

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



Pan American
Health
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World Health
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REGIONAL OFFICE FOR THE Americas

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Foreword

The increasing burden of ill health and premature deaths attributable to chronic non-communicable diseases (NCDs), particularly affects low and middle income countries and the key underlying but modifiable risk factors are tobacco, harmful use of alcohol, physical inactivity and low quality diet. Poor nutrition is a major cause of illness and mortality as documented in the Global Burden of Disease Study 2010, with nutritional factors now being a major contributor to years of life lost and years lived with disease in the Americas.

This report is timely and provides an up-to-date comprehensive perspective on global shifts in sales of ultra-processed food and drink products over the past decade, while exploring the connection between the surge in market share and the epidemic of obesity in Latin America. It examines trends in sales of ultra-processed products, their distribution in supermarkets and retail outlets, and market concentration. The report also examines how sales are associated with socioeconomic drivers including patterns of urbanization, income growth and market deregulation. While sales volumes remain higher in high-income countries, the rate of growth was faster in lower-income countries during the period 2000 to 2013. Consistent with previous findings, sales of ultra-processed products are associated with weight gain and obesity in Latin America. The solutions to this epidemic of unhealthy diets can be found in sound public policies and this monograph provides clear guidance on the way forward.

Anselm Hennis

Director

Department of Noncommunicable Diseases and Mental Health

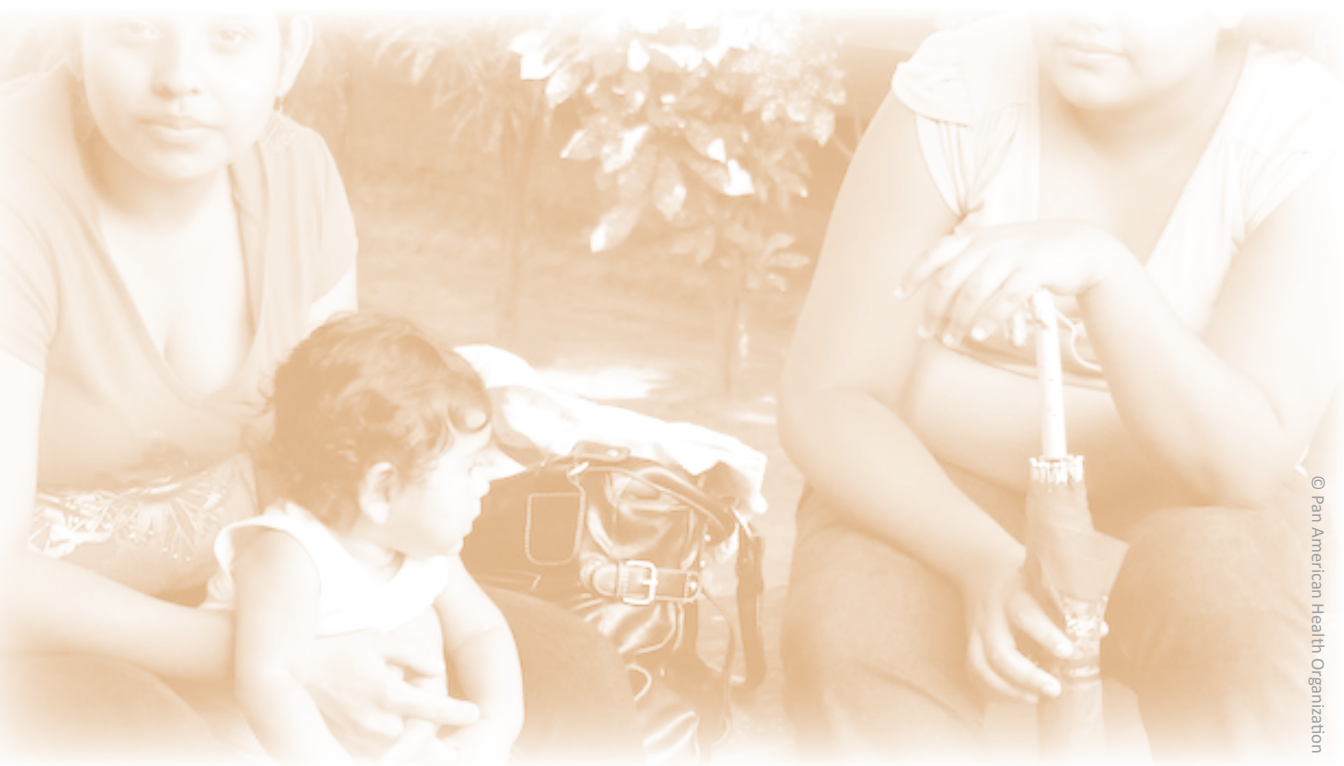
Summary

Commercially, the most attractive markets for ultra-processed food and drink products are no longer the fully industrialized high-income countries of the Global North (North America, Western Europe, and developed parts of East Asia). They are the middle-and low-income countries of the Global South (Africa, economically developing countries in Asia, Eastern Europe, and Latin America).

This study has analyzed sales of ultra-processed products from retail stores (“off trade” purchases) and fast-food outlets (“on-trade” purchases) in 13 countries in Latin America between 2000 and 2013. Both retail sales and fast-food transactions increased steadily in all 13 countries except Argentina and Venezuela, where sales fluctuated during financial crises. In Latin America, most ultra-processed products are increasingly sold in convenience stores, supermarkets, and hypermarkets (“superstores” or combination supermarket/department stores). Market of several leading ultra-processed products is oligopolistic and often dominated by transnational corporations.

Sales of ultra-processed products increase with urbanization, and when national governments open their countries to foreign investment and deregulate markets. While sales volume remains higher in high-income countries, the rate of growth was faster in lower-income countries during 2000-2013. Lastly, consistent with previous findings, sales of ultra-processed products are associated with weight gain and obesity in Latin America.

As stated in the Pan American Health Organization five-year Plan of Action on childhood obesity (2014–2019), to support and encourage health dietary patterns, the strong increase in sales of ultra-processed products throughout the Americas needs to be checked by statutory regulations and the development of market opportunities to protect and strengthen local and national healthy food systems and thus healthy dietary patterns.



Introduction

Obesity and related chronic noncommunicable diseases (NCDs) are now epidemic throughout Latin America, among adults as well as children and adolescents (1,2). In response, in October 2014, Pan American Health Organization (PAHO) Member States approved a five-year Plan of Action on childhood obesity (2014–2019) designed to halt further increase of obesity in children and adolescents in the region (3).

PAHO identifies the current environment as one that causes overweight and obesity. It emphasizes the central importance of diet as well as trade and agriculture policies in determining the quality of food supplies and thus of dietary patterns. Its recommendations include fiscal policies and other incentives for increased production and consumption of healthy food; the regulation of marketing of unhealthy food; better labeling of processed food and drink products; and improvement of school food and increased physical activity among schoolchildren. The recommendations build on public policies already initiated in Latin America, such as the Mexican tax on sugary drinks and energy-dense snacks; regulation of food marketing to children in several countries; and the Brazilian food- and meal-based dietary guidelines (4). PAHO also emphasizes the need for more government interventions to set, achieve, and monitor specific, quantifiable targets.

The most effective policies and actions designed to improve the quality of food supplies to reduce the incidence of overweight and obesity, include the use of public regulations and market interventions (5). For example, the efficacy of price, availability, and other statutory controls on use of tobacco is well-documented (6). However, recent attempts to use mandatory regulations to improve food supplies have been impeded by misinformation and biased science, along with pressure from commercially interested parties (7). Policies and actions to improve food systems for healthier diets need strong political commitment, combined with determined and sustained support from citizens—as voters and parents—and leadership from civil society organizations and social movements at all levels (national, state, and municipal).

Public policies, recommendations and actions concerning nutrition and health have conventionally been based on nutrients (for example, sodium and saturated fats) or on types of foods (for example, fruits and vegetables, and red meat). These methods of approaching and categorizing diets are inadequate and misleading because they are based on a narrow vision of nutrition (in which food are seen as the mere sum of nutrients), and neglect the role of modern industrial food processing and its impact on diet (8). Industrial food processing is now the main driving force shaping what has become a global food system, as especially now affecting now middle-and low-income countries (9).

The most striking change in food systems of high-income countries, and now of low- and middle-income countries, is displacement of dietary patterns based on meals and dishes prepared from unprocessed or minimally processed foods by those that are increasingly based on ultra-processed food and drink products (10–13). The result is diets with excessive energy density, high in free sugars and unhealthy fats and salt, and low in dietary fiber (14–15) that increase the risk of obesity and other diet-related NCDs (16–19). The proportion of ultra-processed products in food supplies can be seen as a measure of overall population diet quality (20).

More information on the manufacture, sale, and consumption of ultra-processed products in specific countries that can be compared internationally is needed in Latin America. Governments will then be able to formulate, agree on, implement, and monitor policies and programs to encourage healthy dietary patterns whose quality is strongly supported by the evidence and directly relevant to the local context.

To help fill the information gap, this study analyzed sales of ultra-processed products from retail stores (“off trade” purchases) and fast-food outlets (“on-trade” purchases) in 13 countries in Latin America between 2000 and 2013. The resulting analyses and recommendations reported here are based on the NOVA conceptual framework for classifying food (21) devised by a research team at the University of São Paulo in Brazil. The NOVA system classifies foods and diets according to the nature, purpose, and extent of industrial food processing rather than in terms of nutrients and food types.

The leading international scientific work based on the NOVA system has come from Latin America and Canada (8–11, 13–16). Assessments of the relationship between patterns of diet and patterns of obesity and related

diseases need to consider the significance of industrial food processing, with specific attention to ultra-processed products. This approach was used in a briefing document supporting the PAHO Plan of Action (22) and is set out in guidelines issued by the Food and Agriculture Organization of the United Nations (FAO) (23). It is also the basis of national dietary guidelines issued by the Brazilian Ministry of Health in November 2014 (4).

Scope of this report

This report describes trends in the sales of ultra-processed food and drink products in 13 Latin American countries (Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Mexico, Peru, Uruguay, and Venezuela) as well as the social and economic factors that drive them and associated implications for the rise, control, and prevention of obesity and related diseases.

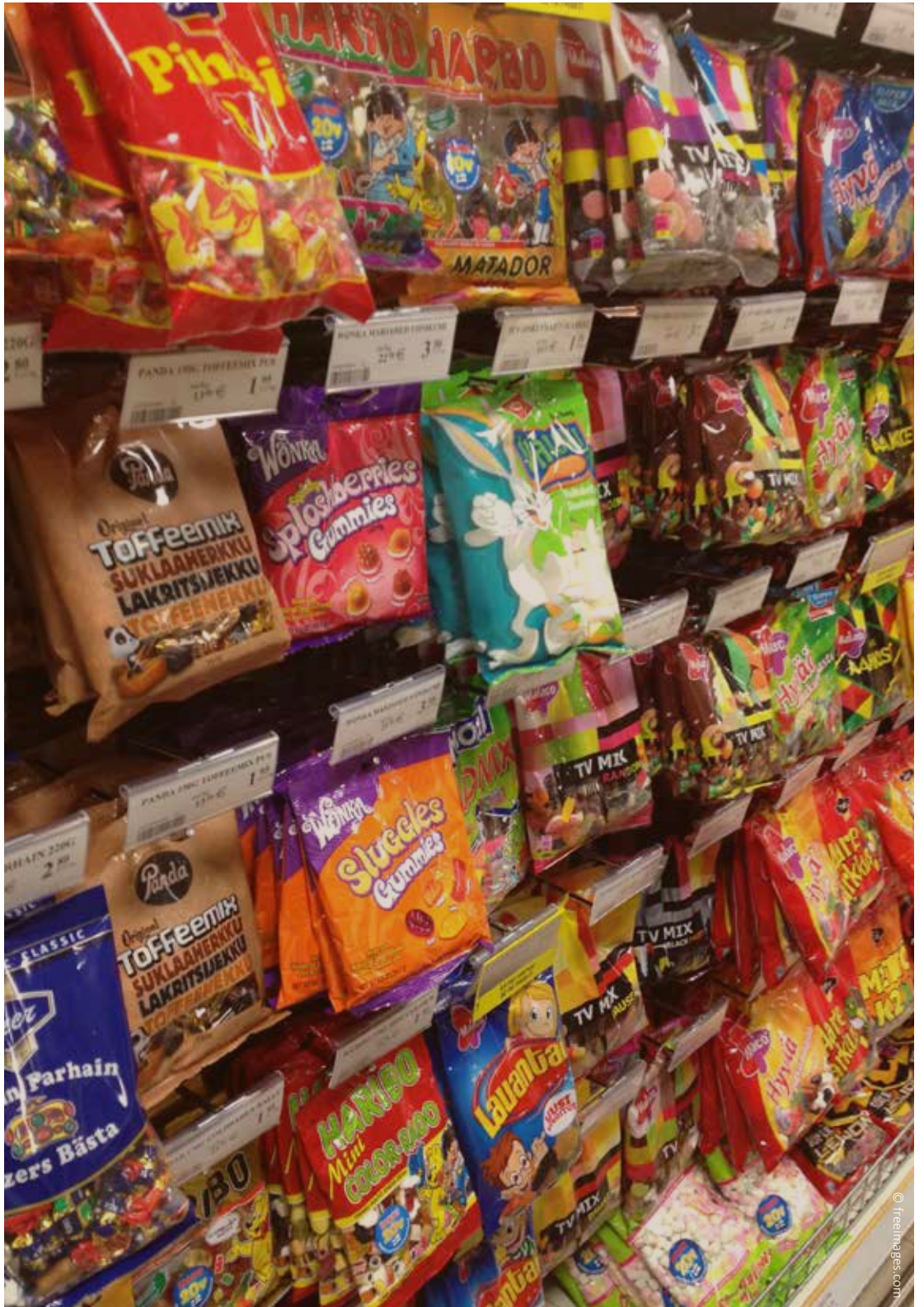
Chapter 1 (“What are ultra-processed products?”) provides a brief summary of the NOVA food classification system (21) plus an overview of ultra-processed food and drink products, their characteristics, and their impact on human health. Chapter 2 describes the methodology used in this report, including data sources and analysis.

Chapter 3 compares trends in sales of ultra-processed products in Latin America with those in other regions of the world, and examines retail sales of ultra-processed products and fast-food transactions (number of single, completed purchases) in the 13 Latin American countries studied as well as their distribution and market concentration.

Chapter 4 provides evidence from throughout the world on the correlation of the sale of ultra-processed products with urbanization, economic growth, and market deregulation, and briefly describes changes in the retail sector in the Americas.

Chapter 5 compares changes over time in sales of ultra-processed products with changes over time in body mass in 12 of the 13 Latin American countries (all but Argentina). Chapter 6 describes policies and actions that could help improve food supplies and dietary patterns to protect health throughout Latin America.

Annex A provides details about the NOVA food classification system. Annex B lists the countries covered in this report by region.



Chapter 1

What are ultra-processed products?

Practically all food consumed today is processed in some way. If processing is defined as methods in which raw food is made more edible and enjoyable, or preserved for later use, food has been processed throughout human history. Food processing has played a central role in human evolution and adaptation in its contribution to securing adequate nourishing food supplies and thus the development of societies and civilizations, the protection of health and well-being, and the achievement of social and emotional well-being through the sharing of meals (24,25).

Since industrialization, and particularly in the second half of the last century, food processing has developed very rapidly and been profoundly transformed through food science and other types of technology (26). This transformation suggests the need for rigorous examination of the impact of all forms of food processing on food systems and supplies; dietary patterns; and nutrition, health, and well-being.

1.1 The NOVA food classification system

Food is not healthy or unhealthy simply because it is “processed.” Meaningful discussion of food processing requires the use of specific terminology with clear definitions that apply universally. Many types of processing are essential, beneficial or harmless. Other types of food processing are harmful in terms of human health and in other ways. A proper understanding of the significance of food processing depends on and can be derived from a classification of food supplies and dietary patterns that distinguishes between types and uses of processing.

This report is based on the NOVA food classification system. The NOVA system groups food according to the nature, purpose, and extent of its processing (21,27). It has four groups, specified below and in more detail in Annex A:

1. Unprocessed or minimally processed foods
2. Processed culinary ingredients
3. Processed foods
4. Ultra-processed food and drink products

The NOVA system enables the study of food supplies and dietary patterns as a whole, within countries over time and between countries. It also enables the study of individual food groups within the system.

Unprocessed or minimally processed foods

Unprocessed foods are parts of plants or animals that have not undergone any industrial processing. Minimally processed foods are unprocessed foods altered in ways that do not add or introduce any new substance (such as fats, sugars, and salt) but may involve the removal of parts of the food. They include fresh, dry, or frozen fruits, vegetables, grains and legumes, nuts, meats, seafood, eggs, and milk. Minimal processing techniques extend the food's duration, aid its use and preparation, and improve its palatability.



Unprocessed or minimally processed foods, including fresh, dry, or frozen fruits, vegetables, grains, legumes, nuts, meats, seafood, eggs, and milk, are the basis of healthy dishes and meals.

Processed culinary ingredients

Culinary ingredients are substances extracted and purified by industry from food constituents or obtained from nature (such as fats, oils, salt and sugars). These substances are normally not consumed by themselves. They are mainly used to prepare foods and to make palatable, diverse, nourishing and enjoyable dishes and meals, which typically are shared with others.



Processed culinary ingredients include fats, oils, salt, and sugars. They are used to prepare foods, and to make palatable, diverse, nourishing and enjoyable dishes and meals.

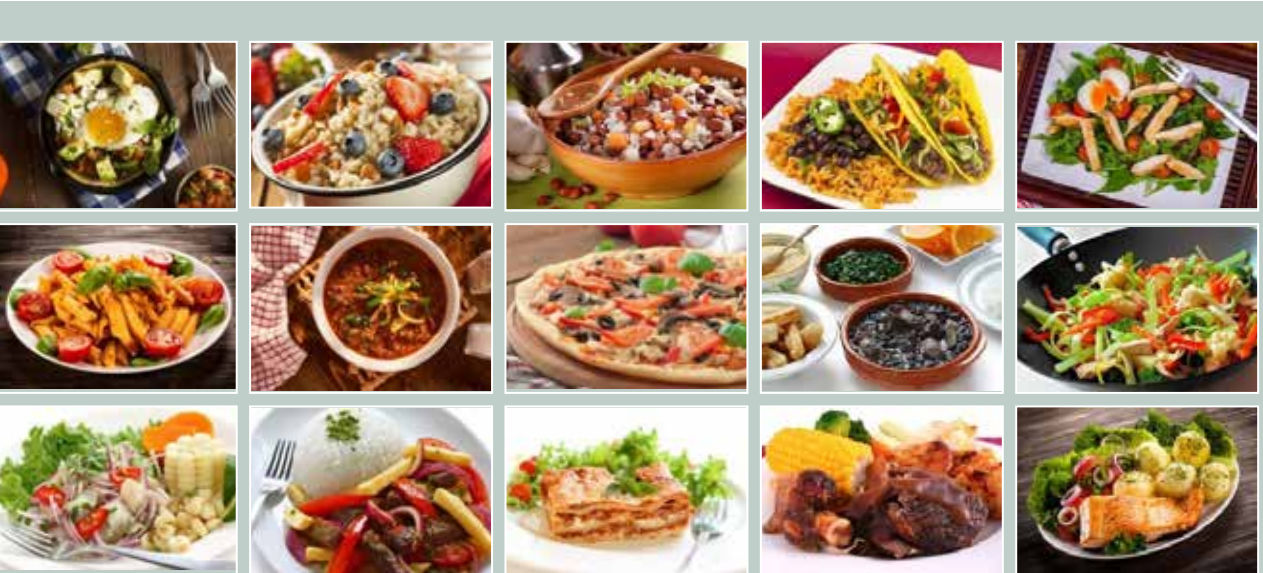
Processed foods

Processed foods are manufactured by adding fats, oils, sugars, salt, and other culinary ingredients to minimally processed foods to make them more durable and usually more palatable. These types of foods include simple breads and cheeses; salted and cured meats, and seafood; and preserved fruits, legumes, and vegetables.



Processed foods include simple breads and cheeses; salted and cured meats and seafood; and fruits, legumes, and vegetables preserved in brine, syrup, or oil. Depending on how they are prepared and used in meals and dishes, these foods can be part of healthy diets.

Unprocessed or minimally processed foods prepared with processed culinary ingredients, and sometimes combined with processed foods, result in handmade dishes. When such dishes are made from a variety of minimally processed foods, mostly of plant origin, and with moderate use of culinary ingredients, the meals and diets they comprise protect health and promote well-being (4,28–30). The new Brazilian dietary guidelines (based on the NOVA food classification system) (4) and the proposed 2015 U.S. dietary guidelines (29) recommend mostly plant-based diets based on minimally processed foods.



Handmade dishes combining unprocessed or minimally processed foods prepared with culinary ingredients and combined with some processed foods are the basis of healthy meals.

Ultra-processed products

Ultra-processed food and drink products are industrial formulations manufactured from substances derived from foods or synthesized from other organic sources. In their current forms, they are inventions of modern industrial food science and technology. Most of these products contain little or no whole food. They are ready-to-consume or ready-to-heat, and thus require little or no culinary preparation.

Some substances used to make ultra-processed products, such as fats, oils, starches, and sugar, are directly derived from foods. Others are obtained through the further processing of food constituents, such as hydrogenation of oils (which generates toxic trans fats), hydrolysis of



Most products sold in supermarkets, especially in central aisles and at the end of aisles, are ultra-processed, along with most products in convenience stores and fast-food outlets.

proteins, and “purification” of starches. Numerically, the great majority of ingredients in most ultra-processed products are additives (binders, bulkers, colors, emulsifiers, flavors, preservatives, sensory enhancers, solvents, stabilizers, and sweeteners). Ultra-processed products are often bulked with air or water. Synthetic micronutrients may be added to “fortify” them.

Examples of ultra-processed products (described in more detail in Annex A) include chips (crisps) and many other types of fatty, salty, or sweet packaged snack products; ice-cream, chocolate, and candies (confectionery); packaged breads, buns, cookies (biscuits), pastries, and cakes; sweetened breakfast cereals; energy bars; preserves; margarines; carbonated drinks and energy drinks; sugar-sweetened milk drinks, including fruit yogurt drinks; fruit and fruit nectar drinks; cocoa drinks; infant formulas, follow-on milks, and other baby products; and “health,” and “slimming” products such as powdered or “fortified” meal and dish substitutes. Ultra-processed ready-to-heat or ready-to-consume products are now very commonly consumed at home or at fast-food outlets. These foods, also known as “ready-meals”, include reconstituted and pre-prepared meat, seafood, vegetable, or cheese dishes; pizza; burgers and hot dogs; French fries (chips); poultry and fish nuggets or sticks (fingers); and powdered and packaged soups, noodles, and desserts. They often appear to be much the same as home-cooked meals or dishes, but their ingredients lists show that they are not.

1.2 Problems with ultra-processed products

Various nutritional and metabolic characteristics of ultra-processed products are problematic, as are their social, cultural, economic, and environmental impacts, especially when they amount to a substantial and increasing proportion of national food supplies and diets (21, 31). These foods are problematic in terms of human health because they have very low nutritional quality and are usually hyper-palatable, and sometimes even quasi-addictive; imitative of food, and falsely seen as healthy; conducive to snacking; aggressively advertised and marketed; and culturally, socially, economically, and environmentally destructive.

Very low nutritional quality

Ultra-processed food and drink products are energy-dense and nutritionally unbalanced (14–15). They are characteristically fatty, salty, or sugary, and depleted in dietary fiber, protein, various micronutrients, and other bioactive compounds. They are often high in saturated fats or trans fats. They often have high glycemic loads. Their true nature is typically disguised by sophisticated use of additives. While some of these additives are innocuous, the safety of others, singly or in combination with other food substances, is unknown or disputed.

Hyper-palatable and quasi-addictive

Ultra-processed products are designed to satiate food cravings, they are often hyper-palatable and habit forming, and sometimes even quasi-addictive (32,33). Certain characteristics (tastes, properties, etc.) engineered into these types of products through food science and other technologies can skew mechanisms in the digestive system and brain that signal satiety and control appetite, and cause overconsumption (31,34). As a result, consumption of these products can impede the ability to control dietary habits.



Imitative of food; falsely seen as healthy

By nature, ultra-processed products are not “modified food,” or any other version of food, but their formulations often use technologies designed to imitate the appearance, shape, and sensory qualities of food. Therefore, they may be molded and extruded into food-like shapes, or contain cosmetic and other additives that imitate the sensory qualities of food, often in an intensified form. In addition, manufacturers often create a false impression that ultra-processed products are healthy by including pictures of natural foods in the labeling, packaging, and promotional material and/or advertising the addition of synthetic vitamins, minerals, and other compounds, which allows them to imply or make health claims.

Conducive to snacking

Ultra-processed products are usually sold in the form of snacks, drinks, or ready-to-consume/ready-to-heat dishes. Most are designed and packaged for immediate consumption. They are available at all sorts of food retailers, as well as many non-food venues, many of which are open 24/7, and thus can be purchased at almost any time. Typically, they can be and are consumed almost anywhere—in catering outlets, at drive-ins and takeaways, at home, in the workplace, or in the street. They are convenient, storable, easily transportable, and usually require no plates or utensils. They are often consumed while focusing on something else (e.g., work, driving, or watching TV). These products displace freshly prepared foods, and dishes and meals made from them, served at home or outside the home (e.g., in restaurants and bars).

Aggressively advertised and marketed

Ultra-processed products typically are branded products of transnational and other corporations that buy or make the required industrial ingredients very cheaply and operate economies of scale. They are designed to be extremely profitable. The biggest corporations allocate huge annual budgets (up to US\$ billions) to advertising and promotion, including cross-advertising between their brands, to make their products attractive and often glamorous (32). As with cigarettes and alcoholic drinks, marketing strategies often use highly charged and seductive ideas, language, and images that undermine the desire and ability to make rational and healthy choices, and are particularly effective when targeting children, adolescents, and other vulnerable groups (32).

Socially and environmentally destructive

Displacement of established food supplies and dietary patterns by ultra-processed products can also damage social and cultural fabric, and mental and emotional health. Freshly prepared meals enjoyed with others are part of all civilizations. Traditional cuisines have evolved as expressions of autonomy and identity (35). Typically, they also are suited to specific climate and terrain, and generally sustainable, and they support local businesses, rural economies, and biodiversity (35). All of these benefits are undermined and can, eventually, be destroyed by the ultra-processed products produced by the global industrial food system.

1.3 Impact on nutrition, health, and well-being



Healthy diets are based on fresh and handmade meals (like the example on the left) derived from sustainable food systems and established food cultures. Diets largely composed of the ready-to-consume ultra-processed products of the globalized industrial food system (like the fast-food meal on the right), are unhealthy.

The 2014 PAHO Plan of Action (3) describes the most important factors promoting weight gain/obesity and chronic noncommunicable diseases as follows:

Authoritative publications, particularly from the World Health Organization (WHO), the Food and Agriculture Organization (FAO), and the World Cancer Research Fund [...] agree that the most important factors that promote weight gain and obesity, as well as associated noncommunicable diseases (NCDs), are: a) high intake of products poor in nutrients and high in sugar, fat, and salt [...], such as snacks and fast foods; b) routine intake of sugar-sweetened beverages; and c) insufficient physical activity.

These types of products—snacks, fast-food, and drinks—are almost invariably ultra-processed and should be identified as such. Because they are nutritionally imbalanced, energy-dense, and possess unique non-nutritional attributes that promote overconsumption, ultra-processed products are most likely the main dietary cause of weight gain and chronic diseases. This is now increasingly recognized by nutrition and public health researchers (5,9,31) and well understood (if not publicly admitted) by food technologists and industry executives (32).

Studies that examine the impact of ultra-processed products on obesity and chronic NCDs show consistent results. In several countries, the level of consumption of ultra-processed products is tightly correlated with overall diet quality (14, 15). Higher consumption of ultra-processed products is associated with dyslipidemia in children (17), and thus higher risk for cardiovascular disease; metabolic syndrome in adolescents (19); and adult obesity in Brazil (16).

Evidence from the United States shows that consumption of various ultra-processed products such as cookies (biscuits), white bread, candy (confectionary) and desserts; sugar-sweetened drinks; processed meats; and French fries (chips) and chips (crisps) is associated with weight gain in adults (18). Increase in fast-food sales predicts an increase in body mass in high-income European, North American, and other countries of the Organization for Economic Co-operation and Development (OECD) (36).

More studies using the NOVA classification system and methodology are needed to supplement the current findings, particularly those producing data that can be compared across countries. However, the lack of supplemental studies should not delay the use or dilute the significance of the PAHO Plan of Action findings and recommendations for the Americas, which could serve as a guide for other regions.

The basic principles of a healthy diet are now well known. Dietary patterns based on meals made from unprocessed or minimally processed food prepared with culinary ingredients are consistently associated with relatively low incidence of disease, as well as good health and well-being (4,29,30). This is a result of the nutritional quality of these foods and ingredients as well as the emotional, mental, and social benefits of preparing and sharing them in meals with others (24,37).

Chapter 2

Methodology

This report describes trends in sales of ultra-processed food and drink products with a focus on Latin America. It is based on data from the Passport Global Market Information Database published online by Euromonitor International, an independent provider of strategic marketing research (38). Euromonitor is an established source of commercial data, including internationally standardized statistics on packaged food as sold through retail outlets and on fast food transactions.

Throughout the report, ultra-processed products are defined and identified according to the NOVA food classification system. These include the following product categories in the Euromonitor Passport database and reported on here: carbonated drinks, breakfast cereals, sweet and savory snacks, confectionery (candy), ice cream, biscuits (cookies), fruit and vegetable juices, sports and energy drinks, spreads, sauces, and ready-meals. The report also includes data on ultra-processed products purchased from fast food outlets (defined as offering limited menus prepared quickly where customers order, pay and pick up from a counter), also obtained from Euromonitor.

In Chapter 3, trends in annual sales of ultra-processed products from retail outlets are reported by volume (in kilotons¹) and per capita by global region (see Annex B for the list of countries studied in each region). Trends in annual sales of ultra-processed products from retail outlets and transactions at fast-food outlets for the 13 Latin American countries studied are also described, and compared with data for Canada and the United States.

Chapter 3 also includes data on ultra-processed product retail sales described in terms of outlet distribution and company market share. Distribution is mainly from “modern” grocery retailers (convenience

¹ 1 kiloton = 1000 metric tons.

stores, discounters, forecourt retailers², hypermarkets, and supermarkets) as opposed to “traditional” grocery retailers (small independent grocers, specialty food sellers, and other food retailers, including those selling other types of goods such as tobacco). Market share data were used to calculate corporate concentration—the percentage of total sales value of a given national market represented by the four largest companies (39). Markets with ratios less than 50% were defined as competitive, while those between 50% and 80% were defined as oligopolies (control by a small number of companies), and those above 80% as highly concentrated oligopolies. Trends in market share were estimated for 2005–2013 (the period for which data were available). Market share data were also used to describe the level of transnationalization, defined here as the proportion of ultra-processed products owned by transnational corporations.

In Chapter 4, correlation analyses are used to show how ultra-processed product sales vary according to three social and economic determinants: urbanization, economic growth, and market deregulation. Analyses were done in 74 of the 80 countries studied (Annex B). The following six countries were excluded: United Arab Emirates (because of the extremely large proportion of expatriates); Singapore and Hong Kong (because they are city-states); and Argentina, the Philippines, and Taiwan (because of incomplete data on social and economic factors).

Country-specific data for urbanization and economic growth were taken from World Bank datasets (40). Urbanization was measured as the percentage of a total population living in urban areas. Economic growth was measured by gross national income (GNI), adjusted for purchase power parity. The degree of market deregulation was measured using the 2009 Index of Economic Freedom created by the Heritage Foundation in partnership with the Wall Street Journal (41). This index indicates the extent to which a country has adopted market deregulation policies, calculated as the mean of 10 subcomponents measuring different aspects of economic freedom as determined from national laws and regulations as well as assessments by experts and investors, on a scale from 1 to 100.

In Chapter 5, an ecological analysis shows the relationship between sales of ultra-processed products and obesity prevalence in 2010 in 12 of the Latin American countries studied (all but Argentina, because of missing data) plus Canada and the United States. Obesity prevalence was taken

² Areas at gas stations where snacks and other food and drinks are sold.

from the WHO 2014 Global status report on noncommunicable diseases (2). The chapter also includes a cross-national time-series analysis in the 12 Latin American countries to test the association between changes in annual sales per capita of ultra-processed food and drink products (expressed in kilograms) and changes in age-standardized mean body mass in adults (expressed as body mass index (BMI) scores), adjusting for social and economic variables. Argentina was excluded because of missing data on economic variables. A fixed-effect regression model was used for the analysis, with gross national income, urban population, and population size as covariates. Covariate data were obtained from World Bank sources (40). BMI data were obtained from the World Health Organization (WHO) Global Burden of Disease database (42).



Chapter 3

Ultra-processed product sales

This chapter contains information on sales of ultra-processed products in 13 countries in Latin America from 2000 to 2013, plus some international comparisons. It includes trends in volume and per capita retail sales, fast food transactions, distribution, and market concentration. The information here relates to those ultra-processed products that can be identified as such in the Euromonitor database.

3.1 Global trends

Volume sales of ultra-processed food and drink products vary greatly across different regions of the world. Table 1 shows sales in 2000 and 2013 in seven regions. The figures include volume sales (in kilotons), overall growth for the period, year-to-year growth, and global market share of sales in 2000 and 2013.

Globally, sales of ultra-processed products increased by 43.7% over the period (from 328 055 kilotons in 2000 to 471 476 kilotons in 2013), with important differences across regions. In 2000, volume sales of ultra-processed products in North America (the United States and Canada) amounted to 102 868 kilotons, representing the biggest single market in the world, with 31.4% of global volume sales. The second biggest market in 2000 was Asia and the Pacific (with 19.5% of global volume share), followed by Western Europe (19.3%) and Latin America (16.3%).

Table 1

Volume, growth (%), and market share of global sales of ultra-processed food and drink products by region, 2000 and 2013

Region	Volume sales (kilotons*)		Growth (%)		Market share (%)	
	2000	2013	2000–2013	Yearly	2000	2013
North America	102,868	105,276	2.3	0.2	31.4	22.3
Asia and the Pacific	64,076	137,687	114.9	6.1	19.5	29.2
Western Europe	63,168	74,863	18.5	1.3	19.3	15.9
Latin America	53,458	79,108	48.0	3.1	16.3	16.8
Middle East and Africa	22,275	38,182	71.4	4.2	6.8	8.1
Eastern Europe	17,789	30,835	73.3	4.3	5.4	6.5
Australasia	4,420	5,526	25.0	1.7	1.3	1.2
World	328,055	471,476	43.7	2.8	100	100

* Kiloton: one thousand tons. Ultra-processed products here include carbonated soft drinks, sweet and savory snacks, breakfast cereals, confectionery (candy), ice cream, biscuits (cookies), fruit and vegetable juices, sports and energy drinks, ready-to-drink tea or coffee, spreads, sauces, and ready-meals. Quantity in liters is converted into tons. Data are from the Euromonitor Passport Database (2014) (38).

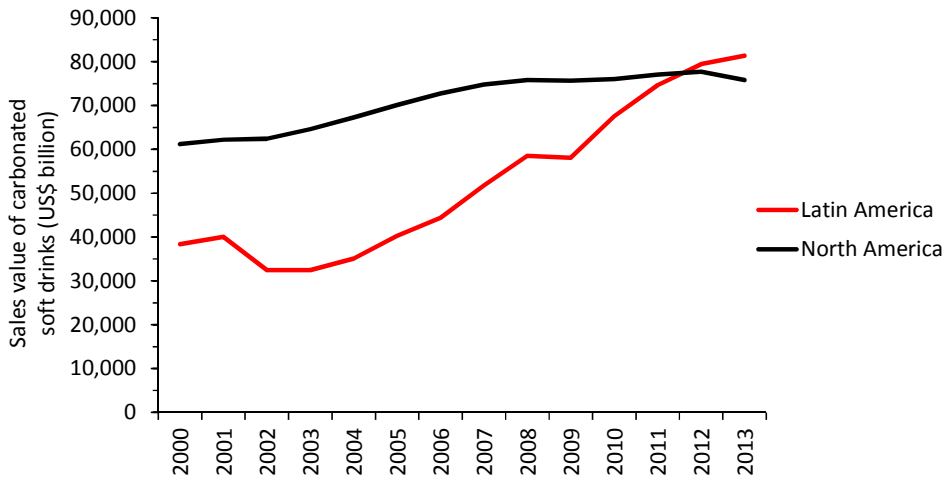
Important shifts occurred between 2000 and 2013. In North America and Western Europe, total volume sales growth was not impressive and began to decline in 2012. Global market share in these two regions decreased by 9.1% and 3.4% respectively. In contrast, throughout Asia and the Pacific, sales increased by 114.9%. In 2013, this region overtook North America as the overall global market leader in terms of volume sales, with 29.2% of the global market. During the same period, Latin American sales increased by almost 50%, and maintained a steady overall global market share of more than 16%. Volume sales during the period also grew substantially in the Middle East and Africa and in Eastern Europe (by 71.4% and 73.3% respectively), but from lower baselines.

Changes in the volume of sales of carbonated soft drinks in the Americas between 2000 and 2013, shown in Figure 1, were striking. In 2000, total sales were US\$ 61 billion in North America and US\$ 38 billion in Latin America. However, by 2013, the situation had transformed. Sales in North America in 2000–2013 increased overall by about 25% and totaled US\$ 76 billion, having leveled off and, if anything, declined after 2012. In contrast, sales in Latin America doubled between 2000 and 2013,

overtaking those in North America, at US\$ 81 billion. Clearly, the potential market for this leading range of ultra-processed products is now greater in Latin America.

Figure 1

Sales value of carbonated soft drinks in North America and Latin America, 2000–2013

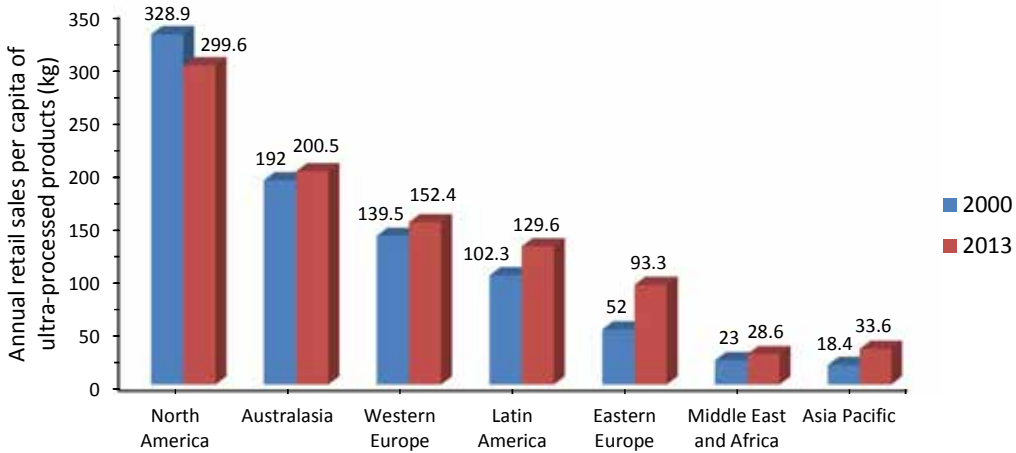


Sales include both off-trade purchases (retail) and on-trade purchases (at bars, restaurants). Data are from the Euromonitor Passport Database (2014) (38). North American data were from Canada and the United States. Latin American data were from Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Mexico, Peru, Uruguay, and Venezuela.

Figure 2 shows trends in annual sales per capita of ultra-processed products from 2000 to 2013 in the seven world regions. In 2000, the highest sales volume was in North America (the United States and Canada), and Australasia (Australia and New Zealand). In 2000, per capita sales in North America (328.9 kg) were almost 20 times higher than in Asia (18.4 kg). From 2000 to 2013, sales per capita dropped by 9.8% in North America (from 328.9 kg to 299.6 kg), and showed only a slight increase in Australasia (from 192 kg to 200.5 kg). During the same period, sales grew by 79.8% in Eastern Europe (from 52 kg to 93.3 kg), and almost doubled in Asia and the Pacific (from 18.4 kg to 33.6 kg). In Latin America, the increase was 26.7% (from 102.3 kg to 129.6 kg), and the region remained the fourth biggest market in terms of sales per capita.

Figure 2

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

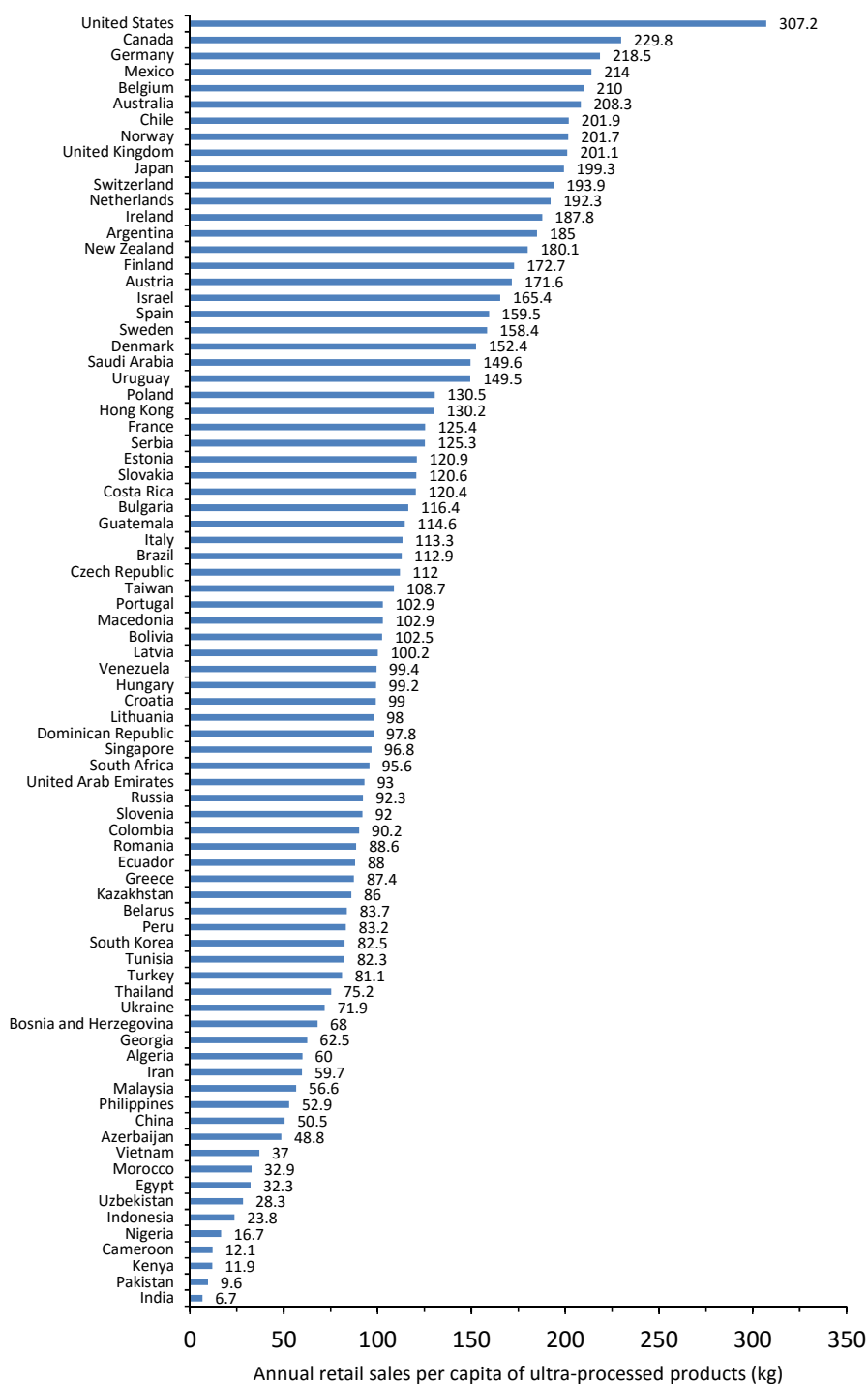


Ultra-processed products here include carbonated soft drinks, sweet and savory snacks, breakfast cereals, confectionery (candy), ice cream, biscuits (cookies), fruit and vegetable juices, sports and energy drinks, ready-to-drink tea or coffee, spreads, sauces, and ready-meals. Quantity in liters is converted into kilograms. Data are from the Euromonitor Passport Database (2014) (38).

As shown in Figure 3, there were large variations in retail sales per capita of ultra-processed products between the 80 countries available in Euromonitor. The heaviest buyers of ultra-processed products by far were in the United States (at 307.2 kg per capita per year or almost 6 kg per week), followed by Canada (229.8 kg) and Germany (218.5 kg). In Western Europe, sales in France (125.4 kg) and Italy (113.3 kg) were far lower than in Germany (218.5 kg), Belgium (210 kg), and the United Kingdom (201.1 kg). In the Global South, high annual sales per capita of ultra-processed products (> 150 kg) were only found in the higher-income countries of Latin America (Mexico, 212.2 kg; Chile, 201.9 kg; and Argentina, 185 kg). Elsewhere (Asia, Eastern Europe, and the Middle East and Africa), consumption was less than 150 kg. Sales were very low in low-income countries in these regions such as India (6.7 kg), Kenya (11.9 kg), and Cameroon (12.1 kg).

Figure 3

Annual retail sales per capita of ultra processed food and drink products in 80 countries, 2013.



Ultra-processed products here include carbonated soft drinks, sweet and savory snacks, breakfast cereals, confectionery (candy), ice cream, biscuits (cookies), fruit and vegetable juices, sports and energy drinks, ready-to-drink tea or coffee, spreads, sauces, and ready-meals. Quantity in liters is converted into kilograms. Data are from the Euromonitor Passport Database (2014) (38).

3.2 Retail sales in Latin America

This section shows trends in retail sales per capita of ultra-processed food and drink products in 13 Latin American countries between 2000 and 2013, plus some comparisons with the United States and Canada.

Figure 4 shows that between 2000 and 2013, annual sales per capita of ultra-processed products increased—steadily, for the most part—in all Latin American countries except Argentina and Venezuela, where sales fluctuated. There were wide variations in regional averages. In 2000, the highest sales volume was in Argentina (194.1 kg), Mexico (164.3 kg), and Chile (125.5 kg). These figures were between two and five times higher than those in Uruguay (60.6 kg), Peru (40.2 kg), and Bolivia (44.6 kg). Sales in North America were far higher, at 337.6 kg (United States) and 247.9 kg (Canada).

The fluctuations in sales observed in Argentina and Venezuela coincided with economic crises. Sales in Argentina fluctuated between 181 kg and 212 kg during 2000–2013 but dropped sharply (by 19%) (from 194.1 kg in 2000 to 157.9 kg in 2002) when the national economy shrank by 28% (43). In Venezuela, sales increased overall during 2000–2013 but dropped on two occasions. The first drop (of 15%) occurred suddenly in 2002–2003 when the country was in crisis and lost 29% of its gross national income. Sales then rose steadily (by 48%) from 2003 to 2008 but dropped again (by 18%) during 2008–2013, when the country lost 7.2% of its gross national income (44).

Table 2 shows 2000 and 2013 annual sales per capita of ultra-processed food and drink products, separately and for all 13 countries. It also shows sales growth for the 2000–2013 period and year-to-year growth.

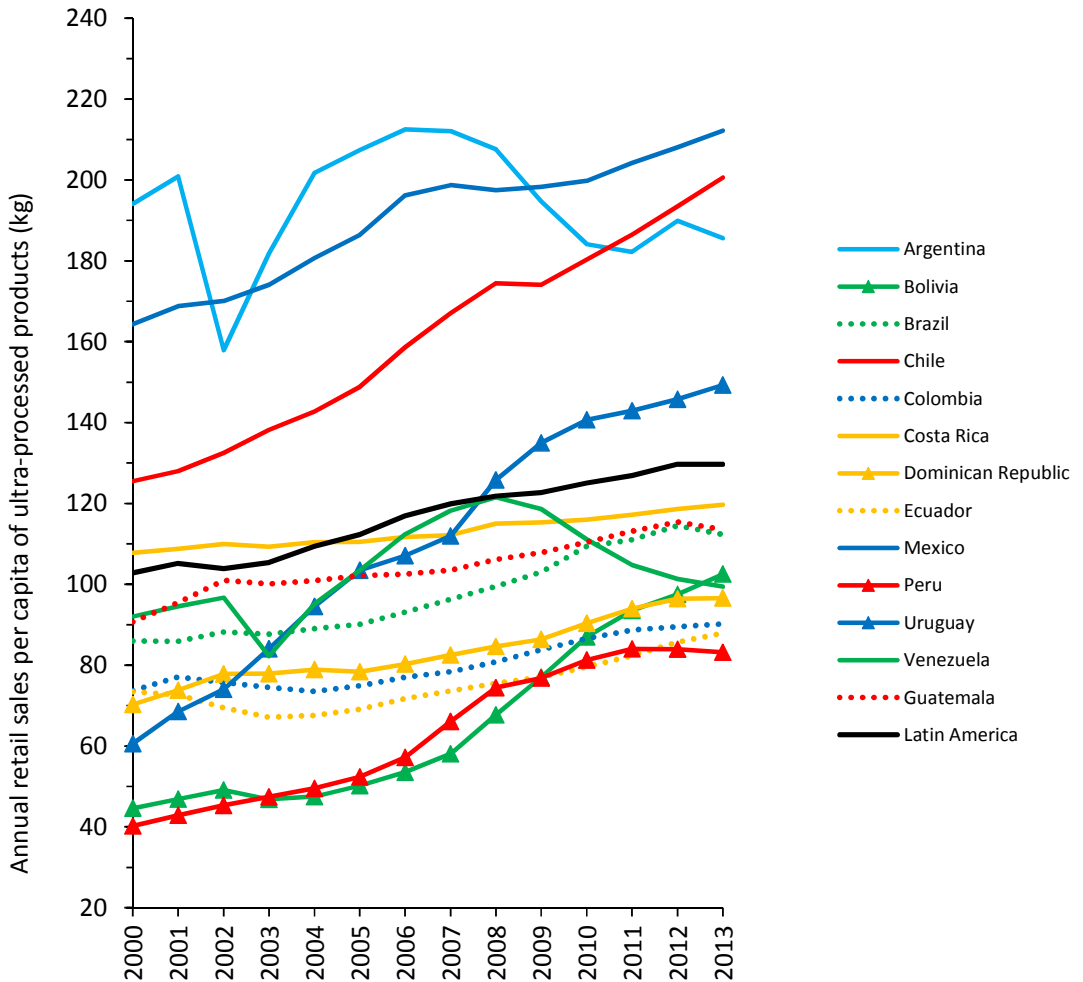
The fastest rates of growth in sales of ultra-processed products, taken together for the study period, were in Peru (107%), Bolivia (129.8%), and Uruguay (146.4%). In other countries, growth during this period ranged from 8% to 59.8%, except in Argentina, which experienced a drop of 4.4%. In comparison, in North America, sales dropped by 9% in the United States and by 7.3% in Canada in the 2000–2013 period.

Growth in sales of ultra-processed food and drink products during the 2000–2013 period ranged from 1.5% in Ecuador to 68.4% in Uruguay. In

Venezuela, there was a decrease of 4.9%. The increase in ultra-processed drinks was greater than for food products, ranging from 9.8% in Costa Rica to 172.5% in Uruguay. Sales of drinks in Argentina decreased by 7.9%.

Figure 4

Annual retail sales per capita of ultra-processed food and drink products in 13 Latin American countries, 2000–2013



Ultra-processed products here include carbonated soft drinks, sweet and savory snacks, breakfast cereals, confectionery (candy), ice cream, biscuits (cookies), fruit and vegetable juices, sports and energy drinks, ready-to-drink tea or coffee, spreads, sauces, and ready-meals. Quantity in liters is converted into kilograms. Sales data are from the Euromonitor Passport Database (2014) (38).

Table 2

Retail sales per capita of ultra-processed food and drink products in 13 Latin American countries, 2000–2013

Countries	Ultra-processed food products				Ultra-processed drink products				Ultra-processed food and drink products			
	Sales (kg)		Growth (%)		Sales (l)		Growth (%)		Sales (kg)		Growth (%)	
	2000	2013	Period	Yearly	2000	2013	Period	Yearly	2000	2013	Period	Yearly
Argentina	24.7	29.5	19.4	1.4	169.4	156.1	-7.9	-0.6	194.1	185.6	-4.4	-0.3
Bolivia	7.0	8.3	18.6	1.3	37.6	94.2	150.5	7.3	44.6	102.5	129.8	6.6
Brazil	16.5	21.4	29.7	2.0	69.5	90.9	30.8	2.1	86.0	112.3	30.6	2.1
Chile	21.3	30.4	42.7	2.8	104.2	170.2	63.3	3.8	125.5	200.6	59.8	3.7
Colombia	8.4	10.7	27.4	1.9	65.3	81.5	24.8	1.7	73.7	92.2	25.1	1.7
Costa Rica	13.3	15.9	19.5	1.4	94.5	103.8	9.8	0.7	107.8	119.7	11.0	0.8
Dominican Republic	7.7	8.3	7.8	0.6	62.6	88.3	41.1	2.7	70.3	96.6	37.4	2.5
Ecuador	6.8	6.9	1.5	0.1	66.6	81.0	21.6	1.5	73.4	87.9	19.8	1.4
Guatemala	10.0	12.4	24.0	1.7	80.7	101.1	25.3	1.7	90.7	113.5	25.1	1.7
Mexico	20.3	27.3	34.5	2.3	144	184.9	28.4	1.9	164.3	212.2	29.2	2.0
Peru	5.5	9.1	65.5	3.9	34.7	74.1	113.5	6.0	40.2	83.2	107	5.8
Uruguay	15.2	25.6	68.4	4.1	45.4	123.7	172.5	8.0	60.6	149.3	146.4	7.2
Venezuela	14.2	13.5	-4.9	-0.4	77.8	85.9	10.4	0.8	92.0	99.4	8.0	0.6
Latin America	14.9	19	27.5	1.9	87.9	110.7	25.9	1.8	102.8	129.7	26.2	1.8

Ultra-processed food products here include sweet and savory snacks, breakfast cereals, confectionery (candy), ice cream, biscuits (cookies), spreads, sauces, and ready-meals. Ultra-processed drink products include carbonated soft drinks, fruit and vegetable juices, sports and energy drinks, and ready-to-drink tea or coffee. Quantity in liters is converted into kilograms. Data are from the Euromonitor Passport Database (2014) (38). Latin American data were from Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Mexico, Peru, Uruguay, and Venezuela.

3.3 Fast-food purchases

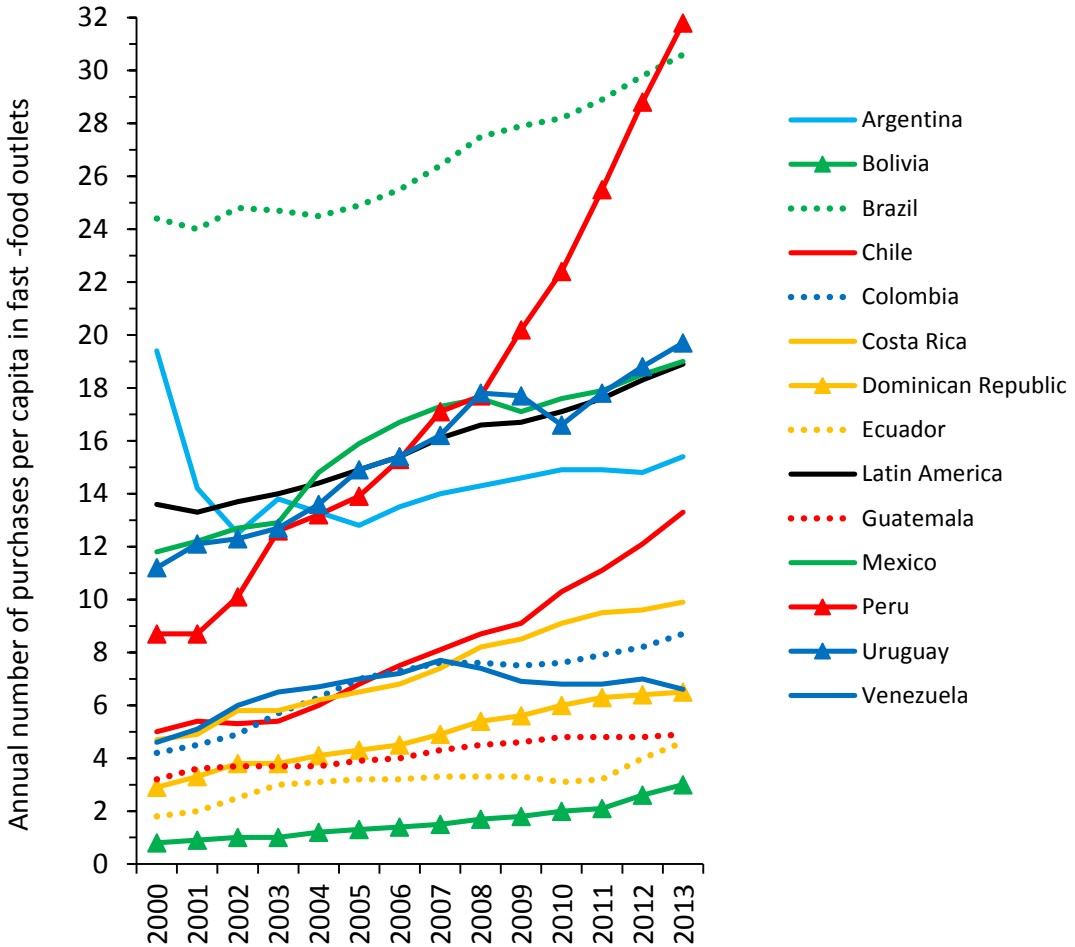
Retail sales do not include ultra-processed food and drinks purchased in fast-food restaurants (“on trade” purchases). Therefore, this section describes trends in fast-food consumption in Latin American countries based on sales purchases at fast-food outlets (defined as establishments offering limited menus prepared quickly where customers order, pay, and pick up from a counter). Figure 5 shows annual per capita transactions (number of single, complete purchases, which may include more than one meal) from fast-food outlets in 13 Latin American countries from 2000 to 2013, with some comparisons with the United States and Canada.

In Latin America, the number of fast-food per capita purchases increased by 38.9% over the study period (from 13.6 in 2000 to 18.9 in 2013). Latin American per capita fast-food purchases increased continuously in all countries except Argentina. They doubled or more than doubled in Bolivia, Colombia, Costa Rica, Dominican Republic, Peru, and Chile. The fastest growth was in Peru (265%), where the number of purchases grew from 8.7 in 2000 to 31.8 in 2013, and Bolivia (275%), which grew from a much lower baseline of 0.8 to 3.0. Sales growth was between 40% and 75% in Guatemala, Mexico, Uruguay, and Venezuela, and was 25% in Brazil. There was a drop of 36% in Argentina (from 19.4 to 12.5) from 2000 to 2002, during the financial crisis. Sales then rose by 23% (from 12.5 to 15.4) between 2002 and 2013.

In 2013, in Latin America, Brazilians and Peruvians were by far the biggest consumers of fast-food, with 10 times more purchases than Bolivia. They remain, however, far behind Canada and the United States, where purchases amounted to 134.9 and 120.9 respectively in 2013.

Figure 5

Annual number of purchases per capita in fast-food outlets in 13 Latin American countries, 2000–2013



Purchases refers to single, completed purchases (which may include more than one meal). Fast-food outlets are defined as establishments offering limited menus prepared quickly where customers order, pay, and pick up from a counter. Data are from the Euromonitor Passport Database (2014) (38).

3.4 Distribution

This section describes the distribution of retail sales of ultra-processed food and drink products in Latin America by type of outlet. Table 3 shows the share (%) of ultra-processed products sold in different types of retail outlets in Latin America in 2013. Almost all types of ultra-processed products were sold exclusively at retail stores. Retail sales outside a fixed retail location, such as through the Internet or door-to-door (non-store based retailers) were of very little importance, accounting for less than 1.5% of retail sales of any types of ultra-processed products in 2013. Most store-based retail sales of ultra-processed products occurred at grocery stores. Sales in non-grocery retailers (e.g., pharmacies, bookstores, etc.) were less than 7.6% of total sales of any types of ultra-processed products. In contrast, in North America, in 2013, non-grocery retailers sold 15% of sweet and savory snacks, 39.2% of confectionery (candy), and 17.1% of spreads.

In 2013, 80.1% of carbonated soft drink sales and 73.3% of juice sales were store-based while the rest occurred at bars, restaurants, and other food service venues. Sales of drinks in non-grocery retailers and by non-store retail operations were of very little importance.

Table 3

Retail sales distribution for ultra-processed food and drink products by type of outlet in Latin America, 2013

Type of outlet	Carbonated soft drinks	Juices	Confectionery (candies)	Ice cream	Biscuits (cookies)	Ready-meals	Breakfast cereals	Sauces	Spreads	Snack bars	Sweet and savory snacks
Store-based retailers	80.1	73.3	99.7	100	99.5	99.6	99.9	99.8	99.9	99.8	98.5
Grocery retailers	80.1	73.1	95.1	96.1	95.3	98.0	98.7	97.4	96.9	92.2	93.6
Modern	35.8	38.1	36.3	28.8	53.9	85.0	70.5	63.3	60.9	37.0	33.8
Supermarkets	15.9	13.9	15.9	13.2	27.9	39.9	27.9	30.3	30.5	13.8	13
Hypermarkets	12.8	13.5	13.5	10.7	19.3	36.7	26.7	26.7	25.1	11.0	11.8
Discounters	3.1	7.7	2.4	1.5	3.9	1.9	14.0	4.7	4.0	4.2	2.9
Convenience stores	2.2	2.3	2.4	0.9	1.1	3.8	1.5	0.7	1.1	3.3	3.8
Forecourt retailers	1.8	0.8	2.1	2.4	1.7	2.8	0.3	0.8	0.2	4.6	2.2
Traditional	44.3	35.0	58.8	67.3	41.4	13	28.2	34.2	35.9	55.1	59.8
Independent small grocers	40.6	31.2	20.7	31.4	28.3	12.2	24.0	30.0	33.6	23.7	43.4
Other food sellers	3.1	3.7	22.1	33.2	9.4	0.7	4.0	4.1	2.2	30.9	16.4
Food/drink/tobacco outlets	0.6	0.1	16.0	2.7	3.7	0.0	0.3	0.1	0.1	0.5	0.1
Non-grocery retailers	0.1	0.2	4.7	3.9	4.2	1.6	1.2	2.4	3.0	7.6	4.9
Non-store-based retailers	0.9	0.2	0.3	0	0.5	0.4	0.1	0.2	0.1	0.2	1.5
Total	81	73.5	100	100	100	100	100	100	100	100	100

Units are the percentage of volume sales (for carbonated soft drinks and juices) and the percentage of sales monetary value (for ultra-processed food products). Forecourt retailers are areas at gas stations where snacks and other food and drinks are sold. Data are from the Euromonitor Passport Database (2014) (38). Latin American data were from Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Mexico, Peru, Uruguay, and Venezuela.

In Latin America in 2013, sales were relatively balanced between modern and traditional food retail outlets, as shown in Table 3. Several types of ultra-processed products were mainly sold in traditional grocery retailers, including carbonated soft drinks (44.3%), sweet and savory snacks (59.8%), confectionery (candy) (58.8%), and ice cream (67.3%). Other products, including ready-meals, spreads, sauces, breakfast cereals, and biscuits (cookies), were mainly sold in modern grocery stores, and mostly at supermarkets and hypermarkets.

In contrast, in North America, almost all sales of ultra-processed products at grocery retailers occurred at modern stores. Traditional grocery retailers have a diminished presence and, for example, account for only 9.4% of carbonated soft drink sales, 8.1% of sweet and savory snack sales, 11.6% of confectionery (candy) sales, and 9.6% of ice cream sales.

Table 4

Retail sales distribution for ultra-processed food and drink products by type of grocery store in Latin America, 2000–2013

Ultra-processed products	Modern grocery retailer			Traditional grocery retailer		
	2000	2013	Change (%)	2000	2013	Change (%)
Carbonated soft drinks	33.4	35.8	2.4	48	44.3	3.7
Juices	27.5	38.1	10.6	36.9	35	-1.9
Sweet and savory snacks	29.8	33.8	4.0	65.5	59.8	-5.7
Confectionery (candy)	28.4	36.3	7.9	65.4	58.8	-6.6
Ice cream	35.8	28.8	-7	60.9	67.3	6.4
Biscuits (cookies)	51.2	53.9	2.7	45.7	41.4	-4.3
Ready-meals	84.2	85.0	0.8	13.0	13.0	0
Breakfast cereals	67.1	70.5	3.4	32.1	28.2	-3.9
Sauces	59.5	63.3	3.8	39.3	34.2	-5.1
Spreads	59.1	60.9	1.8	40.1	35.9	-4.2
Snack bars	30.3	37.0	6.7	24.7	23.7	-1

Units are the percentage of volume sales (for carbonated soft drinks and juices) and the percentage of sales monetary value (for ultra-processed food products). Modern retailers include hypermarkets, supermarkets, discount stores, convenience stores, and forecourt retailers (areas at gas stations where snacks and other food and drinks are sold). Traditional retailers include independent small grocers and shops selling food as well as other goods such as tobacco. Data are from the Euromonitor Passport Database (2014) (38). Latin American data were from Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Mexico, Peru, Uruguay, and Venezuela.

Table 4 shows sales of ultra-processed products in Latin America from 2000 to 2013 by type of grocery store. There is a discernable shift toward more sales of ultra-processed products from modern grocery stores—mostly supermarkets and hypermarkets—at the expense of traditional stores. Other than ice cream, ultra-processed products are being increasingly sold through modern grocery stores. The biggest increase in sales of ultra-processed products in modern grocery stores are of juices (+10.6%), confectionery (+7.9%), and snack bars (+6.7%). However, as of 2013, independent small stores still had a sizeable share of several types of ultra-processed products, particularly carbonated drinks, snacks, confectionery (candy), and ice cream.

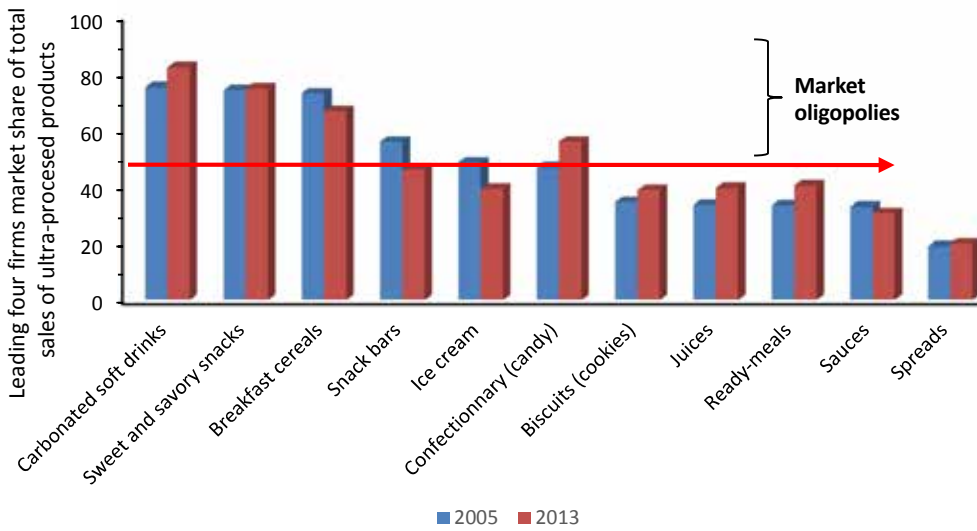
3.5 Market concentration

This section describes the market concentration and transnationalization of ultra-processed products in Latin America. Figure 6 shows the market share for the four largest firms (concentration ratio or CR4) in Latin America

in 2005 and 2013. As mentioned above, when the four leading firms account for less than 50% of sales, the market is defined as competitive. When they account for 50%–80% of sales, the market is defined as oligopolistic (highly concentrated, less competitive). Markets with ratios above 80% are defined as highly concentrated oligopolies.

Figure 6

Leading four firms' market share of total sales of ultra-processed food and drink products in Latin America, 2005 and 2013



The red line indicates a market concentration of 50%. Markets above the line are defined as oligopolies. Data for carbonated soft drinks and juices are for off-trade (retail) sales only (versus sales from on-trade sources such as restaurants and bars). Data are from the Euromonitor Passport Database (2014) (38). Latin American data were from Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Mexico, Peru, Uruguay, and Venezuela.

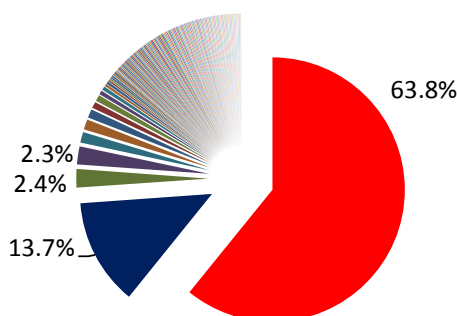
As of 2013, the markets for carbonated soft drinks (82.2%), sweet and savory snacks (74.7%), breakfast cereals (66.7%), and confectionery (candy) (55.9%) were oligopolies (depicted by the bars above the red line in the figure). The markets for juices (39.6%), snack bars (45.9%), ready-meals (40.4%), ice cream (39.2%), biscuits (cookies) (38.8%), sauces (30.7%), and spreads (20%) were competitive. In the period 2005–2013, market concentration increased for carbonated soft drinks (+7.1%), confectionery (+9.1%), juices (+6%), ready-meals (+7%), and biscuits (+4.2%). Market competition increased for breakfast cereals, ice cream, snack bars, and sauces.

Figure 7

Company market share of carbonated soft drinks and sweet and savory snacks in Latin America, 2013

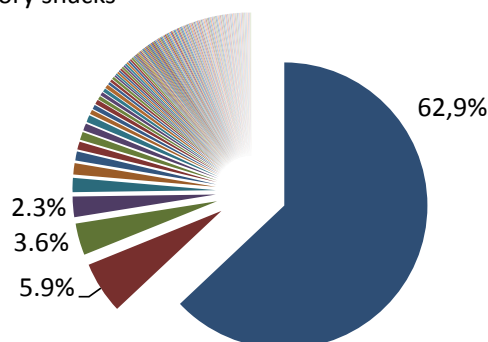
Carbonated soft drinks

CR4=82.2%



Sweet and savory snacks

CR4=74.7%

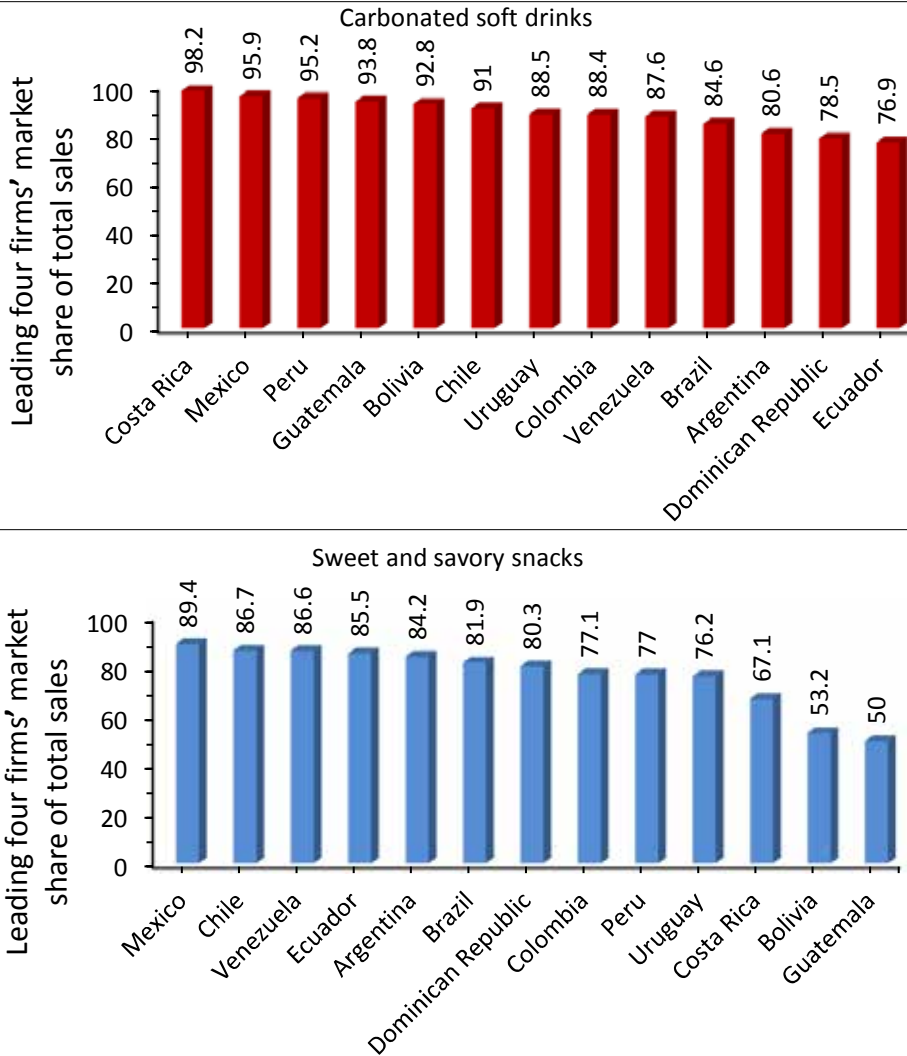


CR4: concentration ratio (market share) for the four largest firms. Latin American data were from Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Mexico, Peru, Uruguay, and Venezuela. Data re from the Euromonitor Passport Database (2014) (38).

The most concentrated market shares in Latin America were for carbonated soft drinks and sweet and savory snacks. As shown in Figure 7, in 2013, the concentration share ratio of the leading four manufacturers of carbonated soft drinks was 82.2% of the total market. The two leading companies were transnationals headquartered in the United States; one had more than half (63%) of the Latin American market for carbonated soft drinks. The other two companies had a far smaller market share; one is headquartered in Peru (with the holding company in Spain), and the other in Belgium. For sweet and savory snacks, four companies had 74.7% of the total market. Of these, three were U.S.-headquartered transnational corporations and the fourth was a Mexican conglomerate. One corporation alone had close to two-thirds of the Latin American market (62.9%).

Figure 8

Leading four firms' share of total sales of carbonated soft drinks and sweet and savory snacks in 13 Latin American countries, 2013



Data are from the Euromonitor Passport Database (2014) (38).

The concentration of market share for carbonated soft drinks and sweet and savory snacks in 13 Latin American countries is shown in Figure 8. For carbonated soft drinks, the market is a highly concentrated oligopoly in almost all countries. One company has more than 50% of the market in nine of the countries. For sweet and savory snacks, the market is an oligopoly in Bolivia, Colombia, Costa Rica, Guatemala, Peru, and Uruguay, and a highly concentrated oligopoly in Argentina, Brazil, Chile, Dominican Republic, Ecuador, Mexico, and Venezuela. One company has more than 50% of the market in 11 of the 13 countries.

3.6 Summary

Sales (and therefore production and consumption) of ultra-processed products have increased worldwide. The main change from 2000 to 2013 was accelerated sales in middle-income countries in the Global South (Asia, Africa, Eastern Europe, and Latin America) in tandem with a slowdown in sales in fully industrialized, high-income countries in the Global North, where overall consumption nonetheless remains highest. More than half of all current sales of ultra-processed products are in the expanding markets of the Global South.

In all 13 Latin American countries studied, between 2000 and 2013 retail sales of ultra-processed products and fast-food transactions increased. The increases were steady for the most part except in Argentina and Venezuela, where sales fluctuated and dropped during financial crises. Almost all ultra-processed products in all countries studied are increasingly sold in large food retail stores, including foreign and nationally owned hypermarkets and supermarkets, and convenience stores. However, in 2013, independent small stores still had a sizeable share of several types of ultra-processed products. The markets of several ultra-processed products are oligopolistic, dominated by transnational corporations. The market for two leading types of ultra-processed products—carbonated soft drinks and sweet or savory snacks—is highly concentrated, with more than two-third of all sales captured by two companies.

Chapter 4

Social and economic drivers

Social, economic, and other factors influence most behaviors, including dietary patterns. Much depends on personal circumstances. A well-educated, employed, and informed person with plenty of purchasing power has a much wider scope of dietary choices than someone who is out of work, unskilled, and with little disposable income. This fact is neglected by researchers and organizations that put too much emphasis on personal responsibility for health when they state or imply that people are free to choose healthy food and enjoy a healthy diet.

PAHO's Plan of Action for the prevention of obesity in children and adolescents, approved by Member States in late 2014, recognizes the influence of social, economic and environmental factors on dietary



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behaviors stating the following: “Food preferences, purchasing decisions, and eating behaviors are shaped by price, marketing, availability, and affordability. These factors are in turn influenced by upstream policies and regulations on trade and agriculture (3)”. Therefore, PAHO recommendations include the implementation of regulations specifically designed to address factors contributing to obesity, including obesogenic environments. These factors need to be identified and specified, and their impacts—including those from ultra-processed products—analyzed and addressed in future policy-making.

Some of the social and economic factors influencing processed food supply and demand in the Global South have already been studied, including urbanization and rises in income (9,45–47), changes in retailing sector (48–50), and trade policies and market deregulation (36,51–53). The ways in which these factors affect sales of ultra-processed products are analyzed below.

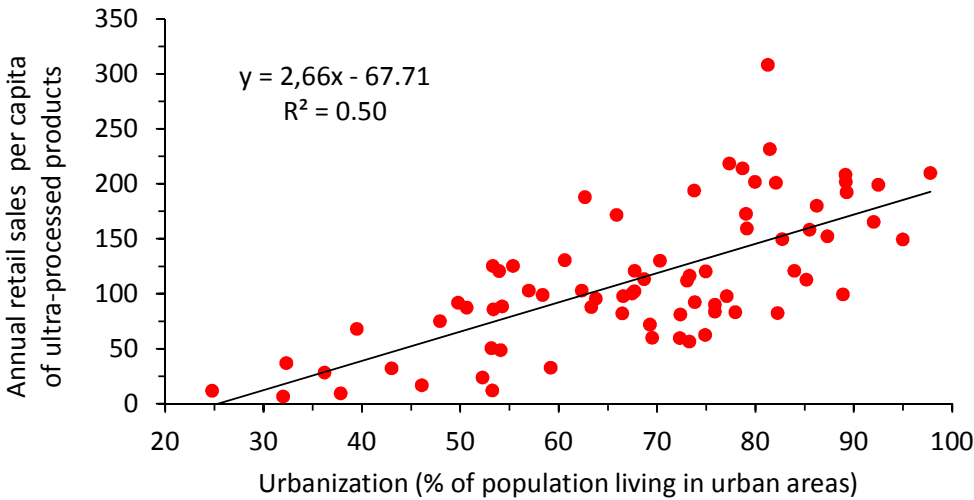
4.1 Urbanization

As people move into cities, they acquire more of their food from shops. Worldwide, grocery stores and specialty food retailers tend to be displaced by hypermarkets, supermarkets, and convenience stores whose main business is packaged long-life products. In cities, ultra-processed products are available all day, every day, in food and non-food venues, near transportation, in schools and hospitals, and at the workplace. They appear to be convenient and attractive choices for people who feel pressured by work constraints and busy schedules, who can choose to give little time to eating and who have easy access to ready-to-consume snacks and dishes.

Figure 9 shows annual sales per capita of ultra-processed products as a function of urbanization in 74 countries in 2013. The 74 countries analyzed included all those listed in Annex B except United Arab Emirates (because of the extremely large proportion of expatriates); Singapore and Hong Kong (because they are city-states); and Argentina, the Philippines, and Taiwan (because of incomplete data on social and economic factors). The degree of urbanization was obtained from the World Bank World Development Indicators for 2013. There was a positive, moderate, and significant correlation ($R^2 = 0.50$; $p < 0.001$) showing that sales of ultra-processed products are higher in more urbanized countries.

Figure 9

Annual sales per capita of ultra-processed food and drink products as a function of urbanization in 74 countries, 2013



Ultra-processed products here include carbonated soft drinks, sweet and savory snacks, breakfast cereals, confectionery (candy), ice cream, biscuits (cookies), fruit and vegetable juices, sports and energy drinks, ready-to-drink tea or coffee, spreads, sauces, and ready-meals. Quantity in liters is converted into kilograms. Sales data are from the Euromonitor Passport Database (2014) (38). The 74 countries included all those listed in Annex B except United Arab Emirates (because of the extremely large proportion of expatriates); Singapore and Hong Kong (because they are city-states); and Argentina, the Philippines, and Taiwan (because of incomplete data on social and economic factors). Data for urbanization were taken from World Bank datasets (40).

For example, in the most urbanized countries, including Belgium (where 97.8% of the population live in towns and cities), Uruguay (95%), and Argentina (91.5%), annual sales per capita are higher than 150 kg, whereas in the least urbanized countries, including Kenya (24.8%), Vietnam (32.3%), and India (32%), annual sales per capita are less than 50 kg. However, as observed, the correlation between urbanization and sales of ultra-processed products is imperfect. For example, annual sales per capita are three times lower in South Korea than in the United States (82.5 kg versus 308.4 kg respectively) even though both countries have similar (high) urbanization rates (82.2% and 81.3% respectively). In Switzerland, with 73.8% urbanization, annual per capita sales are high (193.9 kg), whereas in Italy, which has a similar urbanization rate (68.7%), annual sales per capita are much lower (113.3 kg). These numbers indicate that urbanization alone does not fully explain the degree of penetration of ultra-processed products.

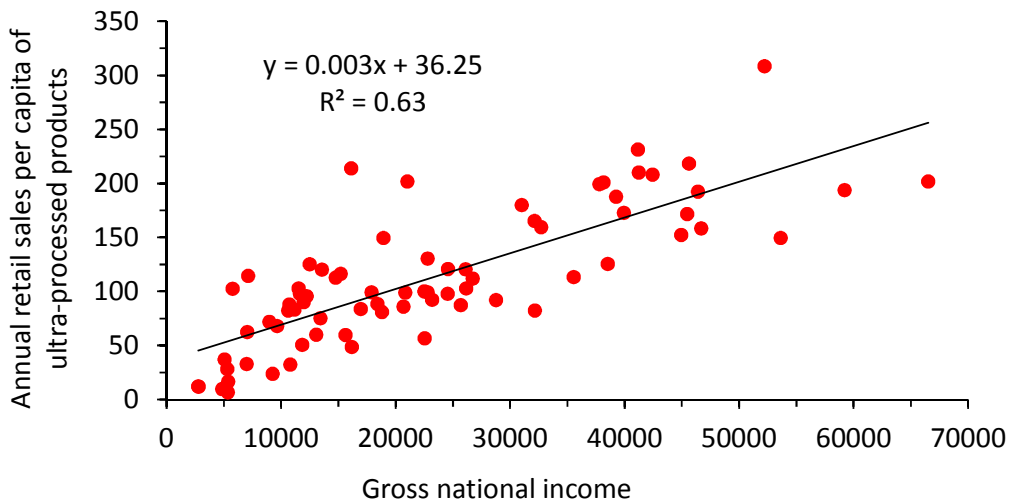
4.2 Increased income

As shown in the previous chapter, sales of ultra-processed products were highest in high-income countries but are rapidly increasing in lower-income countries. This study outcome confirms previous findings (5,9).

Figure 10 shows annual sales per capita of ultra-processed products as a function of GNI in the 74 countries in 2013. There was a relatively strong and positive significant correlation ($R^2 = 0.63$; $p < 0.001$) showing that an increase in income of US\$ 10,000 was associated with a threefold increase in sales. A similar association was found in the 12 Latin America countries studied (all but Argentina) ($R^2=0.49$; $p < 0.001$) (not shown).

Figure 10

Annual retail sales per capita of ultra-processed food and drink products as a function of gross national income in 74 countries, 2013

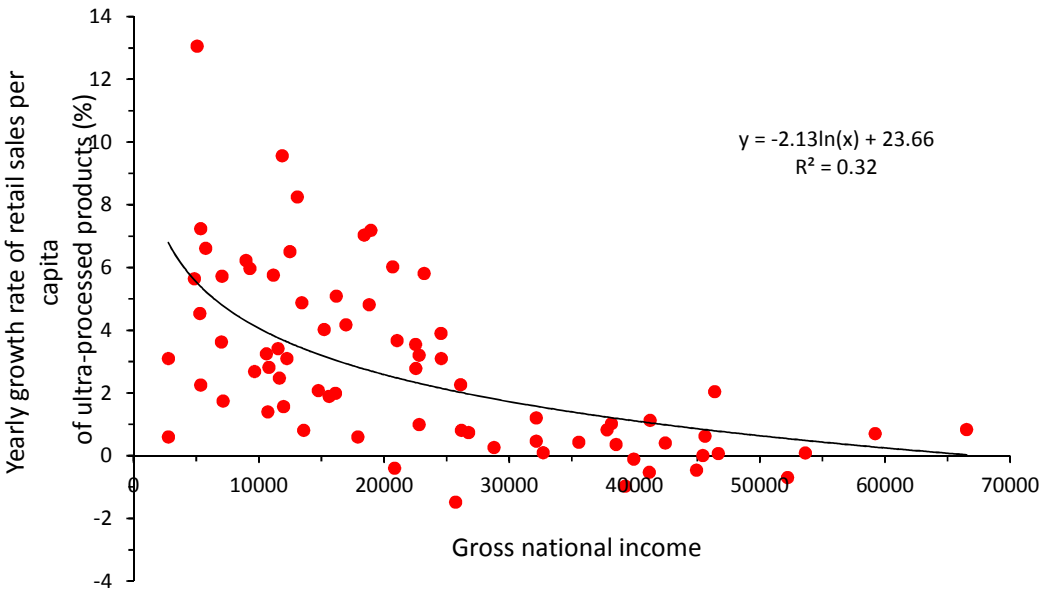


Ultra-processed products here include carbonated soft drinks, sweet and savory snacks, breakfast cereals, confectionery (candy), ice cream, biscuits (cookies), fruit and vegetable juices, sports and energy drinks, ready-to-drink tea or coffee, spreads, sauces, and ready-meals. Quantity in liters is converted into kilograms. Sales data are from the Euromonitor Passport Database (2014) (38). Gross national income is adjusted for purchasing power parity (as measured by the World Bank) for comparability between countries (40). The 74 countries included all those listed in Annex B except United Arab Emirates (because of the extremely large proportion of expatriates); Singapore and Hong Kong (because they are city-states); and Argentina, the Philippines, and Taiwan (because of incomplete data on social and economic factors).

Year-to-year growth of sales per capita of ultra-processed products from 2000 to 2013 is shown in Figure 11 as a function of GNI in the 74 countries. A moderate, negative, significant correlation was found ($R^2 = 0.33$; $p < 0.001$) confirming that sales of ultra-processed products are growing faster in lower-income countries. As mentioned in the previous chapter, sales are decreasing in some high-income countries.

Figure 11

Growth of retail sales per capita of ultra-processed food and drink products as a function of national income in 74 countries, 2000–2013



Ultra-processed products here include carbonated soft drinks, sweet and savory snacks, breakfast cereals, confectionery (candy), ice cream, biscuits (cookies), fruit and vegetable juices, sports and energy drinks, ready-to-drink tea or coffee, spreads, sauces, and ready-meals. Quantity in liters is converted into kilograms. Sales data are from the Euromonitor Passport Database (2014) (38). Gross national income is adjusted for purchasing power parity (as measured by the World Bank) for comparability between countries (40). The 74 countries included all those listed in Annex B except United Arab Emirates (because of the extremely large proportion of expatriates); Singapore and Hong Kong (because they are city-states); and Argentina, the Philippines, and Taiwan (because of incomplete data on social and economic factors). $\ln(x)$ is the natural logarithm of x .

4.3 Market deregulation

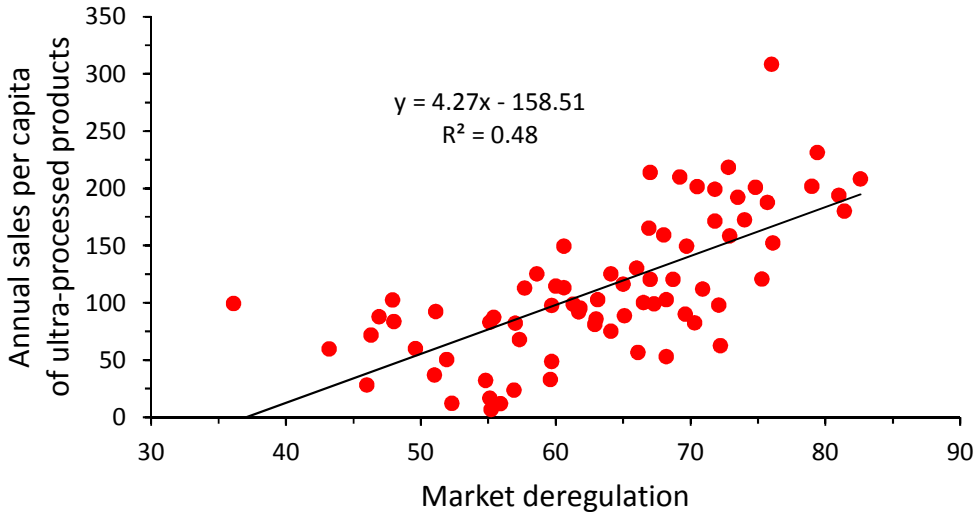
One main reason for the penetration of ultra-processed products in the Global South are the prevailing dominant political and economic policies that, since the 1980s, have promoted the flow of international capital and trade, foreign entry into national markets, and market deregulation. These policies have enabled the rapid rise of transnational food manufacturing, distribution, catering, and retail corporations (50).

When national governments adopt market deregulation policies and fiscal measures that favor large food industries, production, sales and consumption of ultra-processed products tend to increase (36,53). Support for this finding is shown below by the correlation of sales per capita of ultra-processed products with the degree of country deregulation according to the *Index of Economic Freedom* (41).

Figure 12 shows annual retail sales per capita of ultra-processed products as a function of market deregulation in the 74 world countries in 2013. The positive correlation between market deregulation and sales of ultra-processed products is significant ($R^2 = 0.48$; $p < 0.001$), indicating that the greater the degree of deregulation, the higher the sales of ultra-processed products.

Figure 12

Annual retail sales per capita of ultra-processed food and drink products as a function of market deregulation in 74 countries, 2013



Ultra-processed products here include carbonated soft drinks, sweet and savory snacks, breakfast cereals, confectionery (candy), ice cream, biscuits (cookies), fruit and vegetable juices, sports and energy drinks, ready-to-drink tea or coffee, spreads, sauces, and ready-meals. Quantity in liters is converted into kilograms. Sales data are from the Euromonitor Passport Database (2014) (38). The 74 countries included all those listed in Annex B except United Arab Emirates (because of the extremely large proportion of expatriates); Singapore and Hong Kong (because they are city-states); and Argentina, the Philippines, and Taiwan (because of incomplete data on social and economic factors). Market deregulation is represented by the Index of Economic Freedom published by the Heritage Foundation and the Wall Street Journal (41).

4.4 Changes in the retail sector

Transnational and national supermarket chains and convenience stores are growing, and displacing independent grocers and specialty food retailers, while fast-food chains are displacing restaurants and other food establishments that serve freshly prepared dishes and meals. This phenomenon, which began in the Global North, is now prevalent worldwide, including most parts of Asia (48), higher-income parts of Africa (49), and throughout Latin America (50). In lower-income countries and settings, transnational corporations also market their products to small retail outlets such as independent grocers and newsstands (54) and by hiring door-to-door sellers of branded “popularly positioned products” to impoverished communities (55).

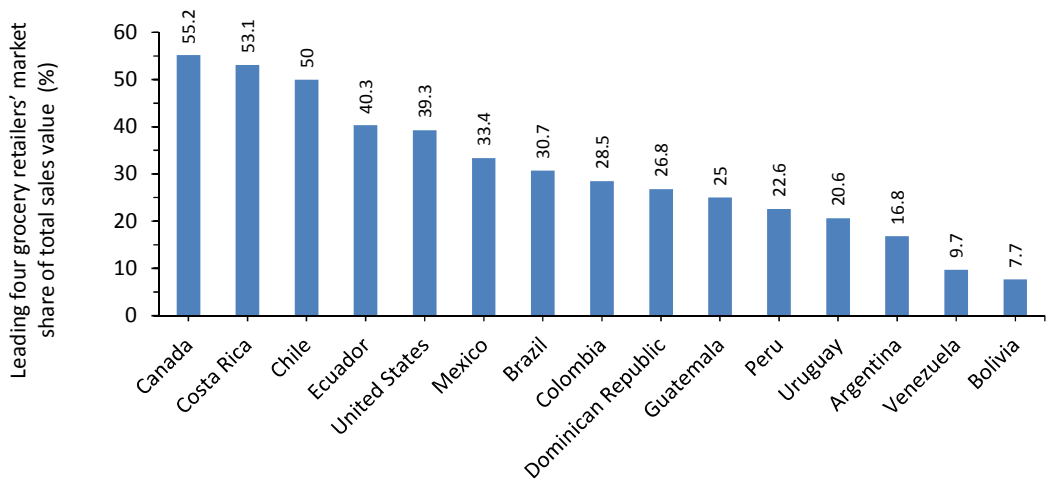
Overall, the grocery retail sector is still competitive in Latin America, but is increasingly less so. From 2004 to 2013, the combined retail sales value

share of the leading four retailers rose from 9.9% to 17.3%. The leading company in the region increased its share from 4.4% to 8.2%. There was considerable variation across countries.

Figure 13 shows the leading four grocery retailers' share of total sales value for 2013 in 15 countries in the Americas (all 13 Latin American countries studied plus Canada and the United States). The retail grocery market is an oligopoly in Canada and Costa Rica and is almost an oligopoly in Chile but remains fairly competitive in the remaining 12 countries. Across all countries, the leading four grocery retailers' market share of total sales value for 2013 ranged from 7.7% (in Bolivia) to 40.3% (in Ecuador).

Figure 13

Leading four grocery retailers' market share of total sales value in 15 countries in the Americas, 2013



Source: Euromonitor Passport Database (2014) (38).

4.5 Marketing

Leading transnational food product manufacturers are colossal, with sales comparable with the gross national products of middle-size countries (55). Transnationals spend vast and increasing sums on advertising and marketing of their products. For example, the cost of one leading fast-food corporation's advertising increased from US\$ 768.6 million in 2011 to US\$ 808.9 million in 2013 (56), and the leading soft drink corporation increased its worldwide advertising and marketing spending from US\$ 1.0 billion in 1993 to US\$ 2.6 billion in 2006 (57). Their sales strategies are based on techniques that incorporate the latest knowledge of behavior motivation according to psychoanalysis, brain imagery, and consumer science (32). Their advertising and marketing campaigns can therefore exploit irrational beliefs, desires, and illusions that undermine rational decisions and self-control.



4.6 Summary

Urbanization, increased income, and market deregulation are some of the drivers of increased production, sales, and consumption of ultra-processed food and drink products. Overall, the rapid increase in sales—and therefore manufacture and consumption—of ultra-processed products in the Global South, including Latin America, has been enabled by political and economic policies that have empowered transnational corporations.

The power of scale has given these corporations an additional edge in all markets. Because of their size, these companies can cut costs of materials, develop new technologies, and distribute and market more effectively than smaller operations (51). Most of the food and drink products sold by these corporations are ultra-processed. As explained in the previous chapter, competition in these markets is reduced by the tendency of the leading corporations to become oligopolies.

Chapter 5

Impact on obesity

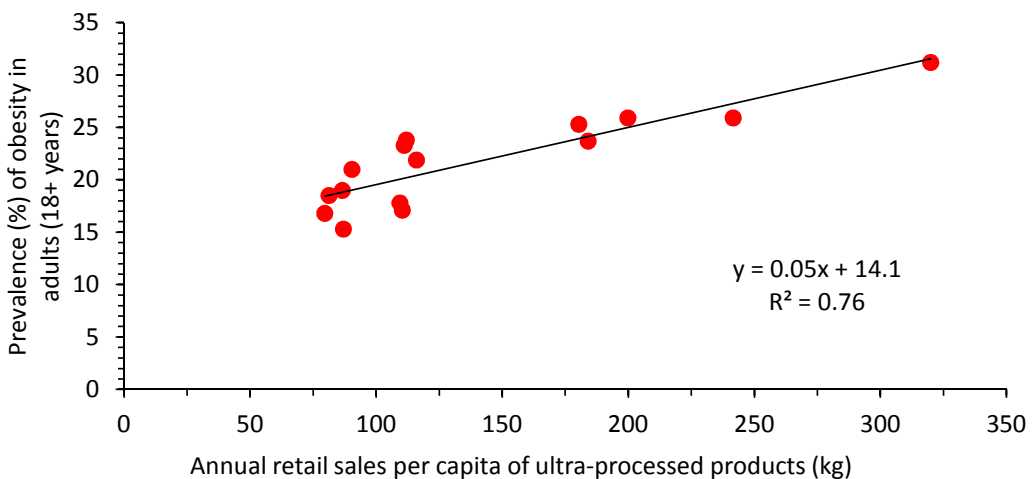
As mentioned in Chapter 1, weight gain in U.S. adults is predicted by consumption of various ultra-processed products including cookies (biscuits, white bread, candy (confectionery) and desserts, sugar-sweetened drinks, processed meats, and French fries (chips) and chips (crisps) (18). In OECD countries, fast-food sales predict increased body mass (36). In Brazil, higher risk for cardiovascular disease, metabolic syndrome in adolescents (19), and adult obesity (16) is predicted by higher consumption of ultra-processed products, as is dyslipidemia in children (17). These findings are supported by those in the analysis below on the association of sales of ultra-processed products with increased body mass and obesity in Latin America.



Figure 14 shows an association between sales per capita of ultra-processed products and prevalence of obesity in adults (18+ years) in 14 countries in the Americas (all Latin American countries studied except Argentina, plus Canada and the United States). There was a positive, strong, and significant association ($R^2 = 0.76$; $p < 0.001$) between prevalence of adult obesity and higher sales per capita of ultra-processed products. After controlling for confounders (GNI, urbanization, and deregulation), the association remained significant ($R^2 = 0.84$; $p < 0.001$).

Figure 14

Annual retail sales per capita of ultra-processed food and drink products and prevalence of obesity (%) in adults in 14 countries in the Americas, 2013

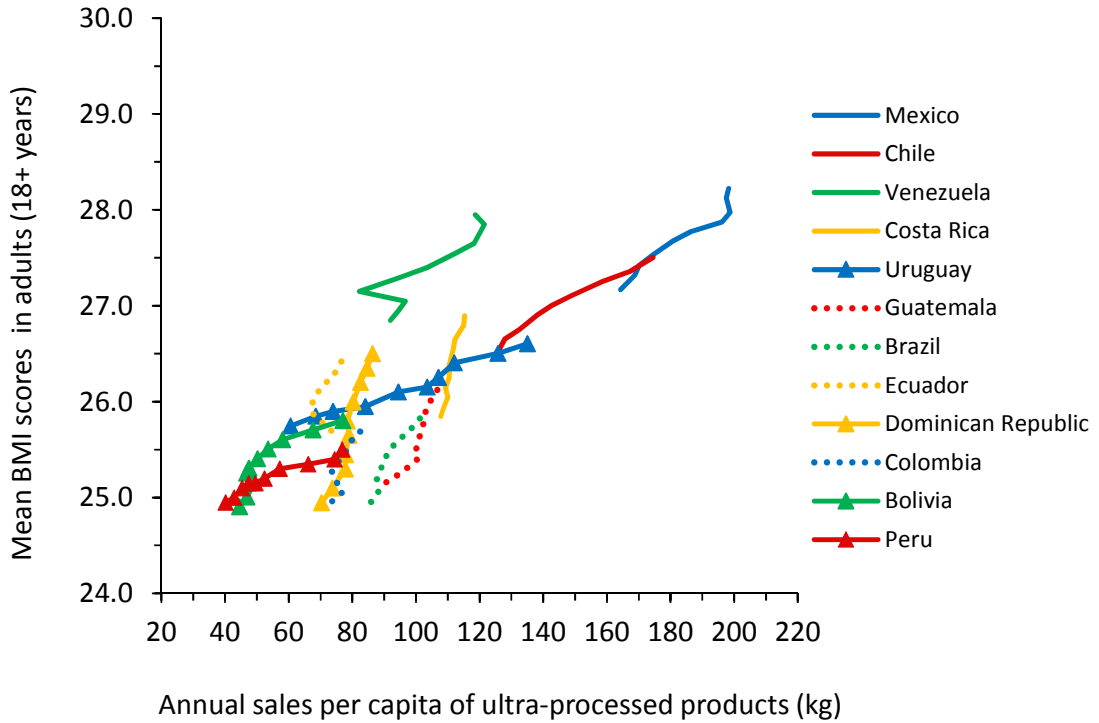


Ultra-processed products here include carbonated soft drinks, sweet and savory snacks, breakfast cereals, confectionery (candy), ice cream, biscuits (cookies), fruit and vegetable juices, sports and energy drinks, ready-to-drink tea or coffee, spreads, sauces, and ready-meals. Quantity in liters is converted into kilograms. Sales data are from the Euromonitor Passport Database (2014) (38). Obesity data are from the WHO 2014 Global status report on noncommunicable diseases (2).

Figure 15 shows changes in body mass in adults (18+ years) as a function of changes in sales of ultra-processed products in 12 Latin American countries (all countries analyzed in the study except Argentina) between 2000 and 2009. Countries where sales of ultra-processed products are lower and traditional diets still prevail, such as Bolivia and Peru, had lower mean body mass. Countries where sales of these products are higher, such as Mexico and Chile, had higher mean body mass.

Figure 15

Annual sales per capita of ultra-processed food and drink products and mean body mass index (BMI) scores in 12 Latin American countries, 2000–2009



Ultra-processed products here include carbonated soft drinks, sweet and savory snacks, breakfast cereals, confectionery (candy), ice cream, biscuits (cookies), fruit and vegetable juices, sports and energy drinks, ready-to-drink tea or coffee, spreads, sauces, and ready-meals. Quantity in liters is converted into kilograms. Sales data are from the Euromonitor Passport Database (2014) (38). BMI data are from the WHO Global Infobase (42).

Changes in sales of ultra-processed products and changes in body mass were strongly, positively, and significantly associated after adjustment for population size, urban population, and GNI ($R^2 = 0.86$; $p < 0.0001$). Each 20-unit increase in average annual sales per capita of ultra-processed products was associated with an increase of 0.28 kg/m^2 in age-standardized BMI scores (coefficient = 0.014; standard error = 0.002; Student's t -test coefficient = 5.48; 95% confidence interval: 0.008–0.020).

Discussion and recommendations

This report described trends in sales of ultra-processed food and drink products in Latin America, using a well-established source of industry data; their social and economic drivers; and their implications for obesity and related chronic non-communicable disease pandemics.

6.1 Main findings

As shown in Chapter 3, middle-income countries in the Global South are replacing fully industrialized countries in the Global North as the most attractive commercial markets for ultra-processed products. Between 2000 and 2013, sales of ultra-processed products from retail stores and fast-food outlets increased steadily in all Latin American countries studied except Argentina and Venezuela, where sales fluctuated as a result of financial crises. At present, sales for these products in Argentina, Chile, and Mexico are approaching those in the United States and Canada.

In Latin America, most ultra-processed products are still sold at traditional grocery stores, but an increasing amount are sold in modern stores such as hypermarkets, supermarkets, and convenience stores, many of which are owned by transnational corporations. Sales in non-food retail stores, such as drugstores, are still low, compared to the United States and Canada. The low sales at the latter type of retail venue represent an opportunity for the use of public regulation to prevent further penetration of ultra-processed products by reducing their overall availability.

Market penetration of several leading ultra-processed products is oligopolistic and typically dominated by transnational corporations. Wealthy food companies' increasing concentration and domination of the global economy raises important concerns about their marketing power and influence on consumers as well as their political power vis-à-vis nation states and subsequent capacity to influence policies that affect food supply and food product consumption (5, 7, 39).

As shown in Chapter 4, sales of ultra-processed products increase with urbanization, income, and market deregulation. Sales were highest in the more urbanized countries and in urban areas. However, it is known that transnational corporations have devised strategies for penetrating markets in rural and impoverished areas in the Global South (55). This may explain why comparable volume sales of “highly processed food” have been reported in both rural and urban areas of East and Southern Africa (46).

During 2000–2013, sales of ultra-processed products were higher in high-income countries but grew at a faster rate in lower-income countries. These findings concur with evidence from previous studies (5,9). Markets for these products are expanding in countries where the number of people with relatively substantial disposable income is increasing. During times of financial crisis, as in Argentina and Venezuela, sales decrease.

Sales (and therefore manufacture and consumption) of ultra-processed products increase when national governments open their countries to foreign investment and deregulate markets. This finding supports previous evidence that fast-food consumption and obesity increase fastest in countries that adopt more aggressive market deregulation policies (36,53). Market deregulation enables conditions conducive to higher rates of obesity by increasing the production, marketing, accessibility, and sales of ultra-processed products and thus boosts their consumption.

As shown in Chapter 5, ultra-processed products promote weight gain and obesity. This finding is consistent with previous studies showing that the level of consumption of ultra-processed products is tightly correlated with overall diet quality (14,15) and risk of obesity and related chronic noncommunicable diseases (16–19). Snacks and fast-food, which are almost all ultra-processed, and carbonated drinks, which are all ultra-processed, are identified by WHO as obesogenic (3,58).

6.2 Study limitations

The analyses presented in this report have several limitations. First, coverage of Latin America was limited to the 13 countries for which data were available in the Euromonitor Passport database (38). However, it is reasonable to believe that the general findings for those 13 countries would apply throughout the region. In addition, the data were limited to national averages and were not disaggregated by gender; age; or regional, geographic, socioeconomic, or demographic factors within and between countries. Data broken down for those variables would be valuable in determining patterns, trends, and other significant information.

Second, while the amount and quality of data from the Euromonitor Passport database (38) allowed for time trend analysis and comparisons across countries, the database did not include comprehensive data from informal points of sale or any data for certain types of ultra-processed products, so the actual volume of sales and consumption of ultra-processed products was most certainly underestimated. Products that were not covered included industrial versions of breads and other commercial bakery products; packaged soups and noodles; processed cheese products; and pre-prepared, reconstituted animal products such as sausages, chicken or fish nuggets or sticks. These were not available in Euromonitor or found in aggregated categories with minimally processed food. In addition, data on fast-food were only available as “number of purchases” (versus “number of meals”), so it was not possible to estimate the volume of ultra-processed products sold.

Third, the analysis did not cover trends in sales of unprocessed or minimally processed foods (which would have provided useful information on changing food supplies and consumption patterns) because the Euromonitor database (38) did not include information on all types of these foods, and data were only available for retail sales (versus sales direct from producers or street markets, and foods acquired in the wild, from home gardens, or through exchange). However, studies using national food expenditure surveys have shown that unprocessed or minimally processed foods are displaced as ultra-processed consumption grows (10–13). Therefore, it is reasonable to assume that increased sales of ultra-processed products in Latin America indicate decreased consumption of unprocessed or minimally processed foods, and therefore of fresh and handmade meals.

Fourth, market deregulation was measured indirectly using the *Index of Economic Freedom* (41). The index is based on national laws and regulations, taking into account the perspective of investors and the business community, and therefore may have introduced bias. However, the index is correlated strongly with other indices of economic deregulation, such as the World Bank’s “Ease of Doing Business” Index and the Fraser Institute’s Economic Freedom of the World Index (36), which helped mitigate this limitation. Furthermore, the index provided an overall measure of the relative freedom of foreign investment and trade and enabled comparison across countries and was therefore a valuable component of the study.

A final limitation stemmed from the use of the age-standardized mean body mass scores that were used in the cross-sectional time-series analysis. These scores were estimated from a Bayesian hierarchical model that included several variables, including gross national income and urbanization (59). Therefore, the reported correlation between sales of ultra-processed products and mean body mass may have reflected, at least in part, the likely association between these products and gross national income and/or urbanization. However, after controlling for both gross national income and urbanization, a strong association between changes in sales of ultra-processed products and changes in



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body mass scores remained. This association was further supported by the cross-sectional model, which showed a strong association between the prevalence of obesity and sales of ultra-processed products in 2013, as well as previous studies (16,18,36).

6.3 Recommendations

One purpose of this report is to generate more evidence to support and further develop PAHO's Plan of Action for healthy diets, which outlines policies and actions agreed upon by governments in the Americas to improve food systems and supplies to halt and reverse the epidemic of obesity in the region (3). Synergistic and coherent actions from government, the scientific community, civil society organizations and social movements, the media, and appropriate private sector actors are needed to implement the agreed-upon policies. Also, market solutions are needed to re-design food systems in ways that are protective and supportive of healthy food choices. This work can be divided into four general lines of action.

Reducing consumption of ultra-processed products

There is an urgent need to reduce the health risk posed by ultra-processed products by reducing their overall consumption. This requires implementation of various fiscal policies as well as statutory and other regulation of ultra-processed product labeling, promotion, and advertising, as proposed in PAHO's Plan of Action (3) and already established or planned in Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, and Peru. Fiscal policies should aim to raise taxes on ultra-processed products and restrict their availability in non-food outlets, which is currently low. Statutory regulation should be used to prohibit all types of marketing of ultra-processed products to children and adolescents (including on packages), and to restrict marketing in all public spaces including places where food is sold. Regulations need to be monitored, reviewed, and strengthened, as commonly done for tobacco products and alcoholic drinks

Protecting and promoting healthy diets

To promote and protect general good health and well-being, policies and actions are needed to reduce and reverse the displacement of unprocessed or minimally processed foods and meals, by ultra-processed products and snacks. Healthy, sustainable national and local food systems and supplies must be protected, strengthened, and maintained in both urban and rural areas to ensure healthy dietary patterns.

Penetration of transnational corporations that produce and market ultra-processed products into Latin America has been rapid. However, food cultures based on meals shared with family and others and made from unprocessed or minimally processed food remains strong throughout the region and thus still protects healthy sustainable national and local food systems and supplies.

Statutory and other forms of regulation on pricing, incentives, agriculture, and trade, along with information and education campaigns, are needed to protect and promote family farming; establish limits of land concentration; promote and strengthen the use of traditional and neglected crops; improve availability of locally sourced fresh food in school lunch programs; and protect, promote, and strengthen domestic food preparation and cooking skills. Brazil's Family Farming Food Procurement Program and School Meal Program and the promotion of vegetable and fruit production in various countries in Central America are encouraging examples (3).



Changing consumer perceptions and knowledge of food processing

New strategies are needed at all levels from community to national to change consumer perception and knowledge of food processing and nutrition. Informed consumers can act as empowered citizens and become agents in creating demand for better and healthier food systems and food supplies. To help achieve this goal, dietary guidelines must be based on principles and concepts that adopt a holistic approach to nutrition and health and that fully address the significance of food processing. The



guidelines should be food-based (60,61) rather than strictly nutrient-based and should promote minimally processed foods and freshly prepared meals and avoidance of ultra-processed products. The dietary guidelines issued by the Brazil's Ministry of Health in 2014 (4) could be used as a model.

Developing new market opportunities to increase availability of healthy foods

Finally, new market opportunities should be developed to increase the availability and affordability of unprocessed or minimally processed foods and fresh, handmade prepared and served meals. These need to comply with national dietary guidelines and new public policies. Using their own purchasing power, governments can support local family farms to enable the supply of fresh produce to schools, hospitals, and municipal markets and thus support healthier food cultures and dietary patterns. Established business models can be adapted and new models developed for independent stores, street markets, community kitchens, and restaurants to improve access to and affordability of meals and dishes made with healthy foods.

6.4 Conclusion

Creation, development, and strengthening of national and local food systems that will protect public health in Latin America require commitment and investment as a top priority for national governments. This is already agreed upon and stated in PAHO's Plan of Action (3). The work will not be easy and will require strong, determined leadership from governments, sustained by citizens—as voters and parents—and civil society organizations and social movements at all levels (national, state, and municipal). Such public–public partnership is essential to protect public health and other public goods, including food systems that nourish populations in ways that are rational, appropriate, healthy, and sustainable in all relevant ways. Toward this end, all work must be undertaken in line with principles of social justice, cultural sensitivity, economic viability, and environmental sustainability.

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Annex A

The NOVA food classification system

Food group and definition	Examples
<p>1 Unprocessed or minimally processed foods</p> <p>Unprocessed foods are foods of plant origin (leaves, stems, roots, tubers, fruits, nuts, seeds), or animal origin (meat, other flesh, tissue and organs, eggs, milk) distributed shortly after harvesting, gathering, slaughter, or husbanding. Minimally processed foods are unprocessed foods altered in ways that do not add or introduce any substance but may involve removing parts of the food. Minimal processes include cleaning, scrubbing, washing; winnowing, hulling, peeling, grinding, grating, squeezing, flaking; skinning, boning, carving, portioning, scaling, filleting; pressing, drying, skimming, pasteurizing, sterilizing; chilling, refrigerating, freezing, sealing, bottling, simple wrapping, vacuum- and gas-packing. Malting, which adds water, is a minimal process, as is fermenting, which adds living organisms, when it does not generate alcohol.</p>	<p>Fresh, chilled, frozen, vacuum-packed vegetables and fruits; grains (cereals) including all types of rice; fresh, frozen, and dried beans and other legumes (pulses), roots and tubers; fungi; dried fruits and freshly prepared or pasteurized non-reconstituted fruit juices; unsalted nuts and seeds; fresh, dried, chilled, frozen meats, poultry, fish, and seafood; dried, fresh, pasteurized full-fat, low-fat, skimmed milk, and fermented milk such as plain yogurt; eggs; flours, "raw" pastas made from flour and water; teas, coffee, herbal infusions; tap, filtered, spring, mineral water.</p>
<p>2 Processed culinary ingredients</p> <p>Substances extracted and purified by industry from food constituents or obtained from nature. Preservatives, stabilizing or "purifying" agents, and other additives may be used.</p>	<p>Plant oils; animal fats; starches; sugars and syrups; salt.</p>
<p>3 Processed foods</p> <p>Manufactured by adding salt or sugar (or other culinary ingredient such as oil or vinegar) to foods to make them more durable or modify their palatability. Directly derived from foods and recognizable as versions of the original foods. Generally produced to be consumed as part of meals or dishes. Processes include canning and bottling, fermentation, and methods of preservation such as salting, salt-pickling, and curing.</p>	<p>Canned or bottled vegetables and legumes (pulses) preserved in brine or pickled; peeled or sliced fruits preserved in syrup; tinned whole or pieces of fish preserved in oil; salted nuts or seeds; non-reconstituted salted or cured processed meat and fish such as ham, bacon, and dried fish; cheeses made from milk, salt, and ferments; and breads made from flours, water, salt, and ferments.</p>
<p>4 Ultra-processed products</p> <p>Formulated mostly or entirely from substances derived from foods or other organic sources. Typically, they contain little or no whole foods. They are durable, convenient, packaged, branded, accessible, highly or ultra-palatable, often habit-forming. Typically not recognizable as versions of foods, although may imitate the appearance, shape, and sensory qualities of foods. Many ingredients are not available in retail outlets. Some ingredients are directly derived from foods, such as oils, fats, starches, sugars, and others are obtained by further processing of food constituents or synthesized from other organic sources. Numerically the majority of ingredients are preservatives and other additives such as stabilizers, emulsifiers, solvents, binders, bulkers, sweeteners, sensory enhancers, colors and flavors, and processing aids. Bulk may come from added air or water. Micronutrients may "fortify" the products. Most are designed to be consumed by themselves or in combination as snacks, or to replace freshly prepared dishes and meals based on unprocessed or minimally processed foods. Processes include hydrogenation, hydrolysis, extruding, molding, reshaping, preprocessing by frying, baking.</p>	<p>Chips (crisps) and many other types of sweet, fatty, or salty packaged snack products; ice-cream, chocolates, candy (confectionery); French fries (chips), burgers and hot dogs; poultry and fish nuggets or sticks (fingers); packaged breads, buns, cookies (biscuits); sweetened breakfast cereals; pastries, cakes, cake mixes; energy bars; preserves (jams), margarines; packaged desserts; canned, bottled, dehydrated, packaged soups, noodles; sauces; meat and yeast extracts; carbonated drinks, energy drinks; sugar-sweetened milk drinks including fruit yogurts; fruit and fruit nectar drinks; no-alcohol wine, beer; pre-prepared meat, fish, vegetable, cheese, pizza, pasta dishes; infant formulas, follow-on milks, other baby products; "health" and "slimming" products such as powdered or "fortified" meal and dish substitutes.</p>

Annex B

80 Countries included in this report by region

Region	Quantity	Countries
Latin America	13	Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Mexico, Peru, Uruguay, Venezuela
North America	2	Canada, United States
Western Europe	17	Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom
Eastern Europe	18	Belarus, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Latvia, Lithuania, Macedonia, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Ukraine
Asia and the Pacific	16	Azerbaijan, China, Hong Kong, India, Indonesia, Japan, Kazakhstan, Malaysia, Pakistan, Philippines, Singapore, South Korea, Taiwan, Thailand, Uzbekistan, Vietnam
Middle East and Africa	12	Algeria, Cameroon, Egypt, Iran, Israel, Kenya, Morocco, Nigeria, Saudi Arabia, South Africa, Tunisia, United Arab Emirates
Australasia	2	Australia, New Zealand



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