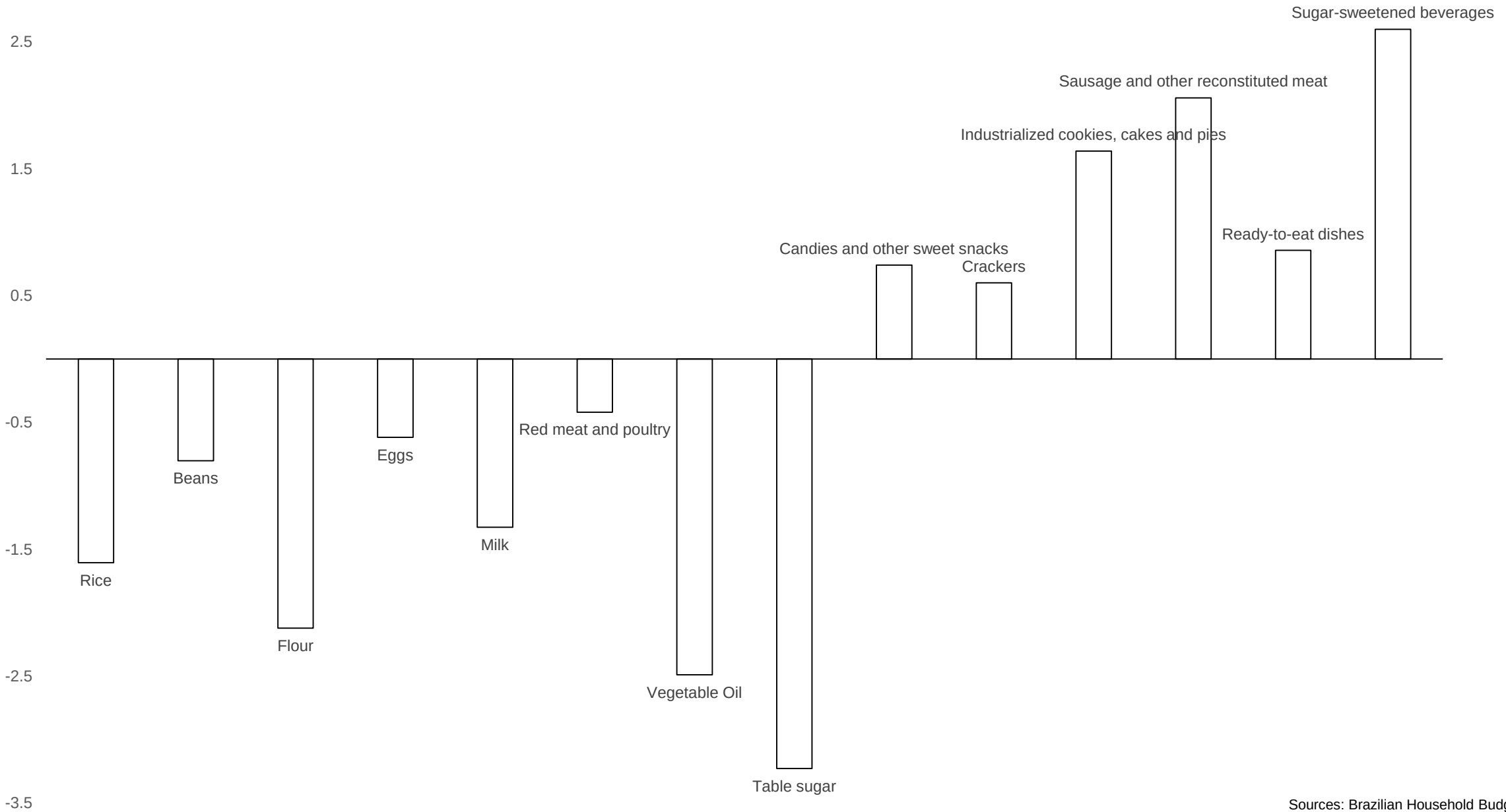
Ultra-processed foods: background, concepts and scientific evidence

Maria Laura da Costa Louzada

On Behalf the Center of Epidemiological Studies on Nutrition and Health (NUPENS) team

University of Sao Paulo

Changes in food purchases by the Brazilian population (1987-2009)



Sources: Brazilian Household Budget Surveys

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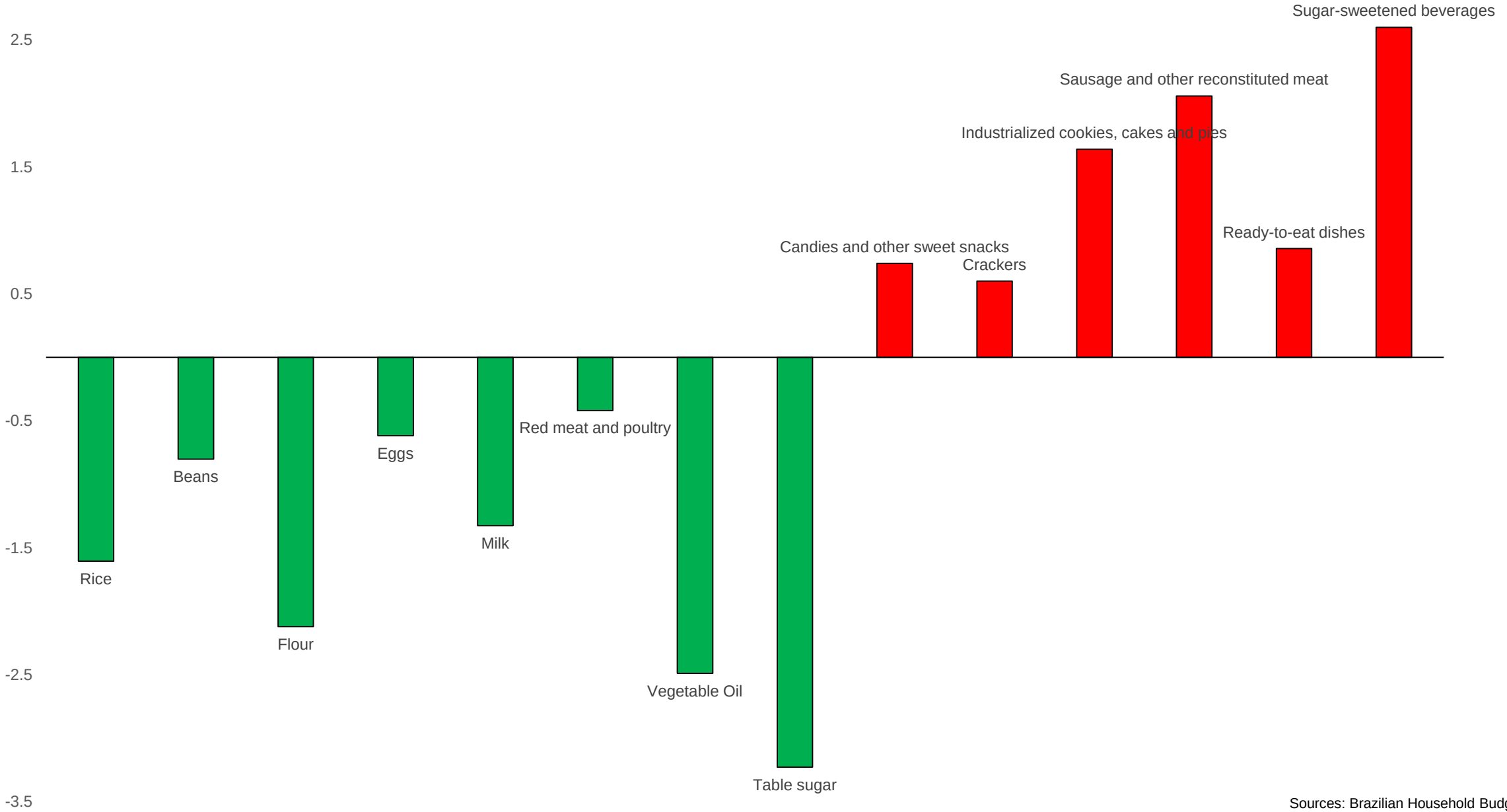


Sources: Brazilian Household Budget Surveys

NOVA classification system and types of food processing: harmless, beneficial or essential processing

Unprocessed foods

Industrial processing to increase the durability, optimize or shorten preparation time and modify sensory characteristics.

Removing non-edible parts, drying, freezing, pasteurization, fermentation, pressing, packaging, adding salt or sugar...

Minimally processed foods

Processed culinary ingredients

Processed foods

Freshly prepared culinary preparations

NOVA classification system and types of food processing: harmful processing

Unprocessed foods

→

Several step of industrial processing: ultra-processing

→

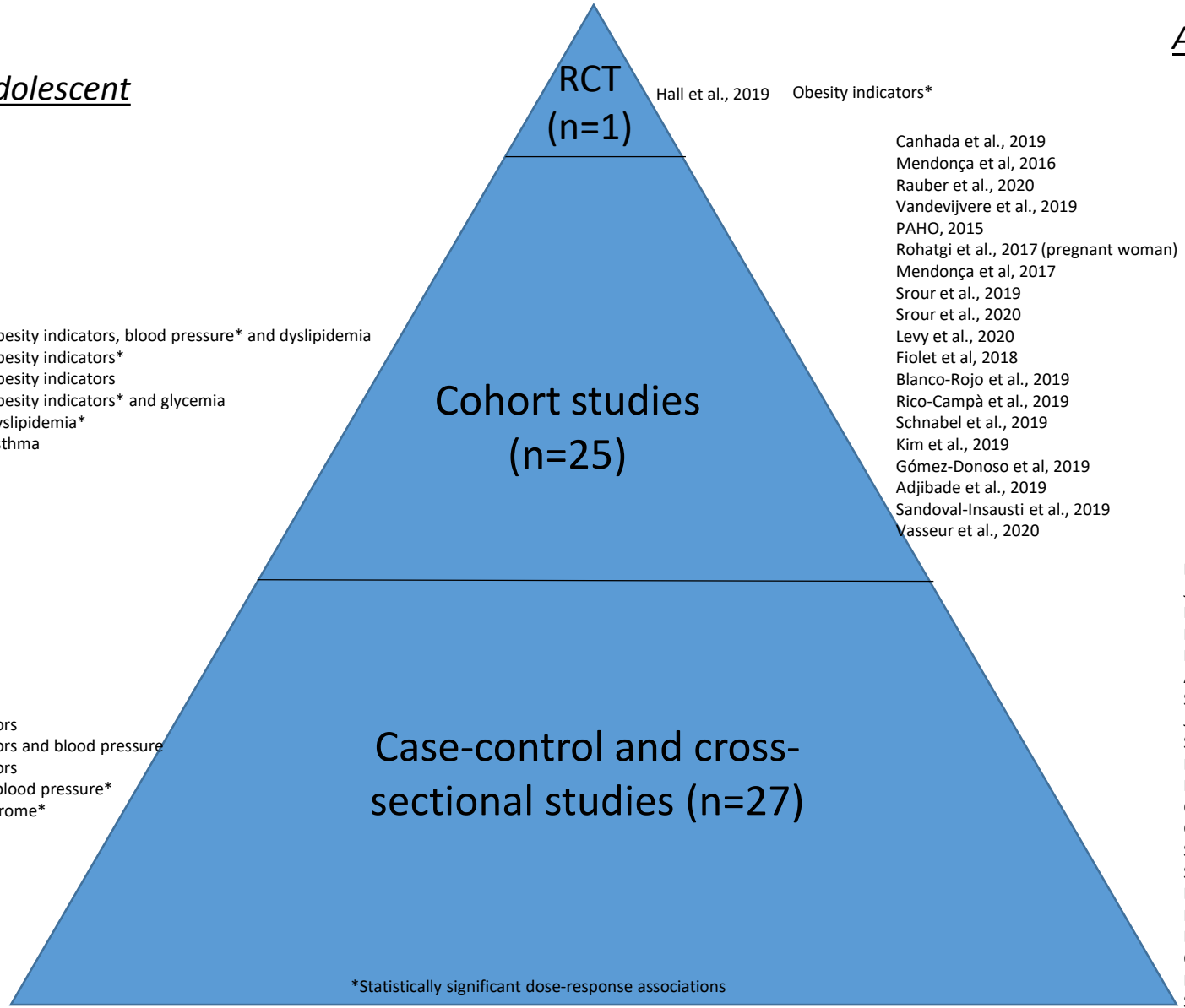
Ready-to-eat industrial formulations of food-derived substances (oils, fats, sugars, starch, protein isolates) that contain little or no whole food and are often added with flavorings, colorings, emulsifiers and other cosmetic additives.

Whole foods broken down into components (oils / proteins / starch / sugar)
Hydrogenation, hydrolysis and other chemical modifications
“Recombination” (extrusion, immersion frying, etc.)
Addition of flavorings, dyes, emulsifiers...
Sophisticated packaging often with synthetic materials

Why avoid ultra-processed foods?

Impact of ultra-processed food consumption on children's, adolescent's and adult's health: a systematic literature review.

Louzada et al. Reports in Public Health. Under review.



Children/adolescent

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Ultra-processed foods and obesity in adults

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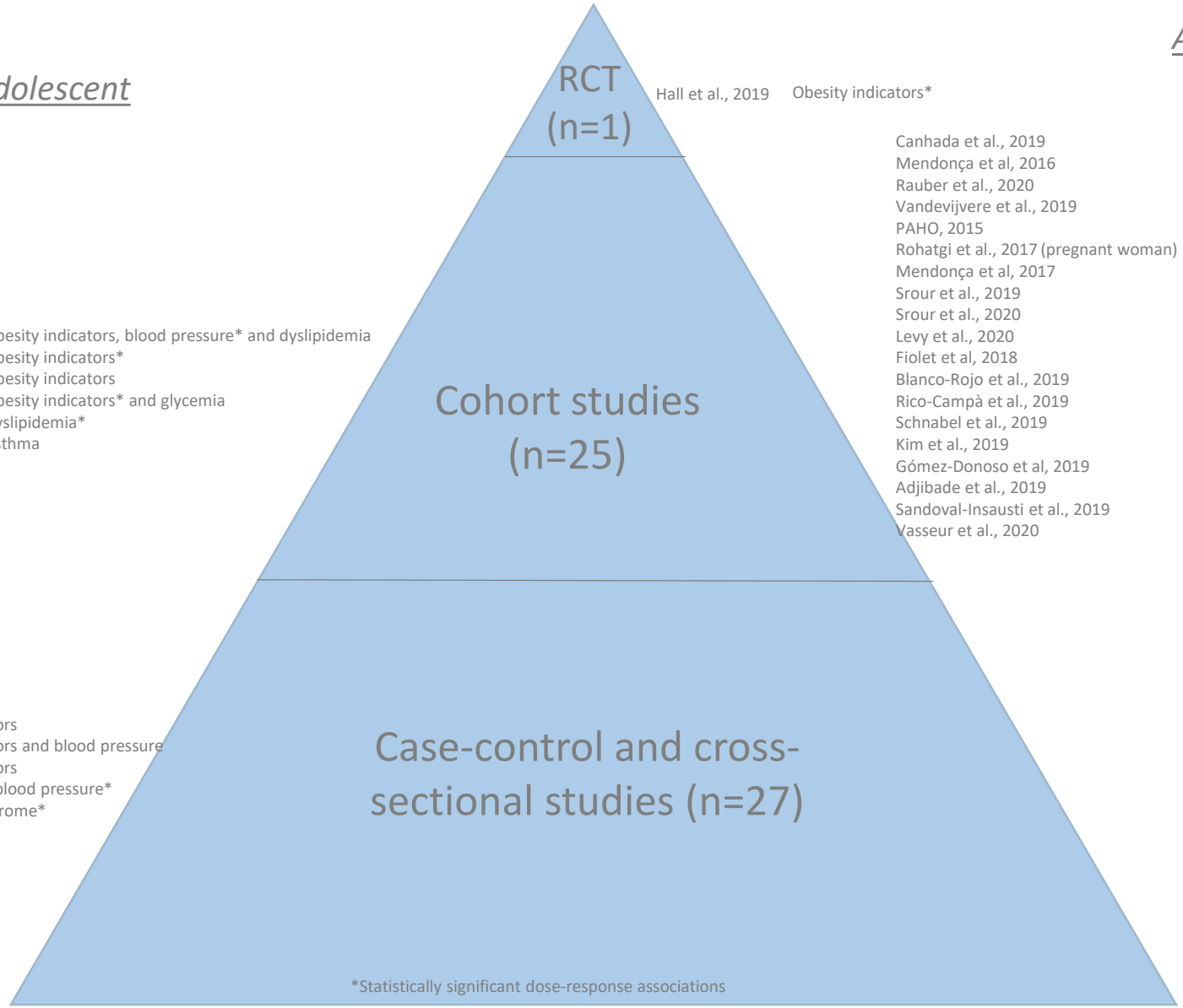

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Cohort studies (n=25)

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Schnabel et al., 2018	Functional Gastrointestinal Disorders*

Natioanally representative samples from Brazil, US, UK, Australia and Canada

Ultra-processed foods and obesity in adults

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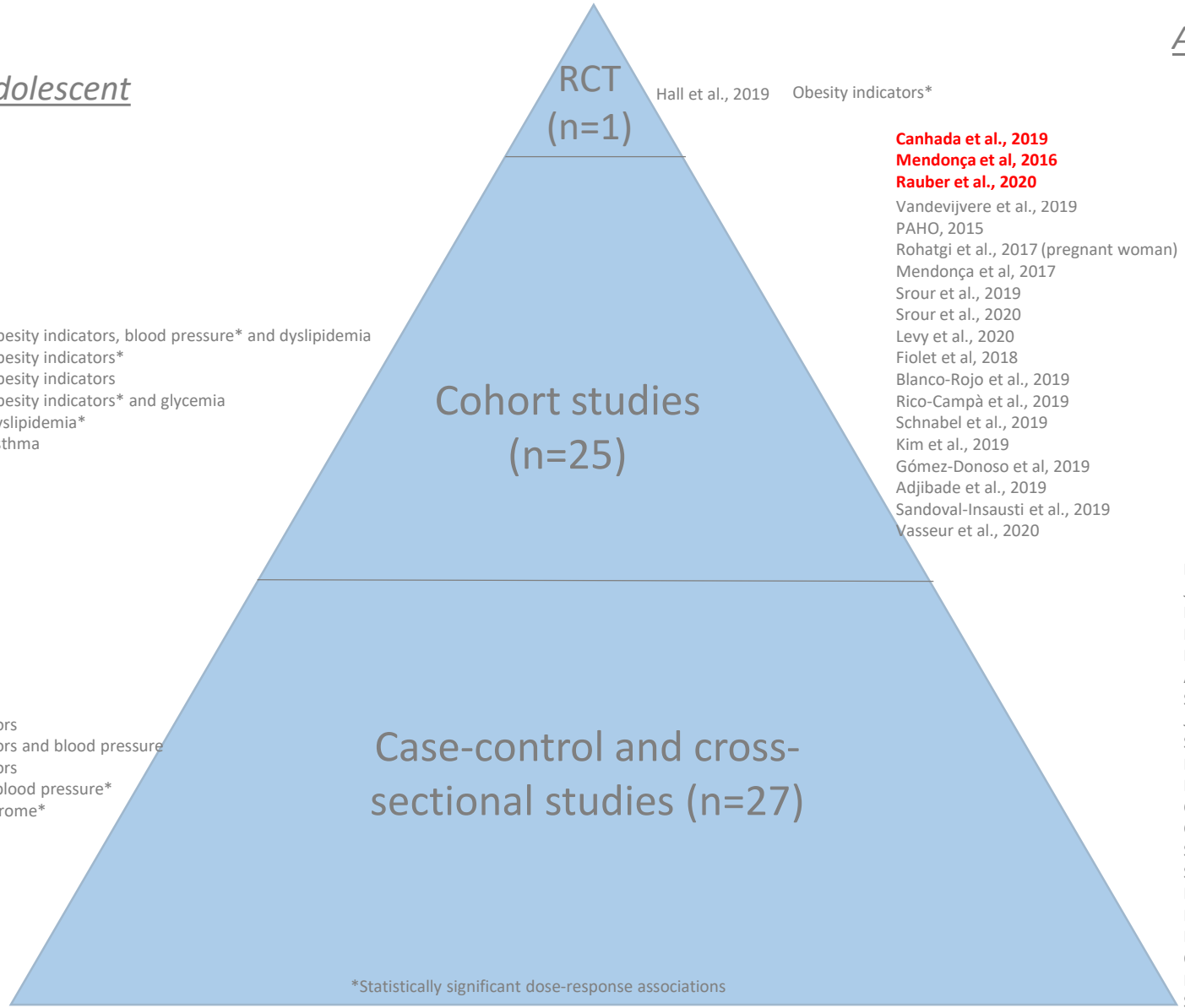

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Elsa Study (Brazil)
The Sun Project (Spain)
UK Biobank

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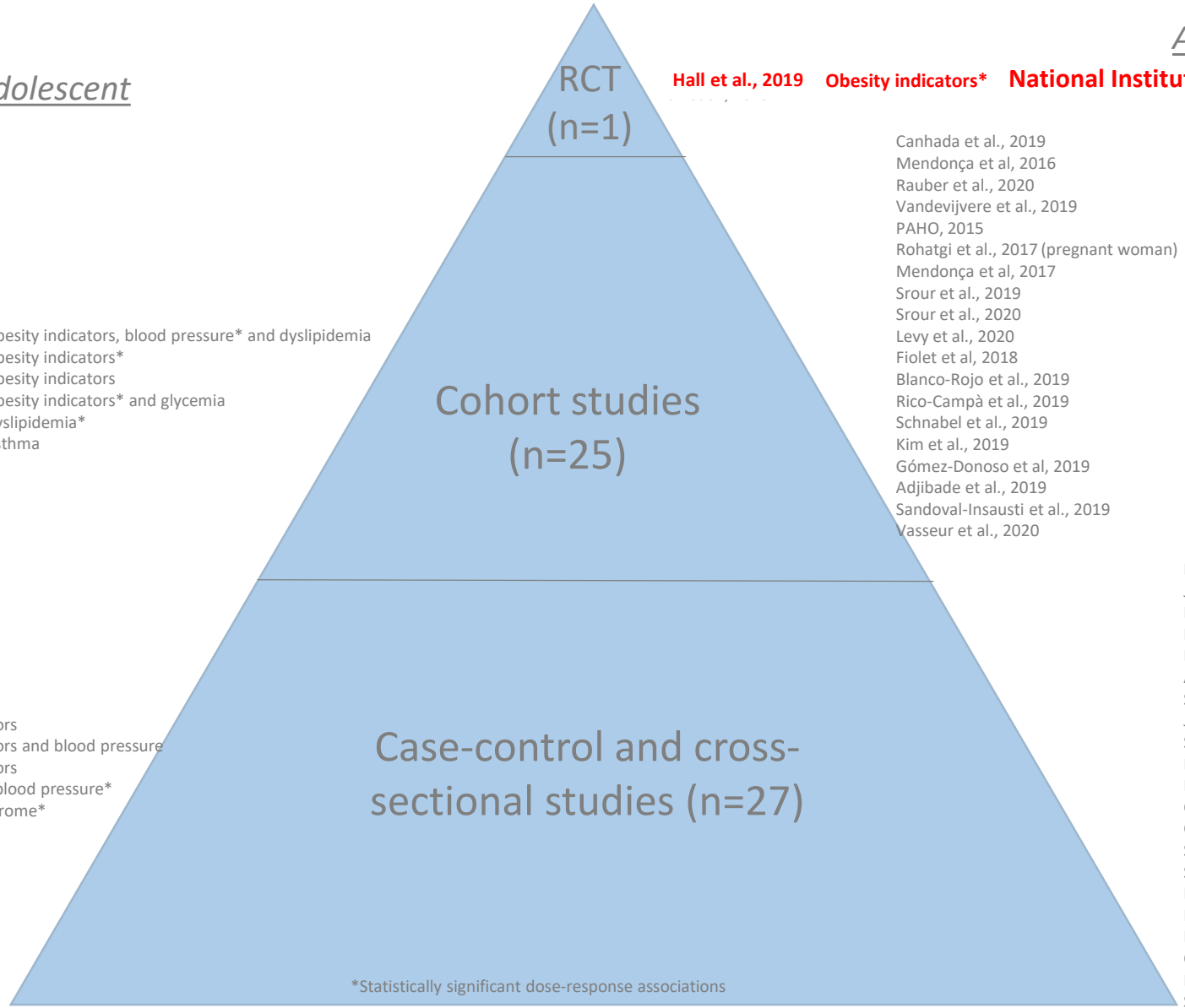

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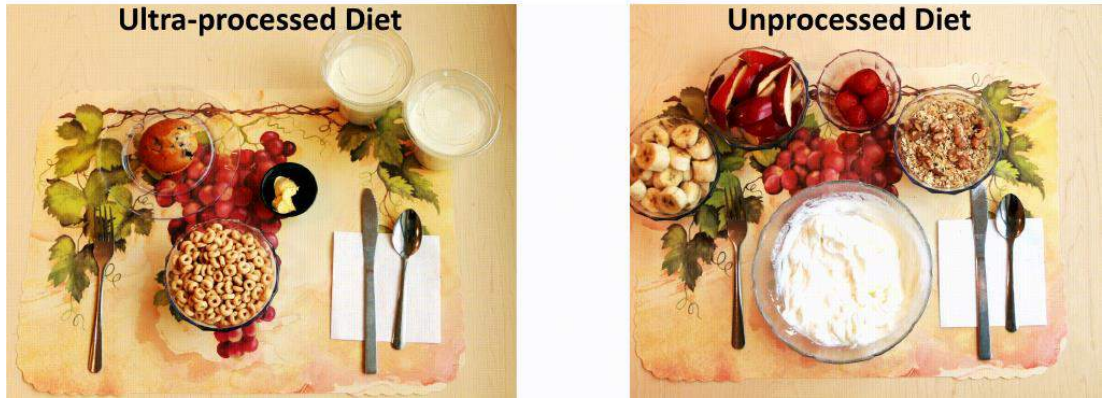
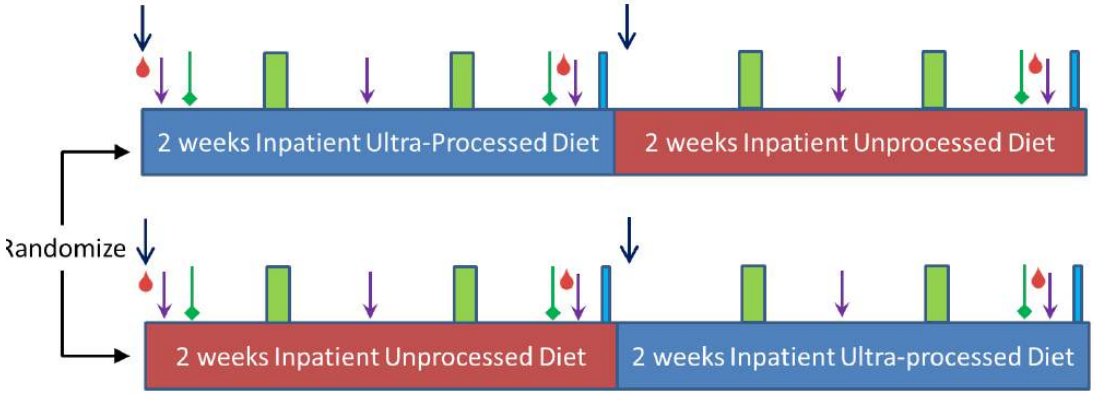
Ultra-processed diets cause excess calorie intake and weight gain





Hall et al., 2019

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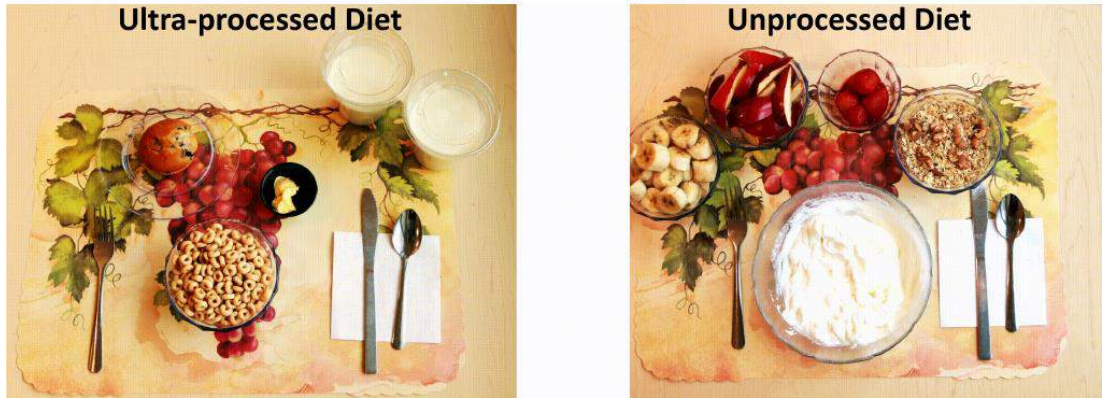
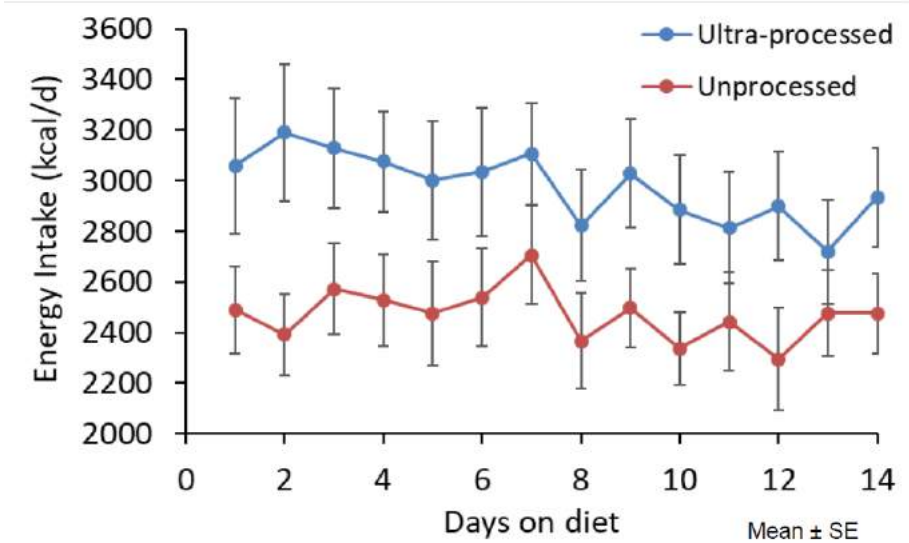
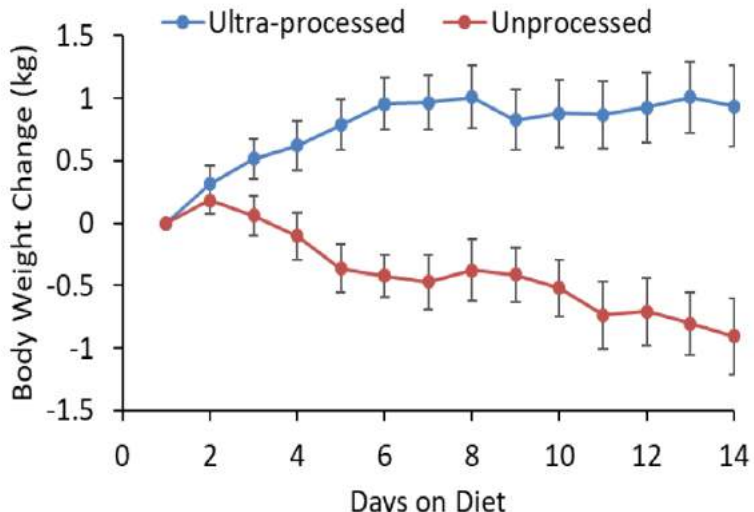






Hall et al., 2019

Ultra-processed foods and cardiovascular disease, diabetes and cancer

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]

BMJ 2018;360:k322

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

JAMA Intern Med. 2020;180(2):283-291.

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

Thibault Fiolet,[1] Bernard Srour,[1] Laury Sellem,[1] Emmanuelle Kesse-Guyot,[1] Benjamin Allès,[1] Caroline Méjean,[2] Mélanie Deschasaux,[1] Philippine Fassier,[1] Paule Latino-Martel,[1] Marie Beslay,[1] Serge Hercberg,[1,4] Céline Lavalette,[1] Carlos A Monteiro,[3] Chantal Julia,[1,4] Mathilde Touvier[1]

BMJ 2019;365:l1949

Ultra-processed foods and depression

Adjibade *et al. BMC Medicine* (2019) 17:78
https://doi.org/10.1186/s12916-019-1312-y

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 Touvier[1], Cédric Lemogne[3],
Serge Hercberg[1,2], Pilar Galan[1], Karen E. Assmann[1] and Emmanuelle Kesse-Guyot[1]

European Journal of Nutrition (2020) 59:1093–1103
https://doi.org/10.1007/s00394-019-01970-1

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]

Ultra-processed foods and all-cause mortality

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]

BMJ 2019;365:l1949

MAYO CLINIC

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

Ruth Blanco-Rojo, PhD; Helena Sandoval-Insausti, MD, MPH; Esther López-Garcia, MhPharm, 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

Public Health Nutr. 2019 July ; 22(10): 1777–1785. doi:10.1017/S1368980018003890.

Ultra-processed food intake and mortality in the United States: 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]

JAMA Internal Medicine | **Original Investigation**

Association Between Ultraprocessed Food Consumption and Risk of Mortality Among Middle-aged Adults in France

Laure Schnabel, MD, MSc; Emmanuelle Kesse-Guyot, PhD; Benjamin Allès, PhD; Mathilde Touvier, PhD; Bernard Srour, PharmD; Serge Hercberg, MD, PhD; Camille Buscail, MD, PhD; Chantal Julia, MD, PhD

Ultra-processed food and NCDs: mechanisms

Convenient, assessible, ready-to-eat, and “appealing”.

Higher energy intake rates (kcal/min)

Forde et al (2020)

Large portion sizes

Excessive and “mindless” calorie consumption

Replacement of freshly made meals based on unprocessed or minimally processed foods.

Ultra-processed food and NCDs: mechanisms

- Higher **energy density**, more **free sugar** and **saturated and trans fats**
- Less dietary **fiber, protein, vitamins and minerals** and **bioactive compounds**.
- Overall deterioration of the nutritional dietary quality demonstrated in nationally representative studies of 10 middle- and high-income countries.

Moubarac et al., 2017; Louzada et al., 2018; Cediel et al., 2018; Steele et al., Rauber et al., 2018, Marron-Ponce et al., 2019; Koiwai et al., 2019; Parra et al., 2019, Machado et al., 2019; Andrade et al *unpublished*

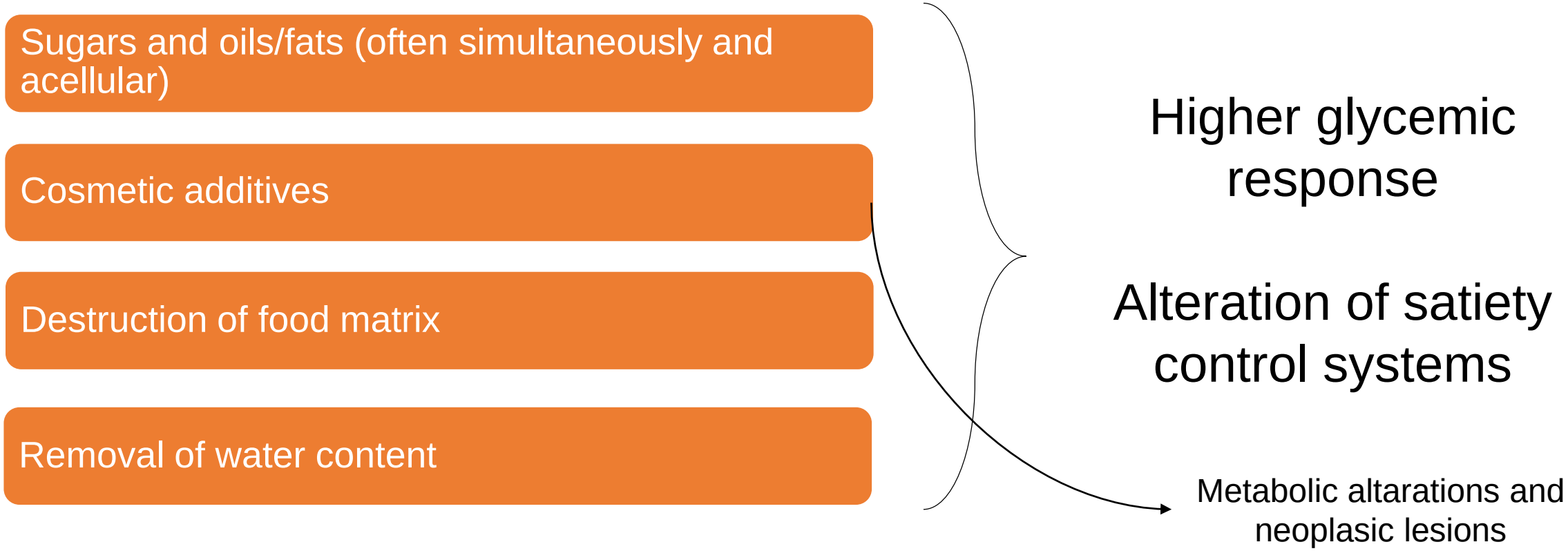
Ultra-processed food and NCDs: mechanisms

- Sugars and oils/fats (often simultaneously and acellular)
- Cosmetic additives
- Destruction of food matrix
- Removal of water content

Higher glycemic response

Alteration of satiety control systems

Ultra-processed food and NCDs: mechanisms



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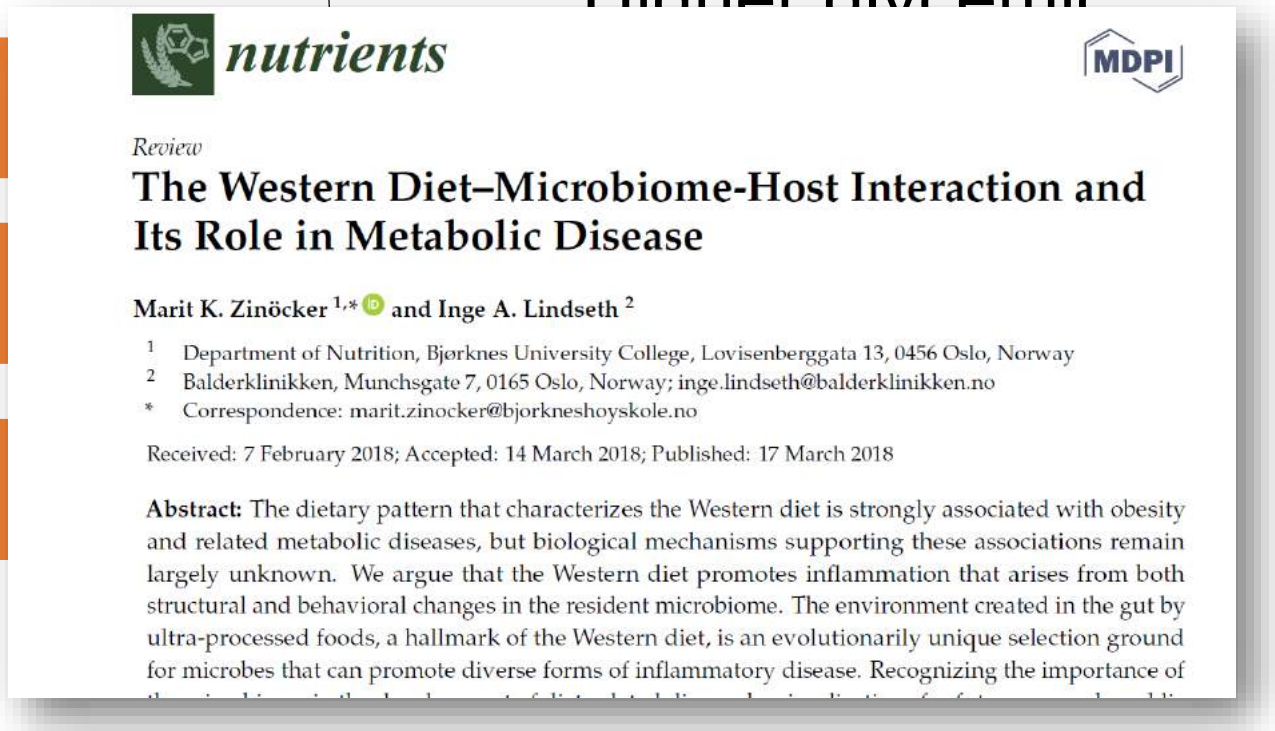


nutrients

MDPI

Review

The Western Diet–Microbiome-Host Interaction and Its Role in Metabolic Disease

Marit K. Zinöcker [1,*] and Inge A. Lindseth [2]

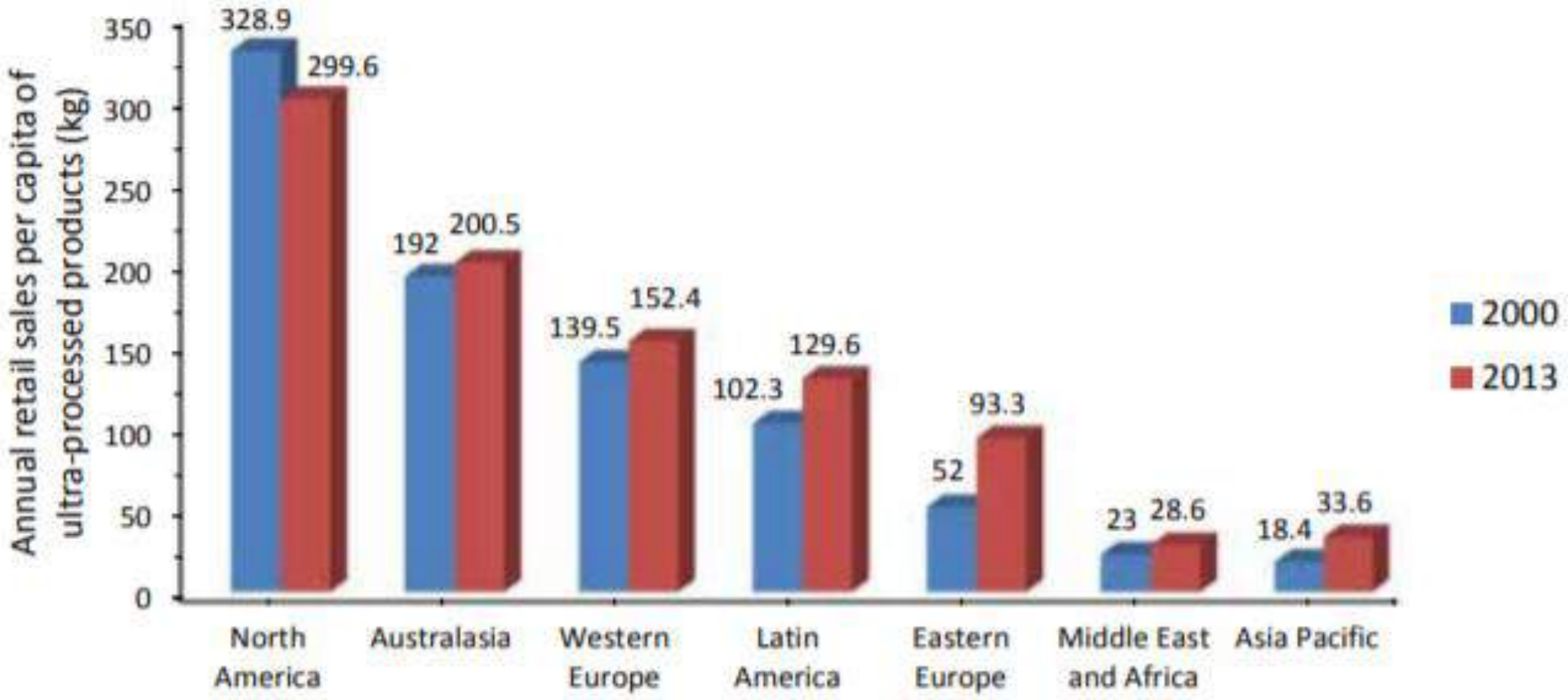
[1] Department of Nutrition, Bjørknes University College, Lovisenberggata 13, 0456 Oslo, Norway
[2] Balderklinikken, Munchsgate 7, 0165 Oslo, Norway; inge.lindseth@balderklinikken.no
* Correspondence: marit.zinocker@bjorkneshoyskole.no

Received: 7 February 2018; Accepted: 14 March 2018; Published: 17 March 2018

Abstract: The dietary pattern that characterizes the Western diet is strongly associated with obesity and related metabolic diseases, but biological mechanisms supporting these associations remain largely unknown. We argue that the Western diet promotes inflammation that arises from both structural and behavioral changes in the resident microbiome. The environment created in the gut by ultra-processed foods, a hallmark of the Western diet, is an evolutionarily unique selection ground for microbes that can promote diverse forms of inflammatory disease. Recognizing the importance of

Ultra-processed food and NCDs: mechanisms

Retail sales per capita of ultra-processed food and drink products in global regions, 2000 and 2013

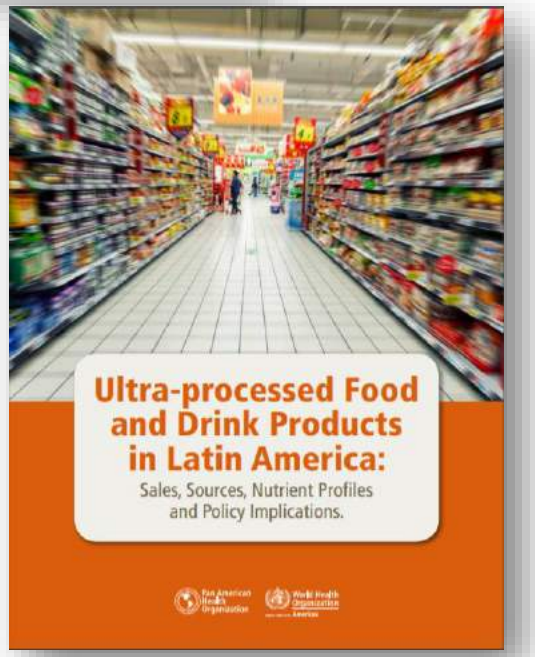


PAHO, 215. Ultra-processed food and drink products in Latin America: Trends, impact on obesity, policy implications

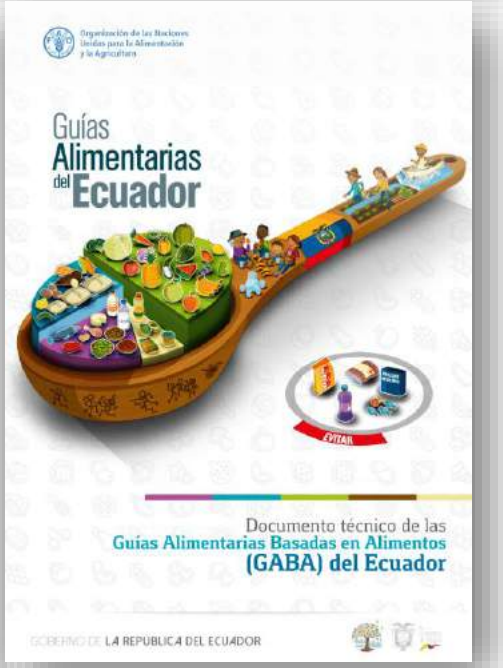

Ultra-processed foods, diet quality, and health using the NOVA classification system


GUÍA ALIMENTARIA PARA LA POBLACIÓN URUGUAYA
Para una alimentación saludable, compartida y placentera.
Ministerio de SALUD


MINISTÉRIO DA SAÚDE
GUIA ALIMENTAR PARA A POPULAÇÃO BRASILEIRA
2ª edição
1ª reimpressão
Brasília – DF
2014


Ultra-processed Food and Drink Products in Latin America:
Sales, Sources, Nutrient Profiles and Policy Implications.


PERÚ
Guías Alimentarias para la Población Peruana
Lima, 2019


Guías Alimentarias del Ecuador
Documento técnico de las Guías Alimentarias Basadas en Alimentos (GABA) del Ecuador
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