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Great Debates in Nutrition, June 14, 2022

Does the Concept of 'Ultra-Processed Foods' Help Inform Dietary Guidelines, Beyond Conventional Classification Systems?

Carlos A. Monteiro

carlosam@usp.br

Center for Epidemiological Studies in Health and Nutrition
University of Sao Paulo, Brazil

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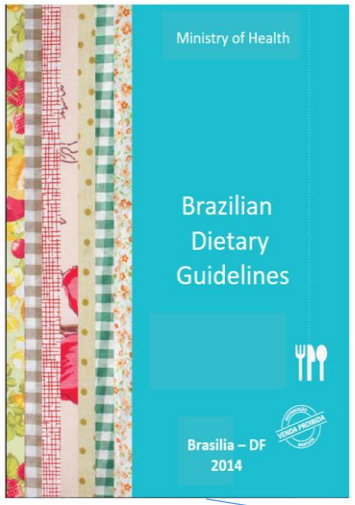
No conflicts to disclose

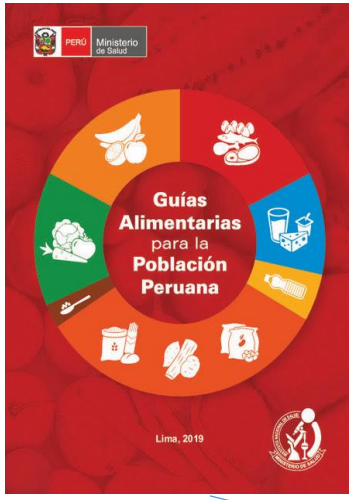
Does the Concept of 'Ultra-Processed Foods' Help Inform Dietary Guidelines, Beyond Conventional Classification Systems?

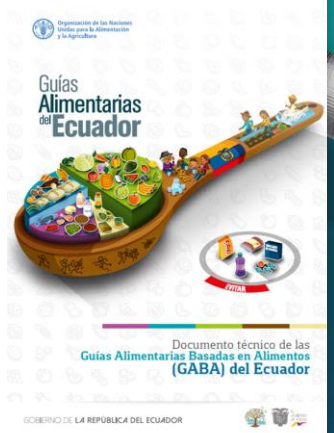
- Others have asked themselves this question, including:

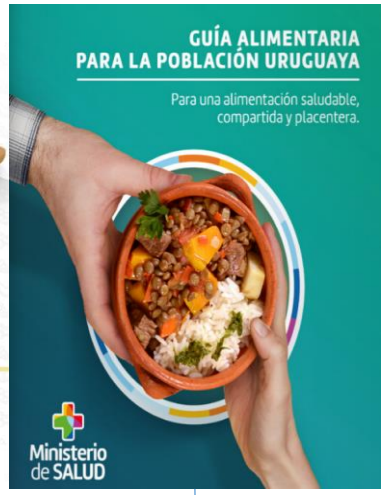
  - Experts responsible for issuing national dietary guidelines in several countries
  - Experts from national and international health associations responsible for issuing dietary guidance to prevent specific diseases

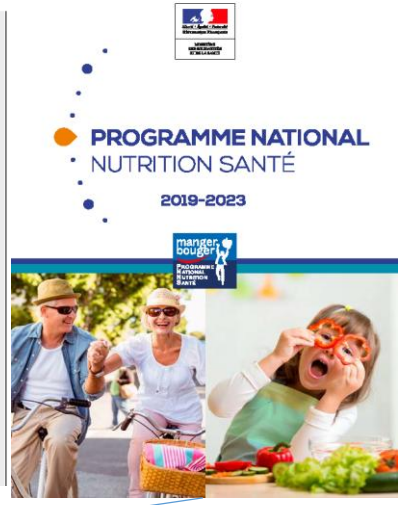
And their answer was: yes, it does help











UPF avoided or reduced

Circulation

AHA SCIENTIFIC STATEMENT

2021 Dietary Guidance to Improve Cardiovascular Health: A Scientific Statement From the American Heart Association

Alice H. Lichtenstein, DSc, FAHA, Chair*; Lawrence J. Appel, MD, MPH, FAHA, Vice Chair*; Maya Vadiveloo, PhD, RD, FAHA, Vice Chair; Frank B. Hu, MD, PhD, FAHA; Penny M. Kris-Etherton, PhD, RD, FAHA; Casey M. Rebholz, PhD, MS, MNSP, MPH, FAHA; Frank M. Sacks, MD, FAHA; Anne N. Thorndike, MD, MPH, FAHA; Linda Van Horn, PhD, RD, FAHA; Judith Wylie-Rosett, PhD, RD, FAHA; on behalf of the American Heart Association Council on Lifestyle and Cardiometabolic Health; Council on Arteriosclerosis, Thrombosis and Vascular Biology; Council on Cardiovascular

The Lancet Commissions

The EASL–*Lancet* Liver Commission: protecting the next generation of Europeans against liver disease complications and premature mortality

Tom H Karlsen, Nick Sheron†, Shira Zelber-Sagi, Patrizia Carrieri, Geoffrey Dusheiko, Elisabetta Bugianesi†, Rachel Pryke†, Sharon J Hutchinson, Bruno Sangro†, Natasha K Martin, Michele Cecchini, Mae Ashworth Dirac, Annalisa Belloni, Miquel Serra-Burriel, Cyriel Y Ponsioen, Brittney Sheena, Alienor Lerouge, Marion Devaux, Nick Scott, Margaret Hellard, Henkjan J Verkade, Ekkehard Sturm, Giulio Marchesini, Hannele Yki-Järvinen, Chris D Byrne, Giovanni Targher, Aviad Tur-Sinai, Damon Barrett, Michael Ninburg, Tatjana Reic, Alison Taylor, Tim Rhodes, Carla Treloar, Claus Petersen, Christoph Schramm, Robert Flisiak, Marieta Y Simonova, Albert Pares, Philip Johnson, Alessandro Cucchetti, Isabel Graupera, Christos Lionis, Elisa Pose, Núria Fabrellas, Ann T Ma, Juan M Mendive, Vincenzo Mazzaferro, Harry Rutter, Helena Cortez-Pinto, Deirdre Kelly†, Robyn Burton, Jeffrey V Lazarus†, Pere Ginès†, Maria Buti†, Philip N Newsome†‡, Patrizia Burra*‡, Michael P Manns*‡*

Executive summary

Liver diseases have become a major health threat across

care using multilevel interventions acting on curre barriers.

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Why avoidance or reduction of ultra-processed foods (UPF) is recommended?

- UPF: definition and identification
- Evidence on UPF intake and diet quality
- Evidence on UPF intake and diseases and on mechanisms

Nova: the food classification based on the **extent** and **purpose** of industrial processing

Nova groups	Examples
1) Fresh or minimally processed foods	   
2) Processed culinary ingredients	   
3) Processed foods	   
4) Ultra-processed foods Industrial formulations made by deconstructing natural food into its chemical constituents, modifying them and recombining them with additives into products liable to displace all other Nova food groups	        

Source: Monteiro et al *Public Health Nutrition* 2017

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TANG
ORANGE/NARANJA


Coca-Cola
classic

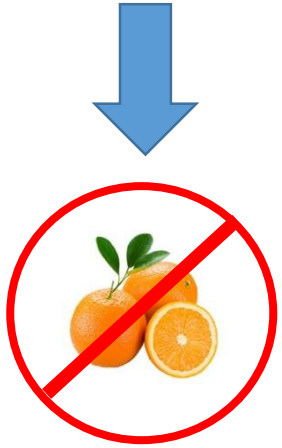

OREO


Kraft
Singles
American
24


PANCO
Pão Premium


VALUE SIZE
Kraft
macaroni & cheese
smmmile, it's the cheesiest
original


20
CHICKEN McNUGGETS

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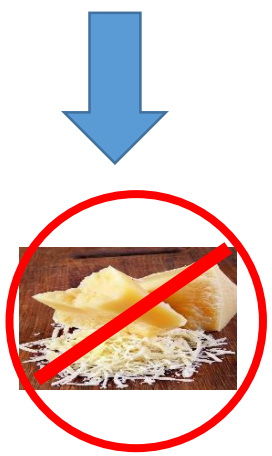

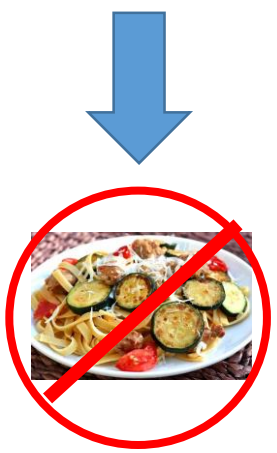

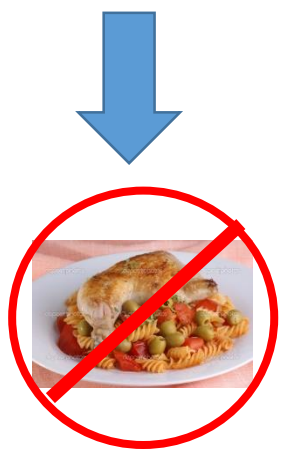

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The displacement of all other Nova food groups by UPFs is facilitated by their affordable prices, convenience, craving-like palatability, and massive marketing

while their cheap ingredients make them incomparably profitable

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UPF dietary share:

the main metric Nova uses to assess diet quality

Total dietary intake (in kcal or g)

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A practical way to identify UPFs

Ingredients: Sugar, corn flour blend (whole grain yellow corn flour, degerminated yellow corn flour), wheat flour, whole grain oat flour, oat fiber, soluble corn fiber, contains 2% or less of partially hydrogenated vegetable oil (coconut, soybean and/or cottonseed), salt, red 40, natural flavor, blue 2, turmeric color, yellow 6, annatto color, blue 1, BHT for freshness. **Vitamins and Minerals:** Vitamin C (sodium ascorbate and ascorbic acid), niacinamide, reduced iron, zinc oxide, vitamin B_6 (pyridoxine hydrochloride), vitamin B_2 (riboflavin), vitamin B_1 (thiamin hydrochloride), vitamin A palmitate, folic acid, vitamin D, vitamin B_{12}.

UPF markers

- Food substances of exclusive or almost exclusive industrial use

(protein isolates, gluten, casein, whey protein, 'mechanically separated meat', high-fructose corn syrup, 'fruit juice concentrate', invert sugar, maltodextrin, dextrose, lactose, soluble or insoluble fibre, hydrogenated or interesterified oil)

- Cosmetic additives

(flavors, flavor enhancers, colors, emulsifiers, sweeteners, thickeners, and anti-foaming, bulking, carbonating, foaming, gelling and glazing agents)

See: Monteiro CA et al. Ultra-processed foods: what they are and how to identify them. Public Health Nutr. 2019 22(5):936-941

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Nova in cell phone apps

OPEN FOOD FACTS
the free food products database

2,369,824 products in the data base

Steel cut oats - Quaker - 709 g

Barcode: 0055577102114 (EAN / EAN-13) 055577102114 (UPC / UPC-A)

This product page is not complete. You can help to complete it by editing it and adding more data from the
taking more photos using the app for Android or iPhone/iPad. Thank you!

Nutri-Score A

NUTRI-SCORE A B C D E

Very good nutritional quality

NOVA 1

NOVA 1

Unprocessed or minimally processed foods

Froot loops - Kellogg's - 410 g

Barcode: 7501008023518 (EAN / EAN-13)

This product page is not complete. You can help to complete it by editing it and adding more data from the phot
taking more photos using the app for Android or iPhone/iPad. Thank you!

Nutri-Score E

NUTRI-SCORE A B C D E

Bad nutritional quality

NOVA 4

NOVA 4

Ultra processed foods

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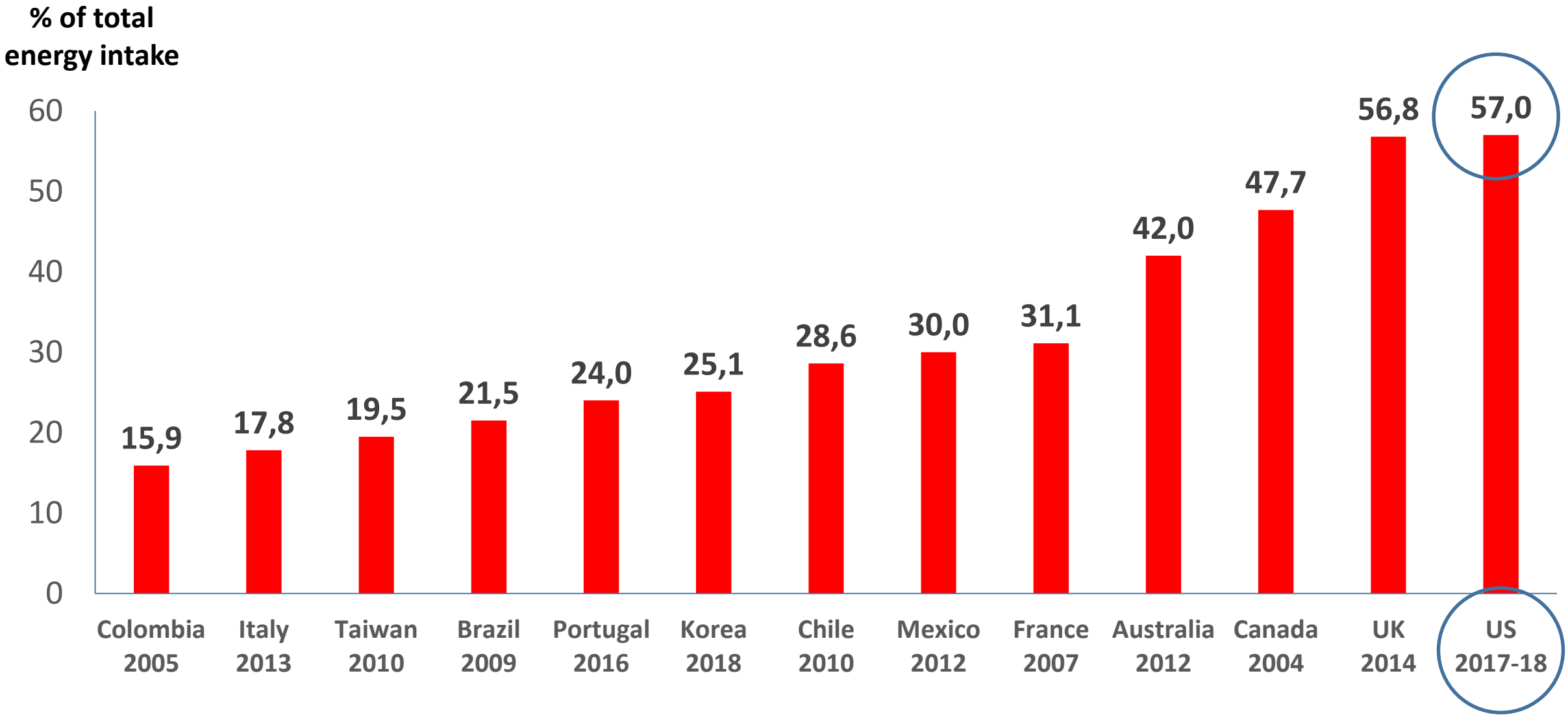
Dietary share of UPFs in nationally-representative samples of 13 countries



Source: Martini et al Nutrients 2021 and Juul et al. AJCN 2021

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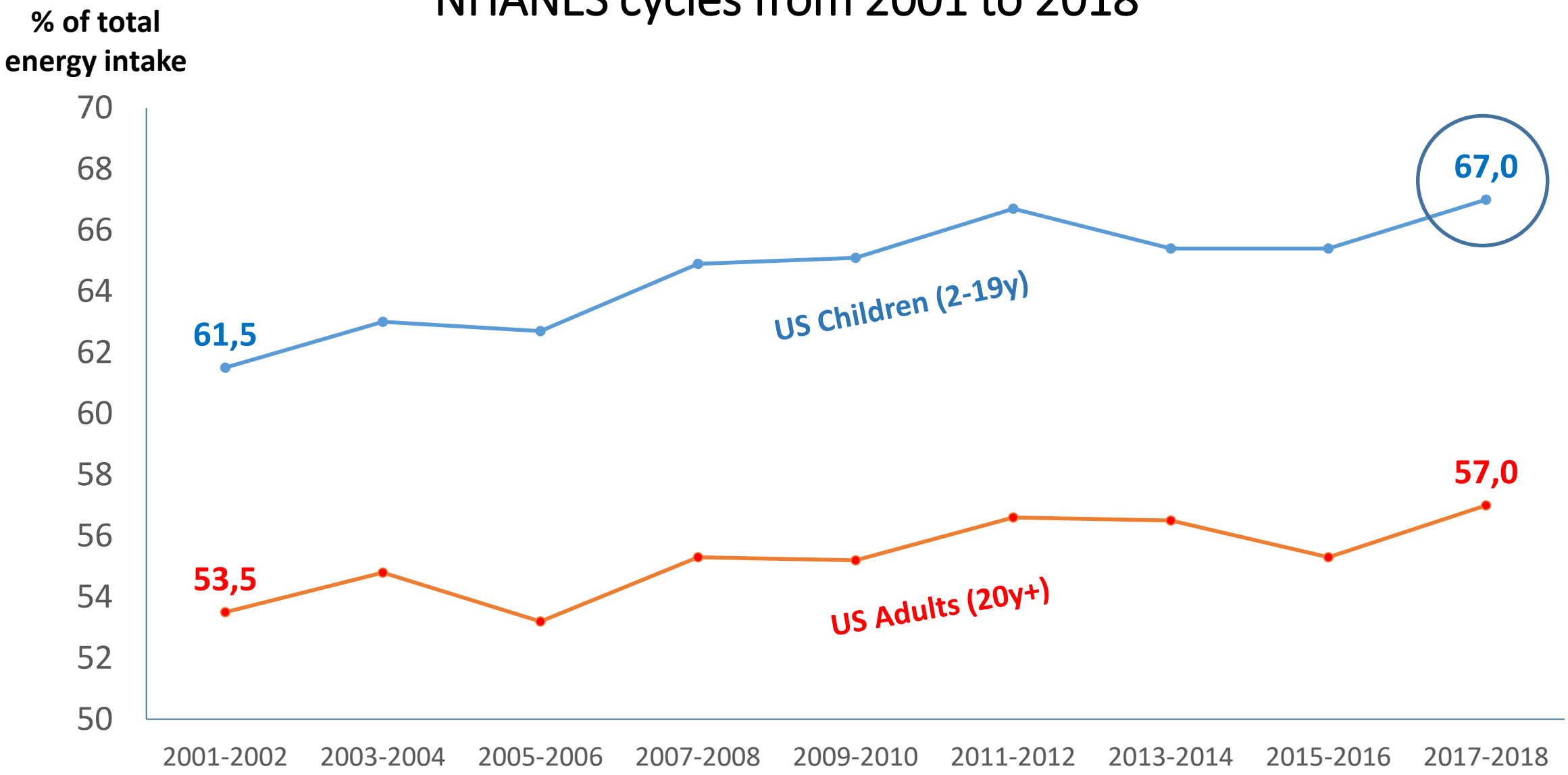
Dietary share of UPFs among US children and adults
NHANES cycles from 2001 to 2018



Sources: Juul et al AJCN 2021 and Wang et al JAMA 2022

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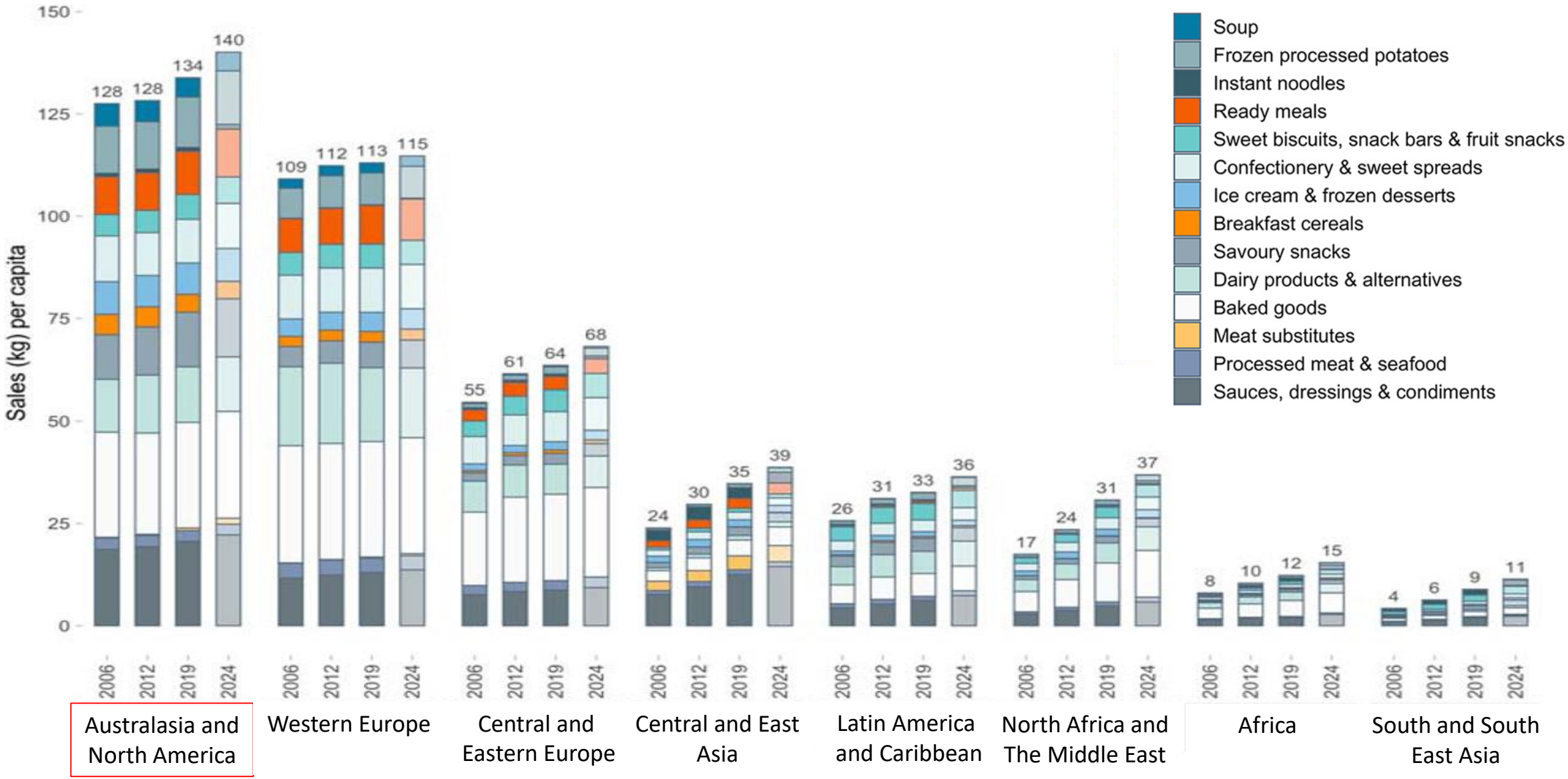
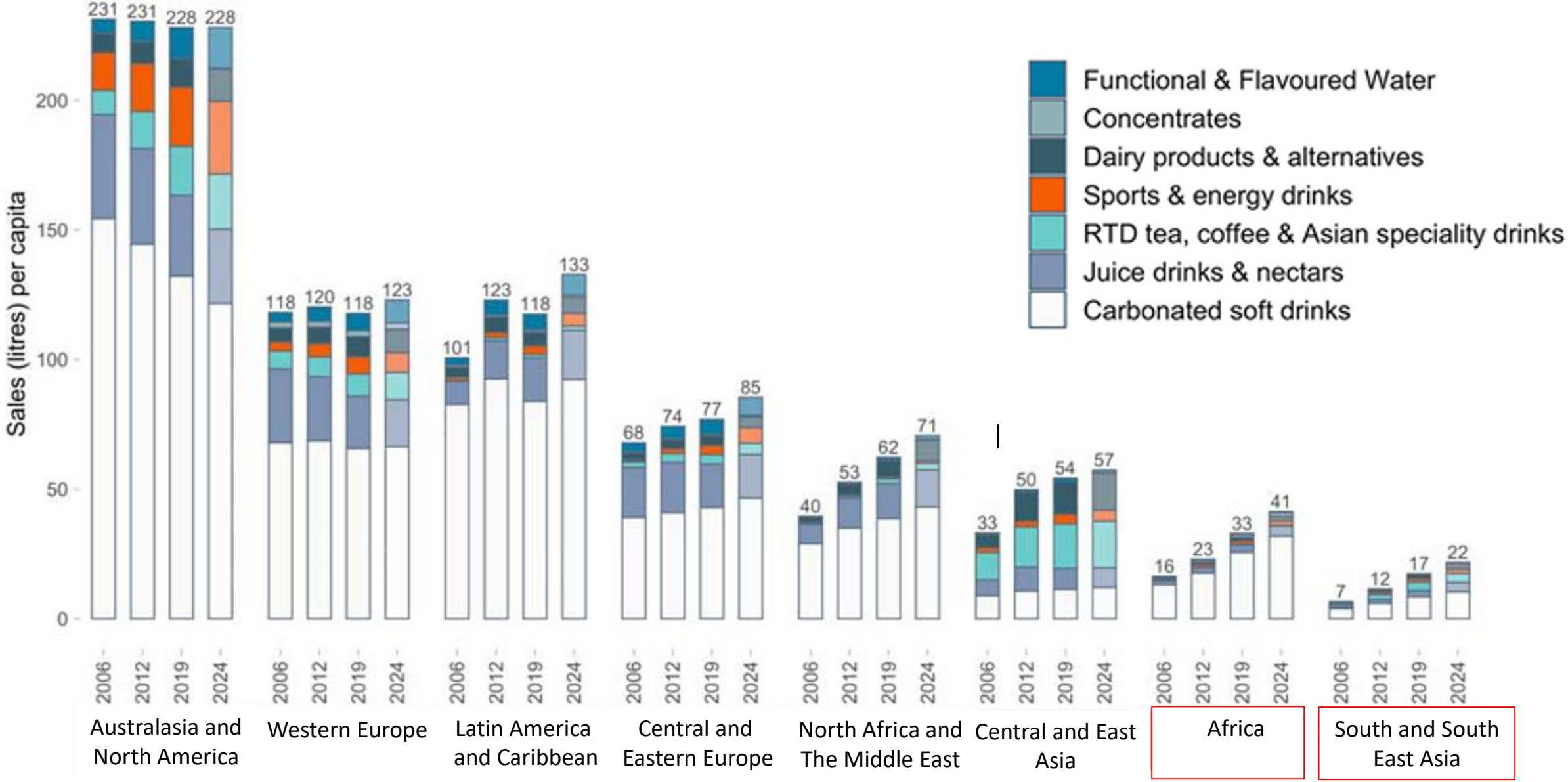
Annual retail sales of ultra-processed food products from 2006 to 2019



Source: Baker et al. Obesity Reviews 2020

Annual retail sales of ultra-processed drink products from 2006 to 2019

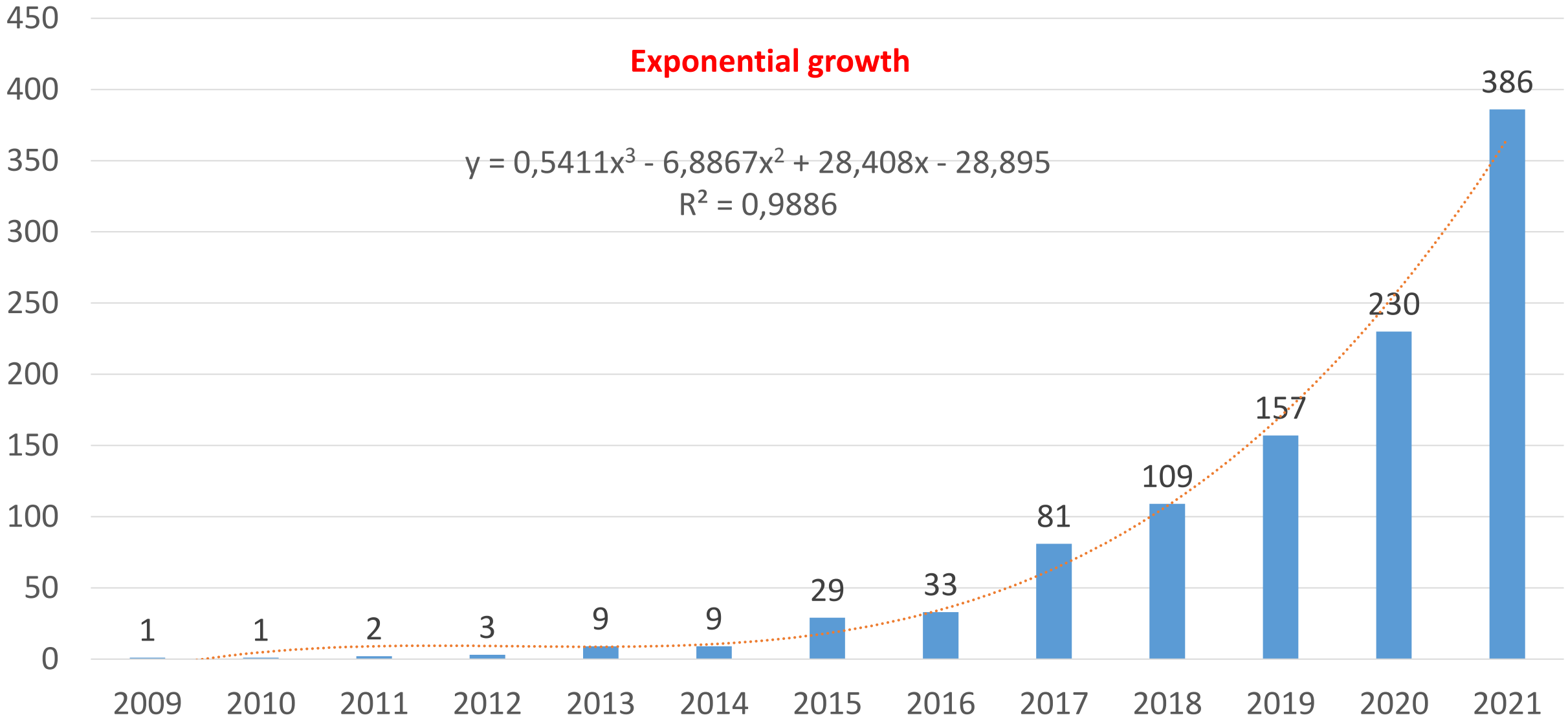


Source: Baker et al. Obesity Reviews 2020

Why avoidance or reduction of ultra-processed foods (UPF) is recommended?

- UPF: definition and identification
- Evidence on UPF intake and diet quality
- Evidence on UPF intake and disease and on mechanisms

1,044 papers in PubMed with the term ‘ultra-processed’



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nutrients 2021, 13, 3390. https://doi.org/10.3390/nu13103390 MDPI

Review

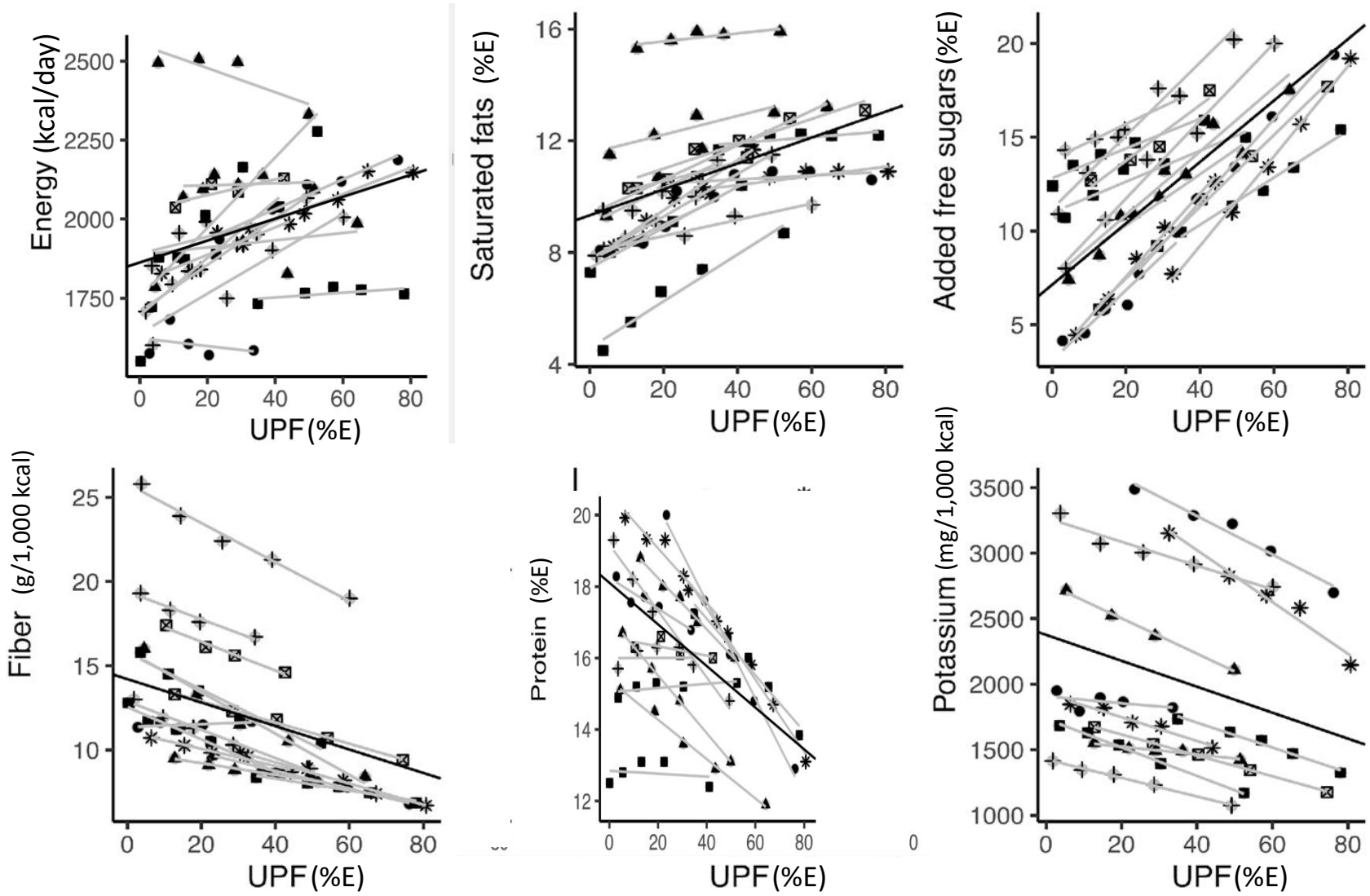
Ultra-Processed Foods and Nutritional Dietary Profile: A Meta-Analysis of Nationally Representative Samples

Daniela Martini [1,†], Justyna Godos [2,*,†], Marialaura Bonaccio [3], Paola Vitaglione [4] and Giuseppe Grosso [2]

[1] Department of Food, Environmental, and Nutritional Sciences, Università degli Studi di Milano, 20133 Milan, Italy; daniela.martini@unimi.it

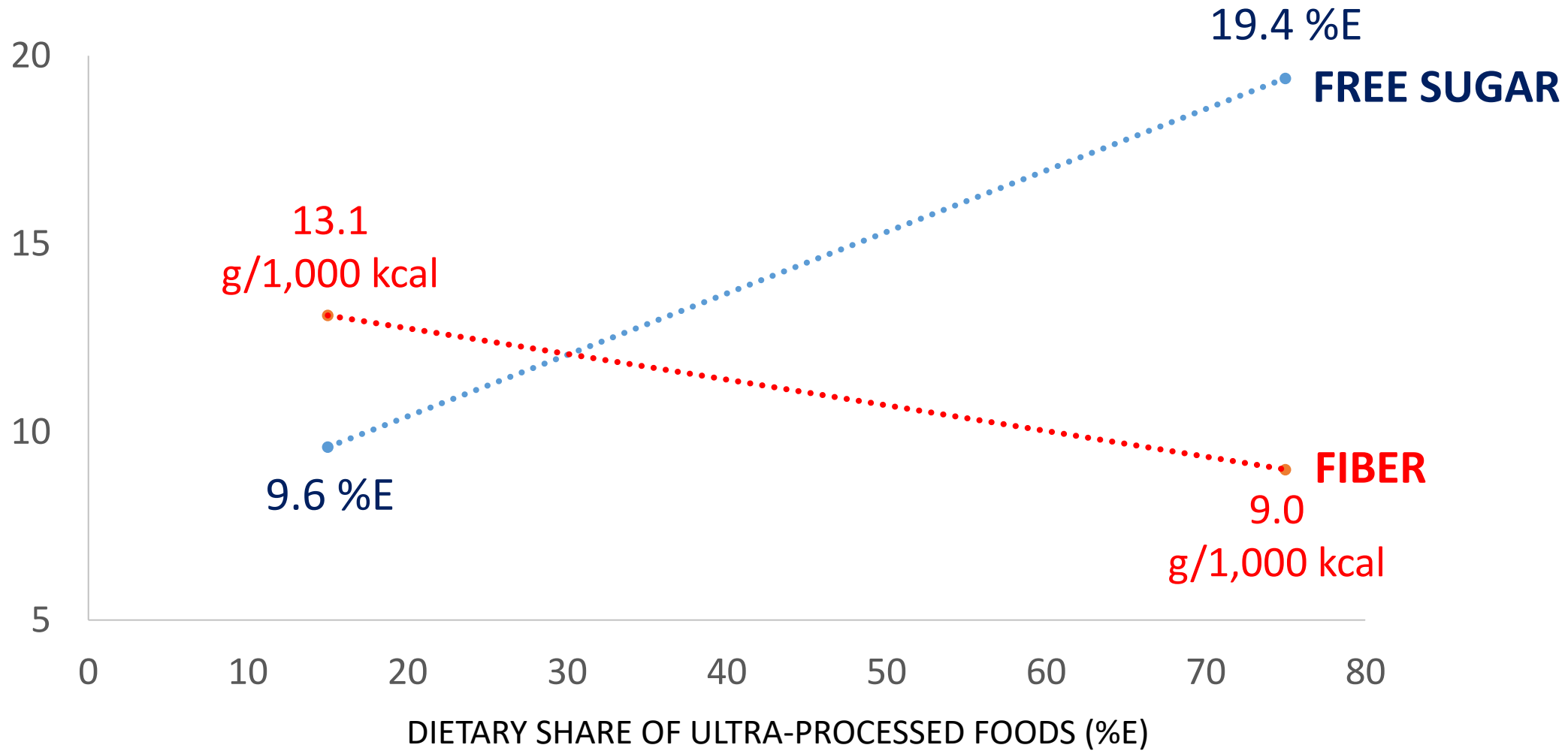
Meta-analysis of data from national dietary surveys in 13 countries: Australia, Brazil, Canada, Chile, Colombia, France, Italy, Korea, Mexico, Portugal, Taiwan, the UK and the USA

MORE UPF IN THE DIET LEADS TO HIGHER ENERGY INTAKE, MORE SATURATED FAT, AND FREE SUGARS AND LESS FIBER, PROTEIN, AND POTASSIUM



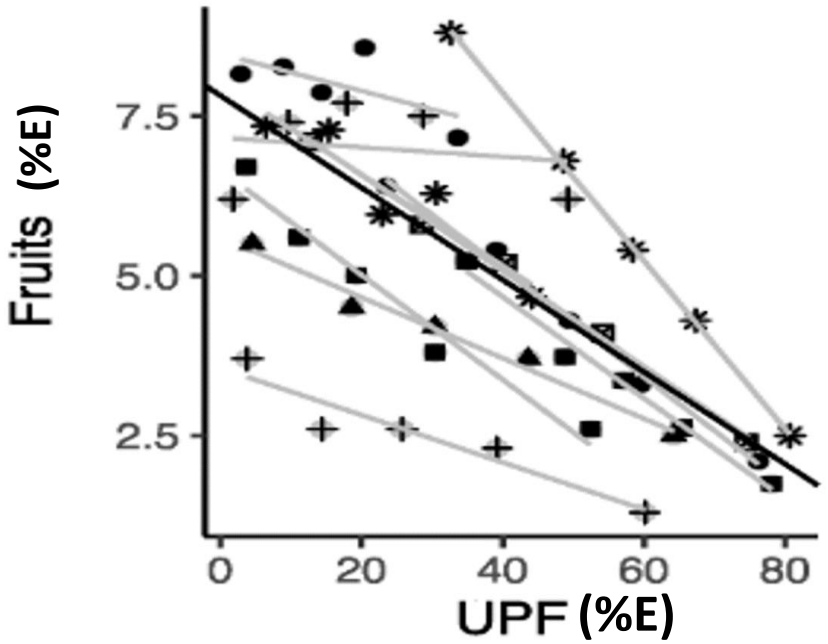
Source: Martini et al 2021

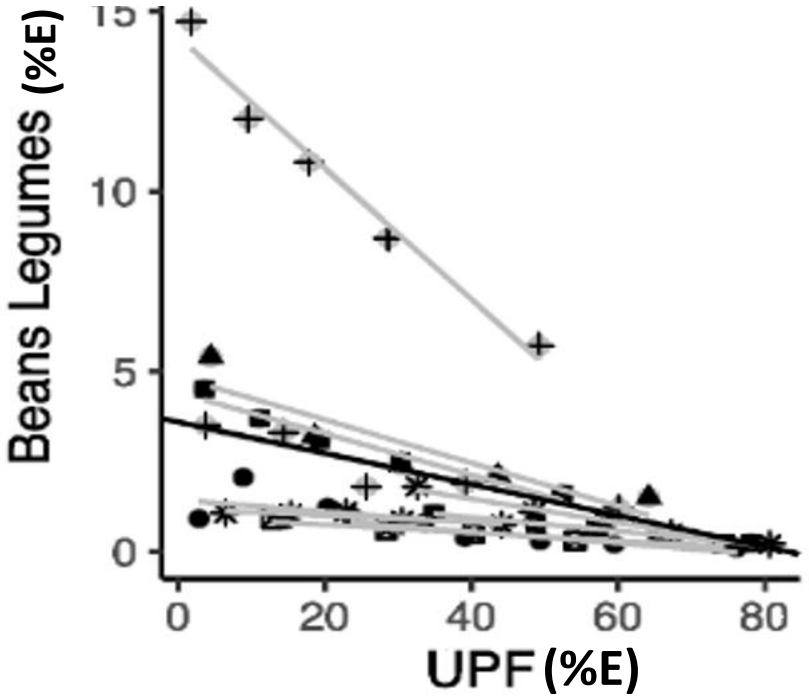
Diet content of free sugar and fiber according to the UPF dietary share as predicted by the meta-analysis of 13 national dietary surveys

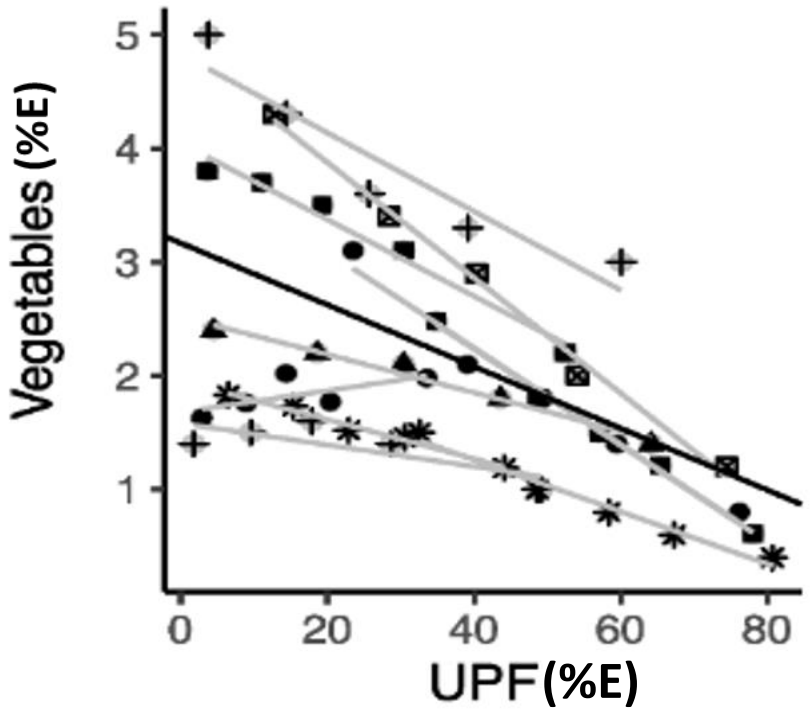


Source: Martini et al 2021

UPFs also displace health-protective whole foods







Source: Martini et al 2021

American Journal of
Preventive Medicine

RESEARCH ARTICLE

Consumption of Ultraprocessed Foods and Diet Quality Among U.S. Children and Adults

Junxiu Liu, PhD,[1,2] Euridice Martinez Steele, PhD,[3,4] Yan Li, PhD,[1,5] Dimitra Karageorgou, PhD,[2] Renata Micha, PhD,[2] Carlos A. Monteiro, PhD,[3,4] Dariush Mozaffarian, MD, DrPH[2]

Methods: Data were derived from the **National Health and Nutrition Examination Survey** (2015-2018), including **9,758 adults** (aged ≥20 years) and **5,280 children** (aged 2-19 years) with 24-hour dietary recalls (≥1), with analysis performed in 2020. Ultraprocessed foods were identified using the NOVA classification, with intake (% energy) assessed in quintiles. Diet quality was assessed using the validated **American Heart Association 2020 continuous primary and secondary diet scores and Healthy Eating Index 2015**.

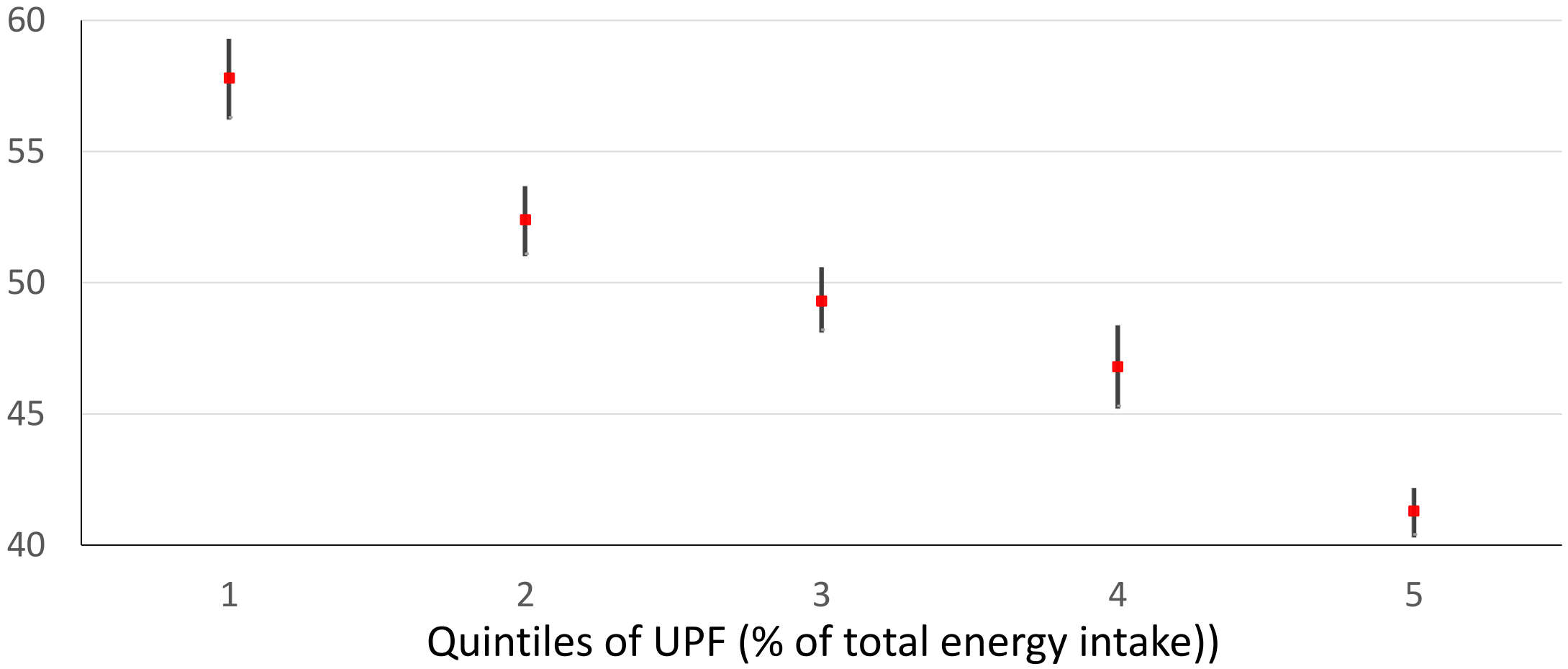
Conclusions: Higher ultraprocessed food consumption is associated with substantially lower diet quality among children and adults.

Predicted Healthy Eating Index-2015 (95% CI)* across quintiles of UPF

US child population, NHANES 2015–2018

HEI-2015

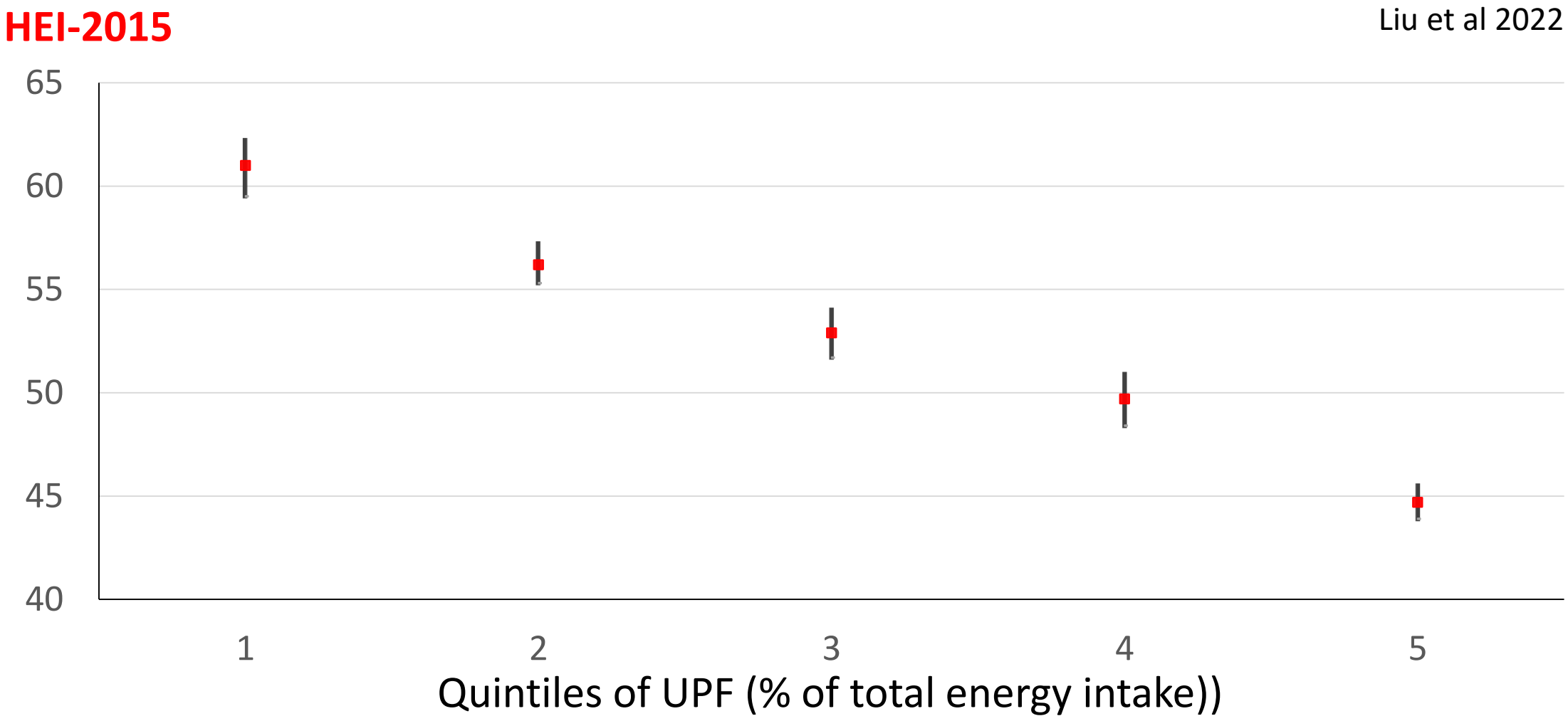
Liu et al 2022



*Data were weighted to be nationally representative, and adjusted for age, sex, race/ethnicity, and education

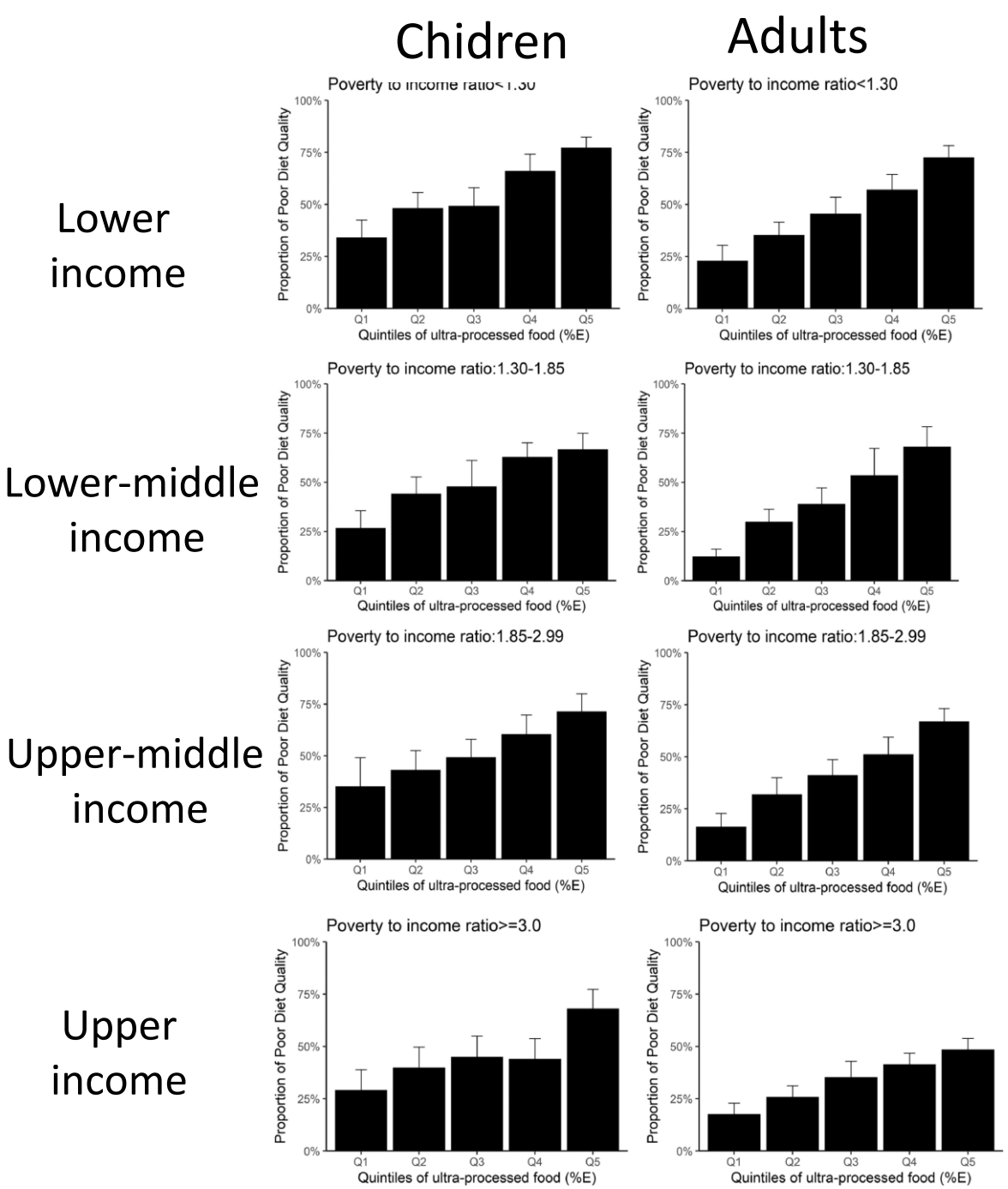
Predicted Healthy Eating Index-2015 (95% CI)* across quintiles of UPF

US adult population, NHANES 2015–2018



*Data were weighted to be nationally representative, and adjusted for age, sex, race/ethnicity, and education.

Prevalence(%) of poor quality diets* across quintiles of UPF NHANES 2015–2018



*<40% adherence to the AHA secondary diet score; data were weighted to be nationally representative, and adjusted for age, sex, race/ethnicity, and education.

Source: Liu et al 2022

Why avoidance or reduction of ultra-processed foods (UPF) is recommended?

- UPF: definition and identification
- Evidence on UPF intake and diet quality
- Evidence on UPF intake and diseases

‘More than 30 cohort studies*, adjusted for a broad range of potential confounders, have shown prospective dose-response associations between increased UPF intake and:

obesity, visceral adiposity, increased adiposity from childhood to early adulthood, type 2 diabetes, hypertension, dyslipidemias, hyperuricemia, coronary heart disease, cerebrovascular disease, breast cancer, non-alcoholic liver disease, Crohn’s disease, chronic kidney disease, depression, and all-cause mortality.’

Source: Dicken and Batterham 2022

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*Cohorts included Harvard, Framingham, ARIC, Nhanes follow-up, EPIC, PURE, Predimed, UK Biobank, UK ALSPAC, NutriNet Santé, SUN Navarra, ENRICA Spain, Moli-sani Italy, Lifelines Netherlands, ELSA Brazil, CHNS China ...

*Journals included AJCN, JAMA, PLoS MED, BMJ, BMC Med, BMC Psyquiatry J Am Coll Cardiol, Am J Hypert, Am J Gastroenterol, Clin Gastroenterol Hepatol, Clinical Nutrition, JN, EJCN, Int J Epi ...

Source: Dicken and Batterham 2022

Three meta-analyses of high-quality cohort studies show significant pooled risk ratios for obesity, type 2 diabetes, depression, cardio and cerebrovascular disease, and all-cause mortality

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Consumption of ultra-processed foods and health status: a systematic review and meta-analysis

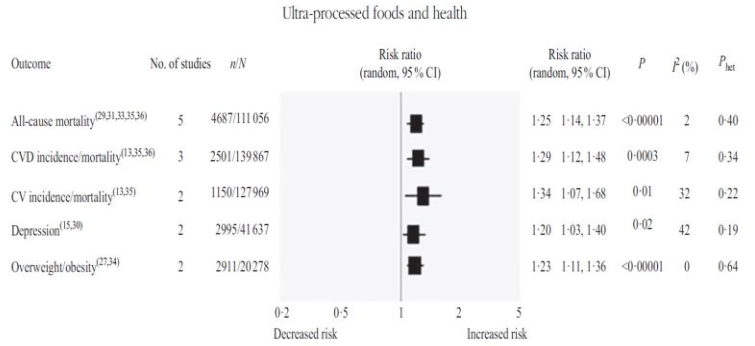
G. Pagliai[1,2], M. Dinu[1,2]*, M. P. Madarena[1], M. Bonaccio[3], L. Iacoviello[3,4] and F. Sofi[1,2]

[1]*Department of Experimental and Clinical Medicine, University of Florence, 50134 Florence, Italy*
[2]*Unit of Clinical Nutrition, Careggi University Hospital, 50134 Florence, Italy*
[3]*Department of Epidemiology and Prevention, IRCCS Neuromed, Pozzilli, 86077 Isernia, Italy*
[4]*Department of Medicine and Surgery, Research Center in Epidemiology and Preventive Medicine (EPIMED), University of Insubria, 21100 Varese, Italy*

(Submitted 27 March 2020 – Final revision received 30 June 2020 – Accepted 9 July 2020)

Abstract

Increasing evidence suggests that high consumption of ultra-processed foods (UPF) is associated with an increase in non-communicable diseases, overweight and obesity. The present study systematically reviewed all observational studies that investigated the association between UPF



g. 3. Forest plot of prospective cohort studies investigating the association between ultra-processed foods consumption and different health outcomes. *P* value is for st of no overall association between exposure and outcome; P_{het} is for test of no differences in association measure among studies; I^2 estimates from heterogenei ther than sampling error. CV, cerebrovascular.

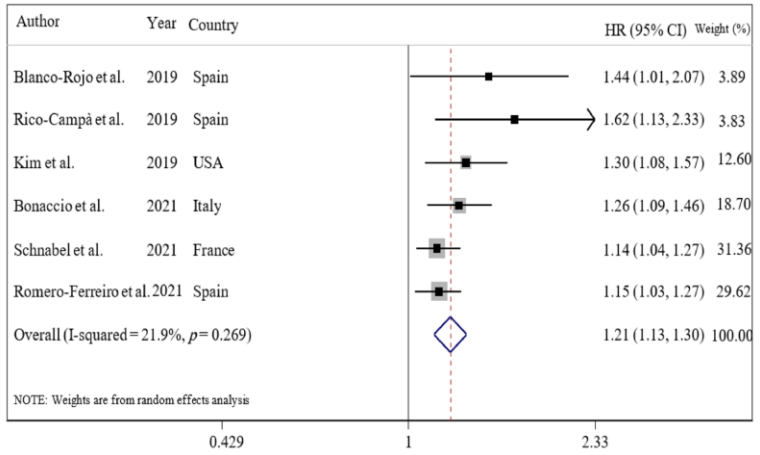
nutrients MDPI

Review

Ultra-Processed Food Consumption and Adult Mortality Risk: A Systematic Review and Dose–Response Meta-Analysis of 207,291 Participants

Wanich Suksatan [1], Sajjad Moradi [2,3,*], Fatemeh Naeini [4], Reza Bagheri [5], Hamed Mohammadi [4], Sepide Talebi [4], Sanaz Mehrabani [6], Mohammad ali Hojjati Kermani [7] and Katsuhiko Suzuki [8,*]

1 Faculty of Nursing, HRH Princess Chulabhorn College of Medical Science, Chulabhorn Royal Academy, Bangkok 10210, Thailand; wanich.suk@pccms.ac.th
2 Halal Research Center of IRI, FDA, Tehran 314715311, Iran
3 Nutritional Sciences Department, School of Nutritional Sciences and Food Technology, Kermanshah University of Medical Sciences, Kermanshah 6718773654, Iran
4 Department of Clinical Nutrition, School of Nutritional Science, Tehran University of Medical Science, Tehran 1449614535, Iran; Naeini_F34@yahoo.com (F.N.); mohamadihd@gmail.com (H.M.); talebisepide7@gmail.com (S.T.)
5 Department of Exercise Physiology, University of Isfahan, Isfahan 8174673441, Iran; will.fivb@yahoo.com
6 Department of Clinical Nutrition, School of Nutrition and Food Science, Isfahan University of Medical Sciences, Isfahan 8174673461, Iran; sanaz_mehr6500@yahoo.com
7 Clinical Tuberculosis and Epidemiology Research Center, National Research Institute of Tuberculosis and



nutrients MDPI

Review

Ultra-Processed Food Consumption and Adult Diabetes Risk: A Systematic Review and Dose-Response Meta-Analysis

Sajjad Moradi [1,2], Mohammad ali Hojjati Kermani [3], Reza Bagheri [4], Hamed Mohammadi [5], Ahmad Jayedi [6], Melissa M. Lane [7], Omid Asbaghi [8], Sanaz Mehrabani [9,*] and Katsuhiko Suzuki [10,*]

1 Halal Research Center of IRI, FDA, Tehran 314715311, Iran; sajadmoradi9096@gmail.com
2 Nutritional Sciences Department, School of Nutritional Sciences and Food Technology, Kermanshah University of Medical Sciences, Kermanshah 6715847141, Iran
3 Clinical Tuberculosis and Epidemiology Research Center, National Research Institute of Tuberculosis and Lung Diseases (NRITLD), Masih Daneshvari Hospital, Shahid Beheshti University of Medical Sciences, Tehran 14167-53955, Iran; IMHOJJATI@gmail.com
4 Department of Exercise Physiology, University of Isfahan, Isfahan 81746-73441, Iran; will.fivb@yahoo.com
5 Department of Clinical Nutrition, School of Nutritional Sciences and Dietetics, Tehran University of Medical Sciences, Tehran 14176-13151, Iran; mohamadihd@gmail.com
6 Department of Community Nutrition, School of Nutritional Science and Dietetics, Tehran University of Medical Sciences, Tehran 14176-13151, Iran; ahmadjayedi@yahoo.com
7 IMPACT (The Institute for Mental and Physical Health and Clinical Translation), Food & Mood Centre, School of Medicine, Barwon Health, Deakin University, Geelong, VIC 3217, Australia; Melissa.Lane@deakin.edu.au
8 Cancer Research Center, Shahid Beheshti University of Medical Sciences, Tehran 14167-53955, Iran;

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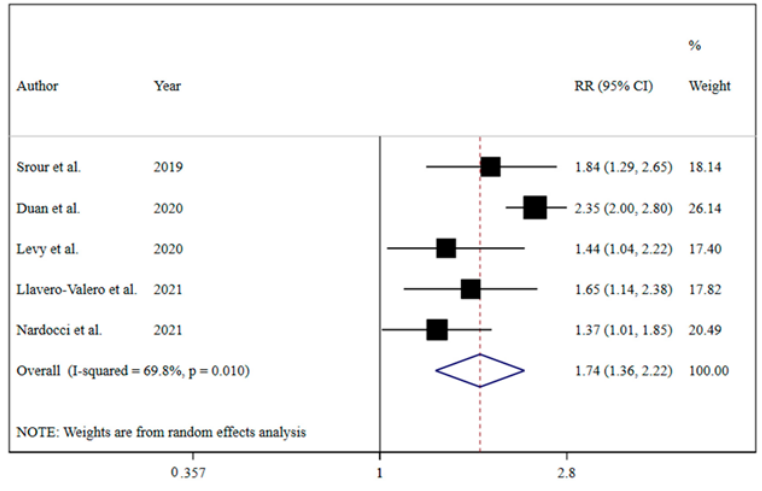

Review

Ultra-Processed Food Consumption and Adult Mortality Risk: A Systematic Review and Dose–Response Meta-Analysis of 207,291 Participants

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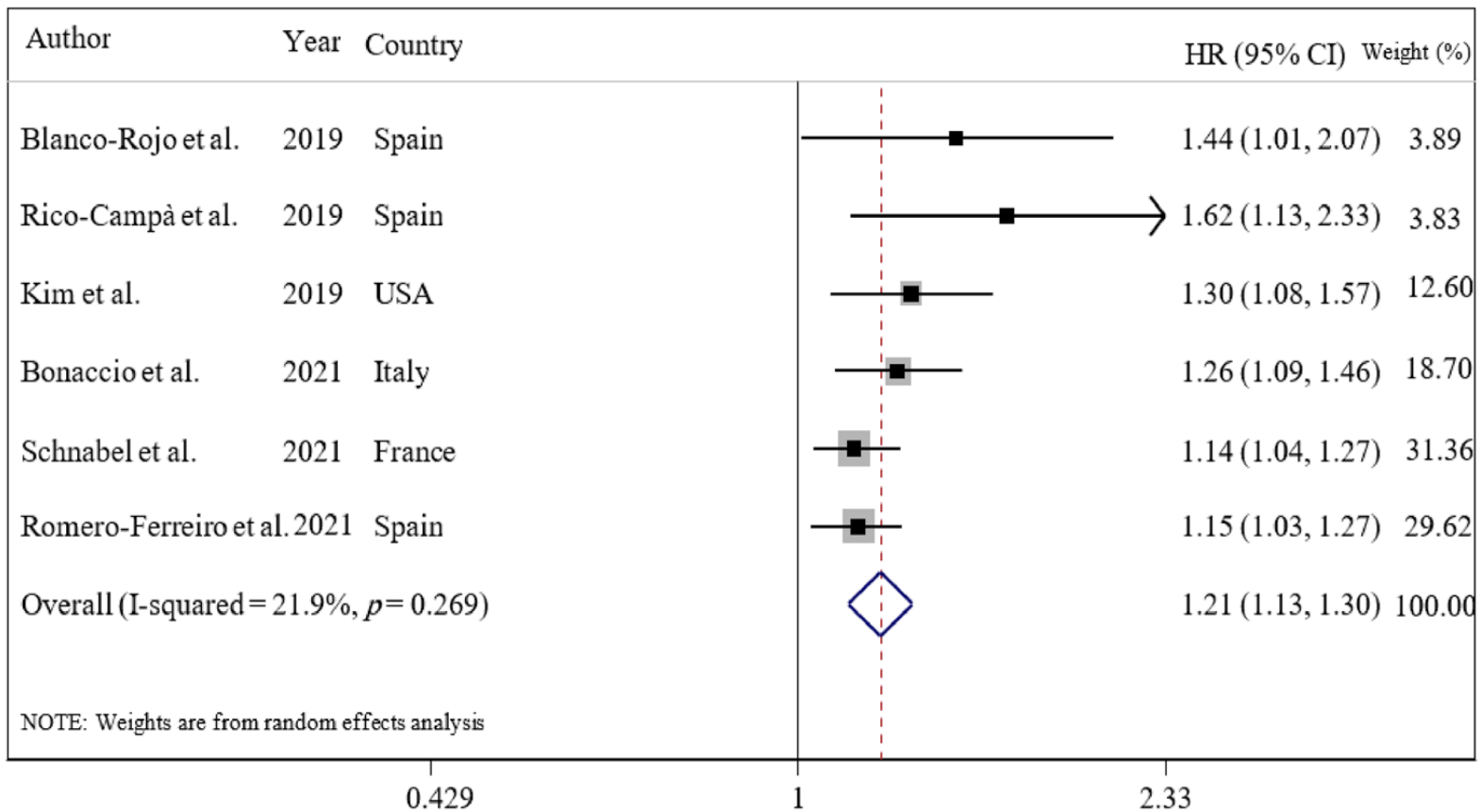
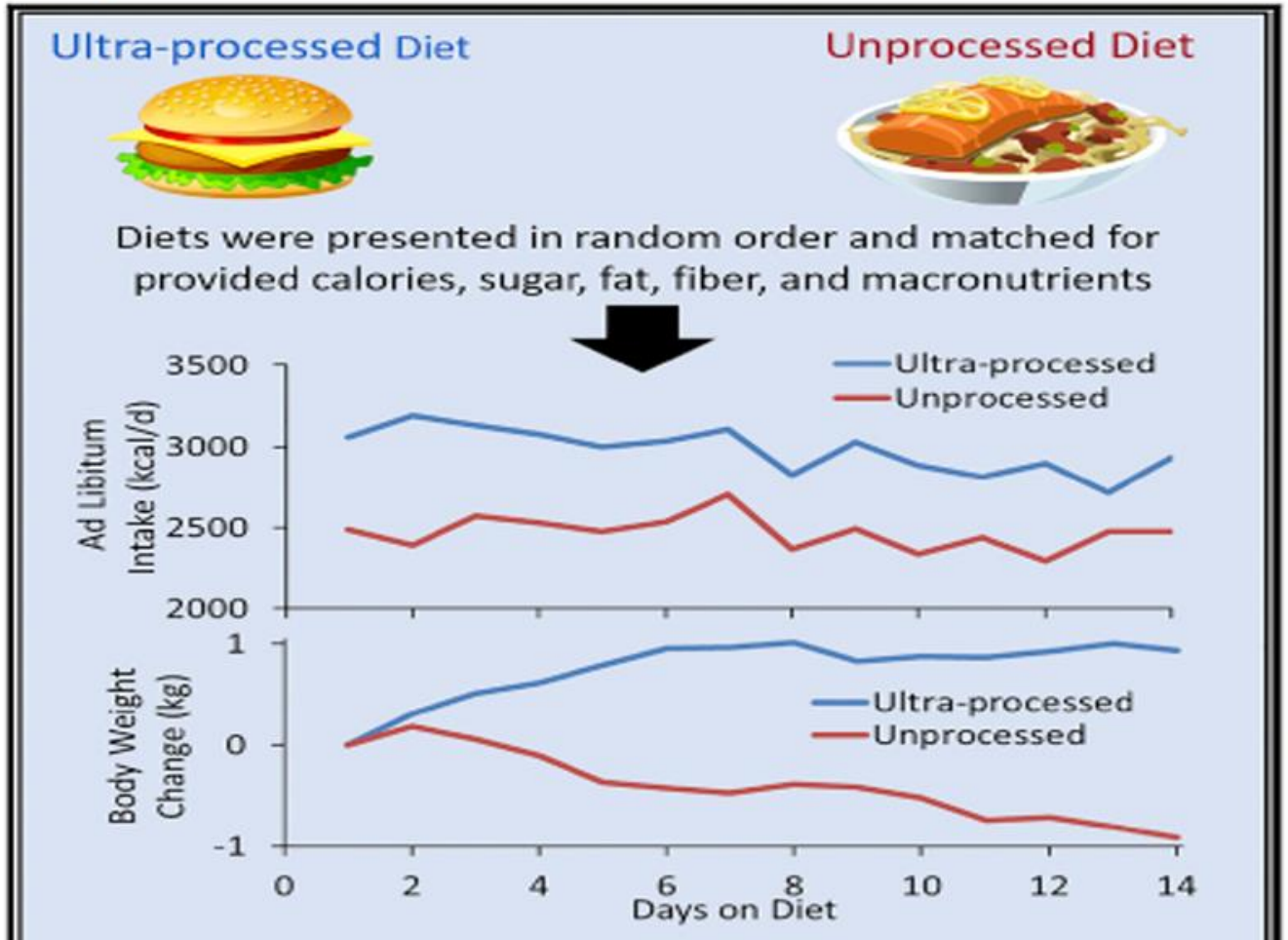


Clinical and Translational Report

Cell Metabolism

Ultra-Processed Diets Cause Excess Calorie Intake and Weight Gain: An Inpatient Randomized Controlled Trial of *Ad Libitum* Food Intake

Graphical Abstract



Authors

Kevin D. Hall, Alexis Ayuketah, Robert Brychta, ..., Peter J. Walter, Shanna Yang, Megan Zhou

Correspondence

kevinh@nih.gov

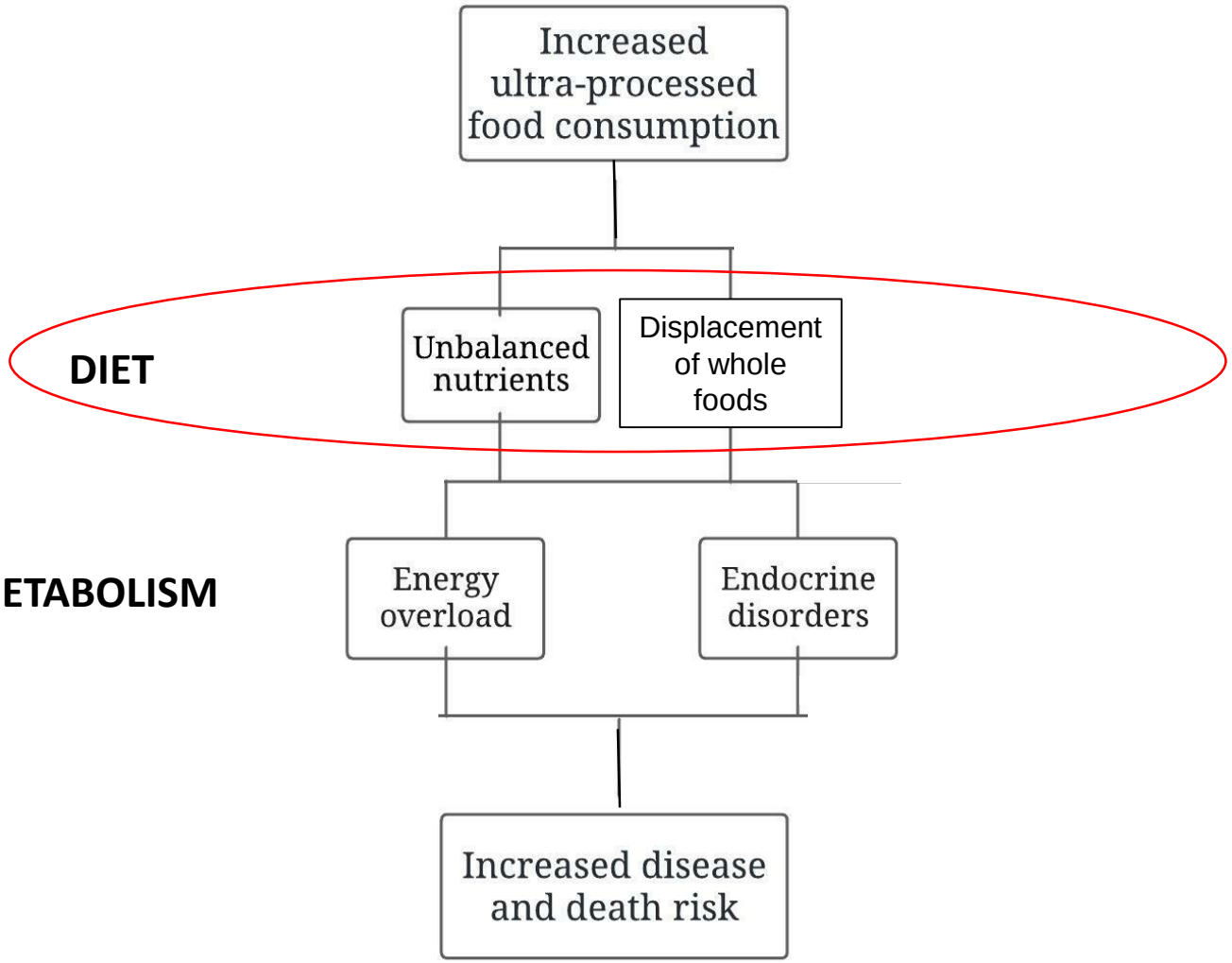
In Brief

Hall et al. investigated 20 inpatient adults who were exposed to ultra-processed versus unprocessed diets for 14 days each, in random order. The ultra-processed diet caused increased *ad libitum* energy intake and weight gain despite being matched to the unprocessed diet for presented calories, sugar, fat, sodium, fiber, and macronutrients.

Why avoidance or reduction of ultra-processed foods (UPF) is recommended

- UPF: definition and identification
- Evidence on UPF intake and diet quality
- Evidence on mechanisms linking UPF intake to disease

Unbalanced diet nutrient profiles and displacement of whole foods are well-documented mechanisms for the association between UPF consumption and disease



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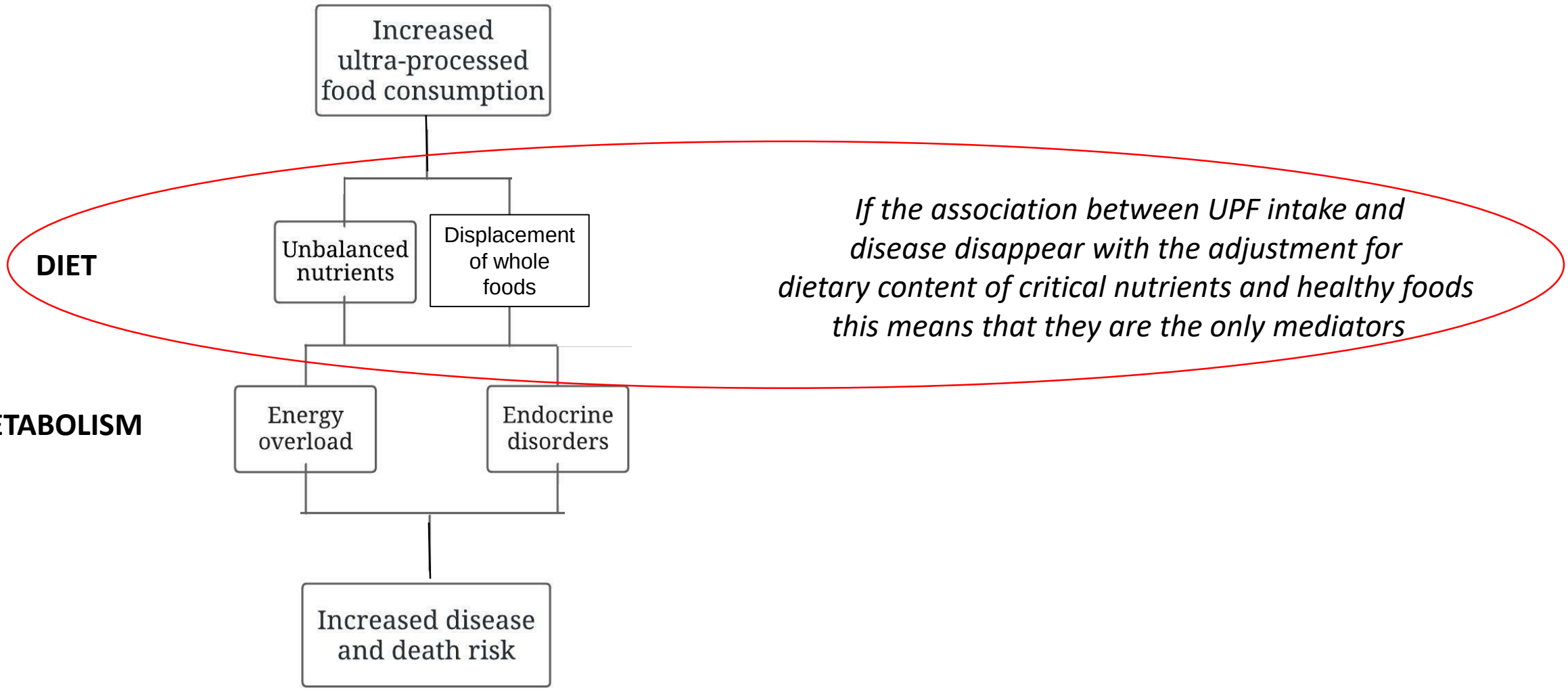
Unbalanced diet nutrient profiles and displacement of whole foods are well-documented mechanisms for the association between UPF consumption and numerous chronic diseases



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nutrients

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Review

The Role of Diet Quality in Mediating the Association between Ultra-Processed Food Intake, Obesity and Health-Related Outcomes: A Review of Prospective Cohort Studies

Samuel J. Dicken [1] and Rachel L. Batterham [1,2,3,*]

[1] Centre for Obesity Research, Department of Medicine, University College London (UCL), London WC1E 6JF, UK; samuel.dicken.20@ucl.ac.uk
[2] Bariatric Centre for Weight Management and Metabolic Surgery, University College London Hospital (UCLH), London NW1 2BU, UK
[3] National Institute for Health Research, Biomedical Research Centre, University College London Hospital (UCLH), London W1T 7DN, UK
* Correspondence: r.batterham@ucl.ac.uk

Abstract: Prospective cohort studies show that higher intakes of ultra-processed food (UPF) increase the risk of obesity and obesity-related outcomes, including cardiovascular disease, cancer and type 2 diabetes. Whether ultra-processing itself is detrimental, or whether UPFs just have a lower nutritional quality, is debated. Higher UPF intakes are inversely associated with fruit, vegetables, legumes and seafood consumption. Therefore, the association between UPFs and poor health could simply be from excess nutrient intake or from a less healthful dietary pattern. If so, adjustment for dietary quality or pattern should explain or greatly reduce the size of the significant associations between UPFs and health-related outcomes. Here, we provide an overview of the literature and by using a novel approach, review the relative impact of adjusting for diet quality/patterns on the

check for updates

37 cohort studies that have adjusted the association between UPF intake and health outcomes for the dietary content of critical nutrients and healthy foods

Author, Year	Cohort
Schnabel 2019 [102]	Nutri-Net Santé
Rico-Campa 2019 [103]	SUN
Kim 2019 [104]	NHANES III
Bonaccio 2021 [105]	Moli-sani
Beslay 2020 [106]	Nutri-Net Santé
Mendonca 2016 [107]	SUN
Li 2021 [108]	CHNS
Koniecnzna 2021 [109]	PREDIMED-Plus
Sandoval-Insausti 2020 [110]	Seniors-ENRICA-1
Cordova 2021 [111]	EPIC
Canhada 2020 [112]	ELSA-Brazil

Nutrients 2022, *14*, 23

Author, Year	Cohort
Rohatgi 2017 [113]	Women's Healt Center and Obste & Gynecology Cl
Leone 2021 [114]	SUN
Chang 2021 [115]	ALSPAC
Costa 2021 [116]	Pelotas-Brazil 2(Birth Cohort
Srour 2019 [117]	Nutri-Net Sant
Juul 2021 [118]	Framingham Offspring Cohc
Zhong 2021 [119]	Prostate, Lung Colorectal, an Ovarian Cance Screening Tria
Scaranni 2021 [120]	ELSA-Brasil

Nutrients 2022, *14*, 23

Author, Year	Cohort
Monge 2021 [121]	Mexican Teachers' Cohort
Mendonca 2017 [122]	SUN
Llavero-Valero 2021 [123]	SUN
Srour 2020 [124]	Nutri-Net Santé
Zhang 2021 [125]	TCLSIH
Fiolet 2018 [126]	Nutri-Net Santé
Vasseur 2021 [127]	Nutri-Net Santé
Narula 2021 [128]	PURE
Schnabel 2018 [129]	Nutri-Net Santé
Lo 2021 [130]	NHS, NHS II, HPFS
Adjibade 2019 [131]	Nutri-Net Santé
Gómez-Donoso 2020 [132]	SUN
Rey-Garcia 2021 [133]	Seniors-ENRICA-1
Zhang 2021 [134]	TCLSIH

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Author, Year	Cohort
Leffa 2020 [135]	Impact of the "Ten Steps for Healthy Feeding of Children Younger Than Two Years" in Health Centers
Donat-Vargas 2021 [136]	ENRICA
Borge 2021 [137]	Norwegian Mother, Father and Child Cohort Study
Zhang 2021 [138]	TCLSIH

nutrients

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Review

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'Consistent across many studies, **adjustment for fat, sugar and sodium intake, or adjustment for adherence to a range of healthy or unhealthy dietary patterns has a minimal impact on the adverse associations between UPF intake and a diverse range of health-related outcomes.**

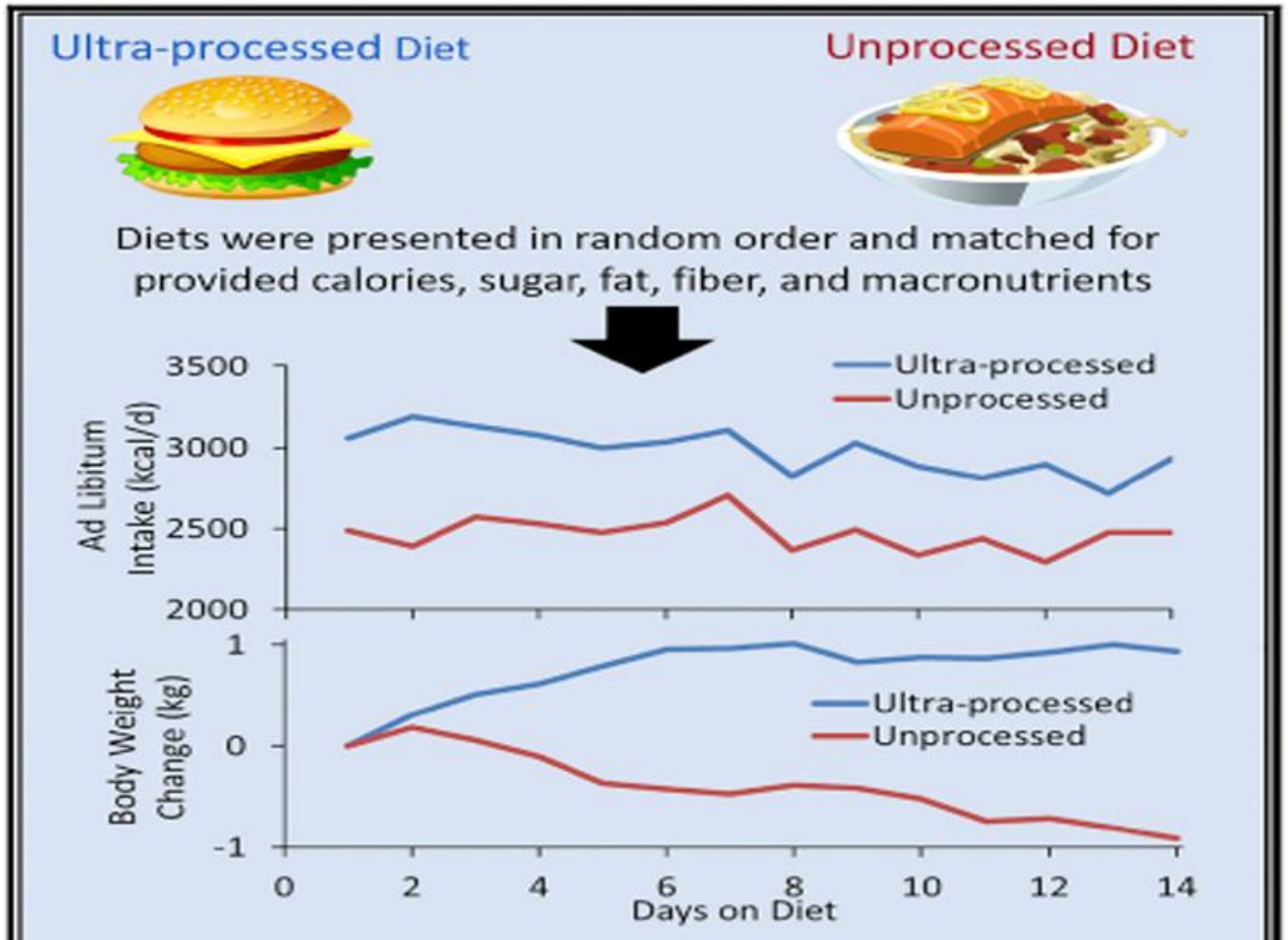
These findings strongly point towards aspects of ultra-processing as being important factors that impact health, and question the ability to conclude that the adverse outcomes from UPFs can be solely attributed to their nutritional quality'.

Clinical and Translational Report

Cell Metabolism

Ultra-Processed Diets Cause Excess Calorie Intake and Weight Gain: An Inpatient Randomized Controlled Trial of *Ad Libitum* Food Intake

Graphical Abstract



In line with Dicken & Batterham review of 37 cohort studies

In Brief

'The ultra-processed diet caused increased ad libitum energy intake and weight gain ***despite being matched to the unprocessed diet for presented calories, sugar, fiber, and macronutrients.'***

Potential mechanisms for UPF health effects other than the deterioration of dietary nutrient profiles and displacement of healthy foods

1) Reduced phytochemicals (Martinez-Steele & Monteiro 2018)
2) Phthalates/Bisphenol A released from packaging materials (Martinez-Steele et al. 2020)
3) Acrylamid and other neoformed substances (Morales et al 2020)
4) Quasi-addictive properties (Gearhardt 2021)
5) Potentially harmful additives (Debras et al 2022)
6) Increased energy intake rate (Forde et al 2020)
7) Increased glycemic response (Fardet 2016)
8) Reduced satiety (Fardet 2016, Dioneda et al 2020)
9) Reduced thermic effect (Dioneda et al 2020)
10) Pro-inflammatory gut microbiota (Zinocker & Lindseth 2018)

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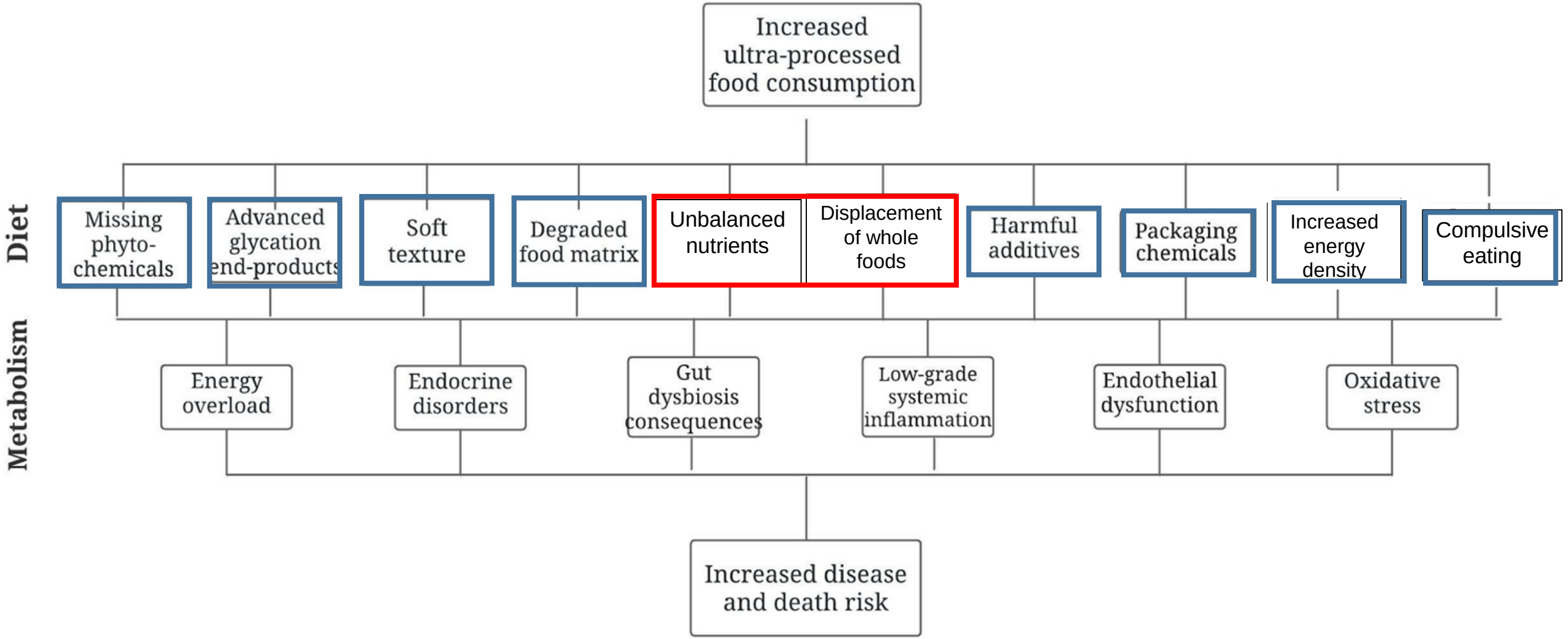

Source: Monteiro & Astrup 2022.

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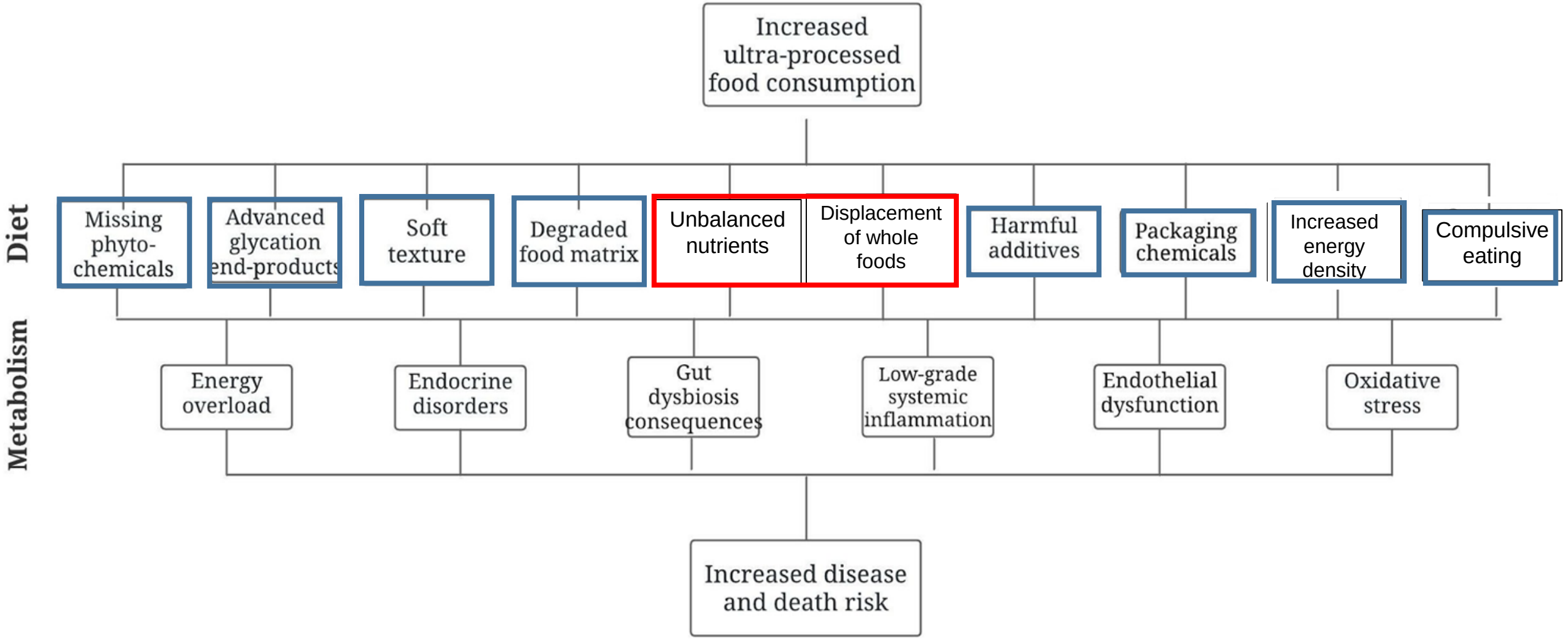
It is very likely that different combinations of mechanisms link UPF to different diseases (fascinating area for research)



Source: Monteiro & Astrup 2022.

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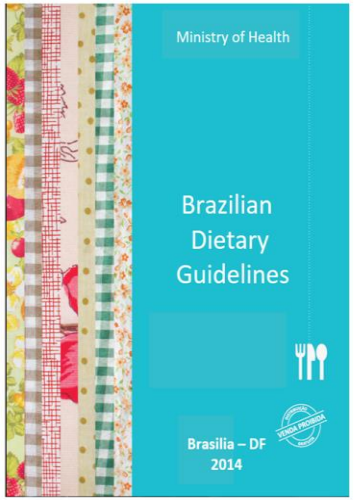
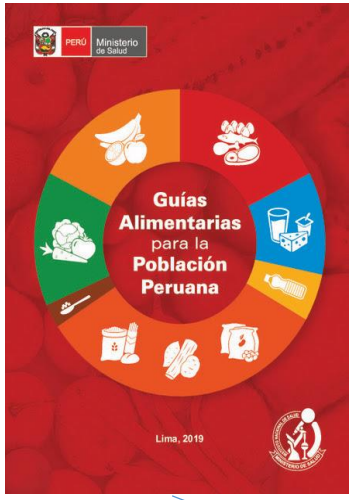
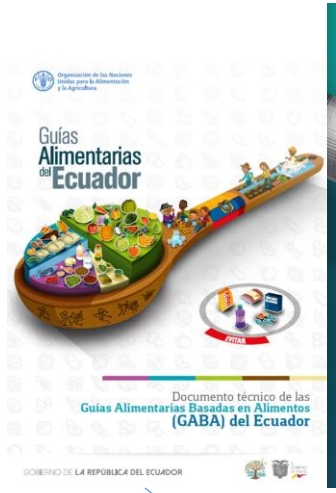
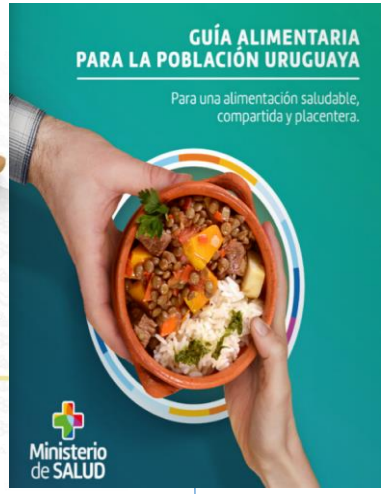
But do we need to know the exact combination of mechanisms that link ultra-processed food to each disease before recommending for people to reduce or avoid its consumption?









UPF avoided or reduced

Circulation

AHA SCIENTIFIC STATEMENT

2021 Dietary Guidance to Improve Cardiovascular Health: A Scientific Statement From the American Heart Association

Alice H. Lichtenstein, DSc, FAHA, Chair*; Lawrence J. Appel, MD, MPH, FAHA, Vice Chair*; Maya Vadiveloo, PhD, RD, FAHA, Vice Chair; Frank B. Hu, MD, PhD, FAHA; Penny M. Kris-Etherton, PhD, RD, FAHA; Casey M. Rebholz, PhD, MS, MNSP, MPH, FAHA; Frank M. Sacks, MD, FAHA; Anne N. Thorndike, MD, MPH, FAHA; Linda Van Horn, PhD, RD, FAHA; Judith Wylie-Rosett, PhD, RD, FAHA; on behalf of the American Heart Association Council on Lifestyle and Cardiometabolic Health; Council on Arteriosclerosis, Thrombosis and Vascular Biology; Council on Cardiovascular

The Lancet Commissions

The EASL–*Lancet* Liver Commission: protecting the next generation of Europeans against liver disease complications and premature mortality

Tom H Karlsen, Nick Sheron†, Shira Zelber-Sagi, Patrizia Carrieri, Geoffrey Dusheiko, Elisabetta Bugianesi†, Rachel Pryke†, Sharon J Hutchinson, Bruno Sangro†, Natasha K Martin, Michele Cecchini, Mae Ashworth Dirac, Annalisa Belloni, Miquel Serra-Burriel, Cyriel Y Ponsioen, Brittney Sheena, Alienor Lerouge, Marion Devaux, Nick Scott, Margaret Hellard, Henkjan J Verkade, Ekkehard Sturm, Giulio Marchesini, Hannele Yki-Järvinen, Chris D Byrne, Giovanni Targher, Aviad Tur-Sinai, Damon Barrett, Michael Ninburg, Tatjana Reic, Alison Taylor, Tim Rhodes, Carla Treloar, Claus Petersen, Christoph Schramm, Robert Flisiak, Marieta Y Simonova, Albert Pares, Philip Johnson, Alessandro Cucchetti, Isabel Graupera, Christos Lionis, Elisa Pose, Núria Fabrellas, Ann T Ma, Juan M Mendive, Vincenzo Mazzaferro, Harry Rutter, Helena Cortez-Pinto, Deirdre Kelly†, Robyn Burton, Jeffrey V Lazarus†, Pere Ginès†, Maria Buti†, Philip N Newsome†‡, Patrizia Burra*‡, Michael P Manns*‡*

Executive summary

Liver diseases have become a major health threat across

care using multilevel interventions acting on current barriers.

An official website of the United States government Here's how you know

Proposed Scientific Questions to Inform the Development of the Dietary Guidelines for Americans, 2025-2030 Available for Public Comment Starting April 15th

WASHINGTON, April 14, 2022 –

*New questions address **ultra-processed foods** and food-based strategies that can be used by individuals and families to put the Dietary Guidelines into action and help prevent or manage overweight and obesity.*

Universities and research centers where UPF studies were undertaken

- **US**: Harvard, NYU, Tufts, UNC, Columbia, John's Hopkins, CDC, NHI ...
- **Canada**: Montreal, Toronto, PHA/Ottawa ...
- **UK**: Imperial College, Cambridge, Manchester, City University ...
- **Australia**: Melbourne, Deakin, Sydney ...
- **Netherlands**: VU Amsterdam, Wageningen, Utrecht ...
- **France**: Sorbonne Paris Nord ...
- **Spain**: Navarra, NIH Carlos III/Madrid, UAM/Madrid ...
- **Italy**: Florence, IRCCS/Pozzili, Mediterranea Cardiocentro/Napoli, Insubria/Varese
- **Sweden**: Karolinska
- **Norway: Oslo NUC, OsloMet, NIPH Oslo ...**
- **Portugal:** Porto, Trás-os-Montes e Alto Douro
- **Japan**: Kagawa/Saitama ...
- **China**: Wuhan, Qingdao, Chongqing ...
- **Taiwan**: School of Public Health/Taipei
- **Korea**: Seoul National University ...
- **Brazil**: USP, UFMG, UFPEL, UFRGS …
- **Mexico**: NIH/Cuernavaca, UAM/Mexico ...
- **Chile**: INTA ...
- **Colombia**: Antioquia, Javeriana ...
- **Argentine**: CESNI, FIC/Buenos Aires ...
- **Uruguay**: Universidad de la Republica ...
- ...

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