Centre hospitalier
universitaire vaudois

Swiss dietary recommendations: scientific background

Annexes

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2. Search strategies, link between diet and NCDs

2.1. Water

Pubmed:

("cancer"[All Fields] OR "neoplasms"[MeSH Terms] OR "cardiovascular system"[MeSH Terms] OR "cardiovascular"[All Fields] OR "diabetes mellitus"[MeSH Terms] OR ("diabetes"[All Fields] AND "mellitus"[All Fields]) OR "diabetes mellitus"[All Fields] OR "diabetes"[All Fields] OR "obesity"[MeSH Terms] OR "obesity"[All Fields]) AND ("water"[Title/Abstract] OR "water"[MeSH Terms] AND ((meta-analysis[Filter] OR randomizedcontrolledtrial[Filter] OR systematicreview[Filter] OR review[Filter]) AND (humans[Filter]) AND (2018:2021[pdat]) AND (english[Filter]) AND (alladult[Filter]))

2.2. Coffee

Pubmed:

("cancer"[All Fields] OR "neoplasms"[MeSH Terms] OR "cardiovascular system"[MeSH Terms] OR "cardiovascular"[All Fields] OR "diabetes mellitus"[MeSH Terms] OR ("diabetes"[All Fields] AND "mellitus"[All Fields]) OR "diabetes mellitus"[All Fields] OR "diabetes"[All Fields] OR "obesity"[MeSH Terms] OR "obesity"[All Fields]) AND ("coffee"[Title/Abstract] OR "caffeine"[MeSH Terms] OR "coffee"[MeSH Terms] OR "caffeine products"[MeSH Terms] OR “caffeine” [Title/Abstract] OR "espresso"[MeSH Major Topic] OR "moka"[Title/Abstract] OR "caffeinated"[Title/Abstract] OR “caffeinated” [MeSH Terms] OR "caffeinated beverage*" OR "caffeinated product*" [Title/Abstract] AND ((meta-analysis[Filter] OR randomizedcontrolledtrial[Filter] OR systematicreview[Filter] OR review[Filter]) AND (humans[Filter]) AND (2018:2021[pdat]) AND (english[Filter]) AND (alladult[Filter]))

EMBASE:

('cancer'/exp OR 'cancer' OR 'neoplasm'/exp OR 'neoplasm' OR 'cardiovascular system'/exp OR 'cardiovascular system' OR 'cardiovascular'/exp OR 'cardiovascular' OR (('diabetes'/exp OR 'diabetes') AND 'mellitus') OR 'diabetes mellitus'/exp OR 'diabetes mellitus' OR 'diabetes'/exp OR 'diabetes' OR 'obesity'/exp OR 'obesity') AND ('coffee':ab,ti OR caffeine products'/mj/exp OR caffeinated products'/exp OR 'caffeinated' OR 'caffeinated beverage*'/exp OR 'moka'/mj/exp OR 'caffeine'/mj/exp OR 'caffeine':ab,ti OR 'caffeinated':ab,ti OR 'espresso':ab,ti AND ([systematic review]/lim OR [meta analysis]/lim OR [randomized controlled trial]/lim OR [review]/lim) AND ([adult]/lim OR [aged]/lim) AND [humans]/lim AND [english]/lim AND [abstracts]/lim AND [2018-2021]/py

2.3. Sugar-sweetened beverages

Pubmed:

(("cancer"[All Fields] OR "neoplasms"[MeSH Terms] OR "cardiovascular system"[MeSH Terms] OR "cardiovascular"[All Fields] OR "diabetes mellitus"[MeSH Terms] OR ("diabetes"[All Fields] AND "mellitus"[All Fields]) OR "diabetes mellitus"[All Fields] OR "diabetes"[All Fields] OR "obesity"[MeSH Terms] OR "obesity"[All Fields]) AND ((2018:3000/12/12[pdat]) AND (humans[Filter]) AND (alladult[Filter]) AND (english[Filter]) AND (fha[Filter]) AND ((meta-analysis[Filter] OR review[Filter] OR systematicreview[Filter] OR clinicaltrial[Filter])))) AND ("Sugar-Sweetened Beverages"[MeSH Terms] OR "Energy Drinks"[MeSH Terms] OR "Carbonated Beverages"[MeSH Terms] OR "Artificially Sweetened Beverages"[MeSH Terms] OR "soft drink*"[Tiab] OR "soda*"[Tiab] OR (("sweetened"[Tiab] OR "carbonated"[Tiab] OR "sugary"[Tiab] OR "sugar"[Tiab] OR "sugar sweetened"[Tiab] OR "sugar-sweetened"[Tiab] OR "sugar-added"[Tiab] OR "sugar added"[Tiab] OR "artificially sweetened"[Tiab] OR "soft"[Tiab]) AND ("drink*"[Tiab] OR "beverage*"[Tiab] OR "soda*"[Tiab])))

Pubmed:

(("sugar sweetened beverages"[MeSH Terms] OR ("sugar sweetened"[All Fields] AND "beverages"[All Fields]) OR "sugar sweetened beverages"[All Fields] OR ("sugar"[All Fields] AND "sweetened"[All Fields] AND "beverages"[All Fields]) OR "sugar sweetened beverages"[All Fields]) AND ("meta analysis"[Publication Type] OR "meta analysis as topic"[MeSH Terms] OR "meta analysis"[All Fields])) AND (2018:2021[pdat])

EMBASE:

('cancer':af OR 'neoplasms'/exp OR 'neoplasms' OR 'cardiovascular system'/exp OR 'cardiovascular system' OR 'cardiovascular':af OR 'diabetes mellitus'/exp OR 'diabetes mellitus' OR ('diabetes':af AND 'mellitus':af) OR 'diabetes mellitus':af OR 'diabetes':af OR 'obesity'/exp OR 'obesity' OR 'obesity':af) AND ([cochrane review]/lim OR [systematic review]/lim OR [meta analysis]/lim OR [randomized controlled trial]/lim) AND [english]/lim AND [adult]/lim AND [humans]/lim AND [2018-2021]/py AND ('sugar-sweetened beverage'/exp OR 'energy drink'/exp OR 'carbonated beverages'/exp OR 'artificially sweetened beverage'/exp OR 'soft drink'/exp OR 'soda*':ti,ab,kw OR (('sweetened':ti,ab,kw OR 'carbonated':ti,ab,kw OR 'sugary':ti,ab,kw OR 'sugar':ti,ab,kw OR 'sugar sweetened':ti,ab,kw OR 'sugar-sweetened':ti,ab,kw OR 'sugar-added':ti,ab,kw OR 'sugar added':ti,ab,kw OR 'artificially sweetened':ti,ab,kw OR 'soft':ti,ab,kw) AND ('drink*':ti,ab,kw OR 'beverage*':ti,ab,kw OR 'soda*':ti,ab,kw)))

2.4. Fruit juice

We searched the databases Pubmed and EMBASE to identify Publications about NCDs (cancer, CVD, Diabetes and adiposity) and the food group Fruit Juice in combination. To identify relevant results we set the following Filters: humans, English, 5 years, reviews, systematic reviews and Meta-Analysis. We were able to identify 20 results for the title and abstract screening, which we imported to the systematic Review Tool “Rayyaan”. In the following full-text screening, we excluded 16 studies for meeting the exclusion criteria such as “wrong outcome”, “wrong food” or “wrong population”. At the end of this process, we found 4 eligible studies, which were used for this paper (further details are available in this document “Syntax Fruit Juice”)

Fruit Juice + NCDs (cancer, CVD, Diabetes and adiposity) combined

Filter: Humans, English, Adults, Systematic Review or Review or Meta-Analysis, 2015

Pubmed: 18 Results

("cancer"[All Fields] OR "neoplasms"[MeSH Terms] OR "cardiovascular system"[MeSH Terms] OR "cardiovascular"[All Fields] OR "diabetes mellitus"[MeSH Terms] OR ("diabetes"[All Fields] OR "mellitus"[All Fields]) OR "diabetes mellitus"[All Fields] OR "diabetes"[All Fields] OR "obesity"[MeSH Terms] OR "obesity"[All Fields]) AND fruit juice*

Medline: 2 Results

'fruit juice' AND (cancer OR neoplasm OR 'cardiovascular system' OR cardiovascular OR 'diabetes mellitus' OR diabetes OR obesity) AND [medline]/lim AND ([systematic review]/lim OR [meta analysis]/lim) AND [english]/lim AND [adult]/lim AND [humans]/lim AND [embase]/lim AND [2015-2021]/py

Pubmed overview: 480,511 Results about NCDs:

("cancer"[All Fields] OR "neoplasms"[MeSH Terms] OR "cardiovascular system"[MeSH Terms] OR "cardiovascular"[All Fields] OR "diabetes mellitus"[MeSH Terms] OR ("diabetes"[All Fields] OR "mellitus"[All Fields]) OR "diabetes mellitus"[All Fields] OR "diabetes"[All Fields] OR "obesity"[MeSH Terms] OR "obesity"[All Fields])

2.5. Fruits and vegetables

Pubmed

("cancer"[All Fields] OR "neoplasms"[MeSH Terms] OR "cardiovascular system"[MeSH Terms] OR "cardiovascular"[All Fields] OR "diabetes mellitus"[MeSH Terms] OR ("diabetes"[All Fields] AND "mellitus"[All Fields]) OR "diabetes mellitus"[All Fields] OR "diabetes"[All Fields] OR "obesity"[MeSH Terms] OR "obesity"[All Fields]) AND (humans[Filter]) AND (alladult[Filter]) AND (english[Filter]) AND (fha[Filter]) AND (meta-analysis[Filter] OR review[Filter] OR systematicreview[Filter]) AND "fruits"[Tiab] OR "fruit"[Tiab] OR "vegetables"[Tiab] OR "vegetable"[Tiab]

EMBASE

(('cancer' OR 'neoplasms' OR 'cardiovascular system' OR 'cardiovascular' OR ('diabetes' AND 'mellitus') OR 'diabetes mellitus' OR 'diabetes' OR 'obesity') AND 'humans' AND 'adult' AND 'english' AND ('meta analysis' OR 'review' OR 'systematic review') AND 'fruits' OR 'fruit' OR 'vegetables' OR 'vegetable') AND [2018-2021]/py AND ([adult]/lim OR [aged]/lim OR [very elderly]/lim) AND [humans]/lim AND [english]/lim AND [abstracts]/lim AND ([cochrane review]/lim OR [systematic review]/lim OR [meta analysis]/lim OR [randomized controlled trial]/lim)

2.6. Whole grain, cereals and starchy foods

We searched the databases Pubmed and EMBASE to identify publications about non-communicable diseases (NCDs) (cancer, CVD, diabetes and adiposity) and the food groups whole grains, cereals and starchy foods in combination. To identify relevant results we set the following filters: humans, English, last 3 years, reviews, systematic reviews and Meta-Analysis. We were able to identify 42 results (-2 duplicates) for the title and abstract screening, which we imported to systematic Review Tool “Rayyaan”. In the following full-text screening, we excluded 25 studies for meeting the exclusion criteria such as “wrong outcome”, “wrong food” or “wrong population”. At the end of this process, we found 15 eligible studies, which were used for this review.

whole grain, cereals and starchy foods + NCDs (cancer, CVD, diabetes and adiposity) combined

Filter: humans, English, adults, systematic review or review or Meta-Analysis, 2018 onwards

Pubmed: 36 Results

"whole grain*"[Tiab] OR "wholegrain*"[Tiab] OR "refined grain*"[Tiab] OR "starchy food*"[Tiab] OR "breakfast cereal*"[Tiab] OR "ready-to-eat cereal*"[Tiab] OR "potatoe*"[Tiab] OR "potato*"[Tiab] OR "cereal*"[MeSH Terms] OR "grain*"[MeSH Terms] OR "potatoe*"[MeSH Terms] AND ("cancer"[All Fields] OR "neoplasms"[MeSH Terms] OR "cardiovascular system"[MeSH Terms] OR "cardiovascular"[All Fields] OR "diabetes mellitus"[MeSH Terms] OR ("diabetes"[All Fields] OR "mellitus"[All Fields]) OR "diabetes mellitus"[All Fields] OR "diabetes"[All Fields] OR "obesity"[MeSH Terms] OR "obesity"[All Fields])

EMBASE: 6 Results

('whole grain':ab,ti OR wholegrain:ab,ti OR 'refined grain':ab,ti OR 'starchy food':ab,ti OR 'breakfast cereal':ab,ti OR 'ready-to-eat cereal':ab,ti OR potato:ab,ti OR cereal:ab,ti OR grain:ab,ti) AND (cancer OR neoplasm OR 'cardiovascular system' OR cardiovascular OR 'diabetes mellitus' OR diabetes OR obesity) AND [medline]/lim AND ([systematic review]/lim OR [meta analysis]/lim) AND [english]/lim AND [adult]/lim AND [humans]/lim AND [embase]/lim AND [2018-2021]/py

Overview : 480511 Results about NCDs:

("cancer"[All Fields] OR "neoplasms"[MeSH Terms] OR "cardiovascular system"[MeSH Terms] OR "cardiovascular"[All Fields] OR "diabetes mellitus"[MeSH Terms] OR ("diabetes"[All Fields] OR "mellitus"[All Fields]) OR "diabetes mellitus"[All Fields] OR "diabetes"[All Fields] OR "obesity"[MeSH Terms] OR "obesity"[All Fields])

2.7. Meat, fish and eggs

Pubmed

("cancer"[All Fields] OR "neoplasms"[MeSH Terms] OR "cardiovascular system"[MeSH Terms] OR "cardiovascular"[All Fields] OR "diabetes mellitus"[MeSH Terms] OR ("diabetes"[All Fields] AND "mellitus"[All Fields]) OR "diabetes mellitus"[All Fields] OR "diabetes"[All Fields] OR "obesity"[MeSH Terms] OR "obesity"[All Fields]) AND ((y_5[Filter]) AND (humans[Filter]) AND (alladult[Filter]) AND (english[Filter]) AND (fha[Filter]) AND ((meta-analysis[Filter]) OR (review[Filter]) OR (systematicreview[Filter]))

…AND ("fish"[Tiab] OR "seafood"[Tiab] OR ("sea"[Tiab] AND "food"[Tiab]) OR "seafood"[MeSH Terms])

…AND ("egg"[Tiab] OR "eggs"[Tiab] OR "eggs"[MeSH Terms])

…AND ("meat"[Tiab] OR "meats"[Tiab] OR "beef"[Tiab] OR "pork"[Tiab] OR ("processed"[Tiab] AND "meat"[Tiab]) OR "chicken"[Tiab] OR "poultry"[Tiab] OR "meat"[MeSH Terms] OR "red meat"[MeSH Terms] OR "poultry"[MeSH Terms] OR "meat products"[MeSH Terms])

Cochrane

('cancer':af OR 'neoplasms'/exp 'cardiovascular system' OR 'cardiovascular':af OR 'diabetes mellitus'/exp OR 'diabetes mellitus' OR ('diabetes':af AND 'mellitus':af) OR 'diabetes mellitus':af OR 'diabetes':af OR 'obesity'/exp OR 'obesity' OR 'obesity':af) AND ([cochrane review]/lim OR [systematic review]/lim OR [meta analysis]/lim) AND [english]/lim AND [adult]/lim AND [humans]/lim AND [2016-2021]/py

…AND ("fish"/exp OR "seafood"/exp OR "fish*":ti,ab,kw OR "seafood":ti,ab,kw OR (("sea":ti,ab,kw) AND ("food*":ti,ab,kw)))

…AND ("egg"/exp OR "eggs"/exp OR "eggs":ti,ab,kw OR "egg":ti,ab,kw)

…AND ("meat"/exp OR "meats"/exp OR "beef"/exp OR "pork"/exp OR "processed meat"/exp OR "red meat"/exp OR "chicken"/exp OR "poultry"/exp OR "meat products"/exp OR "meat*":ti,ab,kw OR "pork":ti,ab,kw OR "beef":ti,ab,kw OR "chicken":ti,ab,kw OR "poultry":ti,ab,kw OR (("red":ti,ab,kw OR "processed":ti,ab,kw) AND ("meat*":ti,ab,kw)) OR (("meat":ti,ab,kw) AND ("product*":ti,ab,kw)))

2.8. Milk and dairy

Pubmed

("cancer"[All Fields] OR "neoplasms"[MeSH Terms] OR "cardiovascular system"[MeSH Terms] OR "cardiovascular"[All Fields] OR "diabetes mellitus"[MeSH Terms] OR ("diabetes"[All Fields] AND "mellitus"[All Fields]) OR "diabetes mellitus"[All Fields] OR "diabetes"[All Fields] OR "obesity"[MeSH Terms] OR "obesity"[All Fields]) AND ("dairy"[Title/Abstract] OR "Cultured Milk Products"[MeSH Major Topic] OR “Cultured Milk Products” [MeSH Terms] OR "milk"[MeSH Terms] OR "dairy products"[MeSH Terms] OR "cheese"[MeSH Terms] OR "milk"[MeSH Major Topic] OR “milk” [Title/Abstract] OR "dairy products"[MeSH Major Topic] OR "cheese"[MeSH Major Topic] OR "milk"[Title/Abstract] OR "dairy products"[Title/Abstract] OR "cheese"[Title/Abstract] OR “cheese” [MeSH Terms] OR "quark"[Title/Abstract] OR "lactose free"[Title/Abstract] OR “yoghurt”[Title/Abstract]) AND ((meta-analysis[Filter] OR randomizedcontrolledtrial[Filter] OR systematicreview[Filter] OR review[Filter]) AND (humans[Filter]) AND (2018:2021[pdat]) AND (english[Filter]) AND (alladult[Filter]))

EMBASE

('cancer'/exp OR 'cancer' OR 'neoplasm'/exp OR 'neoplasm' OR 'cardiovascular system'/exp OR 'cardiovascular system' OR 'cardiovascular'/exp OR 'cardiovascular' OR (('diabetes'/exp OR 'diabetes') AND 'mellitus') OR 'diabetes mellitus'/exp OR 'diabetes mellitus' OR 'diabetes'/exp OR 'diabetes' OR 'obesity'/exp OR 'obesity') AND ('dairy':ab,ti OR 'cultured milk products'/mj/exp OR 'cultured milk products'/exp OR 'cultured milk products' OR 'milk'/exp OR 'dairy products'/exp OR 'milk'/mj/exp OR 'milk' OR 'dairy products'/mj/exp OR 'dairy products' OR 'cheese'/mj/exp OR 'milk':ab,ti OR 'dairy products':ab,ti OR 'cheese':ab,ti OR 'cheese'/exp OR 'cheese' OR 'quark':ab,ti OR 'lactose free':ab,ti OR 'yoghurt':ab,ti) AND ([systematic review]/lim OR [meta analysis]/lim OR [randomized controlled trial]/lim OR [review]/lim) AND ([adult]/lim OR [aged]/lim) AND [humans]/lim AND [english]/lim AND [abstracts]/lim AND [2018-2021]/py

2.9. Legumes, pulses and soy products

PubMed

("cancer"[All Fields] OR "neoplasms"[MeSH Terms] OR "cardiovascular system"[MeSH Terms] OR "cardiovascular"[All Fields] OR "diabetes mellitus"[MeSH Terms] OR ("diabetes"[All Fields] AND "mellitus"[All Fields]) OR "diabetes mellitus"[All Fields] OR "diabetes"[All Fields] OR "obesity"[MeSH Terms] OR "obesity"[All Fields]) AND ((y_5[Filter]) AND (humans[Filter]) AND (alladult[Filter]) AND (english[Filter]) AND (fha[Filter]) AND ((meta-analysis[Filter]) OR (review[Filter]) OR (systematicreview[Filter])) AND ("legumes"[Tiab] OR "pulses"[Tiab] "soy"[Tiab] OR "soybean"[Tiab] OR ("soy"[Tiab] AND "product"[Tiab]))

EMBASE

('cancer':af OR 'neoplasms'/exp 'cardiovascular system' OR 'cardiovascular':af OR 'diabetes mellitus'/exp OR 'diabetes mellitus' OR ('diabetes':af AND 'mellitus':af) OR 'diabetes mellitus':af OR 'diabetes':af OR 'obesity'/exp OR 'obesity' OR 'obesity':af) AND ([cochrane review]/lim OR [systematic review]/lim OR [meta analysis]/lim) AND [english]/lim AND [adult]/lim AND [humans]/lim AND [2016-2021]/py AND ("legumes"/exp OR "pulses"/exp OR "soy"/exp OR "soybean"/exp OR "legumes":ti,ab,kw OR "pulses":ti,ab,kw OR "soy":ti,ab,kw OR "soybean":ti,ab,kw)

2.10. Plant protein

Pubmed

("cancer"[All Fields] OR "neoplasms"[MeSH Terms] OR "cardiovascular system"[MeSH Terms] OR "cardiovascular"[All Fields] OR "diabetes mellitus"[MeSH Terms] OR ("diabetes"[All Fields] AND "mellitus"[All Fields]) OR "diabetes mellitus"[All Fields] OR "diabetes"[All Fields] OR "obesity"[MeSH Terms] OR "obesity"[All Fields]) AND ((y_5[Filter]) AND (humans[Filter]) AND (alladult[Filter]) AND (english[Filter]) AND (fha[Filter]) AND ((meta-analysis[Filter]) OR (review[Filter]) OR (systematicreview[Filter])) AND ("legumes"[Tiab] OR "pulses"[Tiab] OR ("plant"[Tiab] AND "protein"[Tiab]) OR ("vegetable"[Tiab] AND "protein"[Tiab]) OR ("grain"[Tiab] AND "protein"[Tiab]) OR ("pea"[Tiab] AND "protein"[Tiab]) OR ("nut"[Tiab] AND "protein"[Tiab]) OR ("fruit"[Tiab] AND "protein"[Tiab]) OR "Plant Proteins, Dietary"[MeSH Terms] OR "Fruit Proteins"[MeSH Terms] OR "Grain Proteins"[MeSH Terms] OR "Nut Proteins"[MeSH Terms] OR "Pea Proteins"[MeSH Terms] OR "Soybean Proteins"[MeSH Terms])

Cochrane

('cancer':af OR 'neoplasms'/exp 'cardiovascular system' OR 'cardiovascular':af OR 'diabetes mellitus'/exp OR 'diabetes mellitus' OR ('diabetes':af AND 'mellitus':af) OR 'diabetes mellitus':af OR 'diabetes':af OR 'obesity'/exp OR 'obesity' OR 'obesity':af) AND ([cochrane review]/lim OR [systematic review]/lim OR [meta analysis]/lim) AND [english]/lim AND [adult]/lim AND [humans]/lim AND [2016-2021]/py AND ("plant protein"/exp OR "grain protein"/exp OR "fruit protein"/exp OR "nut protein"/exp OR "pea protein"/exp OR "soybean protein"/exp OR (("plant":ti,ab,kw OR "grain":ti,ab,kw OR "soy":ti,ab,kw OR "soybean":ti,ab,kw OR "fruit":ti,ab,kw OR "nut":ti,ab,kw OR "pea":ti,ab,kw) AND ("protein*":ti,ab,kw)))

2.11. Ultraprocessed foods

We searched the databases Pubmed and EMBASE to identify publications about NCDs (cancer, cardiovascular diseases (CVD), diabetes mellitus and adiposity) and the food group ultra-processed food ("ultraprocessed food*" OR "ultra-processed food*" OR "packaged food*" OR "convenience food*" OR "industrialized food*" OR highly processed food). To identify relevant results, we set the following filters: humans, English, 5 years. We identified 225 publications. Following, we set the following filters: reviews, systematic reviews, meta-analysis and randomized controlled trials. We were able to identify 31 results for the title and abstract screening, which we imported to the systematic review Tool "Rayyaan". In the following full-text screening we excluded 26 studies for meeting the exclusion criteria such as "wrong scope", "wrong outcome", "wrong food item" or "wrong population". At the end of this process we found 5 eligible studies, which were used for this review. In addition, we included a Swiss cross-sectional study as relevant for the local context in the analysis. (Further details are available in the supplementary document "Syntax ultra-processed foods.")

UPF and NCDs (cancer, CVD, diabetes and adiposity) combined

Filter: humans, English, adults, systematic review or review or Meta-Analysis or randomized controlled trial, 2015 onwards

PUBMED and EMBASE: 31

"ultraprocessed food*" OR "ultra-processed food*" OR "packaged food*" OR "convenience food*" OR "industrialized food*" OR highly processed food AND ("cancer"[All Fields] OR "neoplasms"[MeSH Terms] OR "cardiovascular system"[MeSH Terms] OR "cardiovascular"[All Fields] OR "diabetes mellitus"[MeSH Terms] OR ("diabetes"[All Fields] OR "mellitus"[All Fields]) OR "diabetes mellitus"[All Fields] OR "diabetes"[All Fields] OR "obesity"[MeSH Terms] OR "obesity"[All Fields]) AND systematic review OR meta analysis OR randomized controlled trial AND [english]/lim AND [adult]/lim AND [humans]/lim AND [embase]/lim AND [2015-2021]/py AND [2015-2021]/py

PUBMED Overview : 480511 Results about NCDs:

("cancer"[All Fields] OR "neoplasms"[MeSH Terms] OR "cardiovascular system"[MeSH Terms] OR "cardiovascular"[All Fields] OR "diabetes mellitus"[MeSH Terms] OR ("diabetes"[All Fields] OR "mellitus"[All Fields]) OR "diabetes mellitus"[All Fields] OR "diabetes"[All Fields] OR "obesity"[MeSH Terms] OR "obesity"[All Fields])

2.12. Nuts, seeds, and oleaginous foods

We searched PubMed and Cochrane databases for systematic reviews and meta-analyses focusing on nuts and seeds and NCDs (CVD, cancer, T2D and obesity), but not for intermediate metabolic outcomes, such as blood pressure, changes in blood lipids etc. For PubMed, all studies related to adults (18+ years) published in English in the last five years (up to the 15th of February 2022) were considered, using "nuts" and "food groups" as main search terms. Documents retrieved for "food groups" were then screened for "nuts" in the text and retained whenever nuts had been evaluated as a separate food group. The last specific report in the Cochrane library is of 2012 and was already taken into account for in the FCN report. The studies passing the first screening had their abstract screened and, in case of doubt, the full text was screened. A separate search, with the same filters, was performed for avocado and olives, we excluded studies for meeting the exclusion criteria such as "wrong outcome" (in particular many studies focussing on metabolic intermediate outcomes), "wrong food" (in particular excluding studies focussing on oils extracted from the nuts and seeds, or "wrong population". At the end of this process, we found 16 eligible studies, which were used for this review.

Terms for diseases (all in separate searches): "Mortality" [All Fields], "cancer"[MeSH Terms], "cardiovascular"[All Fields], "diabetes mellitus"[MeSH Terms], "diabetes"[All Fields], "overweight" [All fields], "obesity"[MeSH Terms], [All Fields]

Search combined diseases with the boolean search operator "AND" "Nuts" [all Fields], "Seeds" [All Fields], "avocado" [All Fields], "Olive" [All Fields]

2.13. Oils and fats

Pubmed

Query #1: diseases in all fields

("cancer"[All Fields] OR "neoplasms"[MeSH Terms] OR "cardiovascular system"[MeSH Terms] OR "cardiovascular"[All Fields] OR "diabetes mellitus"[MeSH Terms] OR ("diabetes"[All Fields] AND "mellitus"[All Fields]) OR "diabetes mellitus"[All Fields] OR "diabetes"[All Fields] OR "obesity"[MeSH Terms] OR "obesity"[All Fields]))

Query #2: Vegetable oils:

"plant oils"[MeSH Terms] OR ("plant"[Tiab] AND "oils"[Tiab]) OR "plant oils"[Tiab] OR ("vegetable"[Tiab] AND "oil"[Tiab]) OR "vegetable oil"[Tiab] OR “oil”[Tiab]

Query #3: Fats:

“fat”[Tiab] OR “fats”[Tiab] OR “butter” [Tiab] OR “margarine” [Tiab]

Filters: limited to humans, adults, English papers with abstracts and the last 5 years, reviews, systematic reviews or meta-analyses

AND ((y_5[Filter]) AND (humans[Filter]) AND (alladult[Filter]) AND (english[Filter]) AND (fha[Filter]) AND ((meta-analysis[Filter] OR review[Filter] OR systematicreview[Filter])))

Search conducted in 12.11.2021

For vegetable oils

#1 led to 22,888 references, and #2 to 169,235 references. Crossing #1 and #2 led to 60 references.

For fats

#1 led to 22,888 references, and #3 to 300,212 references. Crossing #1 and #3 led to 487 references.

Cochrane database

Query #1: diseases in title, abstract and keywords

(cancer):ti,a,kw OR (diabetes):ti,a,kw OR (obesity):ti,a,kw OR (cardiovascular):ti,a,kw. Including word variations

Query #2: Oils and fats in title, abstract and keywords

(fat):ti,ab,kw OR (oil):ti,ab,kw OR (butter):ti,ab,kw OR (margarine):ti,ab,kw. Including word variations

Limits

With Cochrane Library publication date from Jan 2016 to Nov 2021, in Cochrane Reviews

Search conducted in 12.11.2021

#1 led to 360,538 references; and #2 to 47,724 references. Applying limits and crossing #1 and #2 led to 58 references. Further extending the time limit to January 2011 led to 82 results, of which 11 were selected

3. Link between diet and noncommunicable diseases

Table 1 summarizes the associations between diet and noncommunicable diseases. The individual tables are in the main document, with each subchapter of chapter 2.

Table 1: Summary associations between diet and noncommunicable diseases

	Class	Level
Water		
High H_2 water and green tea intake have protective effects on CVD health	I	B
Nitrate and fluoride in water might not be associated with cancer	II	A
Water, alkaline water, and mineral water do not seem to have positive effects on glycemic parameters	II	B
Drinking water before or after the meal might be beneficial in weight reduction	I	B
Coffee	**Class**	**Level**
Coffee does not appear to be a risk factor for CVD, and it generally has protective effects on CVD outcomes	I	A/B
Coffee may be a protective factor for several cancers like liver cancer, breast cancer in postmenopausal women, endometrial cancer, skin carcinoma, prostate cancer, brain cancer, oral cancer and thyroid cancer	I	A/B
Coffee showed confounding and controversial effects on colorectal cancer and ovarian cancer	II	A
Coffee showed a potential harmful effect for pancreatic cancer and for bladder cancer	III	A/B
Coffee might have a protective effect on T2D	II	A/B
Coffee might affect weight in a moderate way	II	B
SSBs	**Class**	**Level**
Increasing SSB intake increases the risk of CVD	III	B
Increasing SSB intake increases the risk of cancer	II	B/C
Increasing SSB intake increases the risk of T2D	III	B
Increasing SSB intake increases the risk of obesity	II	B
Fruit juice	**Class**	**Level**
Increasing fruit juice intake decreases the risk of CVD	II	A
Increasing fruit juice intake decreases the risk of cancer	II	A
Increasing fruit juice intake decreases the risk of T2D	II	A
Increasing fruit juice intake increases the risk of obesity	III	A
Fruit	**Class**	**Level**
Increasing fruit intake decreases the risk of CVD	I/II [1]	B
Increasing fruit intake decreases the risk of cancer	I/II [2]	B

	Class	Level
Increasing fruit intake decreases the risk of T2D	II	B
Increasing fruit intake decreases the risk of obesity/weight gain	I/II	B
Vegetables	**Class**	**Level**
Increasing vegetables intake decreases the risk of CVD	I/II [1]	B
Increasing vegetables intake decreases the risk of cancer	I/II	B
Increasing vegetables intake decreases the risk of T2D	I/II	B
Increasing vegetables intake decreases the risk of obesity/weight gain	I/II	B
Potatoes	**Class**	**Level**
Fried potato /French fries intake increases the risk of CVD	II	A
Fried potato /French fries intake increases the risk of cancer	II	A
Fried potato /French fries intake increases the risk of T2D	III	A
Fried potato /French fries intake increases the risk of obesity	III	A
Whole grain	**Class**	**Level**
Whole grain intake decreases the risk of CVD	I	A
Whole grain intake decreases the risk of cancer	I	A
Whole grain intake decreases the risk of T2D	I	A
Whole grain intake decreases the risk of obesity	II	A
Red mead	**Class**	**Level**
Increasing intake of red meat increases the risk of CVD	III	B
Increasing intake of red meat increases the risk of cancer	II/III	B
Increasing intake of red meat increases the risk of T2D	III	B
Increasing intake of red meat increases the risk of obesity	II	B
Processed meat	**Class**	**Level**
Increasing intake of processed meat increases the risk of CVD	III	B
Increasing intake of processed meat increases the risk of cancer	II/III	B
Increasing intake of processed meat increases the risk of T2D	III	B
Increasing intake of processed meat increases the risk of obesity	II	B
White meat	**Class**	**Level**
Increasing intake of white meat decreases the risk of CVD	II	B
Increasing intake of white meat decreases the risk of cancer	II	B
Increasing intake of white meat decreases the risk of T2D	II	B
Increasing intake of white meat decreases the risk of obesity	II	B
Fish	**Class**	**Level**
Increasing intake of fish decreases the risk of CVD	I	B

	Class	Level
Increasing intake of fish decreases the risk of cancer	II	B
Increasing intake of fish decreases the risk of T2D	II	B
Increasing intake of fish decreases the risk of obesity	II	B
Eggs	**Class**	**Level**
Increasing intake of eggs decreases the risk of CVD	II	B
Increasing intake of eggs decreases the risk of cancer	II	B
Increasing intake of eggs decreases the risk of T2D	II	B
Increasing intake of eggs decreases the risk of obesity	II	B
Milk and dairy	**Class**	**Level**
Milk and dairy, especially yoghurt, might reduce the risk for strokes and CVD	II	A
Milk and dairy, especially yoghurt, seem to have a protective effect on several cancers, especially colon, oropharyngeal and bladder cancer	II	A
Milk and dairy seem to increase the risk for prostate cancer and to a weaker extend some other cancers such as hepatocellular carcinoma (except for yoghurt)	III	A
Milk and dairy, especially yoghurt, might have a protective effect on T2D	II	A
Milk and dairy might reduce weight, but only within a weight-reducing diet	II	A
Soy	**Class**	**Level**
Increasing soy intake decreases the risk of CVD	I/II [4]	B
Increasing soy intake decreases the risk of cancer	I/II [3]	B
Increasing soy intake decreases the risk of T2D	II	B
Increasing soy intake decreases the risk of obesity	II	B
Pulses	**Class**	**Level**
Increasing pulses intake decreases the risk of CVD	I/II [4]	B
Increasing pulses intake decreases the risk of cancer	II	B
Increasing pulses intake decreases the risk of T2D	II/III	B
Increasing pulses intake decreases the risk of obesity	I [5]	B
Plant protein	**Class**	**Level**
Increasing intake of plant protein decreases the risk of CVD	II	B
Increasing intake of plant protein decreases the risk of cancer	II	B
Increasing intake of plant protein decreases the risk of T2D	II	B
Increasing intake of plant protein decreases the risk of obesity	II	B/C
Ultraprocessed foods	**Class**	**Level**
UPF intake increases the risk of CVD	III	B

	Class	Level
UPF intake increases the risk of certain cancers	III	B
UPF intake increases the risk of T2D	III	B
UPF intake increases the risk of obesity	III	A
Total fat	**Class**	**Level**
Total fat is not associated with CVD	II	A
Total fat might increase cancer (bladder)	III	B
Saturated fat	**Class**	**Level**
SFA might be associated with CVD	III	A
SFA might increase cancer	III	B
SFA might protect against T2D	I	B
SFA might increase weight	III	A
Monounsaturated fat	**Class**	**Level**
MUFA might protect against stroke	I	B
MUFA might protect against cancer (skin)	I	B
MUFA might be associated with T2D	III	B
Polyunsaturated fat	**Class**	**Level**
PUFA might protect against CVD	I	A
PUFA effect appears cancer-specific	II	A
PUFA might protect against T2D	I	B
PUFA is not associated with obesity	II	B
Trans fat	**Class**	**Level**
TFA are associated with CVD	III	A
TFA might increase cancer (prostate, colon)	III	B
TFA are not associated with T2D	II	B
Omega fats	**Class**	**Level**
Omega-3 might protect against CVD	I	A
Omega-3 effect on diabetes is unclear	II	A
Omega-6 are not associated with CVD	II	B
Omega-6 might protect against T2D	I	B
Omega-6 are not associated with obesity	II	B
Animal fat	**Class**	**Level**
Butter is not associated with CVD	II	B
Butter might increase cancer (endometrium)	III	B
Vegetable fat	**Class**	**Level**

	Class	Level
Vegetable oil is not associated with cancer	II	B
Vegetable fat might protect against T2D	I	B
Olive oil might protect against cancer	I	B
Olive oil might protect against T2D	I	A
Palm oil is associated with CVD	III	B
Coconut oil is not associated with obesity	II	B

[1], depends on CVD outcome; [2] depends on cancer type and/or fruit and vegetable type and/or lifestyle characteristics (e.g., smoking); [3], depends on cancer types; [4], depends on CVD outcome; [5], one study only.

4. Recommendations regarding diet and noncommunicable diseases

The table below groups all the recommendations regarding diet provided in the main document.

Table 2: Summary recommendations regarding diet and noncommunicable diseases

Food group / NCD	Min	Max	Optimal
Water			
CVD [1]	-	-	3.5 mg of H_2/500 ml/day
Cancer [2]	-	-	-
Colorectal cancer [3]	0	0	0
T2D	-	-	-
T2D [4]	-	-	-
T2D [5]	-	-	-
Green Tea			
CVD	-	-	1 L/day
Coffee			
CVD	750 ml/day	1250 ml/day	
Cancer	250 ml/day		750 ml/day
T2D			Up to 1000 ml/day
Obesity			1000 to 1500 ml/day
Sugar-sweetened beverages			
CVD	0	0	0
Cancer	0	0	0
T2D	0	0	0
Obesity	0	0	0
Fruit juice			
CVD	-	125 ml/day	0
Cancer	-	125 ml/day	0
T2D	-	0	0
Obesity	-	0	0
Fruits			
CVD	200 g	-	400 g
Cancer	-	-	-
T2D	-	-	-
Obesity	-	-	3 servings (~360 g*)

Food group / NCD	Min	Max	Optimal
Vegetables			
CVD	200 g		400 g
Cancer	-	-	-
T2D	-	-	-
Obesity	-	-	3 servings (~360 g*)
Potato (boiled, baked or mashed)			
CVD	-	212 g/day	-
Cancer (colorectal)	-	134 g/day	-
Cancer (all)	-	100 g/day	-
T2D	-	150 g/day	-
Obesity	-	-	-
Fried potato			
CVD	-	-	0 g/day
Cancer	-	-	0 g/day
T2D	-	80 g/day	0 g/day
Obesity	-	-	0 g/day
Whole grain			
CVD	no new evidence	no new evidence	no new evidence
Cancer (all)	30 g/day	-	90 g/day
Cancer (breast)	50 g/day	-	> 50 g/day
T2D	30 g/day	-	-
Obesity	-	-	-
Refined grain			
CVD	no new evidence	no new evidence	no new evidence
Cancer	-	-	-
T2D	-	-	-
Obesity	-	-	-
Red meat			
CVD	0 g/day	100 g/day	40 g/day
Cancer (colorectal)	0 g/day	50 g/day	0 g/day
T2D	every 100 g/day increase in intake of red meat significantly increased the risk of T2D with pooled RRs of 1.17 (95% CI: 1.08-1.26)		
Obesity	0 g/day	100 g/day	0 g/day
Processed meat			

Food group / NCD	Min	Max	Optimal
CVD	0 g/day	0 g/day	0 g/day
Cancer (colorectal)	0 g/day	0 g/day	0 g/day
T2D	every 50 g/day increase in intake of processed meat significantly increased the risk of T2D with pooled RRs of 1.37 (95% CI: 1.22-1.55)		
Obesity	0 g/day	0 g/day	0 g/day
White meat			
CVD	-	-	-
Cancer	-	-	-
T2D	-	-	-
Obesity	-	-	-
Fish			
CVD	>0 g/day	90 g/day	50 g/day
Cancer	-	-	-
T2D	-	-	-
Obesity	-	-	-
Eggs			
CVD	0	5/day	1
cancer	-	-	-
T2D	1/week	2/week	1
Obesity	-	-	-
Total dairy			
Colon cancer	400 g/day §	-	-
T2D	270 g/day §	-	-
Insulin resistance	3-5 servings/day #	-	-
Obesity [6]	2-4 servings/day #	-	-
Obesity [7]	4-5 servings/day #	-	-
Milk			
Bladder cancer	227 mL/day §	-	-
Bladder cancer	-	220 g/day §	
Colon cancer [8]	200 g/day §	-	-
T2D [9]	200 g/day §	-	-
Obesity [9]	200 mL/day #	-	-
Milk and yoghurt			
Stroke	400 g/day §; RR between 0.92 and	-	-

Food group / NCD	Min	Max	Optimal
	0.98 per increment of 200 g (for yoghurt 100 g) §		
Fermented dairy			
Bladder cancer	67 g/day §	-	-
Yoghurt			
ER- breast cancer	60 g/day §	-	-
T2D	100 g/day §; RR 0.94 per increment of 100 g §	-	-
Cottage cheese			
ER- breast cancer	25 g/day §	-	-
Cheese			
Colon cancer	50 g/day §	-	-
T2D	-	40 g/day §	-
Soy			
CVD	-	-	-
Cancer	-	-	-
T2D	-	-	-
Obesity	-	-	-
Pulses			
CVD	1/day	1/day	1/day
Cancer	-	-	-
T2D	-	-	-
Obesity	-	-	-
Plant protein			
CVD	-	-	-
Cancer	-	-	-
T2D	-	-	-
Obesity	-	-	-
Ultraprocessed foods			
CVD	0 g/day	-	0 g/day
Cancer	0 g/day	-	0 g/day
T2D	0 g/day	-	0 g/day
Obesity	0 g/day	-	0 g/day

Food group / NCD	Min	Max	Optimal
Animal fats			
CVD	-	-	-
Cancer	-	-	-
T2D	-	25 g/day	-
Obesity	-	-	-
Vegetal fats			
CVD	1 tablespoon oil *	3 tablespoons	2 tablespoons
Cancer	0 g/day	20 g/day	-
T2D	5 g/day	35 g/day	13 g/day
Obesity	-	-	-
SFA			
CVD (stroke)	10 g/day	24 g/day	-
Cancer	-	-	-
T2D	20 g/day	25 g/day	-
Obesity	-	-	-
MUFA			
CVD	-	-	-
Cancer	-	-	-
T2D	-	-	-
Obesity	-	-	-
PUFA			
CVD	-	-	-
Cancer	-	-	-
T2D	-	-	-
Obesity	-	-	-
TFA			
CVD	-	-	-
Cancer	-	-	-
T2D	-	-	-
Obesity	-	-	-

[1], high H_2 water; [2], water fluoride; [3], water nitrate; [4], alkaline water; [5], mineral water; [6], dairies within diets; [7], low fat dairies; [8], milk/fermented milk; [9], low fat milk; §, cohort studies; #, randomized controlled trials; -, no data

5. Link between foods and environmental impacts

Table 3: Food list including LCI-inventories and weighting used for different food groups

Food Group	Food items WP4	LCI Data used for calculation of food items (organic excluded)	Weighting	Database used	Edible part
Milk & dairy	Milk for drinking	Liquid milk, semi-skimmed, pasteurised, at dairy	50%	WFLDB	100%
		Liquid milk, whole milk, pasteurised, at dairy	50%	WFLDB	100%
	Yogurt	Yogurt, fermented milk or dairy speciality, plain	33.4%	Agribalyse	100%
		Yogurt, fermented milk or dairy speciality, with fruits, with sugar	33.3%	Agribalyse	100%
		Yogurt, fermented milk or dairy speciality, with chocolate shavings, with cream, with sugar	33.3%	Agribalyse	100%
	Cheese, fresh	Uncured soft cheese, spreadable, around 20% fat, in a tub, processed in FR / chilled / LDPE	50%	Agribalyse	100%
		Mozzarella cheese, from cow's milk	50%	Agribalyse	100%
	Cheese, soft	Soft cheese, Camembert-style, at dairy	100%	WFLDB	100%
	Cheese, hard	Hard cheese, Emmental-style, at dairy	100%	WFLDB	100%
Meat, fish, eggs	Red meat - Beef, veal, lamb, pork, horse	Beef, fresh meat, at slaughterhouse	50%	WFLDB	100%
		Pork, fresh meat, at slaughterhouse	40%	WFLDB	100%
		Meat without bone, veal/FR U	10%	Agribalyse	100%
	Poultry	Chicken, fresh meat, at slaughterhouse	100%	WFLDB	100%
	Processed meats	Frankfurter sausage, processed in FR | Chilled | Already packed - PET | at supermarket/FR	20%	Agribalyse	100%
		Beef, meat balls, cooked, processed in FR | Chilled | PS | at supermarket/FR	20%	Agribalyse	100%
		Poultry nuggets, processed in FR | Chilled | PS | at supermarket/FR	20%	Agribalyse	100%

Food Group	Food items WP4	LCI Data used for calculation of food items (organic excluded)	Weighting	Database used	Edible part
		Cooked ham, choice, processed in FR | Chilled | Already packed - PET | at supermarket/FR	20%	Agribalyse	100%
		Salami, processed in FR | Chilled | Already packed - PP/PE | at supermarket/FR	20%	Agribalyse	100%
	Fish, omega-3 poor	Common sole, raw, processed in FR | Chilled | PS | at packaging/FR	12.5%	Agribalyse	100%
		Cod, raw, processed in FR | Chilled | PS | at packaging/FR	12.5%	Agribalyse	100%
		Saithe, frozen, raw, processed in FR | Frozen | LDPE | at packaging/FR	12.5%	Agribalyse	100%
		European bass, raw, processed in FR | Chilled | PS | at packaging/FR	6.3%	Agribalyse	100%
		European perch, raw, processed in FR | Chilled | PS | at packaging/FR	6.3%	Agribalyse	100%
		Trout, farmed, smoked, processed in FR | Chilled | PVC | at packaging/FR	12.5%	Agribalyse	100%
		Rainbow trout, raw, farmed, processed in FR | Chilled | PS | at packaging/FR	12.5%	Agribalyse	100%
		Tuna, flaked, in oil, canned/FR U	12.5%	Agribalyse	100%
		Pangasius, filets, cooked, processed in FR | Chilled | PP | at packaging/FR	12.5%	Agribalyse	100%
	Shellfish	1 kg of fresh shrimps, China production/FR U	50%	Agribalyse	33%
		Mussels, with shell, at farm gate/FR U	25%	Agribalyse	49%
		Scallop, with coral, raw, processed in FR | Chilled | PS | at packaging/FR	25%	Agribalyse	80%
	Fish, omega-3 rich	Tuna, raw, processed in FR | Chilled | PS | at supermarket/FR	40%	Agribalyse	100%
		Anchovy, fillets, in oil, semi-preserved, drained, processed in FR | Chilled | PS | at packaging/FR	5%	Agribalyse	100%
		European pilchard or sardine, in oil, canned, drained, processed in FR | Ambient (average) | Already packed - Aluminium | at packaging/FR	5%	Agribalyse	100%
		Atlantic herring, marinated, or rollmops, processed in FR | Chilled | PS | at packaging/FR	5%	Agribalyse	100%

Food Group	Food items WP4	LCI Data used for calculation of food items (organic excluded)	Weighting	Database used	Edible part
		Salmon, raw, wild, processed in FR | Chilled | PS | at packaging/FR	22.5%	Agribalyse	100%
		Salmon, raw, farmed, processed in FR | Chilled | PS | at packaging/FR	22.5%	Agribalyse	100%
	Eggs	Chicken egg, in barn single tiered, at farm (WFLDB 3.1)/GLO U	100%	WFLDB	88%
Vegetable & alternative proteins	Legumes	Chickpea {IN}| chickpea production	33%	Ecoinvent v3.8	100%
		Lentils, dry, at farm (WFLDB)/CA U	33%	WFLDB	100%
		Soybean, at farm	33%	WFLDB	100%
	Meat substitutes, vegan, minimally processed	Falafel, at supermarket	50%	Agribalyse	100%
		Tofu, at supermarket	50%	Agribalyse	100%
	Meat substitutes, vegan, highly processed	Mycoprotein (Quorn)	50%	INTEP	50%
		Pea patty (Beyond Meat)	50%	INTEP	50%
	Milk alternatives	Oat drink, at plant (WFLDB)/GLO U	25%	WFLDB	100%
		Almond drink, unsweetened, at plant (WFLDB)/GLO U	25%	WFLDB	100%
		Soymilk, at supermarket	25%	Agribalyse	100%
Cereals and starchy foods	Grains	Oats, at farm	33.4%	WFLDB	100%
		Millet, whole, processed in FR | Ambient (average) | LDPE | at supermarket/FR	33.3%	Agribalyse	100%
		Wheat grains IP, at farm/kg/CH	33.3%	UVEK	100%
	Bread	Bread, from wheat flour, at plant	100%	WFLDB	100%

Food Group	Food items WP4	LCI Data used for calculation of food items (organic excluded)	Weighting	Database used	Edible part
	Crackers	Rusk (Zwieback) Rusk , slice, multigrain, processed in FR | Ambient (short) | Cardboard | at supermarket/FR	50%	Agribalyse	100%
		Crispbread (Knäckebrot), extruded and grilled, processed in FR | Ambient (short) | Cardboard | at supermarket/FR	50%	Agribalyse	100%
	Flour	Wheat flour, at industrial mill	100%	WFLDB	100%
	Rice	Rice, at farm/CN	80%	WFLDB	100%
		Rice, at farm/IN	20%	WFLDB	100%
	Pasta	Pasta, dried, from durum wheat, at plant	50%	WFLDB	100%
		Dried egg pasta, cooked, unsalted, at plant/FR U	50%	Agribalyse	100%
	Potatoes & other tubers	Potato, at farm	98%	WFLDB	83%
		Sweet potatoes Sweet potato, cooked, processed in FR | Chilled | Cardboard | at supermarket/FR	2%	agribalyse	100%
	Polenta	Polenta or maize semolina, cooked, unsalted, processed in FR | Ambient (average) | PP | at supermarket/FR	100%	Agribalyse	100%
Oils, fats, nuts	Vegetable fats	Margarine, 70% fat, at plant	100%	WFLDB	100%
	Vegetable oils, omega 3 rich	Rapeseed oil, at oil mill	90%	WFLDB	100%
		Linseed oil, at oil mill	10%	WFLDB	100%
	Vegetable oils, omega 3 poor/ other oils	Sunflower oil, at oil mill	90%	WFLDB	100%
		Coconut oil, crude {PH}| production | Cut-off, U	10%	UVEK	100%
		Olive oil, at oil mill	90%	WFLDB	100%

Food Group	Food items WP4	LCI Data used for calculation of food items (organic excluded)	Weighting	Database used	Edible part
	Vegetable oils, omega 9 rich	Peanut oil, at oil mill	10%	WFLDB	100%
	Animal fats (Butter)	Butter, unsalted, at dairy	100%	WFLDB	100%
	Nuts & seeds	Hazelnut, in shell, at farm (WFLDB)/GLO U	25%	WFLDB	40%
		Cashew, in-shell, at farm (WFLDB)/GLO U	25%	WFLDB	67.5%
		Walnuts kernels, dried, at plant (WFLDB)/US U	25%	WFLDB	100%
		Almond kernels, from shelling and hulling, at plant (WFLDB)/GLO U	25%	WFLDB	100%
	Olives	Olive, at farm	100%	WFLDB	77.5%
	Avocados	Avocado {GLO}| production	100%	Ecoinvent v3.8	74%
	Cream	Cream, 40% fat, pasteurised, at dairy	100%	WFLDB	100%
Fruits and vegetables	Fruits	Apple, at farm	35%	WFLDB	91%
		Banana, at farm	18%	WFLDB	66%
		Mandarin, at farm	9%	WFLDB	77%
		Orange, fresh grade, at farm	8%	WFLDB	74%
		Peach, at farm	7%	WFLDB	78%
		Pear, at farm	6%	WFLDB	87%
		Strawberries, greenhouse, heated, at farm	1.7%	WFLDB	87%
		Strawberries, open field, macro tunnel, at farm	1.6%	WFLDB	90%
		Grape, table grape, at farm/CL	3.5%	WFLDB	93%
		Kiwi	5%	Ecoinvent v3.8	98%

Food Group	Food items WP4	LCI Data used for calculation of food items (organic excluded)	Weighting	Database used	Edible part
		Apricot	5%	WFLDB	98%
	Dried fruits	Sultanas: own modelling, analogous to fig	25%	intep	100%
		Apricot, pitted, dried, processed in FR | Ambient (average) | LDPE | at supermarket/FR	25%	Agribalyse	100%
		Apple, dried, consumption mix/FR U	25%	Agribalyse	100%
		Fig, dried, consumption mix/FR U	25%	Agribalyse	100%
	Vegetables	Tomato, fresh grade, greenhouse, heated, hydroponic, at farm	9.4%	WFLDB	100%
		Tomato, fresh grade, greenhouse, non heated, hydroponic, at farm	9.3%	WFLDB	100%
		Tomato, fresh grade, open field	9.3%	WFLDB	100%
		Agaricus bisporus mushroom, fresh, at plant (WFLDB)/NL U	22%	WFLDB	89%
		Broccoli {GLO}| production | Cut-off, U	10%	Ecoinvent v3.8	93%
		Carrot, at farm	8%	WFLDB	97%
		Bell pepper {GLO}| bell pepper production, in heated greenhouse	7%	Ecoinvent v3.8	85%
		Courgette or zucchini, pulp and peel, raw, processed in FR | Ambient (average) | No packaging | at packaging/FR	7%	Agribalyse	95%
		Cucumber {GLO}| cucumber production, in heated greenhouse	4%	Ecoinvent v3.8	97%
		French bean	4%	Agribalyse	88%
		Onion, at farm	4%	Agribalyse	88%
		Spinach {GLO}| production	6%	Ecoinvent v3.8	86%
	Salad	Lettuce, conventional, national average, at farm gate/FR U	100%	Agribalyse	94%
Beverages	Mineral water	Mineral water sparkling, still, glass refillable and PET one-way	100%	WFLDB	100%

Food Group	Food items WP4	LCI Data used for calculation of food items (organic excluded)	Weighting	Database used	Edible part
	Tap water	Tap water, CH	100%	UVEK	100%
	Tea	Tea, dried, at farm (WFLDB 3.1)/GLO U	50%	WFLDB	100%
		Tea, dried, at farm (WFLDB 3.1)/GLO U	50%	WFLDB	100%
	Coffee	Coffee, regular, roast and ground: freeze dried	50%	WFLDB	100%
		Coffee, regular, roast and ground	50%	WFLDB	100%
	Soft drinks	Soft drink, carbonated, without fruit juice, with sugar, processed in FR | Chilled | PET | at supermarket/FR	100%	Agribalyse	100%
	Fruit juices (100%)	Frozen concentrated orange juice, 65° Brix, at plant (WFLDB)/GLO U	70%	WFLDB	100%
		Frozen concentrated apple juice, 70° Brix, at plant (WFLDB)/GLO U	30%	WFLDB	100%
Snacks, ingredients	Chocolate	Milk chocolate, at plant	50%	WFLDB	100%
		Dark chocolate, at plant (WFLDB 3.1)/GLO U	50%	WFLDB	100%

Table 4: Environmental impact in milli-points per 100 g of edible food according to ReCiPe (2016)

Food items WP4 (Sustainability) - only edible parts	Agricultural Production	Processing	Packaging	Transport	Supermarket	Total
Milk for drinking	6.229	3.565	0.430	0.372	13.029	23.625
Yogurt	4.832	7.192	0.413	0.345	13.029	25.812
Cheese, fresh	25.301	0.943	0.618	0.345	13.029	40.237
Cheese, soft	24.100	15.981	0.696	0.345	13.029	54.151
Cheese, hard	32.407	20.743	0.696	0.345	13.029	67.220
Red meat - beef, veal, lamb, pork, horse	100.170	36.476	0.333	0.439	13.029	150.446
Poultry	38.096	7.403	0.534	1.290	13.029	60.352
Processed meats	24.028	5.052	0.190	0.407	13.029	42.706
Fish, omega-3 poor	20.955	25.010	4.597	1.410	13.029	65.002
Shellfish	0.000	29.575	1.494	5.293	26.726	63.089
Fish, omega-3 rich	9.427	14.053	1.440	1.466	13.029	39.415
Eggs	38.294	0.000	0.420	0.673	6.878	46.266
Legumes	13.172	0.000	0.696	1.311	6.053	21.231
Meat substitutes, vegan, minimally processed	0.651	0.975	0.413	1.377	13.029	16.445
Meat substitutes, vegan, highly processed	8.296	9.830	0.696	1.351	13.029	33.202
Milk alternatives	0.993	1.486	0.411	1.838	6.053	10.781
Grains	5.375	0.029	0.663	1.123	6.053	13.243
Bread	4.734	32.148	0.503	0.463	6.053	43.900
Crackers	1.767	1.128	0.372	0.626	6.053	9.947

Food items WP4 (Sustainability) - only edible parts	Agricultural Production	Processing	Packaging	Transport	Supermarket	Total
Flour	6.763	2.988	0.503	0.477	6.053	16.784
Rice	7.802	0.342	0.696	1.743	6.053	16.637
Pasta	6.227	10.434	0.555	0.660	6.053	23.929
Potatoes & other tubers	7.021	0.002	0.444	0.537	7.263	15.267
Polenta	6.162	1.763	0.413	0.661	6.053	15.053
Vegetable fats	9.031	8.845	0.419	0.997	6.053	25.345
Vegetable oils, omega 3 rich	21.274	2.028	0.645	0.870	6.053	30.870
Vegetable oils, omega 3 poor/ other oils	17.685	20.403	0.645	2.258	6.053	47.043
Vegetable oils, omega 9 rich	18.528	3.238	0.645	1.311	6.053	29.774
Animal fats (Butter)	41.494	46.339	0.419	0.345	13.029	101.626
Nuts & seeds	71.535	4.915	1.041	3.719	7.874	89.083
Olives	6.895	0.000	2.895	1.522	7.760	19.072
Avocados	11.973	0.000	0.000	4.862	8.180	25.015
Cream	23.448	13.419	0.419	0.372	13.029	50.687
Fruits	6.797	0.000	0.000	2.033	7.272	16.102
Dried fruits	17.233	3.894	0.638	0.726	20.177	42.667
Vegetables	9.846	0.005	0.000	1.034	6.486	17.371
Salad	1.592	0.000	0.000	1.072	6.439	9.103
Mineral water	0.951	0.000	0.781	0.663	6.053	8.447
Tap water	0.023	0.000	0.000	0.000	0.000	0.023
Tea	40.197	0.000	0.696	1.719	20.177	62.789

Food items WP4 (Sustainability) - only edible parts	Agricultural Production	Processing	Packaging	Transport	Supermarket	Total
Coffee	131.673	64.601	0.370	3.770	6.053	206.467
Soft drinks	0.401	0.474	0.781	0.539	6.053	8.248
Fruit juices (100%)	2.166	2.140	0.430	2.776	6.053	13.565
Chocolate	53.457	40.950	0.370	0.663	6.053	101.492

Table 5: Greenhouse gas emissions in kg CO_2-eq / 100 g of edible food according to IPCC (2021)

Food items WP4 (Sustainability) - only edible parts	Agricultural Production	Processing	Packaging	Transport	Supermarket	Total
Milk for drinking	0.138	0.006	0.012	0.003	0.004	0.164
Yogurt	0.128	0.209	0.013	0.003	0.004	0.357
Fresh cheese	0.671	0.028	0.017	0.003	0.004	0.723
Cheese - soft	0.534	0.019	0.018	0.003	0.004	0.577
Cheese- hard	0.718	0.021	0.018	0.003	0.004	0.764
Red meat - beef, veal, lamb, pork, horse	1.518	0.133	0.011	0.003	0.004	1.669
Poultry	0.495	0.077	0.018	0.012	0.004	0.606
Processed meats	0.525	0.103	0.006	0.003	0.004	0.641
Fish, omega-3 poor	0.352	0.308	0.076	0.015	0.004	0.755
Shellfish	0.000	0.356	0.042	0.048	0.008	0.454
Fish, omega-3 rich	0.190	0.171	0.034	0.016	0.004	0.415
Eggs	0.430	0.000	0.011	0.006	0.002	0.450
Legumes	0.213	0.000	0.018	0.012	0.002	0.244
Meat substitutes, vegan, minimally processed	0.010	0.020	0.013	0.013	0.004	0.059
Meat substitutes, vegan, highly processed	0.094	0.099	0.018	0.014	0.004	0.230
Milk alternatives	0.006	0.011	0.011	0.017	0.002	0.048
Grains	0.048	0.001	0.018	0.011	0.002	0.079
Bread	0.055	0.091	0.008	0.004	0.002	0.160
Crackers	0.030	0.032	0.009	0.006	0.002	0.079

Food items WP4 (Sustainability) - only edible parts	Agricultural Production	Processing	Packaging	Transport	Supermarket	Total
Flour	0.079	0.016	0.008	0.004	0.002	0.109
Rice	0.098	0.004	0.018	0.016	0.002	0.137
Pasta	0.058	0.045	0.015	0.006	0.002	0.126
Potatoes & other tubers	0.021	0.000	0.012	0.005	0.002	0.040
Polenta	0.049	0.038	0.013	0.006	0.002	0.108
Vegetable fats	0.107	0.155	0.012	0.010	0.002	0.286
Vegetable oils, omega 3 rich	0.157	0.016	0.016	0.009	0.002	0.200
Vegetable oils, omega 3 poor/ other oils	0.288	0.090	0.016	0.020	0.002	0.417
Vegetable oils, omega 9 rich	0.146	0.034	0.016	0.013	0.002	0.211
Animal fats (Butter)	0.920	0.383	0.012	0.003	0.004	1.321
Nuts & seeds	0.675	0.024	0.027	0.034	0.002	0.761
Olives	0.047	0.000	0.061	0.016	0.002	0.126
Avocados	0.105	0.000	0.000	0.043	0.003	0.151
Cream	0.520	0.024	0.012	0.003	0.004	0.563
Fruits	0.030	0.000	0.000	0.019	0.002	0.051
Dried fruits	0.067	0.054	0.017	0.006	0.006	0.150
Vegetables	0.133	0.000	0.000	0.011	0.002	0.146
Salad	0.020	0.000	0.000	0.011	0.002	0.033
Mineral water	0.004	0.000	0.019	0.006	0.002	0.032
Tap water	0.000	0.000	0.000	0.000	0.000	0.000
Tea	0.479	0.000	0.018	0.016	0.006	0.519

Food items WP4 (Sustainability) - only edible parts	Agricultural Production	Processing	Packaging	Transport	Supermarket	Total
Coffee	1.315	0.352	0.010	0.033	0.002	1.711
Soft drinks	0.005	0.008	0.019	0.005	0.002	0.038
Fruit juices (100%)	0.015	0.010	0.012	0.025	0.002	0.064
Chocolate	1.405	0.173	0.010	0.006	0.002	1.596

Table 6: Comparison of results for the three indicators analysed

Food items WP4 (Sustainability)	Ecological Scarcity [UBP/100g]	ReCiPe Endpoint [Milli-Points / 100 g]	THGem IPCC 2021 [kg CO_2-eq / 100 g]
Milk for drinking	298.63	23.625	0.164
Yogurt	814.96	25.812	0.357
Fresh cheese	1646.93	40.237	0.723
Cheese - soft	1035.42	54.151	0.577
Cheese- hard	1369.86	67.220	0.764
Red meat - beef, veal, lamb, pork, horse	5516.00	150.446	1.669
Poultry	3022.49	60.352	0.606
Processed meats	2182.63	42.706	0.641
Fish, omega-3 poor	9647.03	65.002	0.755
Shellfish	5363.62	63.089	0.454
Fish, omega-3 rich	2131.17	39.415	0.415
Eggs	1802.49	46.266	0.450
Legumes	1017.44	21.231	0.244
Meat substitutes, vegan, minimally processed	415.59	16.445	0.059
Meat substitutes, vegan, highly processed	1172.20	33.202	0.230
Milk alternatives	135.52	10.781	0.048
Grains	441.03	13.243	0.079
Bread	590.68	43.900	0.160
Crackers	403.84	9.947	0.079

Food items WP4 (Sustainability)	Ecological Scarcity [UBP/100g]	ReCiPe Endpoint [Milli-Points / 100 g]	THGem IPCC 2021 [kg CO_2-eq / 100 g]
Flour	621.04	16.784	0.109
Rice	658.65	16.637	0.137
Pasta	576.01	23.929	0.126
Potatoes & other tubers	303.98	15.267	0.040
Polenta	691.11	15.053	0.108
Vegetable fats	1078.24	25.345	0.286
Vegetable oils, omega 3 rich	1448.82	30.870	0.200
Vegetable oils, omega 3 poor/ other oils	2917.86	47.043	0.417
Vegetable oils, omega 9 rich	3975.94	29.774	0.211
Animal fats (Butter)	2362.31	101.626	1.321
Nuts & seeds	5029.45	89.083	0.761
Olives	1716.90	19.072	0.126
Avocados	392.68	25.015	0.151
Cream	1008.52	50.687	0.563
Fruits	513.60	16.102	0.051
Dried fruits	1392.43	42.667	0.150
Vegetables	348.80	17.371	0.146
Salad	114.11	9.103	0.033
Mineral water	67.61	8.447	0.032
Tap water	0.04	0.023	0.000
Tea	4070.54	62.789	0.519

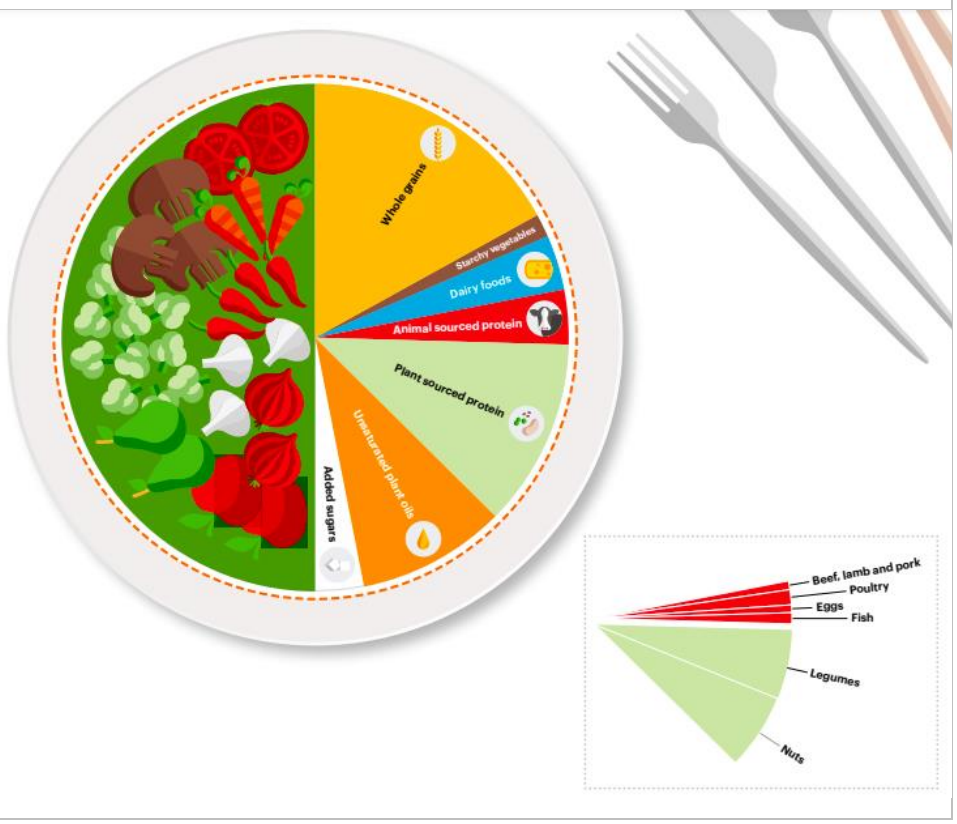
Food items WP4 (Sustainability)	Ecological Scarcity [UBP/100g]	ReCiPe Endpoint [Milli-Points / 100 g]	THGem IPCC 2021 [kg CO_2-eq / 100 g]
Coffee	10896.99	206.467	1.711
Soft drinks	330.79	8.248	0.038
Fruit juices (100%)	397.60	13.565	0.064
Chocolate	4402.70	101.492	1.596

6. Comparison of nutritional recommendations

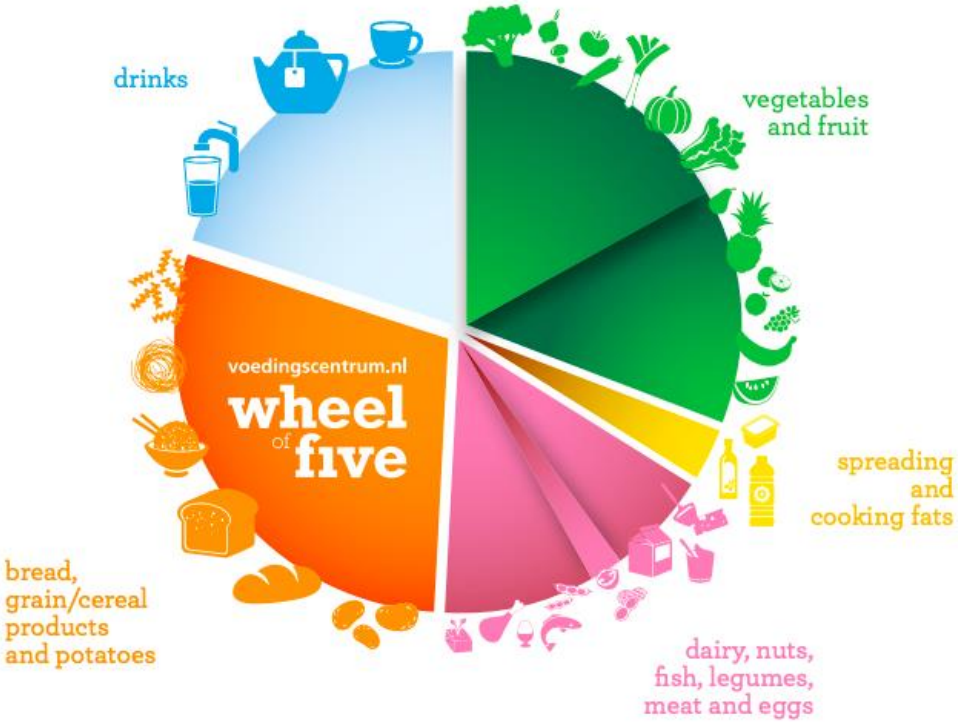
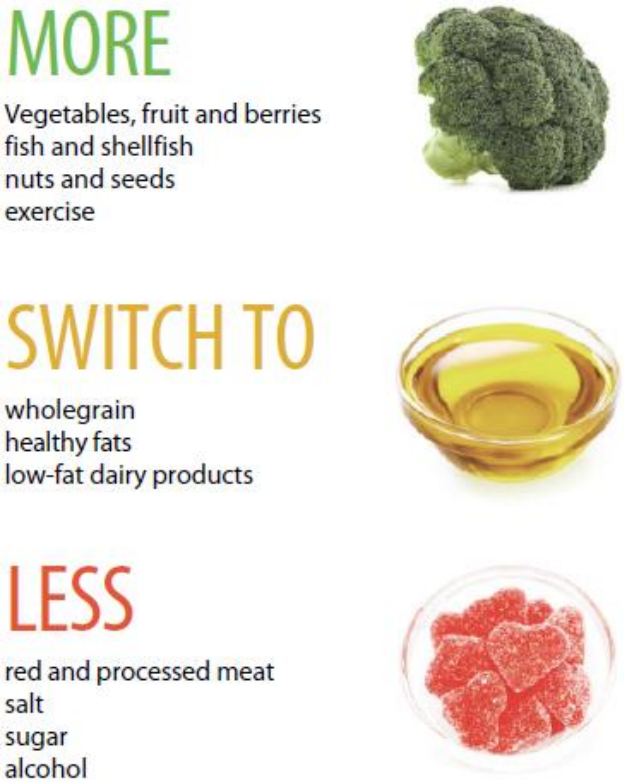
Switzerland, Austria, EAT, Germany, Netherlands and the UK provide visual representations –such as pyramids or plates– that include suggested intake proportions. France and Sweden provide general rules of thumb with visual cues. Italy and WHO do not provide visual representations. Switzerland and Austria provide “top of the pyramid” guidance for sweet and snacks while the UK locates them outside the plate. Switzerland, Austria, Germany, and the UK have similar suggested intake proportions for fruit and vegetables and starchy foods (bread, pasta, rice, potatoes) which combined constitute most of the suggested daily food intake. In contrast, the reference diet from the EAT-Lancet Commission favours the consumption of whole grains over starchy vegetables. While Switzerland and Netherlands include diary and meat in the same food group, Austria, Germany, and the UK have dairy on a separate food group. The UK mentions dairy “and alternatives” and includes both animal and non-animal proteins, comprised legumes and nuts, in a single food group. The UK is the only one that explicitly mentions the word “sustainable” on their visual representation. The EAT visual representation is the only one that provides guidance about different types of meat, suggesting, for example, more poultry than red meat.

Table 7: Visual representations of dietary guidelines

FBDG	Pyramids and plates
Switzerland	 

FBDG	Pyramids and plates
Austria	
EAT	

FBDG	Pyramids and plates
France	
Germany	

FBDG	Pyramids and plates
Netherlands	
Sweden	

FBDG	Pyramids and plates
United Kingdom