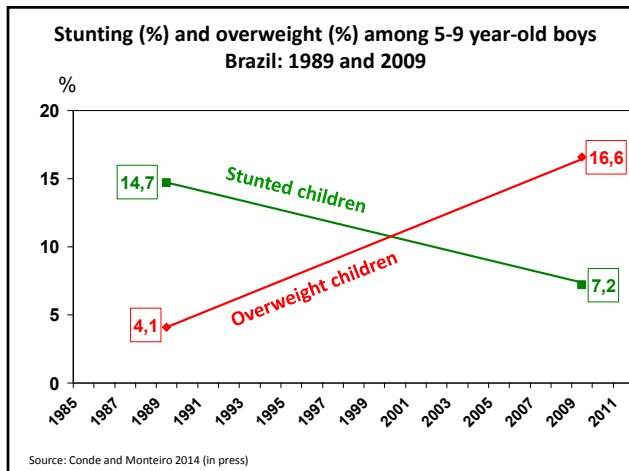
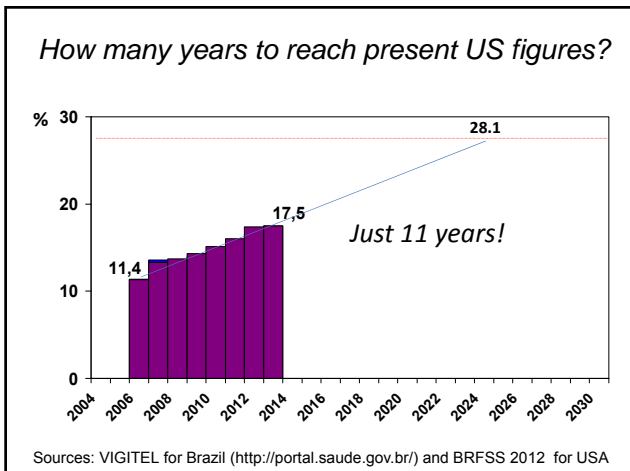
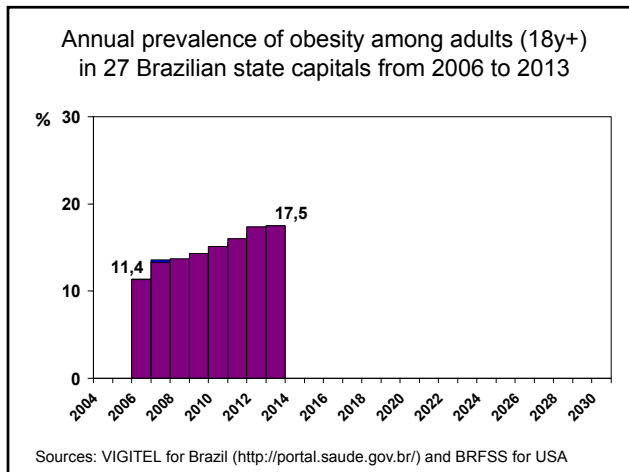


Food Systems, Nutrition Transition and Health
 TRANSNUT, WHO Collaborative Centre for Nutrition at the University of Montreal
 Montreal, Canada, May 12, 2014

Food processing, quality of diets and health

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Food processing, quality of diets and health

- Food processing in the food system is the key factor
- The global shift from foods and freshly prepared meals to ultra-processed products
- Impact on the quality of diets and the risk of NCDs in low, middle, and high income countries
- Implications for national and global public policies

Food processing largely ignored by nutritionists: no distinction between foods and food products!

Piramida McDonald's - a stilului de viață <http://povernews.com/2013/10/29/the-romanian-mcdonalds-food-pyramid/>

Piramida McDonald's a stilului de viață îți arată cum poți combina viața activă cu o dietă echilibrată. Ieșește sfaturi au la bază recomandările Organizației Mondiale a Sănătății.

Exerciții fizice de întărire a musculaturii
Încercă să incluzi în program exerciții de 15-30 minute de forță, două ori pe săptămână, pentru îmbunătățirea tonusului muscular, pentru forță și rezistență.

Cu moderație
Vizionarea programelor TV, ascultarea muzicii și pe calculator.

Exerciții cardiovasculare
Încercă să incluzi 15-30 de minute de exerciții cardio zilnic și să acorțezi intensitatea, cu mai puțin de 3 zile pe săptămână. Alegerea bicicletelor, alergarea, dansul, înotul, tenisul, tenisul de masă, jocurile de masă sunt toate bune pentru activitate fizică.

Activități zilnice
Încercă să faci activități fizice în timpul zilei, cum ar fi mersul pe jos, pe bicicletă, de la și până la serviciu, urcatul pe scări, joacă de masă, activități de joacă, dansul, joacă de masă și activități fizice în general.

Săuturi

Food processing ignored by epidemiologists: only specific products are considered!

To what extent have sweetened beverages contributed to the obesity epidemic?

Gail Woodward-Lopez*, Janice Kao and Lorrene Ritchie
Dr Robert C. and Veronica Atkins Center for Weight & Health, University of California, 3 Giannini Hall #3100, 94720-3100 CA, Berkeley, USA

Original Article

Association of candy consumption with body weight measures, other health risk factors for cardiovascular disease, and diet quality in US children and adolescents: NHANES 1999–2004

Fast-food habits, weight gain, and insulin resistance (the CARDIA study): 15-year prospective analysis

Mark A Pereira, Alex I Kartashov, Cara B Ebbeling, Linda Van Horn, Martha L Slattery, David R Jacobs Jr, David S Ludwig

Food scientists : re-engineering junk food!



Curr Obes Rep
DOI 10.1007/s13679-014-0092-0

OBEISITY TREATMENT (CM APOVIAN, SECTION EDITOR)

Food Classification Systems Based on Food Processing: Significance and Implications for Policies and Actions: A Systematic Literature Review and Assessment

Jean-Claude Moubarac · Diana C. Parra · Geoffrey Cannon · Carlos A. Monteiro

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NOVA: a food classification based on extent and purpose of industrial processing

Groups and sub-groups	Extent, and examples
Unprocessed foods	No industrial processing: <i>raw milk, fruits, nuts</i>
Minimally processed foods	No subtraction of edible parts: <i>brown rice, pasteurized milk</i>
Moderately processed foods	Edible parts subtracted: <i>white rice, white wheat flour</i>
Processed culinary ingredients	Substances extracted from foods or nature: <i>oil, fat, sugar, salt</i>
Processed ready-to-consume products	Single, whole foods added of salt or sugar or other substances: <i>vegetables in brine, fruits in syrup, cheese, simple breads</i>
Ultra-processed ready-to-consume products	Formulations of ingredients extracted or derived from foods and other organic sources, with little or no intact food: <i>sweet/savory snacks, soft drinks, confectionery, 'energy' bars, buns, reconstituted meat products, instant noodles etc</i>

NOVA: a food classification based on extent and purpose of industrial processing

Groups and sub-groups	Purpose
Unprocessed foods	-
Minimally processed foods	Increase duration of foods
Moderately processed foods	Increase duration of foods
Processed culinary ingredients	Converting foods into freshly prepared meals
Processed ready-to-consume products	Increase duration and modify palatability of foods
Ultra-processed ready-to-consume products	Creation of convenient, low cost, hyper-palatable products to replace fresh foods and freshly prepared meals


Source: Moubarac et al. Obesity Reports 2014

Food processing to encourage consumption of foods and freshly prepared meals

Unprocessed foods		 <p>MULTI-FOOD FRESHLY PREPARED MEALS (mostly consumed in regular times, at table, and often in company)</p>
Minimally processed foods		
Moderately processed foods		
Processed culinary ingredients		
Processed ready-to-consume products		

Food processing to displace consumption of foods and freshly prepared meals

Ultra-processed ready-to-consume products



SNACKS, DRINKS AND 'FAST MEALS'
(mostly consumed across the day, on the go, and often alone)

Ultra-processed products are manufactured to displace foods and freshly prepared meals



'Nestlé Canada is thrilled to introduce **Peelin' Pops**, a **unique new frozen treat that looks like a banana and tastes like one too!** Bite the tip of the bar, peel the "banana skin", enjoy the creamy vanilla filling!'

<http://www.corporate.nestle.ca/en/media/pressreleases/...treat-kids-will-go-bananas-over>

The fake banana also in Brazil



See Nestlé. The BenNaNa master plan *World Nutrition* May 2014, 5, 5, 436-445

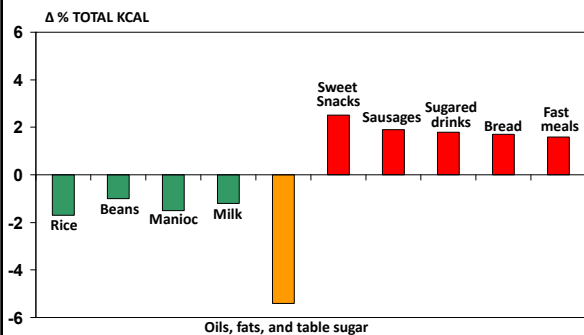
Foods and products ranked by percentage of total energy intake
US population, all ages, 2009-2010

	Foods	Culinary ingredients	Processed products	Ultra-processed products
1	Meat 8%	Oils 1%	Cheese 4%	Pizza, sandwich, other fast meals 10%
2	Fruits 5%	Sugar 1%	Ham 1%	Breads 9%
3	Milk 5%	All other < 1%	All other 2%	Soft drinks, fruit and milk drinks 8%
4	Grains 3%			Sweet snacks, ice cream, desserts 6%
5	Potatoes 2%			Cakes, cookies, pies, pastries 5%
6	Eggs 1%			Salty snacks 4%
7	Pasta 1%			Sugared breakfast cereals 3%
8	Fish < 1%			Alcoholic drinks 3%
9	Legumes < 1%			Sauces, dressings, gravies 3%
10	Veggies < 1%			Reconstituted meat/fish products 2%
	All other 1%			All other 5%
All	30.1%	2.9%	7.1%	59.9%

Source: NHANES 2009-2010 and Martinez et al (manuscript in preparation as part of a PhD dissertation)

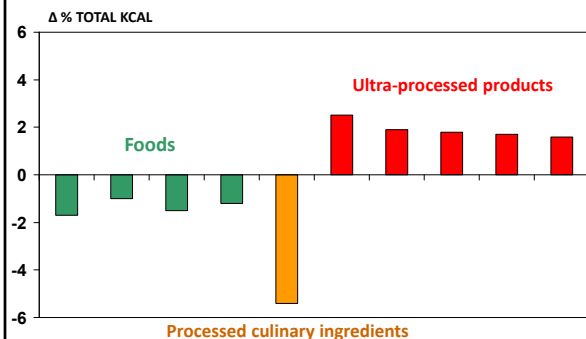
- Food processing in the food system is the key factor
- The global shift from foods and freshly prepared meals to ultra-processed products
- Impact on the quality of diets and the risk of NCDs in low, middle, and high income countries
- Implications for national and global public policies

Changes from 1987 to 2009 in the caloric share of foods and products purchased by Brazilian households

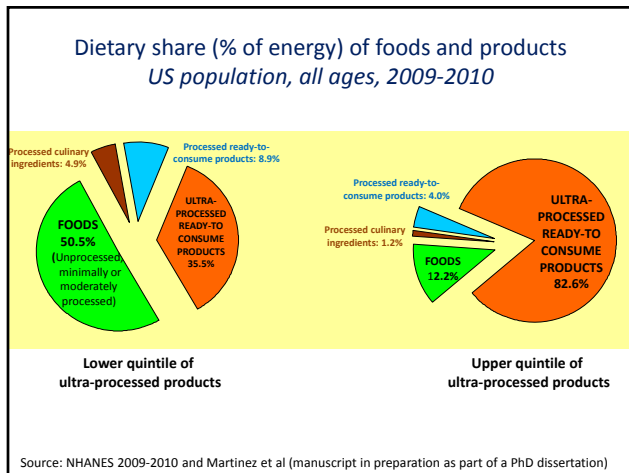
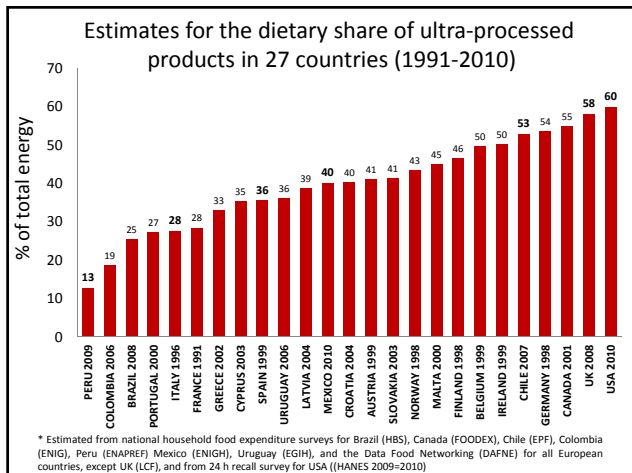
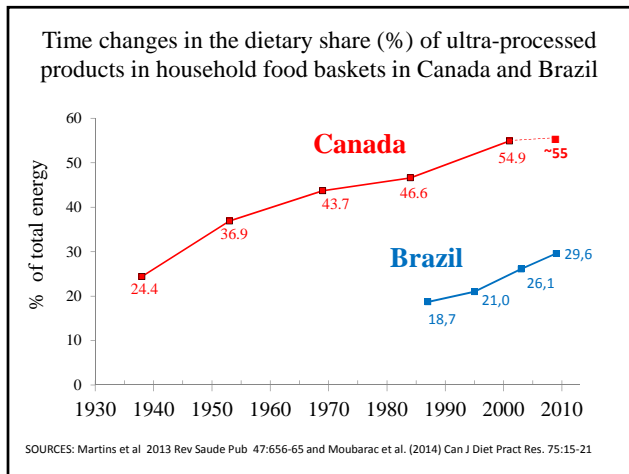
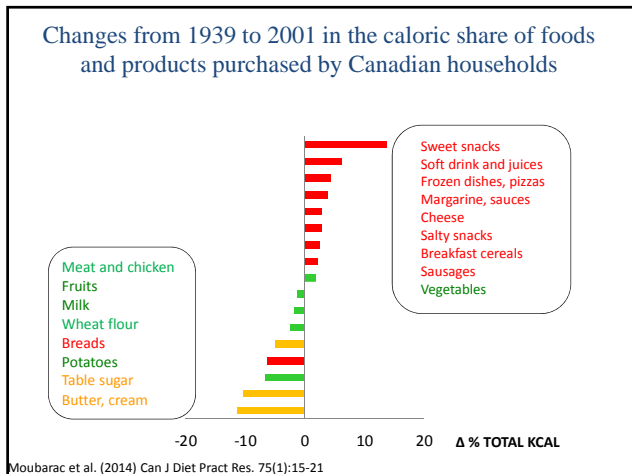


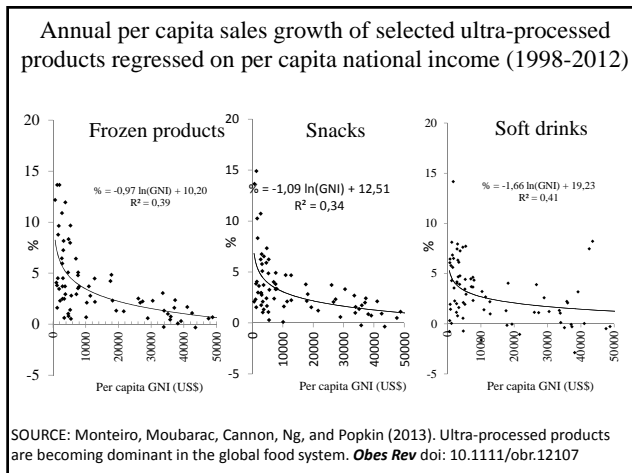
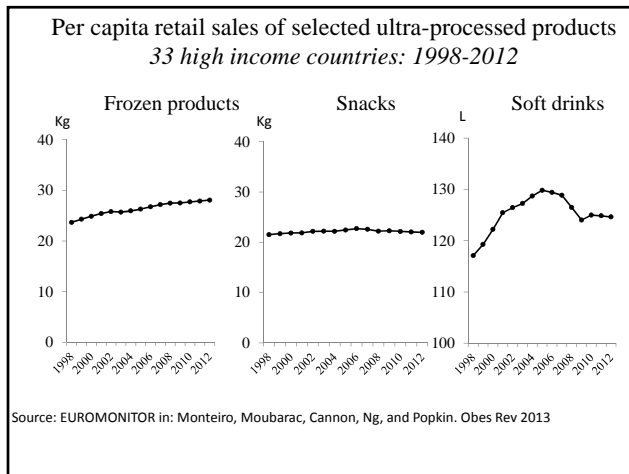
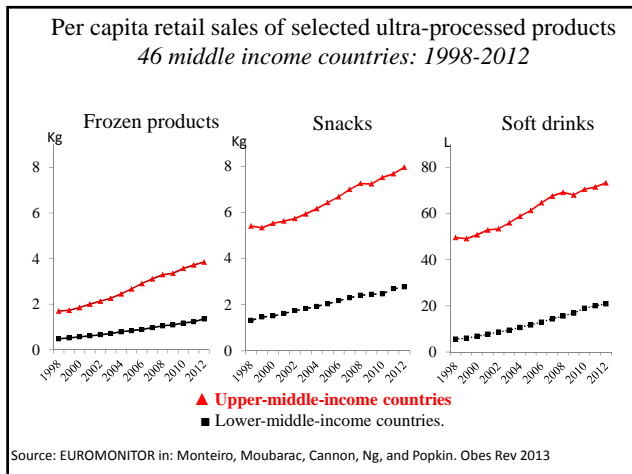
Source: Adapted from Martins et al 2013 Rev Saude Pub 47:656-65

Changes from 1987 to 2009 in the caloric share of foods and products purchased by Brazilian households



Source: Adapted from Martins et al 2013 Rev Saude Pub 47:656-65





- Food processing in the food system is the key factor
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VS.

In all countries we have studied, when compared to foods and freshly prepared meals meals, ultra-processed products have:

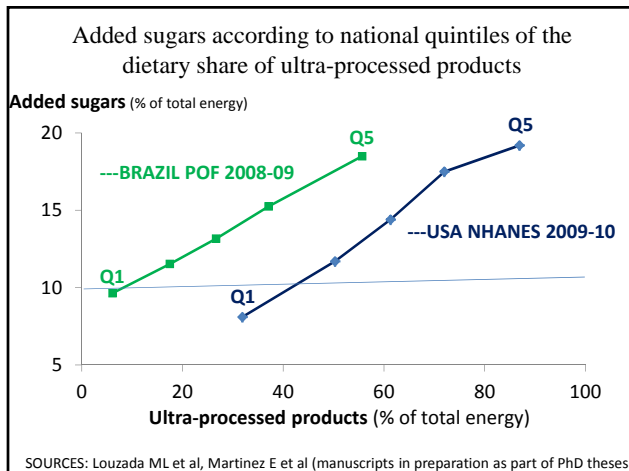
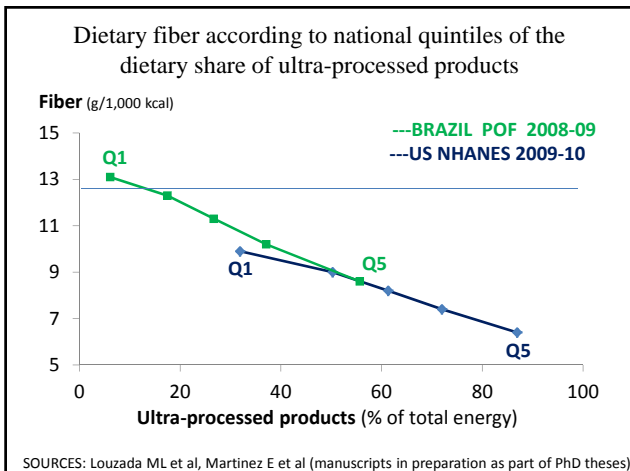
- Higher energy density
- More free sugar
- More trans fats
- Less protein, less fiber
- Less vitamins and minerals in general

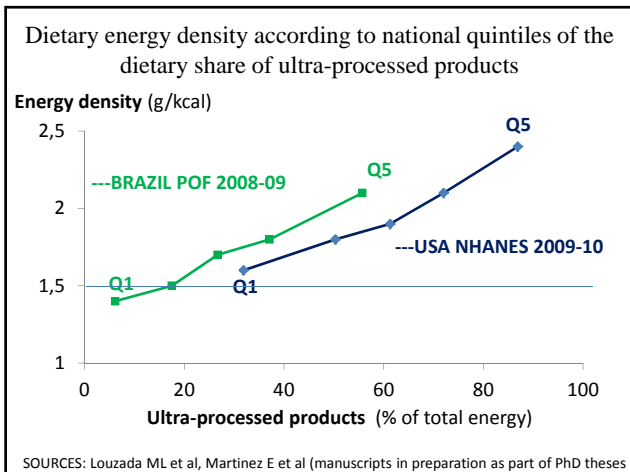
Sources: Monteiro et al Pub Health Nutr 2011; Moubarac et al Pub Health Nutr 2013

ENERGY DENSITY (KCAL/G)

Country	Whole diet without ultra-processed products	Ultra-processed products
CANADA 2001	1.3	2.8
BELGIUM 1999	1.6	3.0
AUSTRIA 1999	1.7	3.1
FINLAND 1998	1.4	2.7
SPAIN 1999	1.9	2.7
GERMANY 1998	1.6	2.9
FRANCE 1991	1.5	2.6
UK 2008	1.4	2.8
BRAZIL 2008-09	1.9	2.9
COLOMBIA 2007	1.8	2.7
ALL (range)	1.3-1.9	2.6-3.1

Estimated from national household food expenditure surveys for Brazil (HBS), Canada (FOODEX), Colombia (ENIG), and the Data Food Networking (DAFNE) for all European countries, except UK (LCF).





- Non-nutrient attributes of ultra-processed products which disturb the regulation of energy balance and make them be often overconsumed*
- Hyper-palatability (all products)
 - Habituation/addiction (some products)
 - Super size servings (many products)
 - Inducement of mindless eating (all products)

Ultra-processed products are made to be overconsumed: sugar, salt, fat, caffeine, sodium monoglutamate, texture, flavors, colors, packaging ...

- Non-nutrient attributes of ultra-processed products which disturb the regulation of energy balance and make them be often overconsumed*
- Hyper-palatability (all products)
 - Habituation/addiction (some products)
 - Super size servings (many products)
 - Inducement of mindless eating (all products)
 - **Aggressive marketing**

The marketing of ultra-processed products typically promotes compulsive overeating

Non-stop

New brand of ultra-processed products in Brazil



It is one after the other!

The name says it all:
'Non-stop is simply irresistible'.

The marketing of ultra-processed products typically promotes compulsive overeating



'With something so fun and tasty, kids and adults alike will be entertained each and every time, **keeping them coming back for more.**'

<http://www.corporate.nestle.ca/en/media/pressreleases/...treat-kids-will-go-bananas-over>

Reformulated ultra-processed products can be as obesogenic as regular products

(or more if advertised as 'healthy foods')



Studies on the association between the dietary share of ultra-processed products and health outcomes (work in progress)

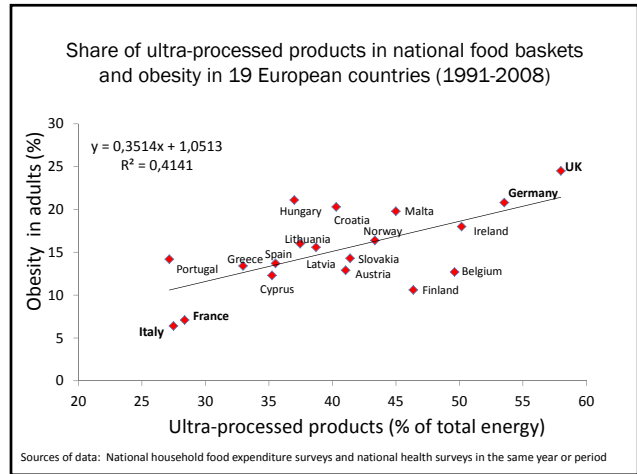
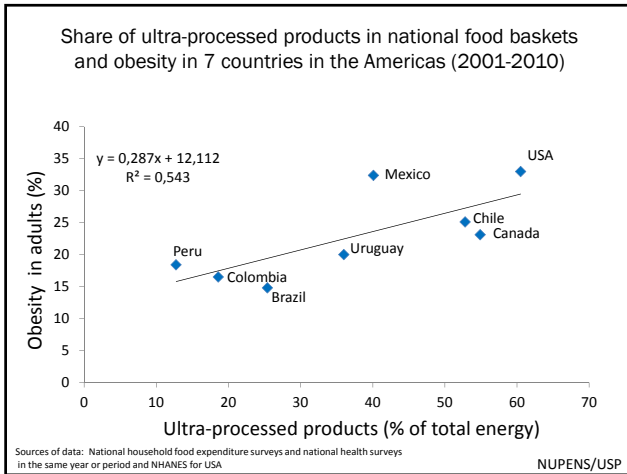


Table 3. Predictive values for household obesity indicators¹ according to the availability of ultra-processed food products (UPP). Brazil, POF 2008-2009.

Canella D et al *PLoS One* 2014 Mar 25

Household daily per capita availability of UPP (quartiles)	Household mean BMI (Z score)	Household prevalence of overweight + obesity (%)	Household prevalence of obesity (%)
1 st (220.0 kcal)	0.56	35.6	9.9
2 nd (345.6 kcal)	0.66	38.7	12.0
3 rd (422.0 kcal)	0.69	39.6	12.3
4 th (564.3 kcal)	0.75	41.7	13.6

¹ From a linear regression model adjusted for income, demographic variables, region and setting, percentage of expenditure on eating out of home, and complementary calories; all confounding variables set to the mean.

Adjusted¹ odds ratio for being obese by the dietary share (% of energy) of ultra-processed products. Brazil POF 2008-09 and US NHANES 2007-08.

Quintiles of ultra-processed products	Brazilian 10 y+ (n=33,613)	US 8-19 y (n=669)
1	1	1
2	1.39	1.55
3	1.47	1.68
4	1.46	2.29
5	1.82	2.41
p for linear trend	< .001	0.14

Sources: Louzada et al for Brazil and Baraldi et al for US – manuscripts in preparation as part of PhD dissertations

¹ In Brazil: adjusted for age, sex, family income, education, ethnicity, region and setting, smoking status, and consumption of fruits, vegetables, red meat and alcohol. In the US: adjusted for age, sex, family income, family head's education, ethnicity, physical activity and screen hours.

- *Food processing in the food system is the key factor*
- *The global shift from foods and freshly prepared meals to ultra-processed products*
- *Impact on the quality of diets and the risk of NCDs in low, middle, and high income countries*
- *Implications for national and global public policies*

Increasing production and consumption of ultra-processed products is now the main shaping force of the global food system, and one of the main determinants of the pandemic of obesity and related NCDs


The diagram features a red arrow pointing from a traditional plate of food (rice, meat, and vegetables) on the left to a collection of ultra-processed products (Cheetos, Coca-Cola, Puffs, Oreo, and Chocos) on the right.

Business as usual
(nutrient-based dietary guidelines, industry-driven product reformulation, marketing self-regulation etc)

The diagram features a red arrow pointing from a traditional plate of food on the left to a collection of ultra-processed products on the right.

The diagram features a red arrow pointing from a collection of ultra-processed products on the right to a traditional plate of food on the left.

Food- and meal-based dietary guidelines, health-oriented fiscal policies, government-driven marketing regulations

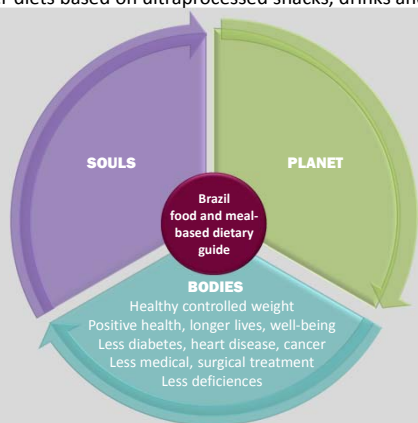


Dietary Guidelines for the Brazilian Population

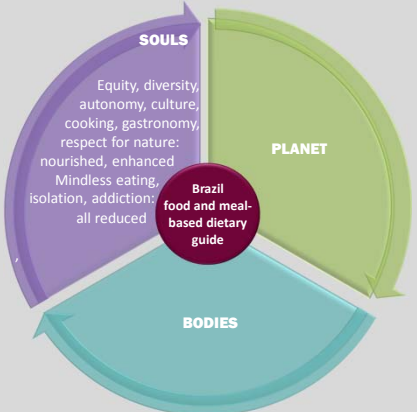
Issued by the Brazilian Federal Ministry of Health, Brasília DF
Draft. Has been for public consultation until 30 April 2014

<http://www.saude.gov.br/consultapublica>

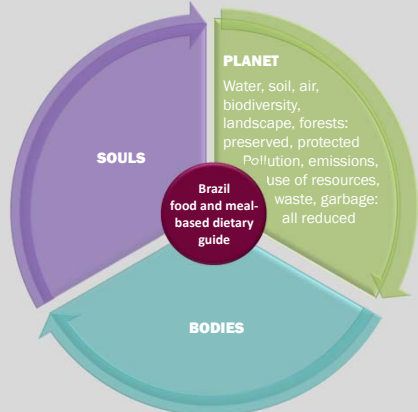
Advantages of diets based on a variety of foods and freshly prepared meals over diets based on ultraprocessed snacks, drinks and fast meals

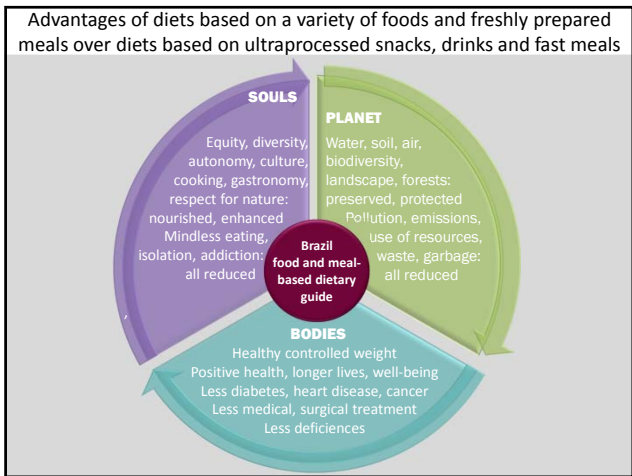


Advantages of diets based on a variety of foods and freshly prepared meals over diets based on ultraprocessed snacks, drinks and fast meals



Advantages of diets based on a variety of foods and freshly prepared meals over diets based on ultraprocessed snacks, drinks and fast meals





General recommendations

1. Make foods the basis of your diet

Foods in great variety, mainly of plant origin, the less processed the better, are the best foundation for nutritionally balanced, delicious, accessible and sustainable diets

Variety means foods of all kinds (grains, legumes, vegetables, roots and tubers, fruits, nuts and seeds, milk, eggs, meat, poultry, fish and seafood, and water) as well as variety within each type

General recommendations

2. Use oils, fats, sugar and salt in moderation to convert foods into freshly prepared dishes and meals

As long as these substances are used in moderation, they make nourishing, food-based dishes and meals palatable and delicious without compromising their nutritional value

General recommendations

3. Limit ready-to-consume processed products

Processed products are convenient and usually very palatable, but tend to be nutritionally unbalanced

To limit

processed products

General recommendations

4. Avoid ready-to-consume ultra-processed products

Ultra-processed products are convenient and hyper-palatable, but, besides being nutritionally unbalanced, they tend to induce energy overconsumption, to damage family and social life and to ruin the environment

To avoid



ultra-processed products

General recommendations





1. Make foods the basis of your diet
2. Use ultra-processed products in moderation to convert foods into fresh meals
3. Limit ready-to-consume ultra-processed products
4. Avoid ready-to-consume ultra-processed products

The golden rule

Always prefer foods and freshly prepared meals to ready-to-consume products, and avoid ultra-processed products





Which foods, dishes, and meals?

Lunch

 <p>Lettuce, rice, lentils, roast pork, potatoes, sautéed cabbage, pineapple <i>Man, 43, South region</i></p>	 <p>Lettuce, tomato, beans, manioc flour, stewed fish, coconut <i>Man, 28, North-East region</i></p>
 <p>Tomatoes, rice, beans, beef, fruit salad <i>Man, 50, Mid-West region</i></p>	 <p>Rice, beans, corn mash, squash, okra, papaya <i>Woman, 49, South region</i></p>

Which foods, dishes, and meals?

Dinner

 <p>Rice, beans, ground beef, vegetables <i>Woman, 28, Mid-West region</i></p>	 <p>Rice, beans, beef liver, zucchini <i>Man, 33, South-East region</i></p>
 <p>Vegetable soup, açai, cassava grits <i>Man, 15, North region</i></p>	 <p>Salad, pasta, chicken <i>Man, 45, South region</i></p>

Ten steps to healthy and sustainable diets
For everybody, everywhere

- 1 Make a variety of plant foods the basis of your diet
- 2 Use oils, sugar and salt in moderation to convert foods into dishes
- 3 Avoid ready-to-consume ultra-processed products
- 4 Eat freshly cooked meals regularly, mindfully, in pleasant places
- 5 Enjoy meals in company
- 6 Buy food in places that offer a variety of fresh, locally produced foods
- 7 Learn, value, practice and share the art of cooking
- 8 Give the pleasure of eating a central place in your life
- 9 Choose places to eat out that serve freshly cooked meals
- 10 Be critical of information and orientation from sources with conflict of interest



THE FOOD SYSTEM

The big issue for nutrition



Carlos Monteiro, Geoffrey Cannon
Renata Bertazzi Levy, Rafael Claro, Jean-Claude Moubarac
Ana Paula Martins, Maria Laura Louzada, Larissa Baraldi, Daniela Canella,
Diana Parra, Logan Mauney, Maluh Barciotte, Semiramis Domene

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