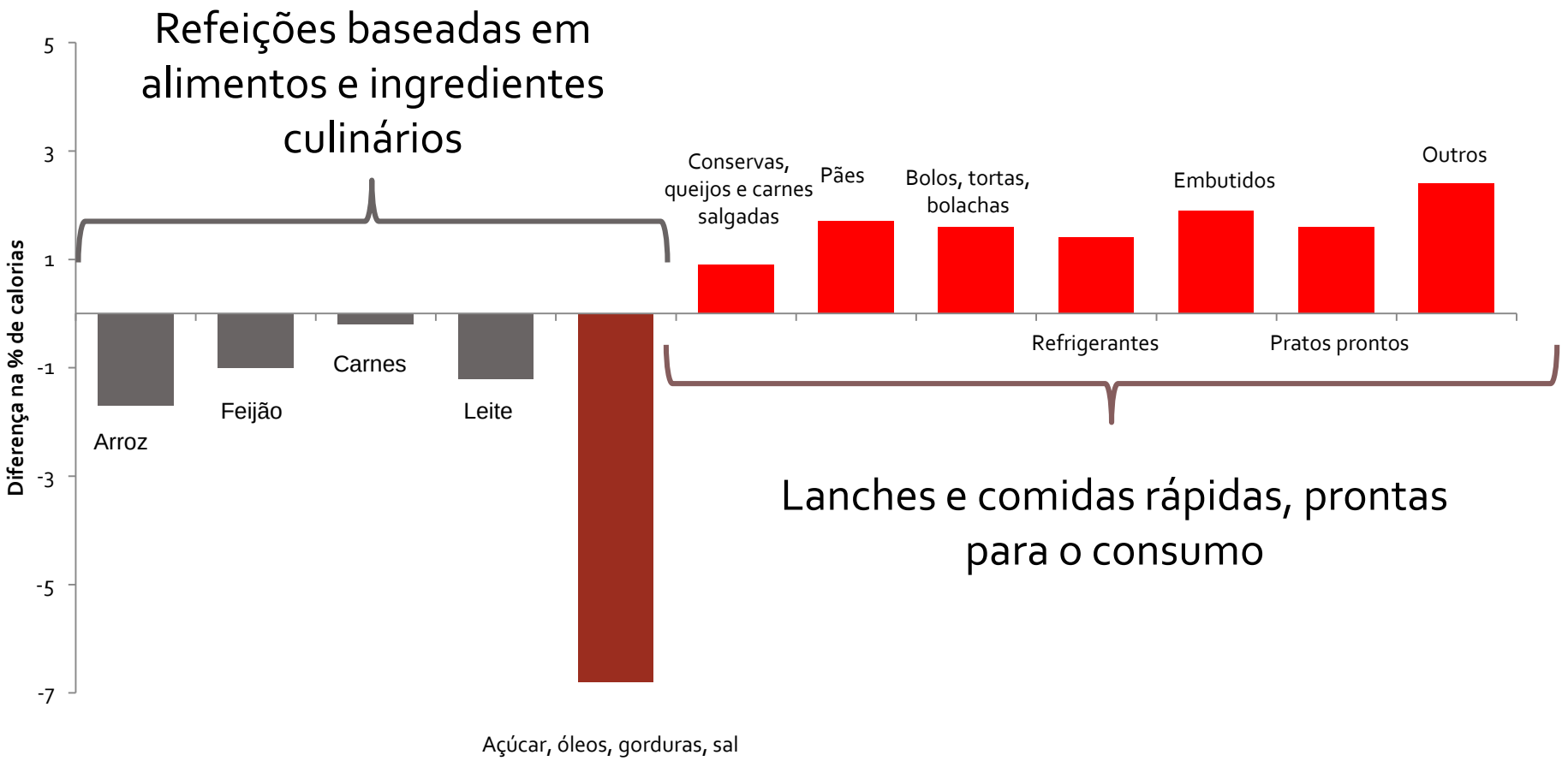
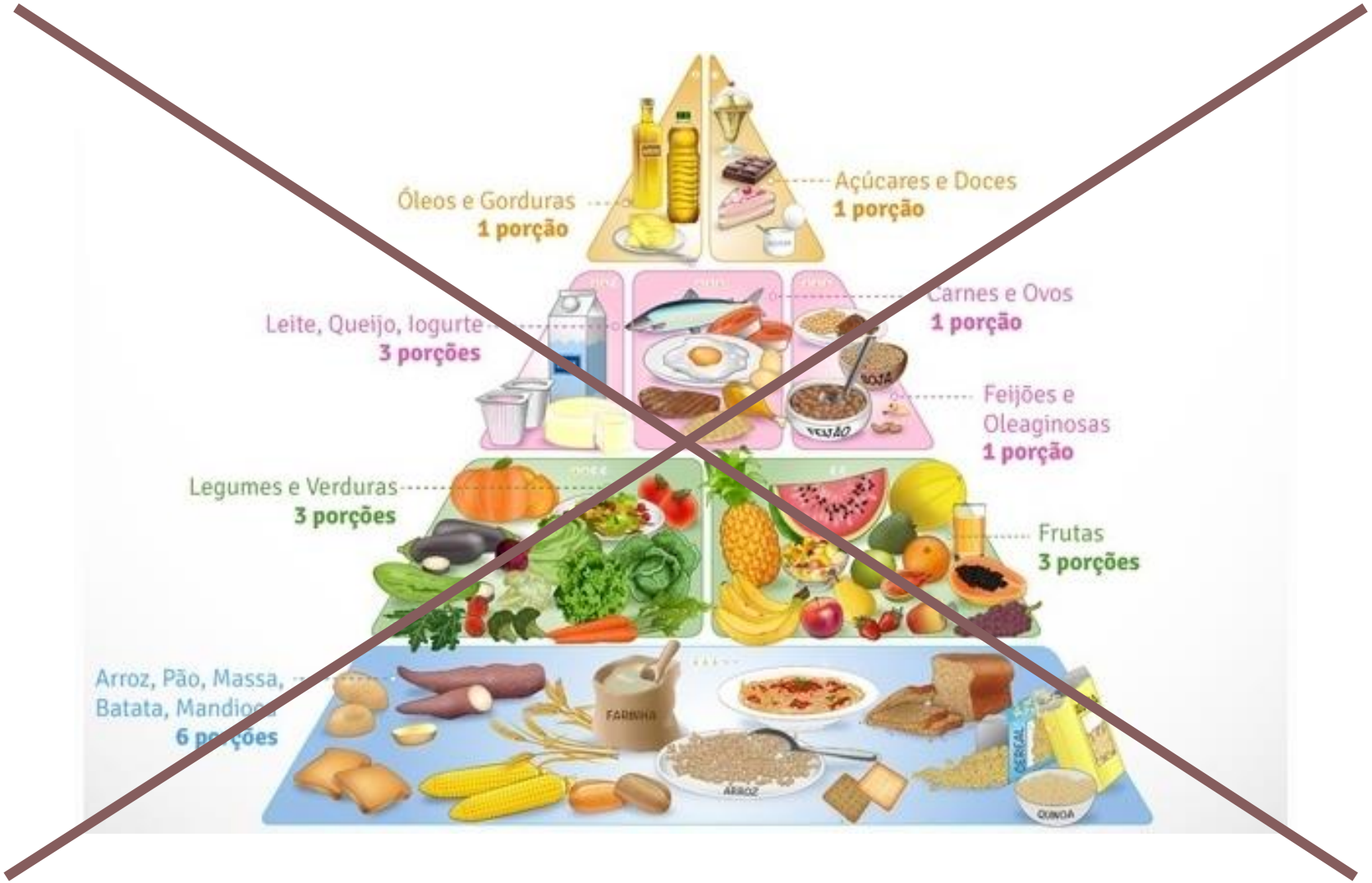
Guia alimentar para a população brasileira

Maria Alvim
maria.alvim@usp.br

Modificação nas compras de alimentos da população brasileira (1987-2009)



Martins, 2014


Óleos e Gorduras
1 porção
Açúcares e Doces
1 porção
Leite, Queijo, Iogurte
3 porções
Carnes e Ovos
1 porção
Feijões e
Oleaginosas
1 porção
Legumes e Verduras
3 porções
Frutas
3 porções
Arroz, Pão, Massa,
Batata, Mandioca
6 porções
FARINHA
ARROZ
QUINOA

Classificação NOVA

Public Health Nutrition: 14(1), 5–13 : Accepted 25 October 2010

Increasing consumption of ultra-processed foods and likely impact on human health: evidence from Brazil

Carlos Augusto Monteiro[1,2,*], Renata Bertazzi Levy[1,3], Rafael Moreira Claro[1], Inês Rugani Ribeiro de Castro[1,4] and Geoffrey Cannon[5]

Cad. Saúde Pública, Rio de Janeiro, 26(11):2039-2049, nov, 2010

A new classification of foods based on the extent and purpose of their processing

Uma nova classificação de alimentos baseada na extensão e propósito do seu processamento

Carlos Augusto Monteiro [1]
Renata Bertazzi Levy [1,2]
Rafael Moreira Claro [3]
Inês Rugani Ribeiro de Castro [4]
Geoffrey Cannon [5]

Public Health Nutrition: page 1 of 13 doi:10.1017/S1368980017000234

Commentary

The UN Decade of Nutrition, the NOVA food classification and the trouble with ultra-processing

Carlos Augusto Monteiro[1,2,*], Geoffrey Cannon[2], Jean-Claude Moubarac[2,3], Renata Bertazzi Levy[2,4], Maria Laura C Louzada[2] and Patrícia Constante Jaime[1,2]
[1]Department of Nutrition, School of Public Health, University of São Paulo, Av. Dr Arnaldo 715, São Paulo 01246-904, Brazil: [2]Center for Epidemiological Research in Nutrition and Health, University of São Paulo, São Paulo, Brazil: [3]Département de Nutrition, Université de Montréal, Montréal, Canada: [4]Department of Preventive Medicine, School of Medicine, University of São Paulo, São Paulo, Brazil

Submitted 27 October 2016: Final revision received 18 January 2017: Accepted 23 January 2017

Public Health Nutrition: page 1 of 6 doi:10.1017/S1368980018003762

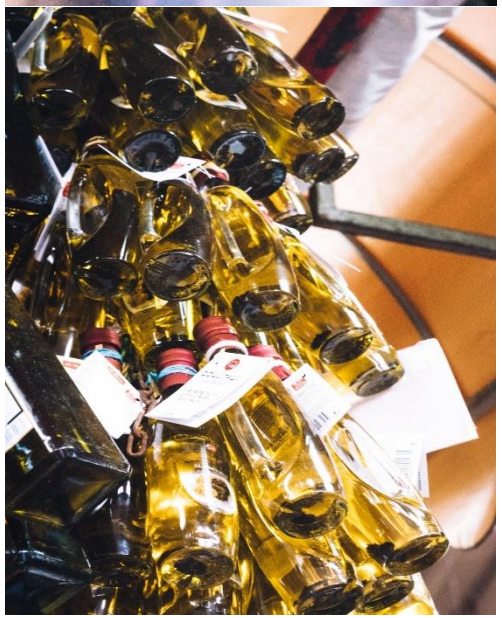
Commentary

Ultra-processed foods: what they are and how to identify them

Carlos A Monteiro[1,2,*], Geoffrey Cannon[2], Renata B Levy[2,3], Jean-Claude Moubarac[4], Maria LC Louzada[2], Fernanda Rauber[2], Neha Khandpur[2], Gustavo Cediel[2], Daniela Neri[2], Euridice Martinez-Steele[2], Larissa G Baraldi[2] and Patricia C Jaime[1,2]
[1]Department of Nutrition, School of Public Health, University of São Paulo, São Paulo, Brazil: [2]Center for Epidemiological Research in Nutrition and Health, Department of Nutrition, School of Public Health, University of São Paulo, Av. Dr Arnaldo 715, São Paulo, SP 01246-904, Brazil: [3]Department of Preventive Medicine, School of Medicine, University of São Paulo, São Paulo, Brazil: [4]Département de Nutrition, Université de Montréal, Montréal, Canada

Submitted 3 September 2018: Final revision received 21 November 2018: Accepted 30 November 2018

Alimentos *in natura* e minimamente processados



Ingredientes culinários processados

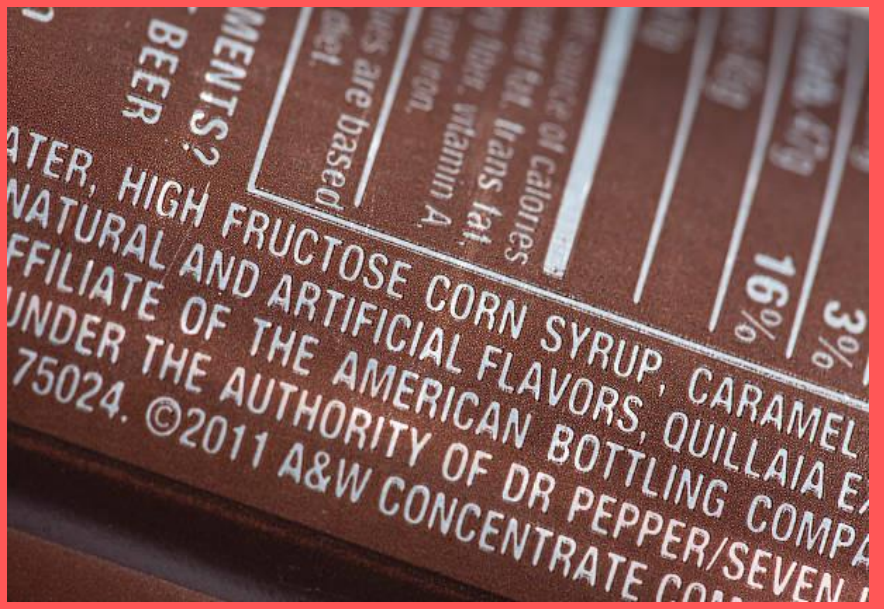
Alimentos processados

Alimentos ultraprocessados

Uma maneira fácil de identificar alimentos ultraprocessados é procurar dois tipos de **marcadores** na lista de ingredientes.

1 – Substâncias nunca ou raramente utilizadas em cozinhas: **proteína isolada, caseína, proteína de soro de leite, xarope de milho rico em frutose, açúcar invertido, dextrose.**

2 – Aditivos cosméticos, que são uma classe de aditivos químicos com outras funções, para além da conservação os alimentos:
aromas artificiais, corantes, emulsionantes, realçadores de sabor.



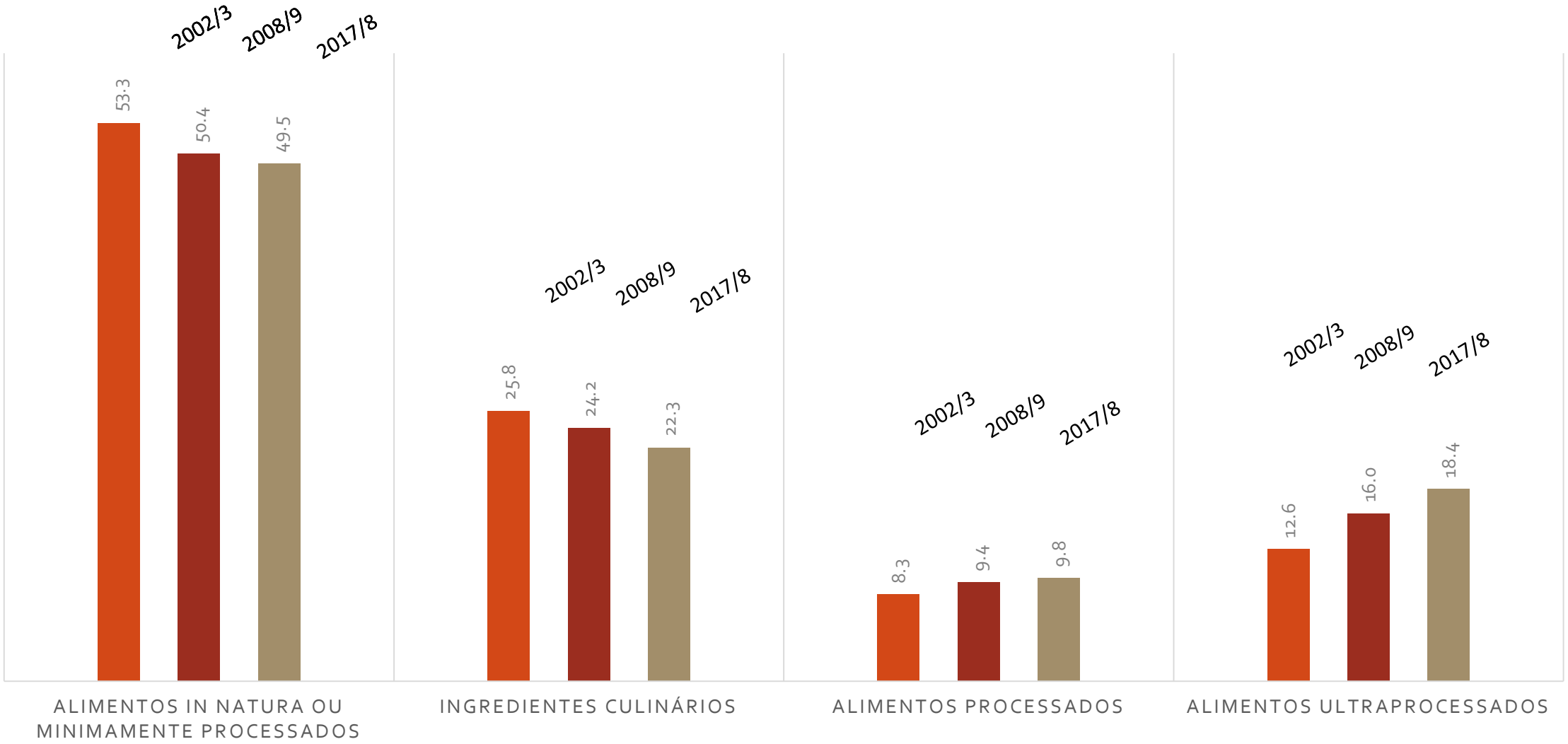
Recomendações para além da Nova

Ministério da Saúde, 2014.

- Comer com regularidade e atenção;
- Ambientes apropriados;
- Em companhia;
- Incentivo às práticas culinárias;
- Boas escolhas ao comer fora de casa;
- Origem do alimento.

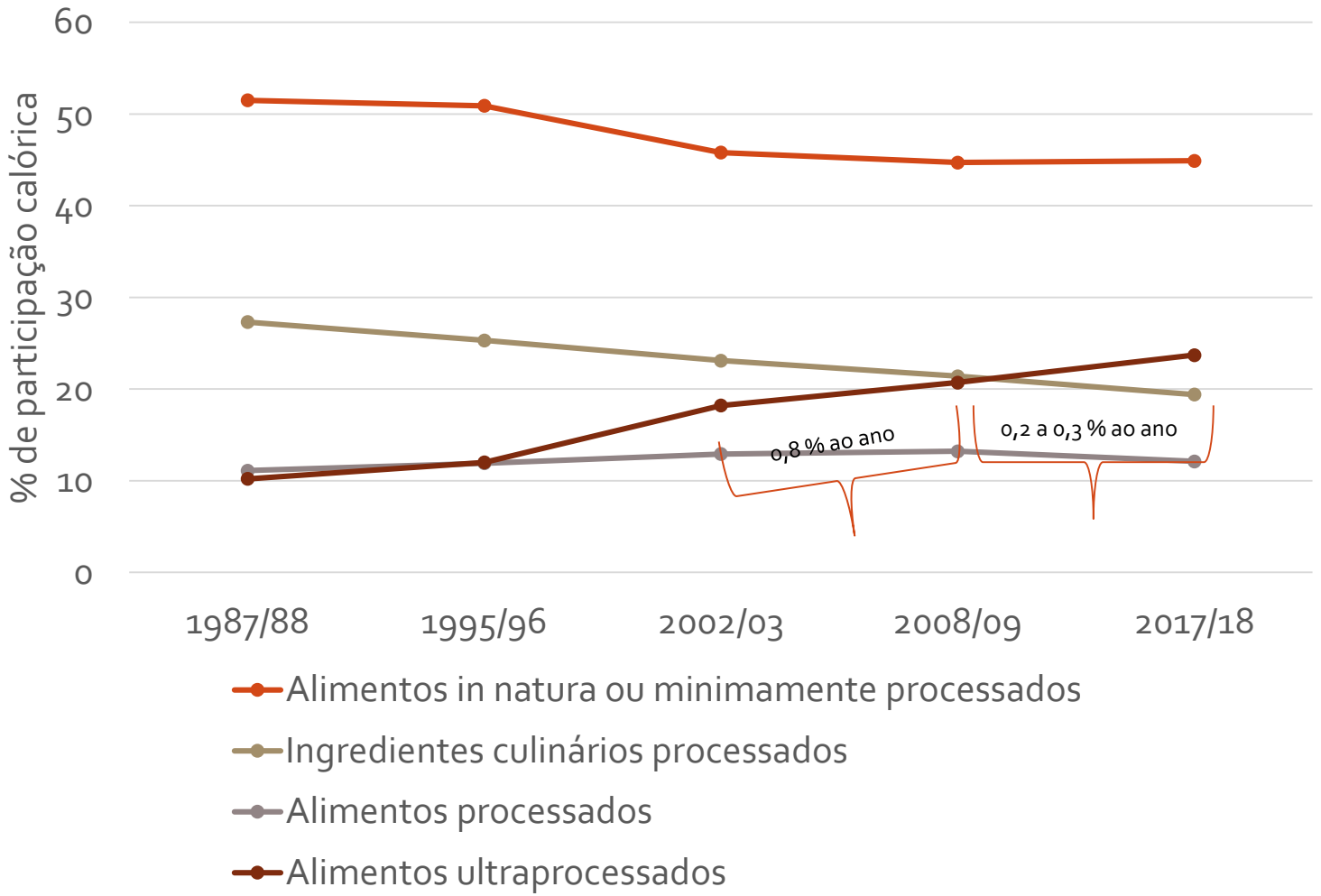
Consumo de ultraprocessados

Contribuição (%) dos alimentos no total de calorias adquiridas nos domicílios segunda a NOVA. Brasil, 2002-2018



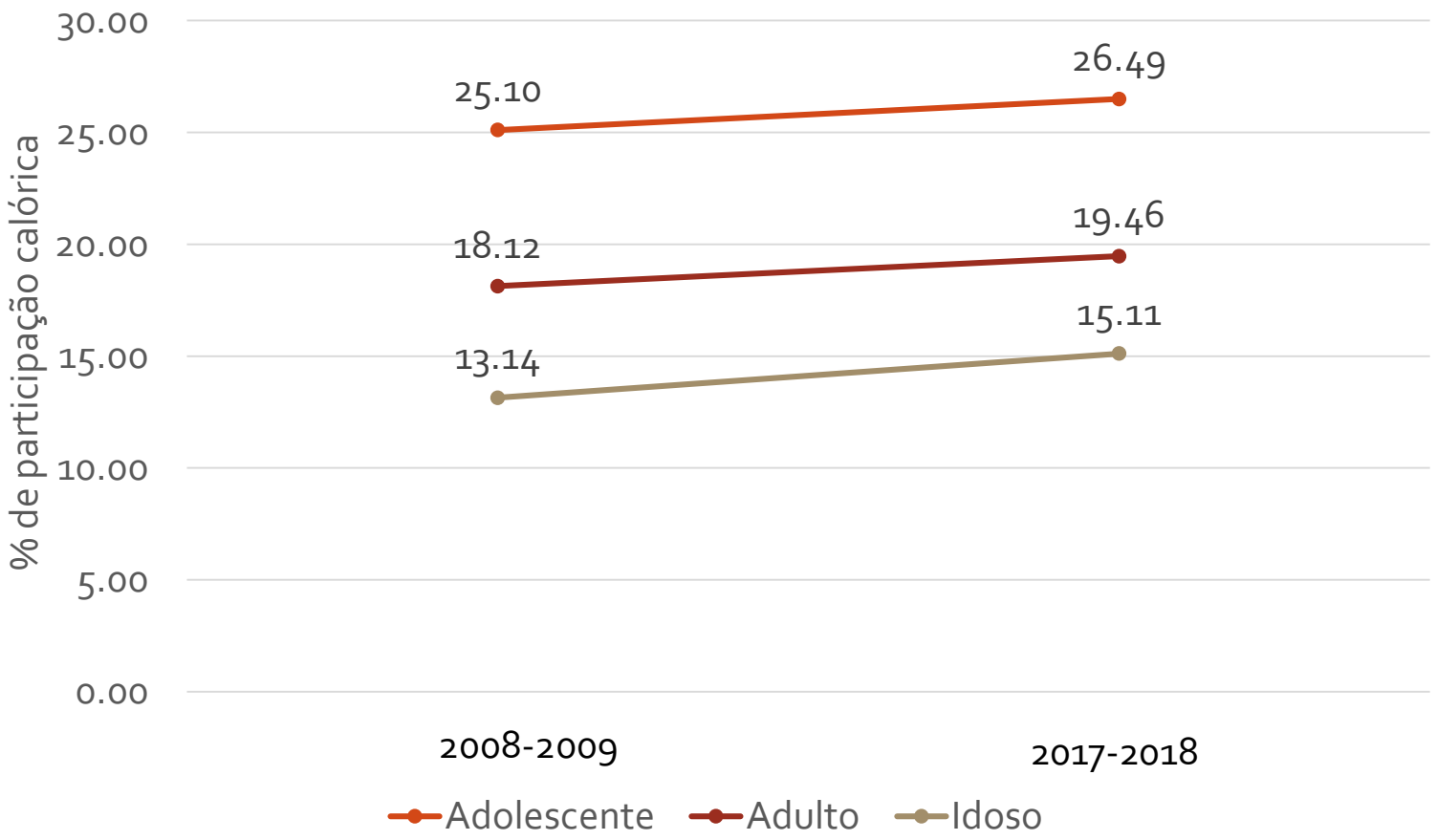
Fonte: IBGE, 2020

Participação relativa de grupos de alimentos da classificação NOVA no total de calorias determinado pela aquisição alimentar domiciliar nas regiões metropolitanas - períodos 1987-1988, 1995-1996, 2002/03, 2008/09 e 2017/18.



É possível observar uma desaceleração do aumento do consumo dos AUP

Evolução temporal da participação de alimentos ultraprocessados no total de energia consumida (%) pela população brasileira com 10 anos ou mais de idade segundo faixas etárias. POF 2008/09 e 2017/18.



Contribuições de alimentos ultraprocessados para a ingestão diária de energia em vários países, com base em pesquisas de consumo alimentar com representatividade nacional

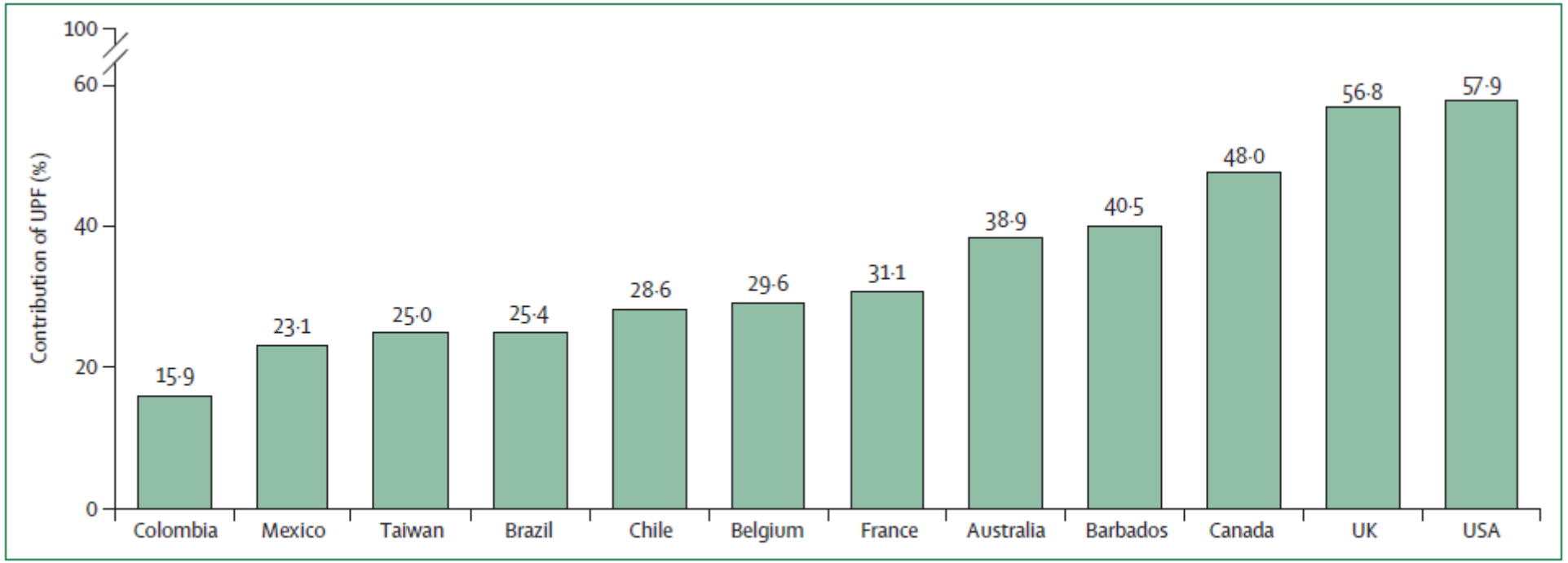
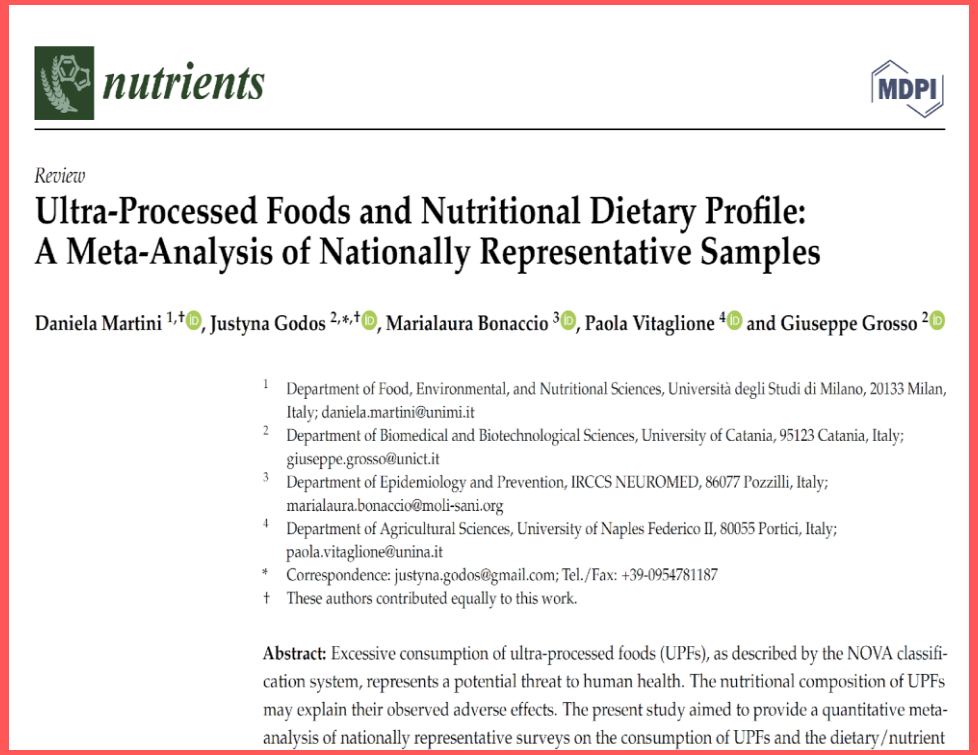


Figure 1: **Contributions of ultra-processed foods to daily energy intakes in several countries, based on dietary intake nationally representative surveys**
Data are numerical values.

Reference:
Srour, Bernard, et al. "Ultra-processed foods and human health: from epidemiological evidence to mechanistic insights." The Lancet Gastroenterology & Hepatology (2022).

Consequências



nutrients

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
2 Department of Biomedical and Biotechnological Sciences, University of Catania, 95123 Catania, Italy; giuseppe.grosso@unict.it
3 Department of Epidemiology and Prevention, IRCCS NEUROMED, 86077 Pozzilli, Italy; marialaura.bonaccio@moli-sani.org
4 Department of Agricultural Sciences, University of Naples Federico II, 80055 Portici, Italy; paola.vitaglione@unina.it
* Correspondence: justyna.godos@gmail.com; Tel./Fax: +39-0954781187
† These authors contributed equally to this work.

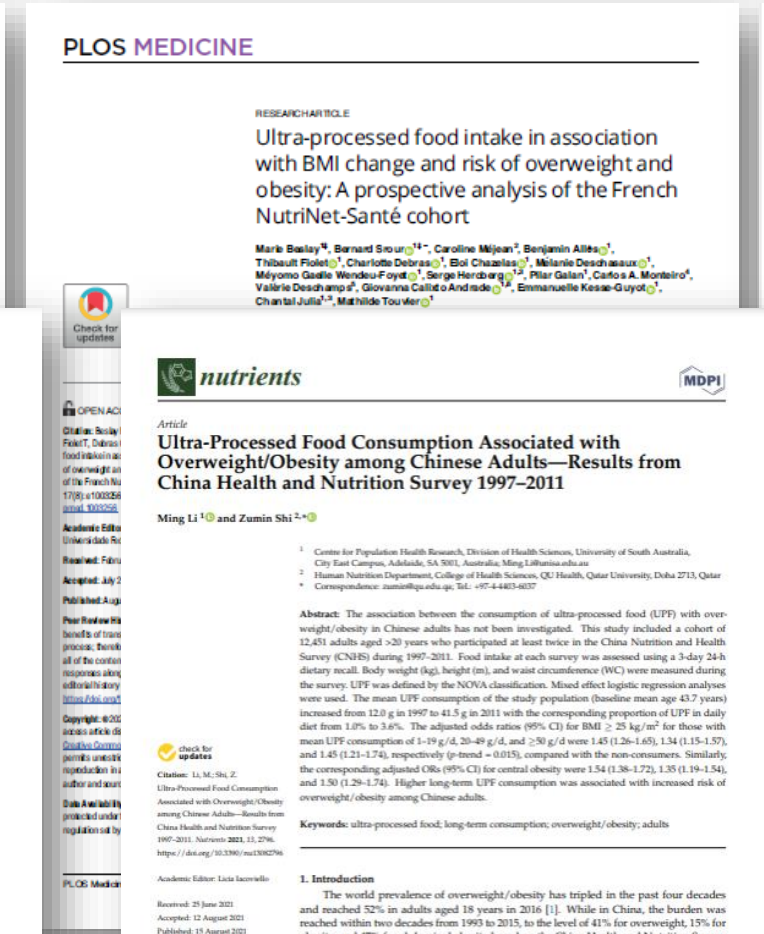
Abstract: Excessive consumption of ultra-processed foods (UPFs), as described by the NOVA classification system, represents a potential threat to human health. The nutritional composition of UPFs may explain their observed adverse effects. The present study aimed to provide a quantitative meta-analysis of nationally representative surveys on the consumption of UPFs and the dietary/nutrient

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

Meta-análise de dados de 13 países (Austrália, Brasil, Canadá, Chile, Colômbia, França, Itália, Coréia, México, Portugal, Taiwan, Reino Unido e EUA) mostra que o aumento do consumo de alimentos ultraprocessados está associado a um declínio da qualidade geral do perfil de nutrientes da dieta

Estudos de coorte avaliando a associação entre alimentos ultraprocessados e obesidade, sobrepeso e adiposidade visceral

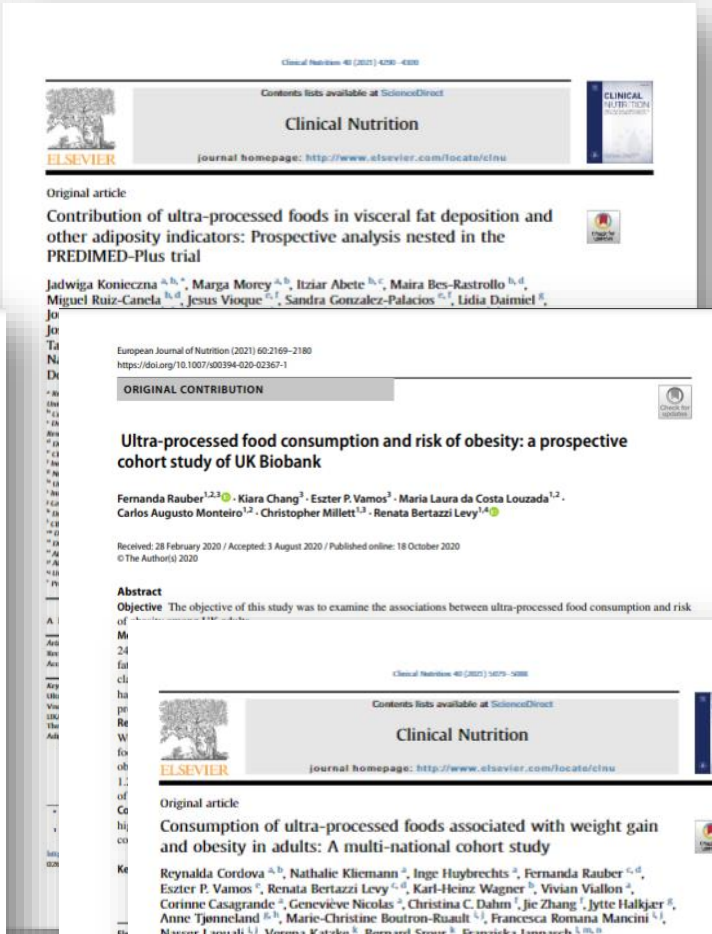
Ultraprocessed food consumption and risk of overweight and obesity: the University of Navarra Follow-Up (SUN) cohort study[1,2]



PLOS MEDICINE

RESEARCH ARTICLE

Ultra-processed food intake in association with BMI change and risk of overweight and obesity: A prospective analysis of the French NutriNet-Santé cohort



Clinical Nutrition

Original article

Contribution of ultra-processed foods in visceral fat deposition and other adiposity indicators: Prospective analysis nested in the PREDIMED-Plus trial

Public Health Nutrition

Ultra-processed foods, incident overweight and obesity, and longitudinal changes in weight and waist circumference: the Brazilian Longitudinal Study of Adult Health (ELSA-Brasil)

nutrients

Article

Ultra-Processed Food Consumption Associated with Overweight/Obesity among Chinese Adults—Results from China Health and Nutrition Survey 1997–2011

European Journal of Nutrition (2021) 60:2169–2180

ORIGINAL CONTRIBUTION

Ultra-processed food consumption and risk of obesity: a prospective cohort study of UK Biobank

Clinical Nutrition

Original article

Consumption of ultra-processed foods associated with weight gain and obesity in adults: A multi-national cohort study

Estudos de coorte avaliando a associação entre alimentos ultraprocessados e diabetes tipo 2

Contents lists available at ScienceDirect

Clinical Nutrition

journal homepage: http://www.elsevier.com/locate/clnu

Original article

Ultra-processed food consumption and type 2 diabetes incidence: A prospective cohort study

Renata B. Levy [a, b, d, *], Fernanda Rauber [a, b, c], Kiara Chang [d], Carlos A. Monteiro [b, c], Christopher Millett [a, b, d], Eszter P. V

ARTICLE INFO

SUMMARY

1. Introduction

Research

JAMA Internal Medicine | Original Investigation

Ultraprocessed Food Consumption and Risk of Type 2 Diabetes Among Participants of the NutriNet-Santé Prospective Cohort

Bernard Srour, PharmD, MPH, PhD; Léopold K. Fezeu, MD, PhD; Emmanuelle Kesse-Guyot, MSc, PhD; Benjamin Allès, PhD; Charlotte Debras, MSc; Nathalie Druesne-Pecollo, PhD; Eloi Chazelas, MSc; Mélanie Deschasaux, MSc, PhD; Serge Hercberg, MD, PhD; Pilar Galan, MD, PhD; Carlos A. Monteiro, MD, PhD; Chantal Julia, MD, MPH, PhD; Mathilde Touvier, PhD, MSc, MPH

Supplemental content

IMPORTANCE Ultraprocessed foods (UPF) are widespread in Western diets. Their consumption has been associated in recent prospective studies with increased risks of all-cause mortality and chronic diseases such as cancer, cardiovascular diseases, hypertension, and dyslipidemia; however, data regarding diabetes are lacking.

OBJECTIVE To assess the associations between consumption of UPF and risk of type 2 diabetes (T2D).

DESIGN, SETTING, AND PARTICIPANTS In this population-based prospective cohort study, 104 707 participants aged 18 years or older from the French NutriNet-Santé cohort (2009-2019) were included. Dietary intake data were collected using repeated 24-hour dietary records (5.7 per participant on average), designed to register participants' usual consumption for more than 3500 different food items. These were categorized according to their degree of processing by the NOVA classification system.

MAIN OUTCOMES AND MEASURES Associations between UPF consumption and risk of T2D were assessed using cause-specific multivariable Cox proportional hazard models adjusted for known risk factors (sociodemographic, anthropometric, lifestyle, medical history, and nutritional factors).

RESULTS A total of 104 707 participants (21 800 [20.8%] men and 82 907 [79.2%] women) were included. Mean (SD) baseline age of participants was 42.7 (14.5) years. Absolute T2D rates in the lowest and highest UPF consumers were 113 and 166 per 100 000 person-years, respectively. Consumption of UPF was associated with a higher risk of T2D (multi-adjusted hazard ratio [HR] for an absolute increment of 10 in the percentage of UPF in the diet, 1.15; 95% CI, 1.06-1.25; median follow-up, 6.0 years; 582 252 person-years; 821 incident cases). These results remained statistically significant after adjustment for several markers of the nutritional quality of the diet, for other metabolic comorbidities (HR, 1.13; 95% CI, 1.03-1.23), and for weight change (HR, 1.13; 95% CI, 1.01-1.27). The absolute amount of UPF consumption (grams per day) was consistently associated with T2D risk, even when adjusting for unprocessed or minimally processed food intake (HR for a 100 g/d increase, 1.05; 95% CI, 1.02-1.08).

CONCLUSIONS AND RELEVANCE In this large observational prospective study, a higher proportion of UPF in the diet was associated with a higher risk of T2D. Even though these results need to be confirmed in other populations and settings, they provide evidence to support efforts by public health authorities to recommend limiting UPF consumption.

TRIAL REGISTRATION ClinicalTrials.gov Identifier: NCT03335644

Author Affiliations: Paris 13 University, Inserm, Inra, Cnam, Nutritional Epidemiology Research Team (EREN), Epidemiology and Statistics Research Center-University of Paris (CRESS), 93017 Bobigny, France (Srour, Fezeu, Kesse-Guyot, Allès, Debras, Druesne-Pecollo, Chazelas, Deschasaux, Hercberg, Galan, Julia, Touvier); Public Health Department, Avicenne Hospital, AP-HP, Bobigny, France (Hercberg, Julia); Department of Nutrition, School of Public Health, University of São Paulo, Av. Dr Arnaldo 715, São Paulo 01246-904, Brazil (Monteiro).

Corresponding Author: Bernard Srour, PharmD, MPH, PhD, Equipe de Recherche en Epidémiologie Nutritionnelle (EREN), Inserm (U1153), Inra(U1125), Cnam, Université Paris 13 Centre de Recherche en Epidémiologie et Statistiques Université de Paris, SMBH Paris 13, 74 rue Marcel Cachin F-93017 Bobigny Cedex, France (b.srour@eren.smbh.univ-paris13.fr).

JAMA Intern Med. 2020;180(2):283-291. doi:10.1001/jamainternmed.2019.5942
Published online December 16, 2019.

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Duan et al. BMC Medicine (2022) 20:7
https://doi.org/10.1186/s12916-021-02200-4

BMC Medicine

RESEARCH ARTICLE Open Access

Ultra-processed food and incident type 2 diabetes: studying the underlying consumption patterns to unravel the health effects of this heterogeneous food category in the prospective Lifelines cohort

Ming-Jie Duan[1*†], Petra C. Vinke[2†], Gerjan Navis[1], Eva Corpeleijn[2] and Louise H. D

Abstract

Background: The overall consumption of ultra-processed food (UPF) has previous diabetes. However, due to the substantial heterogeneity of this food category, in t composition and product type, it remains unclear whether previous results apply t patterns of UPF.

Methods: Of 70,421 participants (35–70 years, 58.6% women) from the Lifelines co assessed with a food frequency questionnaire. UPF was identified according to the component analysis (PCA) was performed to derive UPF consumption patterns. Th adherence to UPF consumption patterns with incidence of type 2 diabetes were st analyses adjusted for age, sex, diet quality, energy intake, alcohol intake, physical a smoking status, and educational level.

Results: During a median follow-up of 41 months, a 10% increment in UPF consur 25% higher risk of developing type 2 diabetes (1128 cases; OR 1.25 [95% CI 1.16, 1. UPF consumption patterns. A pattern high in cold savory snacks (OR 1.16 [95% CI warm savory snacks (OR 1.15 [95% CI 1.08, 1.21]) were associated with an increase a pattern high in traditional Dutch cuisine was not associated with type 2 diabetes 1.14]), while a pattern high in sweet snacks and pastries was inversely associated w (OR 0.82 [95% CI 0.76, 0.89]).

Conclusions: The heterogeneity of UPF as a general food category is reflected by between four distinct UPF consumption patterns and incident type 2 diabetes. For research is encouraged to further clarify how different UPF consumption patterns

Keywords: Dietary pattern, Epidemiology, Nutrition, Type 2 diabetes, Ultra-process

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†Ming-Jie Duan and Petra C. Vinke contributed equally to this work.
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Full list of author information is available at the end of the article

BMC

Contents lists available at ScienceDirect

Clinical Nutrition

journal homepage: http://www.elsevier.com/locate/clnu

Original article

Ultra-processed foods and type-2 diabetes risk in the SUN project: A prospective cohort study

María Llavero-Valero [a, b], Javier Escalada-San Martín [b, c, d], Miguel A. Martínez-González [a, c, d, e], Francisco Javier Basterra-Gortari [a, d, f], Carmen de la Fuente-Arrillaga [a, c, d], Maira Bes-Rastrollo [a, c, d, *]

ARTICLE INFO

SUMMARY

1. Introduction

Estudos de coorte avaliando a associação entre alimentos ultraprocessados e hipertensão

British Journal of Nutrition (2021), 126, 600–611
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doi:10.1017/S0007114520004432

Ultraprocessed beverages and processed meats increase the incidence of hypertension in Mexican women

Adriana Monge[1], Daniela Silva Canella[2], Nancy López-Olmedo[1], Martín Lajous[1,3], Adrian Cortés-Valencia[1] and Dalia Stern[4]*

[1]Center for Research on Population Health, National Institute of Public Health, 62100, Cuernavaca, Mexico
[2]Department of Applied Nutrition, Institute of Nutrition, Rio de Janeiro State University, Rio de Janeiro, 20550-900, Brazil
[3]Department of Global Health and Population, Harv
[4]CONACyT-Center for Research on Population Healt

(Submitted 10 August 2020 – Final revision received 21 October 2

British Journal of Nutrition

Abstract

Higher intake of ultraprocessed foods (UPF), which have
incidence of non-communicable diseases. Yet, its associat
income countries (LMIC). We aimed to estimate the associ
and incident hypertension in a prospective cohort study. We
aged ≥25 years at baseline. We assessed baseline usual dieta
a degree of food processing classification system. UPF and U
total energy intake. Hypertension was self-reported. We est
2-2 years, we identified 5752 incident cases of hypertension.
8·9) % solid, 6·4 (sd 4·8) % liquid). Comparing extreme categ
incident hypertension (IRR 0·96, 95 % CI 0·79, 1·16, IRR 0·91
associated with increased hypertension (IRR 1·52, 95 % CI 1·
and processed meats may help in managing hypertension

Key words: Ultraprocessed foods; Hypertension; Die

High blood pressure is a major public health proble
remains as one of the leading causes of death and di
worldwide[1]. High blood pressure is also a risk factor f
and non-CVD such as cancer[2]. However, there are dis
in low- and middle-income countries (LMIC), where prev
is higher and control of high blood pressure is worse co
with high-income countries (HIC). From 2000 to 2010, the
lence of hypertension decreased by 2·6 % in HIC but in
by 7·7 % in LMIC. During the same period, the propor
hypertension awareness, treatment, and control increas
stantially in HIC. In contrast, hypertension awareness an
ment increased less in LMIC, and hypertension contr
slightly decreased[3,4]. Therefore, it is urgent to identify in
tion strategies that could help prevent and control the
in LMIC. According to the 2019 Global Burden of Di

Abbreviations: HIC, high-income countries; IRR, incidence rate r
sweetened beverage; UPF, ultraprocessed foods.

* Corresponding author: Dalia Stern, email dalia.stern@insp.mx

Public Health Nutrition: 24(13), 4071–4079
doi:10.1017/S1368980020002074

Food processing and risk of hypertension: Cohort of Universities of Minas Gerais, Brazil (CUME Project)

Katiusse Rezende-Alves[1], Helen Hermana Miranda Hermsdorff[2], Aline Elizabeth da Silva Miranda[3], Aline Cristine Souza Lopes[4], Josefina Bressan[2] and Adriano Marçal Pimenta[3,*]

[1]Department of Medicine and Nursing, Federal University of Viçosa, Viçosa, MG, Brazil; [2]Department of Nutrition and Health, Federal University of Viçosa, Viçosa, MG, Brazil; [3]Department of Maternal-Child Nursing and Public Health, School of Nursing, Federal University of Minas Gerais, Belo Horizonte, MG, Brazil; [4]Department of Nutrition, School of Nursing, Federal University of Minas Gerais, Belo Horizonte, MG, Brazil

Submitted 18 December 2019; Final revision received 22 May 2020; Accepted 2 June 2020; First published online 6 August 2020

Public Health Nutrition

Abstract

Objective: To analyse the association between food consumption according to the degree of processing and incidence of hypertension in CUME project participants.
Design: Longitudinal study in which food consumption was evaluated according to the percentage contribution of daily energetic intake (%/d) of each NOVA classification group (unprocessed/minimally processed foods and culinary preparations (U/MPF&CP); processed foods and ultra-processed foods (UPF)). Hypertension was defined according to American College of Cardiology/American Heart Association (ACC/AHA) criteria. Adjusted relative risks (RR) and their 95% confidence intervals (95 % CI) were estimated by Poisson regression models with robust variances.
Setting: Brazil.
Participants: 1221 graduates classified as non-hypertensive at baseline and monitored for 2 years.
Results: Daily energetic percentage from each group according to degree of processing was 64·3 (SD 12)% for U/MPF&CP; 9·9 (SD 5·8)% for processed foods and 25·8 (SD 11)% for UPF. Incidence of hypertension was high (152/1000 person-years; *n* 113, 195/1000 person-years in males and *n* 257, 158/1000 person-years in females). After adjusting for potential confounders, participants in the upper quintile of daily energetic intake of U/MPF&CP presented a reduced risk of hypertension (RR: 0·72; 95 % CI 0·52, 0·98), while those in the upper quintile of daily energetic intake of UPF presented an increased risk of the outcome (RR: 1·35; 95 % CI 1·01, 1·81).
Conclusions: In this prospective cohort of Brazilian middle-aged adult university graduates, the highest consumptions of U/MPF&CP and UPF were associated with, respectively, reduced and increased risk of hypertension. Additional longitudinal studies are needed to confirm our results.

Keywords
Hypertension
Food consumption
Ultra-processed food
Adults

Hypertension is considered a public health problem worldwide, affecting about 22 % of adults aged 18 years old and older[1]. Besides its high magnitude, hypertension is the most important risk factor for CVD, which are the leading cause of death worldwide[2]. Hypertension is estimated to be responsible for at least 45 % of deaths related to ischemic heart disease and 51 % related to cerebrovascular disease[3].

In Brazil, the National Health Survey showed that the prevalence of hypertension in 2013 was 32·5 % in the adult population (31·7 % women and 33·3 % men)[4]. In addition, CVD accounted for more than 27 % of all deaths in 2017[5].

The primary guidelines for the prevention of hypertension advocate for increased consumption of diets rich in fruits and vegetables; regular practice of physical activity; weight loss; and reduced alcohol intake and smoking as strategies that can contribute to the gradual decrease in blood pressure (BP)[3,6–8].

Recent longitudinal studies have shown that the degree of food processing is associated with chronic diseases[9–12]

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Public Health Nutrition: 24(11), 3352–3360
doi:10.1017/S136898002100094X

Ultra-processed foods, changes in blood pressure and incidence of hypertension: the Brazilian Longitudinal Study of Adult Health (ELSA-Brasil)

Patricia de Oliveira da Silva Scaranni[1], Leticia de Oliveira Cardoso[1], Dora Chor[1], Enirtes Caetano Prates Melo[1], Sheila Maria Alvim Matos[2], Luana Giatti[3], Sandhi Maria Barreto[3] and Maria de Jesus Mendes da Fonseca[1,*]

[1]Department of Epidemiology and Quantitative Methods in Health, National School of Public Health, Oswaldo Cruz Foundation, Street Leopoldo Bulhões, 1,480, Manguinhos, Rio de Janeiro, RJ 21041-210, Brazil; [2]Postgraduate Program in Collective Health, Institute of Collective Health, Universidade Federal da Bahia, Salvador, BA, Brazil; [3]Postgraduate Program in Public Health and School of Medicine & Clinical Hospital, Universidade Federal de Minas Gerais, Belo Horizonte, MG, Brazil

Submitted 17 June 2020; Final revision received 13

Abstract

Objective: To estimate changes in blo
sion associated with consumption of u
servants at a 4-year follow-up.
Design: Longitudinal analysis of the EL
baseline. We applied the FFQ at the bas
of processing, using the NOVA classifi
stolic blood pressure (DBP) were meas
follow-up (2012–2014). Incidence
SBP ≥ 140 mmHg or DBP ≥ 90 mmH
previous 2 weeks. A mixed-effect line
regression model were used to estim
and, respectively, changes in blood pr
Setting: Brazil.
Participants: Civil servants of Brazili
(*n* 8754), aged 35–74 years at baseline
Results: UPF consumption contribu
consumed. After adjustment, participa
23 % greater risk of developing hy
than those with low UPF consumption.
sumption and changes in blood pressu
Conclusions: The higher the UPF cons
adults. Reducing UPF consumption
prevent hypertension.

In recent decades, diets began to shift towards
consumption of ultra-processed foods (UPF) a
natural or minimally processed foods[1]. At the
the burden of CVD and mortality related to
eating habits is high and increasing worldwide
Consumption of UPF used to be limited to hi
countries, but such diets have now extended
and low-income countries[1]. These products'
ness goes beyond longer shelf life; their pres

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ORIGINAL ARTICLE

Ultra-Processed Food Consumption and the Incidence of Hypertension in a Mediterranean Cohort: The Seguimiento Universidad de Navarra Project

Raquel de Deus Mendonça[1–3], Aline Cristine Souza Lopes[2], Adriano Marçal Pimenta[1,4], Alfredo Gea[1,5,6], Miguel Angel Martinez-Gonzalez[1,5–7], and Maira Bes-Rastrollo[1,5,8]

BACKGROUND
Some available evidence suggests that high consumption of ultra-processed foods (UPFs) is associated with a higher risk of obesity. Collectively, this association and the nutritional characteristics of UPFs suggest that UPFs might also be associated with hypertension.

METHODS
We prospectively evaluated the relationship between UPF consumption and the risk of hypertension in a prospective Spanish cohort, the Seguimiento Universidad de Navarra project. We included 14,790 Spanish adult university graduates who were initially free of hypertension at baseline who were followed for a mean of 9.1 years (SD, 3.9 years; total person-years: 134,784). UPF (industrial formulations of chemical compounds which, beyond substances of common culinary use such as salt, sugar, oils, and fats, include substances also derived from foods but not used in culinary preparations) consumption was assessed using a validated semi-quantitative 136-item food-frequency questionnaire. Cox proportional hazards models were used to estimate adjusted hazard ratios (HRs) and 95% confidence intervals (CIs) for hypertension incidence.

RESULTS
During follow-up, 1,702 incident cases of hypertension were identified. Participants in the highest tertile of UPF consumption had a higher risk of developing hypertension (adjusted HR, 1.21; 95% CI, 1.06, 1.37; *P* for trend = 0.004) than those in the lowest tertile after adjusting for potential confounders.

CONCLUSIONS
In this large prospective cohort of Spanish middle-aged adult university graduates, a positive association between UPF consumption and hypertension risk was observed. Additional longitudinal studies are needed to confirm our results.

Keywords: blood pressure; feeding food-processing industry; hypertension; prospective studies; SUN cohort.

doi:10.1093/ajh/hpw137

Hypertension accounts for approximately 10.4 million deaths, 208.1 million disability-adjusted life-years, and 7% of the disease burden worldwide.[1,2] Moreover, hypertension is a risk factor for cardiovascular disease and responsible for at least 45% and 51% of deaths due to heart disease and stroke, respectively.[3] The prevalence of hypertension was approximately 22% worldwide in 2014 and 25% in the European region.[1]

Modifiable risk factors for hypertension include an unhealthy diet (consumption of foods containing excess salt and saturated fat and insufficient fruit and vegetables intake), harmful alcohol use, lack of physical activity, and excess weight.[4] In several countries, ultra-processed foods (UPFs) are common sources of salt. According to Monteiro *et al.* UPFs are defined as drink and food products which, beyond substances of common culinary use such as salt, sugar, oils, and fats, include substances also derived from foods but not used in culinary preparation and are ready to eat, drink, or heat.[5–7] They have high amounts of salt, total fat, saturated fat, and trans fat, free sugar, and high energy density, and low fiber and micronutrients content.[8–11]

Consumption of UPFs has been associated with higher risks of overweight/obesity,[12] metabolic syndrome in adolescents,[13] and increased total cholesterol and low-density lipoprotein cholesterol levels in children.[14] Collectively, the nutritional characteristics of UPFs and the association

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Estudos de coorte avaliando a associação entre alimentos ultraprocessados e doenças cardiovasculares

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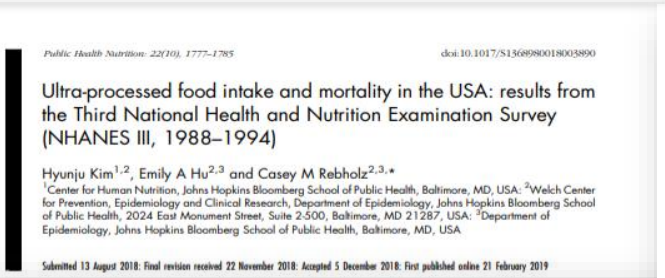
International Journal of Behavioral Nutrition and Physical Activity

RESEARCH Open Access

Association of ultra-processed food consumption with cardiovascular mortality in the US population: long-term results from a large prospective multicenter study



Public Health Nutrition: 22(10), 1777–1785 doi:10.1017/S1368980018003890

Ultra-processed food intake and mortality in the USA: results from the Third National Health and Nutrition Examination Survey (NHANES III, 1988–1994)

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Submitted 13 August 2018: Final revision received 22 November 2018: Accepted 5 December 2018: First published online 21 February 2019

RESEARCH

OPEN ACCESS

Ultra-processed food intake and risk of cardiovascular disease: prospective cohort study (NutriNet-Santé)

Bernard Srour,[1] Léopold K Fezeu,[1] Emmanuelle Kesse-Guyot,[1] Benjamin Allès,[1] Caroline Méjean,[2] Roland M Andrianasolo,[1] Eloi Chazelas,[1] Mélanie Deschasaux,[1] Serge Hercberg,[1,3] Pilar Galan,[1] Carlos A Monteiro,[4] Chantal Julia,[1,3] Mathilde Touvier[1]

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ABSTRACT

OBJECTIVE

To assess the prospective associations between consumption of ultra-processed foods and risk of cardiovascular diseases.

risk of overall cardiovascular disease (1409 cases; hazard ratio for an absolute increment of 10 in the percentage of ultra-processed foods in the diet 1.12 (95% confidence interval 1.05 to 1.20); P<0.001, 518 208 person years, incidence rates in high consumers of ultra-processed foods (fourth quarter)

BMJ: first published as 10.1136/bmj.l4451 on 29 M

Ultra-Processed Foods and Incident Cardiovascular Disease in the Framingham Offspring Study

Filippa Juul, MS, PhD,* Georgeta Vaidean, MD, MPH, PhD,† Yong Lin, PhD,‡,§ Andrea L. Deierlein, MS, MPH, PhD,‖ Niyati Parekh, MS, PhD, FAHA¶,#

ABSTRACT

BACKGROUND Ultra-processed foods provide 58% of total energy in the U.S. diet, yet their association with cardiovascular disease (CVD) remains underdefined.

OBJECTIVES The authors investigated the associations between ultra-processed foods and CVD incidence and mortality in the prospective Framingham Offspring Cohort.

METHODS The analytical sample included 3,003 adults free from CVD with valid dietary data at baseline. Data on diet, measured by food frequency questionnaire, anthropometric measures, and sociodemographic and lifestyle factors were collected quadrennially from 1991 to 2008. Data regarding CVD incidence and mortality were available until 2014 and 2017, respectively. Ultra-processed foods were defined according to the NOVA framework. The authors used Cox proportional hazards models to determine the multivariable association between ultra-processed food intake (energy-adjusted servings per day) and incident hard CVD, hard coronary heart disease (CHD), overall CVD, and CVD mortality. Multivariable models were adjusted for age, sex, education, alcohol consumption, smoking, and physical activity.

RESULTS During follow-up (1991 to 2014/2017), the authors identified 253, 163, and 648 cases of incident hard CVD, hard CHD, and overall CVD, respectively. On average, participants consumed 7.5 servings per day of ultra-processed foods at baseline. Each additional daily serving of ultra-processed foods was associated with a 7% (95% confidence interval [CI]: 1.03 to 1.12), 9% (95% CI: 1.04 to 1.15), 5% (95% CI: 1.02 to 1.08), and 9% (95% CI: 1.02 to 1.16) increase in the risk of hard CVD, hard CHD, overall CVD, and CVD mortality, respectively.

CONCLUSIONS The current findings support that higher consumption of ultra-processed foods is associated with increased risk of CVD incidence and mortality. Although additional research in ethnically diverse populations is warranted, these findings suggest cardiovascular benefits of limiting ultra-processed foods. (J Am Coll Cardiol 2021;77:1520–31) © 2021 by the American College of Cardiology Foundation.

Cardiovascular diseases (CVDs) remain a leading cause of chronic disability and death worldwide (1). Poor diet is a major modifiable CVD risk factor and represents a critical target of cardiovascular prevention efforts (2). Ultra-processed foods (i.e., highly processed industrial formulations made with little or no whole foods) provide 58% of daily calories in the average U.S. diet and are

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See corresponding article on page 428.

Ultra-processed food consumption is associated with increased risk of all-cause and cardiovascular mortality in the Moli-sani Study

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ABSTRACT

Background: Consumption of ultra-processed food (UPF) is gaining growing attention in relation to disease/mortality risk, but less is known on the main nutritional factors or biological mechanisms potentially underlying such associations.

Objectives: We aimed to assess the association between UPF and mortality risk in a large sample of the Italian adult population and test which nutritional factors were on the pathway of this relation. Established risk factors for cardiovascular disease (CVD) were analyzed as potential biological mechanisms linking UPF to mortality.

Methods: Longitudinal analysis was conducted on 22,475 men and women (mean ± SD age: 55 ± 12 y) recruited in the Moli-sani Study (2005–2010, Italy) and followed for 8.2 y. Food intake was assessed using a semiquantitative FFQ. UPF was defined using the NOVA classification according to degree of processing, and UPF intakes were categorized as quartiles of the ratio (%) of UPF (g/d) to total food consumed (g/d).

Results: Individuals reporting the highest intake of UPF (Q4, >14.6% of total food), as opposed to the lowest (Q1, UPF <6.6%), experienced increased risks of CVD mortality (HR: 1.58; 95% CI: 1.23, 2.03), death from ischemic heart disease (IHD)/cerebrovascular disease (HR: 1.52; 95% CI: 1.10, 2.09), and all-cause mortality (HR: 1.26; 95% CI: 1.09, 1.46). High sugar content explained 36.3% of the relation of UPF with IHD/cerebrovascular mortality, whereas other nutritional factors (e.g., saturated fats) were unlikely to be on the pathway. Biomarkers of renal function accounted for 20.1% of the association of UPF with all-cause mortality, and 12.0% for that of UPF with CVD mortality.

Conclusions: A high proportion of UPF in the diet was associated with increased risk of CVD and all-cause mortality, partly through its high dietary content of sugar. Some established biomarkers of CVD risk were likely to be on the pathway of such associations. These findings should serve as an incentive for limiting consumption of UPF, and encouraging natural or minimally processed foods, as several national nutritional policies recommend. *Am J Clin Nutr* 2021;113:446–455.

Supported in part by Italian Ministry of Health grant GR-2013-02356060 (to MB), the HYPERCAN Study Italian Association for Cancer Research (AIRC) grant AIRC "5xMILLE" number 12237 (to LI), POR FESR 2014-2020: DD n. 459 27/11/2018. SATIN: Sviluppo di Approcci Terapeutici INnovativi per patologie neoplastiche resistenti ai trattamenti, and European Commission Seventh Framework Programme FP7/2007-2013 grant HEALTH-F2-2011-278913 (to LI as a partner of BiomarCaRE). The enrolment phase of the Moli-sani Study was supported by unrestricted research grants from Pfizer Foundation (Rome, Italy), Italian Ministry of University and Research (MIUR, Rome, Italy)—Programma Triennale di Ricerca decree 1588, and Instrumentation Laboratory, Milan, Italy. The follow-up phase of the Moli-sani Study (assessment of incident cases) was partially supported by AIRC "5xMILLE" (HYPERCAN Study, number 12237) and the Italian Ministry of Health (PI GdG, CoPI SC; grant number RF-2018-12367074). MB was supported by a Fondazione Umberto Veronesi Fellowship. SC was the recipient of a Fondazione Umberto Veronesi travel grant.

The funders had no role in study design; the collection, analysis, and interpretation of data; nor in the writing of the manuscript or in the decision to submit the manuscript for publication. All authors were and are independent from the funders.

Supplemental Figure 1, Supplemental Methods, Supplemental Tables 1 and 2, and Supplemental Appendix 1 are available from the "Supplementary data" link in the online posting of the article and from the same link in the online table of contents at https://academic.oup.com/ajcn/.

The Moli-sani Study Investigators are listed in Supplemental Appendix 1.

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Abbreviations used: CVD, cardiovascular disease; ICD, International Classification of Diseases; IHD, ischemic heart disease; Lp(a), lipoprotein a; MDS, Mediterranean Diet Score; UPF, ultra-processed food.

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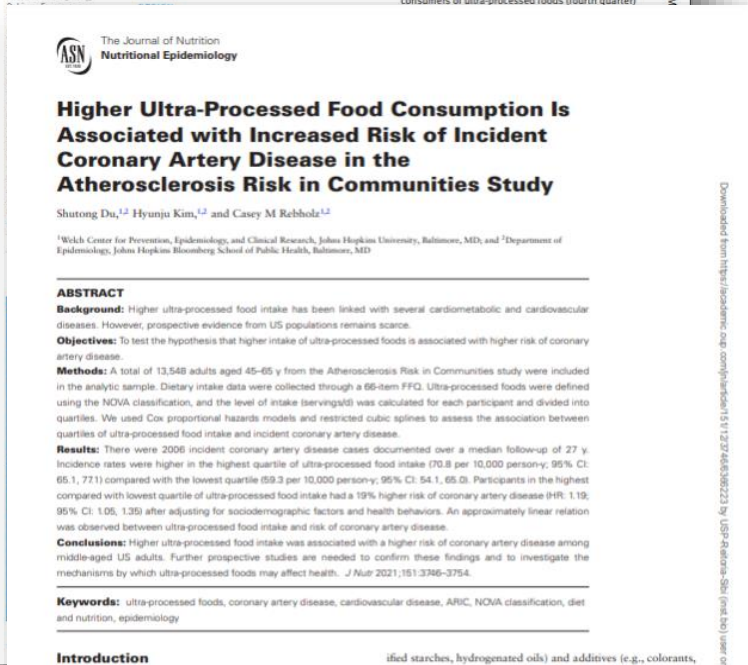
446 *Am J Clin Nutr* 2021;113:446–455. Printed in USA. © The Author(s) 2020. Published by Oxford University Press on behalf of the



The Journal of Nutrition
Nutritional Epidemiology

Higher Ultra-Processed Food Consumption Is Associated with Increased Risk of Incident Coronary Artery Disease in the Atherosclerosis Risk in Communities Study

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ABSTRACT

Background: Higher ultra-processed food intake has been linked with several cardiometabolic and cardiovascular diseases. However, prospective evidence from US populations remains scarce.

Objectives: To test the hypothesis that higher intake of ultra-processed foods is associated with higher risk of coronary artery disease.

Methods: A total of 13,548 adults aged 45–65 y from the Atherosclerosis Risk in Communities study were included in the analytic sample. Dietary intake data were collected through a 66-item FFQ. Ultra-processed foods were defined using the NOVA classification, and the level of intake (servings/d) was calculated for each participant and divided into quartiles. We used Cox proportional hazards models and restricted cubic splines to assess the association between quartiles of ultra-processed food intake and incident coronary artery disease.

Results: There were 2006 incident coronary artery disease cases documented over a median follow-up of 27 y. Incidence rates were higher in the highest quartile of ultra-processed food intake (70.8 per 10,000 person-y; 95% CI: 65.1, 77.1) compared with the lowest quartile (59.3 per 10,000 person-y; 95% CI: 54.1, 65.0). Participants in the highest compared with lowest quartile of ultra-processed food intake had a 19% higher risk of coronary artery disease (HR: 1.19; 95% CI: 1.05, 1.35) after adjusting for sociodemographic factors and health behaviors. An approximately linear relation was observed between ultra-processed food intake and risk of coronary artery disease.

Conclusions: Higher ultra-processed food intake was associated with a higher risk of coronary artery disease among middle-aged US adults. Further prospective studies are needed to confirm these findings and to investigate the mechanisms by which ultra-processed foods may affect health. *J Nutr* 2021;151:3746–3754.

Keywords: ultra-processed foods, coronary artery disease, cardiovascular disease, ARIC, NOVA classification, diet and nutrition, epidemiology

Introduction

Cardiovascular disease is the leading cause of death worldwide, accounting for more than 17 million deaths each year (1). In the United States, cardiovascular disease remains a major cause of growing medical expenditures and health disparities. Despite prevention and treatment efforts over the last few decades, the prevalence of cardiovascular disease continues to grow, with a projection of nearly half of the US population developing cardiovascular disease by 2035 (2). A large proportion of cardiovascular disease cases are attributed to modifiable lifestyle risk factors, including diet (3).

Ultra-processed foods are defined as food and drink products formulated through industrial processes, and they generally contain nonculinary substances (e.g., hydrolyzed protein, modified starches, hydrogenated oils) and additives (e.g., colorants, nonsugar sweeteners, emulsifiers, humectants). Ultra-processed foods usually contain high amounts of refined carbohydrates, saturated fat, salt, and sugar, and are low in fiber and vitamins (4). Many of these nutritional factors have been linked to increased risk of cardiometabolic diseases (5). In addition to the poor nutritional quality of ultra-processed foods, the chemical and physical alterations they undergo, along with compounds that are either generated or added during the process, are believed to pose negative health effects (6). However, due to their hyperpalatable, inexpensive, and accessible nature, the consumption of ultra-processed foods has drastically increased over the last few decades. According to a nationwide cross-sectional study (NHANES), ultra-processed food consumption contributes to as high as 60% of total energy intake in the

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First published online September 7, 2021; doi: https://doi.org/10.1093/jn/nxab285.

3746

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Estudos de coorte avaliando a associação entre alimentos ultraprocessados e câncer

RESEARCH

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Consumption of ultra-processed foods and cancer risk: results from NutriNet-Santé prospective cohort

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Accepted: 10 January 2018

ABSTRACT

OBJECTIVE
To assess the prospective associations between consumption of ultra-processed food and risk of cancer.

DESIGN
Population based cohort study.

SETTING AND PARTICIPANTS
104 980 participants aged at least 18 years (median age 42.8 years) from the French NutriNet-Santé cohort (2009-17). Dietary intakes were collected using repeated 24 hour dietary records, designed to register participants' usual consumption for 3300 different food items. These were categorised according to their degree of processing by the NOVA classification.

MAIN OUTCOME MEASURES
Associations between ultra-processed food intake and risk of overall, breast, prostate, and colorectal cancer assessed by multivariable Cox proportional hazard models adjusted for known risk factors.

RESULTS
Ultra-processed food intake was associated with higher overall cancer risk (n=2228 cases; hazard ratio for a 10% increment in the proportion of ultra-processed food in the diet 1.12 (95% confidence interval 1.06 to 1.18); P for trend<0.001) and breast cancer risk (n=739 cases; hazard ratio 1.11 (1.02 to 1.22); P for trend=0.02). These results remained statistically significant after adjustment for several markers of the nutritional quality of the diet (lipid, sodium, and carbohydrate intakes and/or a Western pattern derived by principal component analysis).

CONCLUSIONS
In this large prospective study, a 10% increase in the proportion of ultra-processed foods in the diet was associated with a significant increase of greater than 10% in risks of overall and breast cancer. Further studies are needed to better understand the relative effect of the various dimensions of processing (nutritional composition, food additives, contact materials, and neoformed contaminants) in these associations.

STUDY REGISTRATION
Clinicaltrials.gov NCT03335644.

WHAT IS ALREADY KNOWN ON THIS TOPIC

Ultra-processed foods are often characterised by lower nutritional quality and the presence of additives, substances from packaging in contact with food, and compounds formed during production, processing, and storage

A few studies have observed ultra-processed food intake to be associated with a higher incidence of dyslipidaemia in Brazilian children and higher risks of overweight, obesity, and hypertension in Spanish university students

Although epidemiological data relating to cancer risk are lacking, mechanistic studies suggest potential carcinogenic effects of several components commonly found in ultra-processed foods

WHAT THIS STUDY ADDS

This study assessed the associations between ultra-processed food consumption and risk of cancer in a large prospective cohort

A 10% increase in the proportion of ultra-processed foods in the diet was associated with a significant increase of more than 10% in the risks of overall and breast cancer

If confirmed in other populations and settings, these results suggest that the rapidly increasing consumption of ultra-processed foods may drive an increasing burden of cancer in the next decades

Introduction

Cancer represents a major worldwide burden, with 14.1 million new cases diagnosed in 2012.[1] According to the World Cancer Research Fund/American Institute for Cancer Research, about a third of the most common neoplasms could be avoided by changing lifestyle and dietary habits in developed countries.[2] Therefore, reaching a balanced and diversified diet (along with avoidance of tobacco use and reduction in alcohol intake) should be considered one of the most important modifiable risk factors in the primary prevention of cancer.[3]

At the same time, during the past decades, diets in many countries have shifted towards a dramatic increase in consumption of ultra-processed foods.[4-6] After undergoing multiple physical, biological, and/or chemical processes, these food products are conceived to be microbiologically safe, convenient, highly palatable, and affordable.[7-10] Several surveys (in Europe, the US, Canada, New Zealand, and Brazil) assessing individual food intake, household food expenses, or supermarket sales have suggested that ultra-processed food products contribute to between 25% and 50% of total daily energy intake.[10-18]

This dietary trend may be concerning and deserves investigation. Several characteristics of ultra-processed foods may be involved in causing disease, particularly cancer. Firstly, ultra-processed foods often have a higher content of total fat, saturated fat, and added sugar and salt, along with a lower fibre and vitamin density.[10-17 19] Beyond nutritional composition, neoformed contaminants, some of which have carcinogenic properties (such as acrylamide, heterocyclic amines, and polycyclic aromatic

RESEARCH

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Association of ultra-processed food consumption with colorectal cancer risk among men and women: results from three prospective US cohort studies

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Additional material is published online only. To view please visit the journal online.
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Accepted: 07 June 2022

ABSTRACT

OBJECTIVE
To examine the association between consumption of ultra-processed foods and risk of colorectal cancer among men and women from three large prospective cohorts.

DESIGN
Prospective cohort study with dietary intake assessed every four years using food frequency questionnaires.

SETTING
Three large US cohorts.

PARTICIPANTS
Men (n= 46 341) from the Health Professionals Follow-up Study (1986-2014) and women (n=159 907) from the Nurses' Health Study (1986-2014; n=67 425) and the Nurses' Health Study II (1991-2015; n=92 482) with valid dietary intake measurement and no cancer diagnosis at baseline.

MAIN OUTCOME MEASURE
Association between ultra-processed food consumption and risk of colorectal cancer, estimated using time varying Cox proportional hazards regression models adjusted for potential confounding factors.

RESULTS
3216 cases of colorectal cancer (men, n=1294; women, n=1922) were documented during the 24-28 years of follow-up. Compared with those in the lowest fifth of ultra-processed food consumption, men in the highest fifth of consumption had a 29% higher risk of developing colorectal cancer (hazard ratio for highest versus lowest fifth 1.29, 95% confidence interval 1.08 to 1.53; P for trend=0.01), and the positive association was limited to distal colon cancer (72% increased risk; hazard ratio 1.72, 1.24 to 2.37; P for trend<0.001). These associations remained significant after further adjustment for body mass index or indicators of nutritional quality of the diet (that is, western dietary pattern or dietary quality score). No association was observed between overall ultra-processed food consumption and risk of colorectal cancer among women. Among subgroups of ultra-processed foods, higher consumption of meat/poultry/seafood based ready-to-eat products (hazard ratio for highest versus lowest fifth 1.44, 1.20 to 1.73; P for trend<0.001) and sugar sweetened beverages (1.21, 1.01 to 1.44; P for trend=0.013) among men and ready-to-eat/heat mixed dishes among women (1.17, 1.01 to 1.36; P for trend=0.02) was associated with increased risk of colorectal cancer; yogurt and dairy based desserts were negatively associated with the risk of colorectal cancer among women (hazard ratio 0.83, 0.71 to 0.97; P for trend=0.002).

CONCLUSIONS
In the three large prospective cohorts, high consumption of total ultra-processed foods in men and certain subgroups of ultra-processed foods in men and women was associated with an increased risk of colorectal cancer. Further studies are needed to better understand the potential attributes of ultra-processed foods that contribute to colorectal carcinogenesis.

WHAT IS ALREADY KNOWN ON THIS TOPIC

Accumulating evidence suggests that high consumption of ultra-processed foods is associated with a higher risk of several chronic diseases

Few studies have assessed the association between ultra-processed food intake and colorectal cancer risk, and the findings are mixed owing to limitations in study design and sample sizes

WHAT THIS STUDY ADDS

High consumption of total ultra-processed foods in men and certain subgroups of ultra-processed foods in men and women was associated with an increased risk of colorectal cancer

The findings support the public health importance of limiting certain types of ultra-processed foods for better health outcomes in the population

Introduction

Colorectal cancer is the third most commonly diagnosed malignancy among both men and women in the United States and the second leading cause of death from cancer worldwide.[1 2] Diet has been recognized as an important modifiable risk factor for colorectal cancer.[3] Meanwhile, ultra-processed foods (that is, industrial ready-to-eat or ready-to-heat formulations made of little or no whole foods) now contribute 57% of total daily calories consumed by American adults, which has been continuously increasing in the past two decades.[4] These foods are usually high in added sugar, oils/fats, and refined starch, altering gut microbiota composition unfavorably[5] and contributing to increased risk of weight gain and obesity, an established risk factor for colorectal cancer. Diets high in ultra-processed foods are also usually low in nutrients and bioactive compounds that are beneficial for the prevention of colorectal cancer, such as fiber, calcium, and vitamin D.[6-9] Beyond poor nutrition profiles, ultra-processed foods commonly contain food additives such as dietary emulsifiers and artificial sweeteners, some types of which have been suggested

Estudos de coorte avaliando a associação entre alimentos ultraprocessados e insuficiência renal crônica

Ultraprocessed food consumption and kidney function decline in a population-based cohort in the Netherlands

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ABSTRACT

Background: Ultraprocessing makes food products more convenient, appealing, and profitable. Recent studies show that high ultraprocessed food (UPF) intake is associated with cardiometabolic diseases.

Objectives: The aim of this study is to investigate the association between UPF consumption and risks of kidney function decline in the general population.

Methods: In a prospective, general population–based Lifelines cohort from Northern Netherlands, 78,346 participants free of chronic kidney disease (CKD) at baseline responded to a 110-item FFQ. We used a multivariable regression analysis to study the associations of the proportion (in grams/day) of UPFs in the total diet with a composite kidney outcome [incident CKD or a ≥30% estimated glomerular filtration rate (eGFR) decline relative to baseline] and annual change in eGFR.

Results: On average, 37.7% of total food intake came from UPFs. After 3.6 ± 0.9 years of follow-up, 2470 participants (3.2%) reached the composite kidney outcome. Participants in the highest quartile of UPF consumption were associated with a higher risk of the composite kidney outcome (OR, 1.27; 95% CI, 1.09–1.47; $P = 0.003$) compared with those in the lowest quartile, regardless of their macro- or micronutrient intake or diet quality. Participants in the highest quartile had a more rapid eGFR decline (β, −0.17; 95% CI, −0.23 to −0.11; $P < 0.001$) compared with those in the lowest quartile. Associations were generally consistent across different subgroups.

Conclusions: Higher UPF consumption was associated with a higher risk of a composite kidney outcome (incident CKD or ≥30% eGFR decline) and a more rapid eGFR decline in the general population, independent of confounders and other dietary indices. *Am J Clin Nutr* 2022;116:263–273.

Keywords: ultraprocessed foods, chronic kidney disease, kidney function decline, eGFR change; Lifelines

Introduction

Chronic kidney disease (CKD) is a growing global public health problem that affects 8% to 16% of the population worldwide (1, 2). Lifestyle modification, including a healthy diet, is important to reduce the incidence of CKD and the estimated glomerular filtration rate (eGFR) decline, delay the progression to kidney failure, and reduce the risk of cardiovascular complications (3–8). Adherence to healthy dietary patterns, often rich in plant-based foods, has been associated with a lower risk of developing CKD (9, 10). Conversely, the Western-style diet, characterized by intakes of highly processed and refined foods that contain excessive sugar, salt, and saturated and trans-fatty acids, has been associated with a higher risk of CKD and impaired kidney function (11–13).

The Lifelines initiative has been made possible by subsidies from the Dutch Ministry of Health, Welfare and Sport; the Dutch Ministry of Economic Affairs; the University Medical Center Groningen; Groningen University; and the Provinces in the North of the Netherlands (Drenthe, Friesland, Groningen). This project has received funding from the European Union's Horizon 2020 research and innovation program under the Marie Sklodowska-Curie grant agreement No 754425.

Supplemental Figures 1 and 2 and Supplemental Tables 1–3 are available from the "Supplementary data" link in the online posting of the article and from the same link in the online table of contents at https://academic.oup.com/ajcn/.

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Abbreviations used: BMR, basal metabolic rate; CKD, chronic kidney disease; eGFR, estimated glomerular filtration rate; EI, energy intake; MDS, Mediterranean diet score; UPF, ultraprocessed food.

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nutrients MDPI

Article

Ultra-Processed Food Consumption is Associated with Renal Function Decline in Older Adults: A Prospective Cohort Study

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Abstract: Ultra-processed food (UPF) consumption has been associated with increased risk of cardiovascular risk factors and mortality. However, little is known on the UPF effect on renal function. The aim of this study is to assess prospectively the association between consumption of UPF and renal function decline. This is a prospective cohort study of 1312 community-dwelling individuals aged 60 and older recruited during 2008–2010 and followed up to December 2015. At baseline, a validated dietary history was obtained. UPF was identified according to NOVA classification. At baseline and at follow-up, serum creatinine (SCr) and estimated glomerular filtration rate (eGFR) levels were ascertained and changes were calculated. A combined end-point of renal decline was considered: SCr increase or eGFR decreased beyond that expected for age. Logistic regression with adjustment for potential confounders was performed. During follow-up, 183 cases of renal function decline occurred. The fully adjusted odds ratios (95% CI) of renal function decline across terciles of percentage of total energy intake from UPF were 1.56 (1.02–2.38) for the second tercile, and 1.74 (1.14–2.66) for the highest tercile; *p*-trend was 0.026. High UPF consumption is independently associated with an increase higher than 50% in the risk of renal function decline in Spanish older adults.

Keywords: ultra-processed food; creatinine serum levels; glomerular filtration rate; renal function decline

1. Introduction

Renal function shows a steady decline when ageing [1]. This decline might be increased under different circumstances (such as the presence of cardiovascular risk factors), even leading to the development of a Chronic Kidney Disease (CKD). [2] CKD affects 10% of the world's population [3] and ranks in the top ten non-communicable diseases contributing to disability and premature death [4]. CKD is linked to high health care costs, a poor quality of life, serious adverse health outcomes [5,6] such as cardiovascular disease, renal failure requiring replacement therapy, infection, or depression, as well as mortality [3]. Over the last decade, a 41.5% increase in CKD mortality has been observed worldwide [7]. Therefore, the decline in the renal function has substantial clinical and therapeutic consequences among the elderly, as well as public health relevance.

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Association between consumption of ultra-processed foods and hyperuricemia: TCLSIH prospective cohort study

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KEYWORDS
Ultra-processed foods;
Hyperuricemia;
Cohort study;
Epidemiology

Abstract *Background and aims:* Emerging evidence suggests that consumption of ultra-processed foods (UPF) plays a role in the development of chronic diseases, but evidence of their influence on hyperuricemia is limited. We therefore designed a cohort study to examine whether UPF consumption increase the risk of hyperuricemia in adults.

Methods and results: This was a prospective study (n = 18,444) performed in Tianjin, China from 2013 to 2019. Participants that were aged 18 years and over and with no history of hyperuricemia, were followed up for 1–6 years (median follow up duration = 4.2 years). UPF consumption was assessed by a validated semi quantitative food frequency questionnaire. Hyperuricemia was defined as serum uric acid levels >420 mg/dl. in males and >360 mg/dl. in females. Multivariable Cox proportional hazards regression models were used to assess the association between UPF consumption and the risk of hyperuricemia. Restricted cubic spline regression was used to estimate the dose–response association between UPF consumption and risk of hyperuricemia. During follow up period, the incidence of hyperuricemia was 20.3% in general population (27.7% in males and 13.2% in females). In the final multivariate models, the hazard ratios (95% confidence interval) for hyperuricemia across energy adjusted UPF consumption quartiles were 1.00 (reference), 1.04 (0.94, 1.14), 1.11 (1.01, 1.23), 1.16 (1.05, 1.28) (*p* for trend = 0.02) in general population.

Conclusions: This population based prospective cohort study suggests that increased consumption of UPF is independently associated the risk of hyperuricemia.

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Estudos de coorte avaliando a associação entre alimentos ultraprocessados e cirrose não alcoólica

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Original article

Harmful Diets

Ultra-processed food consumption and the risk of non-alcoholic fatty liver disease in the Tianjin Chronic Low-grade Systemic Inflammation and Health Cohort Study

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Abstract

Background: Growing evidence supports a link between ultra-processed food consumption and human health outcomes. However, the association between ultra-processed food consumption and non-alcoholic fatty liver disease (NAFLD) is not known. We aimed to explore the association between ultra-processed food consumption and risk of NAFLD.

Methods: The prospective study included 16 168 participants aged 18–90 years from the Tianjin Chronic Low-grade Systemic Inflammation and Health (TCLSIH) Cohort Study. Information on ultra-processed food consumption was collected at baseline using a validated food frequency questionnaire. NAFLD was defined as the presence of sonographic fatty liver in the absence of significant alcohol intake (≥210 g/week for men and ≥140 g/week for women, respectively) and other liver diseases. Multivariable Cox proportional hazards models were used to examine the association between ultra-processed food consumption and risk of NAFLD.

Estudos de coorte avaliando a associação entre alimentos ultraprocessados e a doença de Crohn

Clinical Gastroenterology and Hepatology 2022;20:e1323–e1337

Ultra-processed Foods and Risk of Crohn's Disease and Ulcerative Colitis: A Prospective Cohort Study

Chun-Han Lo, Neha Khandpur, Sinara Laurini Rossato, Paul Lochhead, Emily W. Lopes, Kristin E. Burke, James M. Richter, Mingyang Song, Andres Victor Ardisson Korat, Qi Sun, Teresa T. Fung, Hamed Khalili, Andrew T. Chan

JOURNAL ARTICLE ACCEPTED MANUSCRIPT

Intake of ultra-processed foods is associated with an increased risk of Crohn's disease: a cross-sectional and prospective analysis of 187,154 participants in the UK Biobank

Jie Chen, Judith Wellens, Rahul Kalla, Tian Fu, Minzi Deng, Han Zhang, Shuai Yuan, Xiaoyan Wang, Evropi Theodoratou, Xue Li ... Show more

Author Notes

Journal of Crohn's and Colitis, jjac167, https://doi.org/10.1093/ecco-jcc/jjac167

Published: 28 October 2022 **Article history**

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Abstract

Background and Aims

Ultra-processed food (UPF) consumption has been linked to globally increasing incidence and prevalence in chronic diseases including inflammatory bowel diseases (IBD). We aimed to investigate the association between UPF consumption and IBD incidence, prevalence, and IBD-relevant outcomes.

Methods

We performed a cross-sectional and prospective cohort study in 187,854 individuals included in the national UK Biobank using 24-hour dietary recall questionnaires. Multivariable logistic regression and Cox proportional hazard regression were used to examine the association between UPFs and the prevalent, and incidence risk of IBD, respectively.

Results

185,849 participants with a mean age of 56.2 were included with a mean follow-up of 9.84 years. During follow-up, 841 developed IBD (251 Crohn's disease (CD), and 590 ulcerative colitis (UC)). UPF intake in IBD patients was significantly higher (CD: OR 1.94 (95%CI: 1.52 - 2.49, p<0.001); UC: OR 1.39

RESEARCH

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Association of ultra-processed food intake with risk of inflammatory bowel disease: prospective cohort study

Neeraj Narula, Emily C L Wong, Mahshid Dehghan, Andrew Mente, Sumathy Rangarajan, Fernando Lanas, Patricio Lopez-Jaramillo, Priyanka Rohatgi, P V M Lakshmi, Ravi Prasad Varma, Andres Orlandini, Alvaro Avezum, Andreas Wielgosz, Paul Poirier, Majid A Almadi, Yuksel Altuntas, Kien Keat Ng, Jephat Chifamba, Karen Yeates, Thandi Puoane, Rasha Khatib, Rita Yusuf, Kristina Bengtsson Boström, Katarzyna Zatonska, Romaina Iqbal, Liu Weida, Zhu Yibing, Li Sidong

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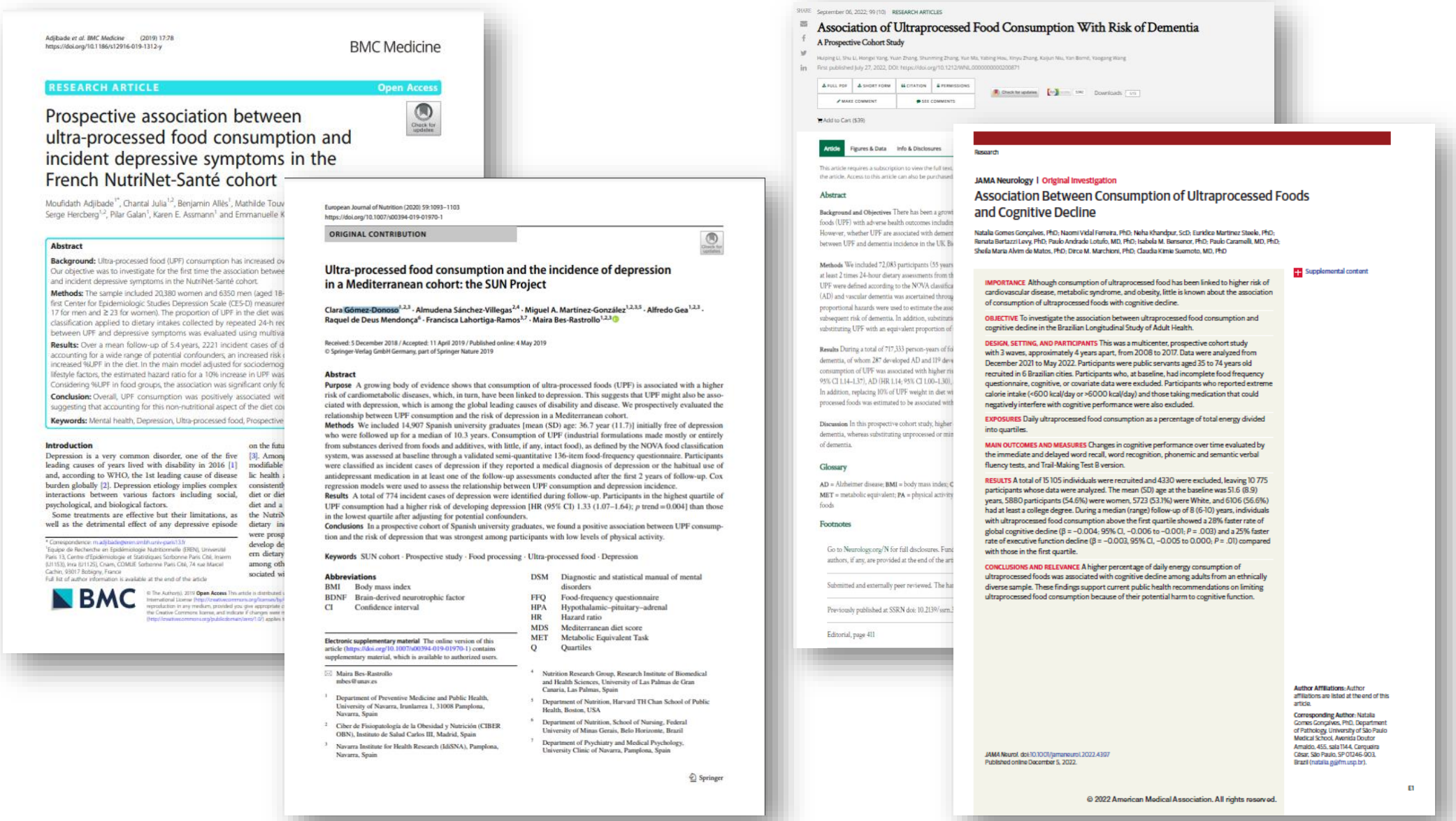
ARTICLE IN PRESS

Clinical Gastroenterology and Hepatology 2022;■:■–■

Food Processing and Risk of Crohn's Disease and Ulcerative Colitis: A European Prospective Cohort Study

Antoine Meyer, Catherine Dong, Corinne Casagrande, Simon S. M. Chan, Inge Huybrechts, Geneviève Nicolas, Fernanda Rauber, Renata Bertazzi Levy, Christopher Millett, Bas Oldenburg, Elisabete Weiderpass, Alicia K. Heath, Tammy Y. N. Tong, Anne Tjønneland, Cecilie Kyrø, Rudolf Kaaks, Verena A. Katzke, Manuela M. Bergman, Domenico Palli, Giovanna Masala, Rosario Tumino, Carlotta Sacerdote, Sandra M. Colorado-Yohar, Maria-Jose Sánchez, Olof Grip, Stefan Lindgren, Robert Luben, Marc J. Gunter, Yahya Mahamat-Saleh, Marie-Christine Boutron-Ruault, and Franck Carbonnel

Estudos de coorte avaliando a associação entre alimentos ultraprocessados e saúde mental



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BMC Medicine

RESEARCH ARTICLE Open Access

Prospective association between ultra-processed food consumption and incident depressive symptoms in the French NutriNet-Santé cohort

Moufidath Adjibade[1*], Chantal Julia[1,2], Benjamin Allès[1], Mathilde Touv
Serge Hercberg[1,2], Pilar Galan[1], Karen E. Assmann[1] and Emmanuelle K

Abstract

Background: Ultra-processed food (UPF) consumption has increased ov
Our objective was to investigate for the first time the association betwee
and incident depressive symptoms in the NutriNet-Santé cohort.

Methods: The sample included 20,380 women and 6350 men (aged 18-
first Center for Epidemiologic Studies Depression Scale (CES-D) measure
17 for men and ≥ 23 for women). The proportion of UPF in the diet was
classification applied to dietary intakes collected by repeated 24-h re
between UPF and depressive symptoms was evaluated using multiva

Results: Over a mean follow-up of 5.4 years, 2221 incident cases of d
accounting for a wide range of potential confounders, an increased risk
increased %UPF in the diet. In the main model adjusted for sociodemog
lifestyle factors, the estimated hazard ratio for a 10% increase in UPF was
Considering %UPF in food groups, the association was significant only fo

Conclusion: Overall, UPF consumption was positively associated wit
suggesting that accounting for this non-nutritional aspect of the diet co

Keywords: Mental health, Depression, Ultra-processed food, Prospective

Introduction

Depression is a very common disorder, one of the five leading causes of years lived with disability in 2016 [1] and, according to WHO, the 1st leading cause of disease burden globally [2]. Depression etiology implies complex interactions between various factors including social, psychological, and biological factors.

Some treatments are effective but their limitations, as well as the detrimental effect of any depressive episode on the futu [3]. Among modifiable lic health consistentl diet or die diet and a the NutriN dietary in were prosp develop de ern dietary among oth sociated wi

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ORIGINAL CONTRIBUTION

Ultra-processed food consumption and the incidence of depression in a Mediterranean cohort: the SUN Project

Clara Gómez-Donoso[1,2,3] · Almudena Sánchez-Villegas[2,4] · Miguel A. Martínez-González[1,2,3,5] · Alfredo Gea[1,2,3] · Raquel de Deus Mendonça[6] · Francisca Lahortiga-Ramos[3,7] · Maira Bes-Rastrollo[1,2,3]

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Abstract

Purpose A growing body of evidence shows that consumption of ultra-processed foods (UPF) is associated with a higher risk of cardiometabolic diseases, which, in turn, have been linked to depression. This suggests that UPF might also be associated with depression, which is among the global leading causes of disability and disease. We prospectively evaluated the relationship between UPF consumption and the risk of depression in a Mediterranean cohort.

Methods We included 14,907 Spanish university graduates [mean (SD) age: 36.7 year (11.7)] initially free of depression who were followed up for a median of 10.3 years. Consumption of UPF (industrial formulations made mostly or entirely from substances derived from foods and additives, with little, if any, intact food), as defined by the NOVA food classification system, was assessed at baseline through a validated semi-quantitative 136-item food-frequency questionnaire. Participants were classified as incident cases of depression if they reported a medical diagnosis of depression or the habitual use of antidepressant medication in at least one of the follow-up assessments conducted after the first 2 years of follow-up. Cox regression models were used to assess the relationship between UPF consumption and depression incidence.

Results A total of 774 incident cases of depression were identified during follow-up. Participants in the highest quartile of UPF consumption had a higher risk of developing depression [HR (95% CI) 1.33 (1.07–1.64); p trend = 0.004] than those in the lowest quartile after adjusting for potential confounders.

Conclusions In a prospective cohort of Spanish university graduates, we found a positive association between UPF consumption and the risk of depression that was strongest among participants with low levels of physical activity.

Keywords SUN cohort · Prospective study · Food processing · Ultra-processed food · Depression

Abbreviations

BMI	Body mass index
BDNF	Brain-derived neurotrophic factor
CI	Confidence interval
DSM	Diagnostic and statistical manual of mental disorders
FFQ	Food-frequency questionnaire
HPA	Hypothalamic–pituitary–adrenal
HR	Hazard ratio
MDS	Mediterranean diet score
MET	Metabolic Equivalent Task
Q	Quartiles

Electronic supplementary material The online version of this article (https://doi.org/10.1007/s00394-019-01970-1) contains supplementary material, which is available to authorized users.

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Association of Ultraprocessed Food Consumption With Risk of Dementia

A Prospective Cohort Study

Huiping Li, Shu Li, Hongxi Yang, Yuan Zhang, Shunming Zhang, Yue Ma, Yabing Hou, Xinyu Zhang, Kaijun Niu, Yan Borné, Yaogang Wang

First published July 27, 2022, DOI: https://doi.org/10.1212/WNL.0000000000200871

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Article Figures & Data Info & Disclosures

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Abstract

Background and Objectives There has been a grow foods (UPF) with adverse health outcomes includin However, whether UPF are associated with dement between UPF and dementia incidence in the UK. Bi

Methods We included 72,083 participants (55 years at least 2 times 24-hour dietary assessments from th UPF were defined according to the NOVA classifica (AD) and vascular dementia was ascertained throug proportional hazards were used to estimate the asso subsequent risk of dementia. In addition, substituti substituting UPF with an equivalent proportion of

Results During a total of 717,333 person-years of fo dementia, of whom 287 developed AD and 119 deve consumption of UPF was associated with higher ris 95% CI 1.14–1.37), AD (HR 1.14; 95% CI 1.00–1.30). In addition, replacing 10% of UPF weight in diet wi processed foods was estimated to be associated with

Discussion In this prospective cohort study, higher dementia, whereas substituting unprocessed or min of dementia.

Glossary

AD = Alzheimer disease; BMI = body mass index; C MET = metabolic equivalent; PA = physical activity foods

Footnotes

Go to Neurology.org/N for full disclosures. Fund authors, if any, are provided at the end of the art

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Editorial, page 411

Research

JAMA Neurology | Original Investigation

Association Between Consumption of Ultraprocessed Foods and Cognitive Decline

Natalia Gomes Gonçalves, PhD; Naomi Vidal Ferreira, PhD; Neha Khandpur, ScD; Euridice Martinez Steele, PhD; Renata Bertazzi Levy, PhD; Paulo Andrade Lotufo, MD, PhD; Isabela M. Bensenor, PhD; Paulo Caramelli, MD, PhD; Sheila Maria Alvim de Matos, PhD; Dirce M. Marchioni, PhD; Claudia Kimie Suemoto, MD, PhD

Supplemental content

IMPORTANCE Although consumption of ultraprocessed food has been linked to higher risk of cardiovascular disease, metabolic syndrome, and obesity, little is known about the association of consumption of ultraprocessed foods with cognitive decline.

OBJECTIVE To investigate the association between ultraprocessed food consumption and cognitive decline in the Brazilian Longitudinal Study of Adult Health.

DESIGN, SETTING, AND PARTICIPANTS This was a multicenter, prospective cohort study with 3 waves, approximately 4 years apart, from 2008 to 2017. Data were analyzed from December 2021 to May 2022. Participants were public servants aged 35 to 74 years old recruited in 6 Brazilian cities. Participants who, at baseline, had incomplete food frequency questionnaire, cognitive, or covariate data were excluded. Participants who reported extreme calorie intake (<600 kcal/day or >6000 kcal/day) and those taking medication that could negatively interfere with cognitive performance were also excluded.

EXPOSURES Daily ultraprocessed food consumption as a percentage of total energy divided into quartiles.

MAIN OUTCOMES AND MEASURES Changes in cognitive performance over time evaluated by the immediate and delayed word recall, word recognition, phonemic and semantic verbal fluency tests, and Trail-Making Test B version.

RESULTS A total of 15 105 individuals were recruited and 4330 were excluded, leaving 10 775 participants whose data were analyzed. The mean (SD) age at the baseline was 51.6 (8.9) years, 5880 participants (54.6%) were women, 5723 (53.1%) were White, and 6106 (56.6%) had at least a college degree. During a median (range) follow-up of 8 (6-10) years, individuals with ultraprocessed food consumption above the first quartile showed a 28% faster rate of global cognitive decline (β = −0.004; 95% CI, −0.006 to −0.001; P = .003) and a 25% faster rate of executive function decline (β = −0.003, 95% CI, −0.005 to 0.000; P = .01) compared with those in the first quartile.

CONCLUSIONS AND RELEVANCE A higher percentage of daily energy consumption of ultraprocessed foods was associated with cognitive decline among adults from an ethnically diverse sample. These findings support current public health recommendations on limiting ultraprocessed food consumption because of their potential harm to cognitive function.

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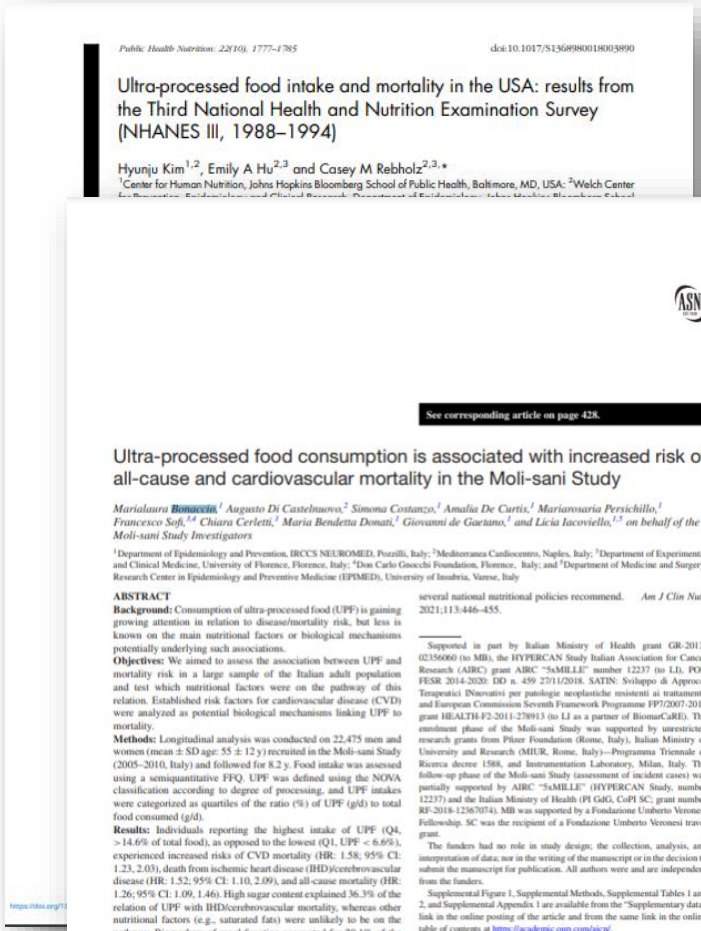
E1

Estudos de coorte avaliando a associação entre alimentos ultraprocessados e mortalidade por todas as causas



Public Health Nutrition: 22(10), 1777–1785 doi:10.1017/S1368980018003890

Ultra-processed food intake and mortality in the USA: results from the Third National Health and Nutrition Examination Survey (NHANES III, 1988–1994)

Hyunju Kim[1,2], Emily A Hu[2,3] and Casey M Rebholz[2,3,*]

[1]Center for Human Nutrition, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA; [2]Welch Center

See corresponding article on page 428.

Ultra-processed food consumption is associated with increased risk of all-cause and cardiovascular mortality in the Moli-sani Study

Marialaura Bonaccio,[1] Augusto Di Castelnuovo,[2] Simona Costanzo,[1] Amalia De Curtis,[1] Mariarosaria Persichillo,[1] Francesco Sofi,[3,4] Chiara Cerletti,[1] Maria Bendetta Donati,[1] Giovanni de Gaetano,[1] and Licia Iacoviello,[1,5] on behalf of the Moli-sani Study Investigators

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ABSTRACT

Background: Consumption of ultra-processed food (UPF) is gaining growing attention in relation to disease/mortality risk, but less is known on the main nutritional factors or biological mechanisms potentially underlying such associations.

Objectives: We aimed to assess the association between UPF and mortality risk in a large sample of the Italian adult population and test which nutritional factors were on the pathway of this relation. Established risk factors for cardiovascular disease (CVD) were analyzed as potential biological mechanisms linking UPF to mortality.

Methods: Longitudinal analysis was conducted on 22,475 men and women (mean ± SD age: 55 ± 12 y) recruited in the Moli-sani Study (2005–2010, Italy) and followed for 8.2 y. Food intake was assessed using a semiquantitative FFQ. UPF was defined using the NOVA classification according to degree of processing, and UPF intakes were categorized as quartiles of the ratio (%) of UPF (g/d) to total food consumed (g/d).

Results: Individuals reporting the highest intake of UPF (Q4, >14.6% of total food), as opposed to the lowest (Q1, UPF < 6.6%), experienced increased risks of CVD mortality (HR: 1.58; 95% CI: 1.23, 2.03), death from ischemic heart disease (IHD)/cerebrovascular disease (HR: 1.52; 95% CI: 1.10, 2.09), and all-cause mortality (HR: 1.26; 95% CI: 1.09, 1.46). High sugar content explained 36.3% of the relation of UPF with IHD/cerebrovascular mortality, whereas other nutritional factors (e.g., saturated fats) were unlikely to be on the pathway. Biomarkers of renal function accounted for 20.1% of the association of UPF with all-cause mortality, and 12.0% for that of UPF with CVD mortality.

Conclusions: A high proportion of UPF in the diet was associated with increased risk of CVD and all-cause mortality, partly through its high dietary content of sugar. Some established biomarkers of CVD risk were likely to be on the pathway of such associations. These findings should serve as an incentive for limiting consumption of UPF, and encouraging natural or minimally processed foods, as several national nutritional policies recommend. *Am J Clin Nutr* 2021;113:446–455.

Supported in part by Italian Ministry of Health grant GR-2013-02356060 (to MB), the HYPERCAN Study Italian Association for Cancer Research (AIRC) grant AIRC "5xMILLE" number 12237 (to LI), POR FESR 2014-2020: DD n. 459 27/11/2018. SATIN: Sviluppo di Approcci Terapeutici INnovativi per patologie neoplastiche resistenti ai trattamenti, and European Commission Seventh Framework Programme FP7/2007-2013 grant HEALTH-F2-2011-278913 (to LI as a partner of BiomarCaRE). The enrolment phase of the Moli-sani Study was supported by unrestricted research grants from Pfizer Foundation (Rome, Italy), Italian Ministry of University and Research (MIUR, Rome, Italy)—Programma Triennale di Ricerca decree 1588, and Instrumentation Laboratory, Milan, Italy. The follow-up phase of the Moli-sani Study (assessment of incident cases) was partially supported by AIRC "5xMILLE" (HYPERCAN Study, number 12237) and the Italian Ministry of Health (PI GdG, CoPI SC; grant number RF-2018-12367074). MB was supported by a Fondazione Umberto Veronesi Fellowship. SC was the recipient of a Fondazione Umberto Veronesi travel grant.

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Supplemental Figure 1, Supplemental Methods, Supplemental Tables 1 and 2, and Supplemental Appendix 1 are available from the "Supplementary data" link in the online posting of the article and from the same link in the online table of contents at https://academic.oup.com/ajcn/.

The Moli-sani Study Investigators are listed in Supplemental Appendix 1.

Address correspondence to MB (e-mail: marialaura.bonaccio@neuromed.it).

Abbreviations used: CVD, cardiovascular disease; ICD, International Classification of Diseases; IHD, ischemic heart disease; Lp(a), lipoprotein a; MDS, Mediterranean Diet Score; UPF, ultra-processed food.

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RESEARCH

BMJ: first published as 10.1136/bmj

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Association between consumption of ultra-processed foods and all cause mortality: SUN prospective cohort study

Anaïs Rico-Campà,[1,2] Miguel A Martínez-González,[1,2,3,4] Ismael Alvarez-Alvarez,[1] Raquel de Deus Mendonça,[1,5] Carmen de la Fuente-Arrillaga,[1,2,3] Clara Gómez-Donoso,[1] Maira Bes-Rastrollo[1,2,3]

ORIGINAL ARTICLE

MAYO CLINIC

Check for updates

Consumption of Ultra-Processed Foods and Mortality: A National Prospective Cohort in Spain

Ruth Blanco-Rojo, PhD; Helena Sandoval-Insausti, MD, MPH; Esther López-García, MiPharm, PhD; Auxiliadora Graciani, MD, PhD; Jose M. Ordovás, PhD; Jose R. Banegas, MD, PhD; Fernando Rodríguez-Artalejo, MD, PhD; and Pilar Guallar-Castillón, MD, PhD

Abstract

Objective: To assess the prospective association between ultra-processed food consumption and all-cause mortality and to examine the effect of theoretical iso-caloric non-processed foods substitution.

Patients and Methods: A population-based cohort of 11,898 individuals (mean age 46.9 years, and 50.9% women) were selected from the ENRICA study, a representative sample of the noninstitutionalized Spanish population. Dietary information was collected by a validated computer-based dietary history and categorized according to their degree of processing using NOVA classification. Total mortality was obtained from the National Death Index. Follow-up lasted from baseline (2008-2010) to mortality date or December 31st, 2016, whichever was first. The association between quartiles of consumption of ultra-processed food and mortality was analyzed by Cox models adjusted for the main confounders. Restricted cubic splines were used to assess dose-response relationships when using iso-caloric substitutions.

Results: Average consumption of ultra-processed food was 385 g/d (24.4% of the total energy intake). After a mean follow-up of 7.7 years (93,999 person-years), 440 deaths occurred. The hazard ratio (and 95% CI) for mortality in the highest versus the lowest quartile of ultra-processed food consumption was 1.44 (95% CI, 1.01-2.07; *P* trend—.03) in percent of energy and 1.46 (99% CI, 1.04-2.05; *P* trend—.03) in grams per day per kilogram. Isocaloric substitution of ultra-processed food with unprocessed or minimally processed foods was associated with a significant nonlinear decrease in mortality.

Conclusion: A higher consumption of ultra-processed food was associated with higher mortality in the general population. Furthermore, the theoretical iso-caloric substitution ultra-processed food by unprocessed or minimally processed foods would suppose a reduction of the mortality risk. If confirmed, these findings support the necessity of the development of new nutritional policies and guides at the national and international level.

Trial Registration: clinicaltrials.gov Identifier: NCT01133093

For editorial comment, see page 2156

Processing of food arose as a need to improve food availability, safety, digestibility, transportability, and storage life.[1,2] In the past decades, processing of food and food supplies have increased broadly providing ready-to-consume processed products that can be distributed all around the world.[3] Several food classifications have been proposed to quantify the nature and the extent of processed food intake when measuring it in populations.[4] The most extreme category corresponds to the ultra-processed foods, which are formulations made mostly or entirely from substances derived from foods and additives, with little if any whole food.[4]

Compared with the rest of the diet, ultra-processed foods often have a higher content of total fat, saturated fat, added sugars, and

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Ultra-Processed Foods and Incident Cardiovascular Disease in the Framingham Offspring Study

ABSTRACT

BACKGROUND Ultra-processed foods provide 58% of total energy in the U.S. diet, yet their association with cardiovascular disease (CVD) remains underdefined.

OBJECTIVES The authors investigated the associations between ultra-processed foods and CVD incidence and mortality in the prospective Framingham Offspring Cohort.

METHODS The analytical sample included 3,001 adults free from CVD with valid dietary data at baseline. Data on diet, measured by food frequency questionnaire, anthropometric measures, and sociodemographic and lifestyle factors were collected quadrennially from 1991 to 2008. Data regarding CVD incidence and mortality were available until 2014 and 2017, respectively. Ultra-processed foods were defined according to the NOVA framework. The authors used Cox proportional hazards models to determine the multivariable association between ultra-processed food intake (energy-adjusted servings per day) and incident hard CVD, hard coronary heart disease (CHD), overall CVD, and CVD mortality. Multivariable models were adjusted for age, sex, education, alcohol consumption, smoking, and physical activity.

RESULTS During follow-up (1991 to 2014/2017), the authors identified 251, 163, and 648 cases of incident hard CVD, hard CHD, and overall CVD, respectively. On average, participants consumed 7.5 servings per day of ultra-processed foods at baseline. Each additional daily serving of ultra-processed foods was associated with a 7% (95% confidence interval [CI]: 1.03 to 1.12), 9% (95% CI: 1.04 to 1.15), 5% (95% CI: 1.02 to 1.08), and 9% (95% CI: 1.02 to 1.16) increase in the risk of hard CVD, hard CHD, overall CVD, and CVD mortality, respectively.

CONCLUSIONS The current findings support that higher consumption of ultra-processed foods is associated with increased risk of CVD incidence and mortality. Although additional research in ethnically diverse populations is warranted, these findings suggest cardiovascular benefits of limiting ultra-processed foods. (J Am Coll Cardiol 2021;77:1520-31) © 2021 by the American College of Cardiology Foundation.

Cardiovascular diseases (CVDs) remain a leading cause of chronic disability and death worldwide (1). Poor diet is a major modifiable CVD risk factor and represents a critical target of cardiovascular prevention efforts (2). Ultra-processed foods (i.e., highly processed industrial formulations made with little or no whole foods) provide 58% of daily calories in the average U.S. diet and are

Listen to this manuscript's audio summary by Editor-in-Chief Dr. Valentin Fuster on JACC.org.

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The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the Author Center.

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ISSN 0735-1097/$36.00 https://doi.org/10.1016/j.jacc.2021.01.049

Causas


Nesquik
Minute Maid
SugarStacks.com
SugarStacks.com

Mecanismos

- Destruição da matriz alimentar promovendo uma grande quantidade de nutrientes acelulares afetando a absorção e bioacessibilidade dos nutrientes
  - Influencia o crescimento bacteriano intestinal
  - Contribuem com inflamação da microbiota intestinal
- Aditivos, emulsificantes e adoçantes artificiais
  - Alteração da integridade da microbiota intestinal
  - Contribuindo para processos intestinais inflamatórios

References:
Fardet A, Rock E, Bassama J, et al. Current food classifications in epidemiological studies do not enable solid nutritional recommendations for preventing diet-related chronic diseases: the impact of food processing. Adv Nutr. Nov 2015;6(6):629-38. doi:10.3945/an.115.008789
Spreadbury I. Comparison with ancestral diets suggests dense acellular carbohydrates promote an inflammatory microbiota, and may be the primary dietary cause of leptin resistance and obesity. Diabetes Metab Syndr Obes. 2012;5:175-89. doi:10.2147/DMSO.S33473
Nettleton JE, Reimer RA, Shearer J. Reshaping the gut microbiota: Impact of low calorie sweeteners and the link to insulin resistance? Physiol Behav. Oct 1 2016;164(Pt B):488-493. doi:10.1016/j.physbeh.2016.04.029
Chassaing B, Van de Wiele T, De Bodt J, Marzorati M, Gewirtz AT. Dietary emulsifiers directly alter human microbiota composition and gene expression ex vivo potentiating intestinal inflammation. Gut. Aug 2017;66(8):1414-1427. doi:10.1136/gutjnl-2016-313099

Mecanismos

- Calor extensivo e extrusão produzem acroleína e acrilamida
- Liberação de Bisfenol A presente em embalagens plásticas

resistência à insulina e estresse oxidativo

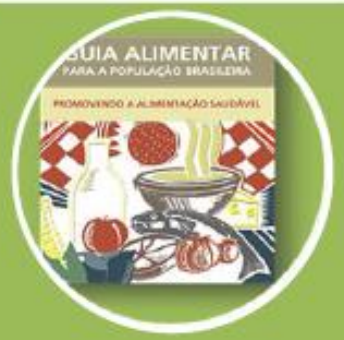
distúrbios metabólicos e processos inflamatórios aumentando o risco de desenvolver algumas doenças crônicas

References:
Buckley JP, Kim H, Wong E, Rebholz CM. Ultra-processed food consumption and exposure to phthalates and bisphenols in the US National Health and Nutrition Examination Survey, 2013-2014. Environ Int. Oct 2019;131:105057. doi:10.1016/j.envint.2019.105057

O Guia

https://www.youtube.com/watch?v=dLzN3aegpBI

Processo de elaboração



1ª Edição -2006

Revisão do Guia Alimentar:

Oficinas técnicas em 2011 e 2013

Parceria CGAN – NUPENS/USP com apoio da OPAS-Brasil

Consulta Pública:

Fevereiro a Maio de 2014

Registros na Plataforma:

3.125 contribuições

(436 indivíduos/instituições)

Consolidação da consulta pública:

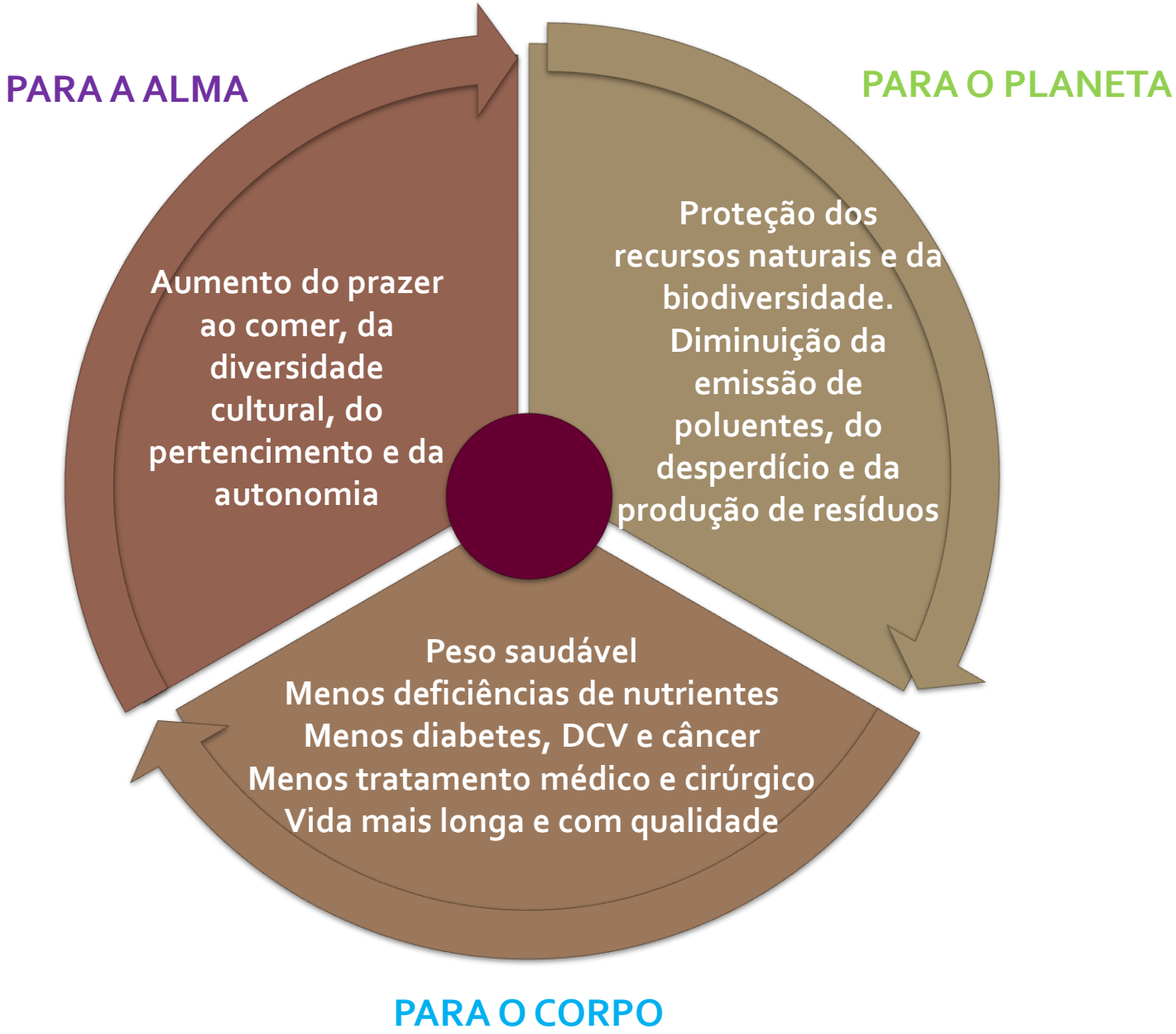
Maio a Agosto de 2014

Parceria CGAN – NUPENS/USP com apoio da OPAS-Brasil

Lançamento:

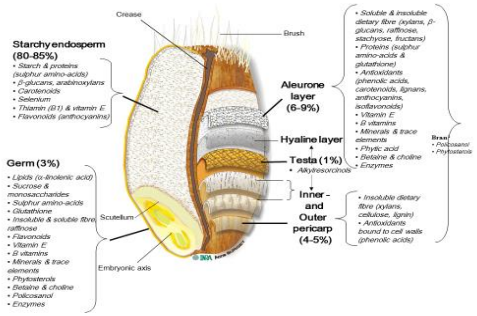
Novembro de 2014

Objetivos do Guia Alimentar Brasileiro



Alimentação

Alimento



Combinações

Modos de comer

Alimento

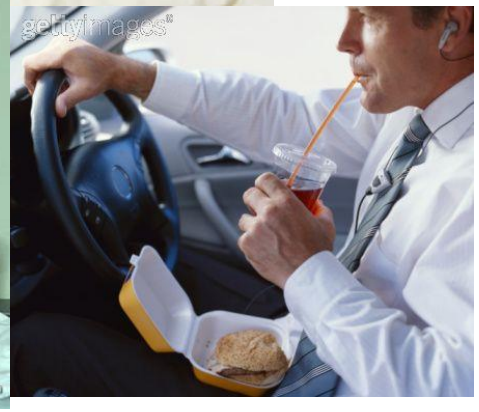
vs.


novo!
TANG
laranja
vitaminas
A, C e Ferro
tang
pró
desenvolvimento físico e mental

Combinações de alimentos

vs.

Modos de comer



vs.

CAPÍTULO 1

PRINCÍPIOS QUE ORIENTARAM A ELABORAÇÃO DO GUIA

- *Alimentação é mais do que a ingestão de nutrientes*
- *Recomendações sobre alimentação devem estar em sintonia com o seu tempo*
- *Alimentação adequada e saudável deriva de sistema alimentar socialmente e ambientalmente sustentável*
- *Diferentes saberes geram o conhecimento necessário para a formulação de guias alimentares*
- *Guias alimentares ampliam a autonomia nas escolhas alimentares*

CAPÍTULO 2
A ESCOLHA DOS ALIMENTOS

ALIMENTOS IN NATURA OU MINIMAMENTE PROCESSADOS

Faça de alimentos *in natura* ou minimamente processados a base da sua alimentação

ÓLEOS, GORDURAS, SAL E AÇÚCAR

Utilize óleos, gorduras, sal e açúcar em pequenas quantidades ao temperar e cozinhar alimentos e criar preparações culinárias



ALIMENTOS PROCESSADOS

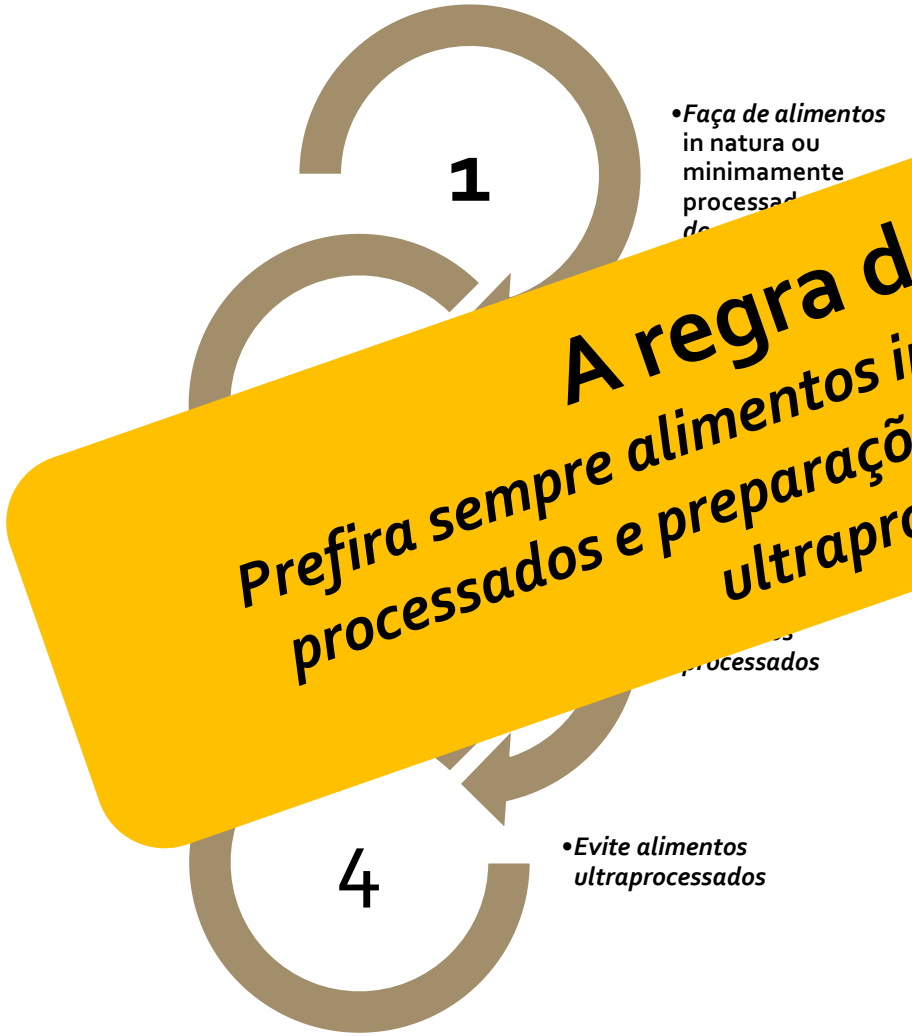
Limite o uso de alimentos processados, consumindo-os, em pequenas quantidades, como ingredientes de preparações culinárias ou como parte de refeições baseadas em alimentos in natura ou minimamente processados

ALIMENTOS ULTRAPROCES-SADOS

INGREDIENTS: WATER (75%), **SUGARS (12%)** (GLUCOSE (48%), FRUCTOSE (40%), SUCROSE (2%), MALTOSE (<1%)), STARCH (5%), FIBRE E460 (3%), **AMINO ACIDS (<1%)** (GLUTAMIC ACID (19%), ASPARTIC ACID (16%), HISTIDINE (11%), LEUCINE (7%), LYSINE (5%), PHENYLALANINE (4%), ARGININE (4%), VALINE (4%), ALANINE (4%), SERINE (4%), GLYCINE (3%), THREONINE (3%), ISOLEUCINE (3%), PROLINE (3%), TRYPTOPHAN (1%), CYSTINE (1%), TYROSINE (1%), METHIONINE (1%)), **FATTY ACIDS (1%)** (PALMITIC ACID (30%), OMEGA-6 FATTY ACID: LINOLEIC ACID (14%), OMEGA-3 FATTY ACID: LINOLENIC ACID (8%), OLEIC ACID (7%), PALMITOLEIC ACID (3%), STEARIC ACID (2%), LAURIC ACID (1%), MYRISTIC ACID (1%), CAPRIC ACID (<1%)), ASH (<1%), PHYTOSTEROLS, E515, OXALIC ACID, E300, E306 (TOCOPHEROL), PHYLLOQUINONE, THIAMIN, **COLOURS** (YELLOW-ORANGE E101 (RIBOFLAVIN), YELLOW-BROWN E160a), **FLAVOURS** (3-METHYLBUT-1-YL ETHANOATE, 2-METHYLBUTYL ETHANOATE, 2-METHYLPROPAN-1-OL, 3-METHYLBUTYL-1-OL, 2-HYDROXY-3-METHYLETHYL BUTANOATE, 3-METHYLBUTANAL, ETHYL HEXANOATE, ETHYL BUTANOATE, PENTYL ACETATE), 1510, NATURAL RIPENING AGENT (ETHENE GAS).

Evite alimentos ultraprocessados

A escolha dos alimentos



A regra de ouro

Prefira sempre alimentos in natura ou minimamente processados e preparações culinárias a alimentos ultraprocessados

CAPÍTULO 3

DOS ALIMENTOS À REFEIÇÃO

Café da manhã

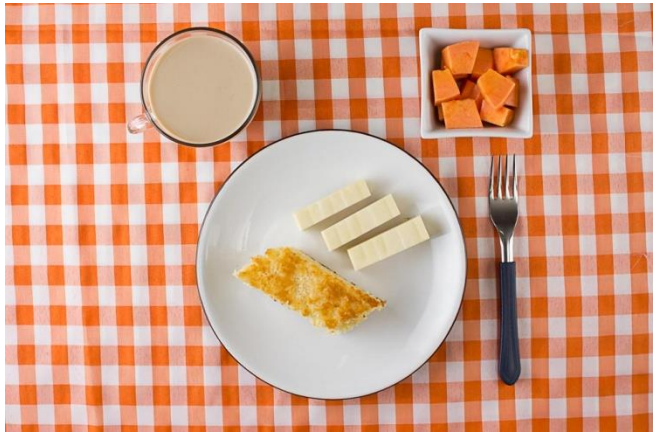
Leite, cuscuz, ovo e banana

Suco de laranja, pão francês, manteiga e mamão

Café com leite, tapioca e banana

Café com leite, bolo de milho e melão

Café da manhã



Café com leite, bolo de aipim, queijo coalho e mamão

Café com leite, pão de queijo e mamão

Café, pão integral caseiro, queijo coalho e ameixa

Café com leite, cuscuz e manga

Almoço

Arroz, feijão, coxa de frango assada, beterraba e polenta com queijo

Alface, arroz, feijão, omelete e jiló refogado

Alface e tomate, arroz, feijão, berinjela recheada e suco natural de cupuaçu

Feijoada, arroz, vinagrete de cebola e tomate, farofa, couve refogada e laranja

Almoço

Alface, arroz, lentilha, porco assado, repolho refogado e abacaxi

Arroz, feijão, purê, abóbora com quiabo e mamão

Tomate, arroz, feijão, bife e salada de frutas

Alface, tomate, feijão, farinha de mandioca, peixe cozido e cocada

Jantar

Arroz, feijão, peito de frango grelhado, abóbora com quiabo e compota de jenipapo

Alface e tomate, arroz, feijão, omelete e mandioca no forno

Salada de folhas, arroz, feijão, ovo de galinha cozido e maçã

Arroz, feijão, coxa de frango assada, repolho refogado, moranga cozida e laranja

Jantar

Arroz, feijão e carne moída com vegetais

Arroz, feijão, bife de fígado e abobrinha

Sopa de legumes e açaí com farinha de rosca

Salada, macarrão e galeto

CAPÍTULO 4

O ATO DE COMER E A COMENSALIDADE

Comer com regularidade e com atenção

Comer em ambientes apropriados

Comer em companhia

Melhor digestão dos alimentos

Maior controle da quantidade consumida

Maiores oportunidades de convivência com familiares e amigos

Maior interação social

MAIS PRAZER AO COMER

CAPÍTULO 5

A COMPREENSÃO E A SUPERAÇÃO DE OBSTÁCULOS

A compreensão e a superação de obstáculos

- *INFORMAÇÃO*
- *OFERTA*
- *CUSTO*
- *HABILIDADES CULINÁRIAS*
- *TEMPO*
- *PUBLICIDADE*

A superação de obstáculos, muitas vezes, requer políticas públicas

- *Ações de informação e educação dos cidadãos*
- *Reorientação dos serviços de saúde para promoção da alimentação saudável*
- *Promoção da alimentação saudável no ambiente escolar*
- *Subsídios para a produção de alimentos orgânicos e de base agroecológica*
- *Incentivos para desenvolvimento de hortas urbanas*
- *Regulamentação e apoio às feiras livres*
- *Criação de restaurantes populares e cozinhas comunitárias*
- *Políticas fiscais*
- *Políticas que melhorem o transporte urbano.*
- ***Regulamentação da publicidade de alimentos, especialmente para crianças.***

Dez Passos Para uma Alimentação Adequada e Saudável

Dez Passos Para uma Alimentação Adequada e Saudável

1. Fazer de alimentos in natura ou minimamente processados a base da alimentação

Dez Passos Para uma Alimentação Adequada e Saudável

1. Fazer de alimentos in natura ou minimamente processados a base da alimentação
2. Usar óleos, gorduras, sal e açúcar em pequenas quantidades ao temperar e cozinhar alimentos e criar preparações culinárias

Dez Passos Para uma Alimentação Adequada e Saudável

1. Fazer de alimentos in natura ou minimamente processados a base da alimentação
2. Usar óleos, gorduras, sal e açúcar em pequenas quantidades ao temperar e cozinhar alimentos e criar preparações culinárias
3. Limitar o consumo de alimentos processados

Dez Passos Para uma Alimentação Adequada e Saudável

1. Fazer de alimentos in natura ou minimamente processados a base da alimentação
2. Usar óleos, gorduras, sal e açúcar em pequenas quantidades ao temperar e cozinhar alimentos e criar preparações culinárias
3. Limitar o consumo de alimentos processados
4. Evitar o consumo de alimentos ultraprocessados

Dez Passos Para uma Alimentação Adequada e Saudável

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2. Usar óleos, gorduras, sal e açúcar em pequenas quantidades ao temperar e cozinhar alimentos e criar preparações culinárias
3. Limitar o consumo de alimentos processados
4. Evitar o consumo de alimentos ultraprocessados
5. Comer com regularidade e atenção, em ambientes apropriados e, sempre que possível com companhia

Dez Passos Para uma Alimentação Adequada e Saudável

1. Fazer de alimentos in natura ou minimamente processados a base da alimentação
2. Usar óleos, gorduras, sal e açúcar em pequenas quantidades ao temperar e cozinhar alimentos e criar preparações culinárias
3. Limitar o consumo de alimentos processados
4. Evitar o consumo de alimentos ultraprocessados
5. Comer com regularidade e atenção, em ambientes apropriados e, sempre que possível com companhia
6. Fazer compras de alimentos em locais que ofertem variedades de alimentos in natura ou minimamente processados

Dez Passos Para uma Alimentação Adequada e Saudável

1. Fazer de alimentos in natura ou minimamente processados a base da alimentação
2. Usar óleos, gorduras, sal e açúcar em pequenas quantidades ao temperar e cozinhar alimentos e criar preparações culinárias
3. Limitar o consumo de alimentos processados
4. Evitar o consumo de alimentos ultraprocessados
5. Comer com regularidade e atenção, em ambientes apropriados e, sempre que possível com companhia
6. Fazer compras de alimentos em locais que ofertem variedades de alimentos in natura ou minimamente processados
7. Desenvolver, exercitar e partilhar habilidades culinárias

Dez Passos Para uma Alimentação Adequada e Saudável

1. Fazer de alimentos in natura ou minimamente processados a base da alimentação
2. Usar óleos, gorduras, sal e açúcar em pequenas quantidades ao temperar e cozinhar alimentos e criar preparações culinárias
3. Limitar o consumo de alimentos processados
4. Evitar o consumo de alimentos ultraprocessados
5. Comer com regularidade e atenção, em ambientes apropriados e, sempre que possível com companhia
6. Fazer compras de alimentos em locais que ofertem variedades de alimentos in natura ou minimamente processados
7. Desenvolver, exercitar e partilhar habilidades culinárias
8. Planejar o uso do tempo para dar à alimentação o espaço que ela merece

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9. Dar preferência, quando fora de casa, a locais que servem refeições feitas na hora

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9. Dar preferência, quando fora de casa, a locais que servem refeições feitas na hora
10. Ser crítico quanto a informações, orientações e mensagens sobre alimentação veiculadas em propagandas

Protocolos

MINISTÉRIO DA SAÚDE
UNIVERSIDADE DE SÃO PAULO

FASCÍCULO 1

PROTOCOLOS DE USO DO GUIA ALIMENTAR PARA A POPULAÇÃO BRASILEIRA NA ORIENTAÇÃO ALIMENTAR: BASES TEÓRICAS E METODOLÓGICAS E PROTOCOLO PARA A POPULAÇÃO ADULTA

MINISTÉRIO DA SAÚDE
UNIVERSIDADE DE SÃO PAULO

FASCÍCULO 2

PROTOCOLO DE USO DO GUIA ALIMENTAR PARA A POPULAÇÃO BRASILEIRA NA ORIENTAÇÃO ALIMENTAR DA PESSOA IDOSA

FASCÍCULO 3

PROTOCOLO DE USO DO GUIA ALIMENTAR PARA A POPULAÇÃO BRASILEIRA NA ORIENTAÇÃO ALIMENTAR DA GESTANTE

FASCÍCULO 4

PROTOCOLO DE USO DO GUIA ALIMENTAR PARA A POPULAÇÃO BRASILEIRA NA ORIENTAÇÃO ALIMENTAR DE CRIANÇAS DE 2 A 10 ANOS

UNIVERSIDADE DE SÃO PAULO

FASCÍCULO 5

PROTOCOLO DE USO DO GUIA ALIMENTAR PARA A POPULAÇÃO BRASILEIRA NA ORIENTAÇÃO ALIMENTAR DA PESSOA NA ADOLESCÊNCIA

MINISTÉRIO DA SAÚDE

GUIA ALIMENTAR PARA CRIANÇAS BRASILEIRAS MENORES DE 2 ANOS

Brasília – DF
2019

Aproveitando...

Estudo NutriNet

NutriNet
BRASIL

Objetivo

Início: janeiro/2020

- Identificar os principais **padrões de alimentação** praticados pela população brasileira e estudar a associação entre esses padrões e a incidência e mortalidade por doenças crônicas não transmissíveis como obesidade, diabetes, hipertensão, doenças cardiovasculares e câncer.

- O recrutamento ocorrerá nos primeiros dois anos da pesquisa.
- Serão acompanhadas 200 mil adultos de todas as regiões do país por um período de 10 anos.

Como participar?

- Para participar do Estudo NutriNet Brasil, é preciso **residir no Brasil, ter idade mínima de 18 anos e ter acesso à internet,** uma vez que a pesquisa é totalmente online.
- A participação é **voluntária** e exige que a pessoa realize um cadastro simples na plataforma digital da pesquisa.

https://nutrinetbrasil.fsp.usp.br

- Toda a comunicação é realizada por envio de notificações ao e-mail de cadastro e por SMS.

Primeiros questionários

- Novos questionários ficam disponíveis **a cada 3-4 meses** e incluem perguntas sobre alimentação, estado de saúde, hábitos de vida, etc.

TEMPO ZERO

Identificação
Escolaridade
Estado de saúde/antropometria
Questionário alimentar simplificado

MÊS #3

Hábitos de vida
Questionário alimentar simplificado

MÊS #6

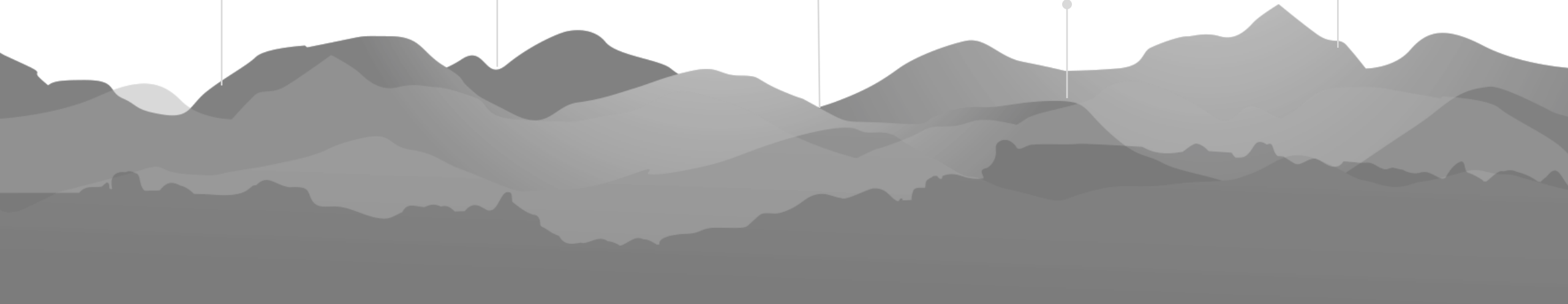
Recordatório Alimentar de 24h (Questionário alimentar detalhado)

MÊS #9

História reprodutiva
Antropometria
Saúde da mulher
Socioeconômico
Questionário alimentar simplificado

MÊS #12

Estado de saúde/ Histórico familiar de doenças
Questionário alimentar simplificado

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Eu participo do
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e você?
https://nutrinetbrasil.fsp.usp.br


Obrigada!