sufficient quantities of **fluids**, at least 1.5 litre/day
13. If you drink alcoholic beverages, **do not exceed daily intake of 20 g (men)/ 10 g (women) of alcohol**



Thanks

