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REVIEW ARTICLE

Junk food: analysis of risks, benefits, and social perception

Comida chatarra: análisis de riesgos, beneficios y percepción social

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Abstract The growing concern for food safety and public health has driven increased consumer interest in the production and marketing of food, especially those considered "junk". International organizations such as FAO and WHO have implemented regulations to mitigate the risks associated with their consumption, emphasizing the importance of clear and accurate labeling that informs about ingredients and nutritional content. Despite the demand for transparency, the excessive consumption of ultra-processed foods has contributed to the rise of chronic diseases such as obesity and diabetes. In response, several countries have adopted measures that include mandatory labeling and the reduction of sugars and fats. With consumers becoming increasingly aware of health issues, nutritional labeling becomes a key tool for facilitating healthier food choices, balancing the information provided with the true nutritional value of products.

Keywords junk food, public health, nutritional labeling, chronic diseases, ultra-processed foods.

Resumen La creciente preocupación por la seguridad alimentaria y la salud pública ha impulsado un mayor interés de los consumidores en la producción y comercialización de alimentos, especialmente los considerados "chatarra". Organizaciones internacionales como la FAO y la OMS han implementado regulaciones para mitigar los riesgos asociados con su consumo, enfatizando la importancia de un etiquetado claro y preciso que informe sobre ingredientes y contenido nutricional. A pesar de la demanda de transparencia, el consumo excesivo de alimentos ultraprocesados ha contribuido al aumento de enfermedades crónicas, como la obesidad y la diabetes. En respuesta, varios países han adoptado medidas que incluyen etiquetado obligatorio y reducción de azúcares y grasas. Con la creciente conciencia de los consumidores sobre la salud, el etiquetado nutricional se convierte en una herramienta clave para facilitar elecciones alimentarias más saludables, equilibrando la información proporcionada con el verdadero valor nutritivo de los productos.

Palabras clave alimentos chatarra, salud pública, etiquetado nutricional, enfermedades crónicas, alimentos ultraprocesados.

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PUBLIS EDITORIAL

Introduction

The right of consumers to protect their health, safety, and economic interests is reflected in most programmatic platforms and constitutions of countries in the hemisphere. This regulatory framework ensures that consumers receive adequate and truthful information, maintaining their freedom of choice and guaranteeing fair treatment conditions (Zharkenova & Kulmakhanova, 2015). To this end, states allow the creation of consumer associations that study relevant provisions, supported by complementary legislation that ensures the enforcement of these rights across various sectors of the economy and society.

Recognizing the importance of providing consumers with safe, wholesome, and nutritious food, the United Nations Guidelines for Consumer Protection have been established and implemented by international bodies such as the Codex Alimentarius Commission, affiliated with FAO/WHO, and Consumers International, among others (Tripathi, 2020). Since its founding in 1945, the FAO has prioritized protecting consumers' health and economic interests, solidified with the establishment of the Codex Alimentarius Commission in 1962, which aims to safeguard consumer health, ensure fair trading practices in food commerce, and develop international standards for food safety and quality (Lee et al., 2021).

Consumers International, a global federation of consumer organizations with 250 members in 120 countries, works to ensure that all consumers have access to safe, nutritious, and culturally acceptable food at affordable prices. Since its inception, it has conducted campaigns and educational actions on a wide range of food-related issues, including infant foods, biotechnology, pesticide use, food irradiation, and food safety (Baba et al., 2023).

The food process provides the body with the necessary nutrients for life; therefore, food quality significantly influences health. Food choices can vary according to cultural characteristics and availability (Silva et al., 2023). Additionally, the social, economic, and cultural factors of each country profoundly affect the food practices and preferences of its inhabitants (Haghighian et al., 2017).

The daily consumption of low-nutrient and high-calorie foods, commonly referred to as "junk food" or fast food, is affecting consumers' health, as well as the lack of awareness among producers and marketers regarding the harm they cause (Pérez, 2014). Although the term "junk food" has gained popularity in recent years, its sale and consumption date back centuries.

In the 21st century, the rise of junk food consumption has created a global commercial dynamism that has made this category of food preferable among the economically active population, thus establishing an inadequate consumption pattern that disconnects individuals from their culinary heritage (Mititelu et al., 2023).

Junk foods are characterized by high levels of saturated fats, cholesterol, sugars, salt, and artificial or synthetic chemicals, such as preservatives and colorings, which are not assimilable by the body. These foods are consumed abundantly worldwide due to their quick preparation and easy access (Mititelu et al., 2023). The lack of time, fast-paced lifestyles and the search for convenience have turned junk food into the daily diet of a large portion of the population, who, often unknowingly, follow a poorly varied and unbalanced diet with multiple health disadvantages (Bohara et al., 2021).

It is essential to reclaim individual responsibility regarding health and risk prevention, including food choices that can negatively affect well-being, such as the consumption of junk food. This task is vital in public health and should include training for producers, suppliers, and consumers to achieve established objectives (Mehar et al., 2023).

Given the need to address the issues of knowledge and perception regarding labeling and the risks associated with the consumption of junk food, the Institute of Pharmacy and Food (IFAL) of the University of Havana, in collaboration with the Sanitary Registration Directorate of the National Institute of Hygiene, Epidemiology, and Microbiology (INHEM), is developing Project 13-II-044 "Sanitary Regulations and Trade" as part of the National Science, Technology, and Innovation Program No. 2, which seeks to organize and improve the quality of health services. The general objective of this work was to analyze the problem of junk food at a global level.

Food legislation

Food legislation enacted by legislative bodies constitutes a set of enforcement policies that establish rules and guidelines that food industries must follow. These laws delineate the Enforcement Standards set by the Government for the relevant industries and determine the penalties for violations of these standards (Tripathi, 2020). Enforcement policy is defined as a set of official statements that establish specific or general limits on products, processes, or conditions by applicable laws and regulations. These statements allow the public and the media to have clear expectations regarding government policy on food (van Bussel et al., 2022).

Most food laws are legislative provisions that allow for mandatory controls over food under certain conditions. These laws grant authority to specific ministries, public officials, or agencies to administer their enforcement (Zharkenova & Kulmakhanova, 2015). In some cases, food legislation assigns responsibility for food control to multiple ministries

and agencies, while in other cases; it may authorize different entities to address specific aspects of food control. It is common for the law to authorize both national agencies and local authorities to carry out food control activities (van Bussel et al., 2022).

Since most laws are written in legal language, difficulties often arise in interpreting their provisions, which may require clarifications and, at times, judicial decisions. This further complicates the administration of food legislation (Zharkenova & Kulmakhanova, 2015).

Food legislation encompasses the set of provisions of a country that regulate the production, handling, and marketing of food. With the rapid technological advancements in the food industry and commerce, along with the growing need to ensure healthy food for consumers and protect them against fraud, adulteration, and contamination, it is necessary to formulate food laws aimed at the following purposes (Veslemøy & Wirtanen, 2019).

a) Protecting consumer health: The production, processing, storage, transportation, handling, and sale of food can pose health hazards to consumers that must be anticipated or eliminated by the legislator.

b) Protecting consumers against fraud: To ensure that consumers receive the expected product, it is crucial to enact legislation or regulations specifically addressing the packaging and labeling of products, thereby avoiding deceptions that compromise consumer good faith. The correct application of these laws will foster fair trading practices by ensuring compliance with fundamental provisions, as well as established standards and regulations. In this way, honest manufacturers and traders will be protected from unfair competition while promoting the development of the food industry and commerce, as quality control based on scientific criteria tends to facilitate better acceptance of food by consumers (Veslemøy & Wirtanen, 2019).

Junk food

Junk food, also known as fast food or garbage food, typically contains high levels of fat, salt, spices, or sugars (which stimulate appetite and thirst, thus generating significant commercial interest for establishments providing such food) along with numerous food additives, such as monosodium glutamate (a flavor enhancer) or tartrazine (a food coloring) (Liu et al., 2021).

"Junk food" is a commonly used term referring to foods that do not provide good nutrition, lack fiber or micronutrients, but deliver excessive calories. Moreover, the few nutrients they do offer are of poor quality, such as saturated fats and synthetic chemicals that are not assimilable by the body (Tarantino et al., 2022).

The global production and/or marketing of junk food has transformed eating practices at an accelerated pace, due to: marked demands of large-scale economic cycles; hierarchical redefinitions occurring in domestic spheres regarding the generic division of labor; migration; and the impact of mass media (Harris & Graff, 2012).

In this regard, advertising has become both a practice and a discourse. As a practice, it has emerged as a specifically created tool to publicize the products crafted by large corporate food chains; as a discourse, it transcends the objective characteristics of the advertised product, providing a global ideology not only about its use, utility, or benefits but also regarding what constitutes the ideal behavior of consumers based on various factors: work, family, leisure, education, body care, or health (Liu et al., 2021).

Indeed, advertising has successfully maintained a constant relationship between the production and acquisition of goods and services, repeatedly reminding consumers of the convenience of satisfying their desires and needs.

It is a widely recognized consideration that the main objectives of companies are to sell products and generate profits; however, these substantial purposes do not exempt them from their responsibility to foster a healthier society and contribute to building an economic life that promotes sustainable growth. The information provided in products and services offered to consumers must be sufficient for them to make informed demands (Latapí et al., 2019).

Transnational corporations that monopolize global food production and trade invest millions of dollars in promoting unhealthy foods and finance multimillion-dollar advertising campaigns specifically targeting children.

One of the largest producers of junk food worldwide is the well-known McDonald's, which was opened by the McDonald brothers in 1948, establishing itself as the first fast-food restaurant in history, located in San Bernardino, California (USA). They offered fast food, meaning pre-prepared meals served quickly. Undoubtedly, the basis of their success lay in replacing conventional tableware used by other restaurants with paper bags. They soon achieved high sales levels, and although the menu was limited, their success continued to grow (Rodríguez, 2014).

McDonald's has expanded to become one of the most present organizations globally, with over 31,000 restaurants, nearly 500,000 employees in 118 nations, and selling 17.5 billion meals annually (Rodríguez, 2014).

The name McDonald's is appealing to children. As if this level of cultural colonization were not enough, McDonald's has chosen public schools as a new venue for marketing and child consumption, developing a core of advertisements called "fragments of life" (Rodríguez, 2014).

Interestingly, the product sold by McDonald's is basically the same worldwide, suggesting that we are not so different in culture or taste. Today, the "Big Mac," the company's

most famous burger, thrives on all five continents, becoming a common point among the planet's inhabitants (Rodríguez, 2014). McDonald's is globally recognized, both for being a high-quality commercial organization and for being one of the best franchise opportunities available (Rodríguez, 2014).

On the other hand, there is the ARCOR group, which was founded in 1951 and is based in Córdoba. It is an Argentine multinational company that produces more than 1,500 varieties of candies, chocolates, cookies, and other foods; it has 31 factories and over 13,000 employees, and it exports its products to more than 100 countries worldwide (Rodríguez, 2014). Other junk food producing companies include FEMSA (Coca-Cola) and Pepsico (Pepsi), large producers of carbonated beverages.

Types of junk food widely consumed today

In recent years, the consumption of junk food has become integrated into the daily diet of a large part of the population, contributing to a diet that is both unvaried and unbalanced, which poses numerous risks to health and overall well-being. The most common types of junk food include fried foods, sweets, candies, and desserts. These diverse foods are consumed daily by many people worldwide, often without adequate knowledge of their composition (Liu et al., 2021).

Among the most representative junk foods are hamburgers, hot dogs, and sandwiches, which have high levels of fats from meat, mayonnaise, and certain cheeses, as well as excessive amounts of salt. Milkshakes, on the other hand, generally contain high levels of sugar. French fries, onion rings, and fried chicken are also rich in fats (oils) and sodium (salt). As for pizzas and pastries, they are high in carbohydrates, such as flours and sugar, in addition to fats like oils and shortenings. Soft drinks and other carbonated beverages contain abundant amounts of sugar, while candies are rich in sugar, salt, and fats. Finally, snacks contain high levels of sodium chloride, colorants, flavorings, sugars, and fats.

Possible benefits of junk food

Junk food is popular due to its easy preparation (often subjected to industrial processes) and preservation (many do not require refrigeration and have a long shelf life). Their relatively low price, wide commercial distribution, and effective advertising make them easily accessible to consumers. Additionally, they typically require no preparation on the part of the consumer, making them convenient options for consumption. These foods offer a wide variety of flavors, can be consumed in just a few minutes, and are suitable for consumption anywhere, even while standing (Fuhrman, 2018).

Possible risks of junk food

The impact of junk food on nutrition and health varies depending on the frequency of consumption. For both, children and adults, consuming junk food once a week is not equivalent to consuming it daily (Datar & Nicosia, 2012). Currently, the prevalence of food-related diseases represents one of the most concerning health problems in many countries, where the typical diet is based on foods high in calories, saturated fats, trans fats, sodium, and sugar. Daily consumption of junk food is associated with an increased likelihood of developing blood-related diseases, obesity, diabetes, and elevated cholesterol levels.

Frequent consumption of junk food can lead to a range of health issues for consumers, including poor bone mass development due to low calcium intake, as well as dental cavities resulting from high levels of simple sugars. Additionally, biochemical changes have been observed at the brain level, similar to those caused by drugs, attributable to the high amounts of sugars and fats in these foods. This consumption is also associated with an increase in the incidence of cardiovascular diseases, overweight, hypercholesterolemia, increased blood pressure, and diabetes, all related to high consumption of animal-based proteins, saturated fats, sugars, and cholesterol. Furthermore, high doses of sodium, preservatives, and flavor enhancers can induce alterations in taste perception, leading to increased appetite and unhealthy eating habits. Collectively, these factors contribute to the overall deterioration of health, resulting from an imbalance in nutrient intake (Melis & Sollai, 2023).

Social perception of junk food

Eating habits develop from the earliest years of life and are the result of multiple factors that interact throughout an individual's growth and development. Experiences with food, linked to family, social, and environmental situations (mainly during childhood), positively or negatively influence the formation of eating habits (Abdoli et al., 2023).

The global food situation presents a polarization between hunger and diseases caused by excess and imbalances in nutrition. The latter dominate health issues in numerous countries, and, according to current trends, a worsening is expected in the coming years.

In Latin America, several factors in the school food environment negatively influence eating practices, with the sale of junk food being one of the most prominent. Evaluations conducted by the Food and Agriculture Organization of the United Nations (FAO) in countries such as El Salvador, Honduras, Mexico, Guatemala, the Dominican Republic, and other Caribbean nations have shown that in most schools, junk food is the most available and accessible option due to its low cost and popularity among students. In the shops of many of the schools studied the predominant foods and beverages were processed and/or industrially produced items, which are generally significant sources of sugars, salt, saturated fats, and artificial additives (for example, nachos, cheese snacks, churros, fried plantains, salted peanuts, and

corn with salt and lime; cookies and sweets; soft drinks and artificial juices). Fresh fruits were found in very few cases, and the prepared products available were mainly fried foods (Duran et al., 2021).

Currently, Mexico is one of the countries most affected by obesity or overweight problems among students due to the sale of junk food both inside and outside schools. About 20% of children are obese or overweight, around 50% of children buy tacos and sandwiches within schools, 49% purchase sugary drinks, and 35% buy sweets and fried snacks. The high consumption of junk food among Mexican children is expected to reduce the life expectancy of the population from 75 to 50 years (Popkin & Ng, 2022).

Data from various studies indicate that in most Latin American countries, there has been an increase in overweight and obesity among children, which is concerning due to the strong association between obesity and high mortality rates resulting from the risk of chronic degenerative diseases and psychosocial disorders—conditions that, throughout the life cycle, double in individuals who were overweight during childhood and adolescence (Corvalán et al., 2017).

In countries such as Mexico, Ecuador, Chile, Colombia, Venezuela, Cuba, and the United States, projects have been implemented to understand consumer opinions about junk food through opinion polls. The results obtained vary from one country to another according to consumer preferences.

According to data from the National Health and Nutrition Survey (Ensanut) conducted in Mexico, it was found that between 1988 and 2012, the proportion of women aged 20 to 49 years with overweight increased from 25% to 35.5%, and the percentage of obese women in this group rose from 9.5% to 37.5%. Among Mexican children aged 5 to 11 years, 29% were overweight, as were 35% of young people aged 11 to 19 years, while one in ten school-aged children suffered from anemia. Furthermore, it is stated that between 6.5 million and 10 million people suffer from diabetes in this country (Shamah-Levy et al., 2019).

Perceptions of food issues depend on multiple factors, some related to the influence of culture or individual ethics, while others are associated with more specific aspects such as social position, the influence of corporate interests, or the professional background of the group in question (Monterrosa et al., 2020).

Projection of international organizations regarding junk food

Various international organizations, such as the Food and Agriculture Organization of the United Nations (FAO), Codex Alimentarius, World Health Organization (WHO), World Trade Organization (WTO), Organisation for Economic Co-operation and Development (OECD), and the United Nations Development Programme (UNDP), are taking actions to ensure that the marketing and use of junk food do not neglect essential aspects related to the safety and nutritional value of these products, depending on their target destination. Among the actions highlighted by these organizations is the FAO, which, during the Second International Conference on Nutrition held in Rome in 2009, proposed fighting against junk food, recognized as a cause of overweight and obesity worldwide, and combating chronic malnutrition. The FAO also called on governments to collaborate with industries to reduce the sale of products that do not provide adequate levels of proteins and vitamins while exceeding in fats and sugars. Additionally, it requested greater transparency in the information provided to consumers through product labels (Taillie et al., 2019).

Codex Alimentarius has established an Intergovernmental Action Group on junk food, where experts designated by governments develop standards, guidelines, or recommendations as appropriate. This group focuses on evaluating aspects of safety and nutritional value, as well as principles for risk analysis, traceability, labeling, and examination of analytical methods. On another note, in May 2004, during the 57th World Health Assembly, the WHO Global Strategy on Diet, Physical Activity, and Health was approved, aiming to reduce mortality and morbidity caused by malnutrition, including undernutrition and nutritional deficiencies, by improving dietary practices and physical activity. The overall goal of this strategy is to promote and protect health by creating an environment conducive to the adoption of sustainable measures at the individual, community, national, and global levels, which contribute to the reduction of morbidity and mortality associated with unhealthy eating and lack of physical activity (Kumar & Preetha, 2012).

Criteria for the health assessment of junk food

The existence of national food control systems is fundamental to protecting the health and safety of consumers. It is also essential to ensure the safety and quality of both exported and imported foods, ensuring that these meet national requirements. The new global environment of food trade necessitates that both, importing and exporting countries strengthen their control systems and adopt risk-based strategies. Confidence in the safety and integrity of food is a fundamental requirement for consumers (Swainson, 2019).

The FAO and WHO are interested in promoting national food control systems based on scientific principles and guidelines that cover all sectors of the food chain. This is especially relevant for developing countries seeking to improve food safety and quality, as well as nutrition, which will require strong political and regulatory commitment (Swainson, 2019).

Regulations for the marketing and consumption of junk food

Currently, consumer protection has gained significant relevance globally. Information and education for consumers are fundamental aspects to safeguard their rights, health, and safety (Veslemøy et al., 2023). Greater knowledge about food products enables consumers to effectively exercise their rights, leading consumer associations to demand to be informed and educated on these issues. These organizations consider proper labeling of products essential, so that consumers, with informed opinions, can make educated decisions about the foods they choose to consume (Zafar et al., 2022).

Over the last decade, non-communicable chronic diseases, such as cardiovascular and respiratory diseases, cancer, diabetes, overweight, and obesity, have caused the death of approximately 388 million people. The risk of developing these diseases has increased as dietary patterns have changed, incorporating a higher amount of processed foods rich in fats, sugars, and industrially produced trans fatty acids (Clemente-Suárez et al., 2023).

The Pan American Health Organization and the World Health Organization (PAHO/WHO) have urged the food industry to reduce salt and sugar content in their products, especially those aimed at children. According to new guidelines from PAHO/WHO, sugar consumption should not exceed 10% of the daily energy intake of the population (Patiño et al., 2021). Additionally, they have proposed the gradual elimination of trans fatty acids to improve food quality and promote a healthier lifestyle in the Americas, recommending that their consumption does not exceed 1% of daily energy intake. They also suggested increasing the proportion of monounsaturated and polyunsaturated fats in the food chain and the dietary habits of the population.

In response to the widespread consumption of junk food, various countries in the region have implemented actions ranging from increasing prices for these products, such as Mexico and Colombia, to approval of legislation with stricter measures regarding the advertising of these foods. At the international level, regulatory agencies have taken action, such as Brazil's National Health Surveillance Agency (ANVISA), which enacted a law requiring foods high in fat, sugar, and salt to include warnings about health risks associated with their consumption (Duran et al. 2019).

Consumer protection and labeling of junk food

Consumers have shown unprecedented interest in how food is produced, processed, and marketed, increasingly demanding that their governments take responsibility for the safety of food products and consumer protection (Wu et al., 2021). This demand translates into a desire for detailed information about the food they purchase, including aspects such as the nature of the product, its preparation and use, the content and quantity of its ingredients, the nutrients it contains, and its caloric value.

The reasons behind this interest are diverse. Consumers seek to compare products, evaluate prices, avoid ingredients they dislike or that have caused adverse reactions, and identify foods suitable for specific groups, such as those with celiac disease or those containing phenylalanine, which should not be consumed by individuals with phenylketonuria (Bathrellou et al., 2023). In this regard, it is established that prepackaged foods must not be described or presented in a false, misleading, or deceptive manner, as this could create a false impression about their nature (Bathrellou et al., 2023).

Labels on prepackaged foods must contain key information, including the name of the food, the list of ingredients, net content, manufacturer or distributor information, country of origin, lot identification, and minimum durability date (Bathrellou et al., 2023). Nutritional labeling, in turn, provides essential data for consumers to make informed dietary choices. It serves as an effective means to indicate nutrient content, promotes the application of nutritional principles in food preparation, and contributes to public health by offering the possibility of including additional nutritional information on labels (Bathrellou et al., 2023).

Nutritional labeling is based on several principles. First, the nutrient declaration aims to provide consumers with an appropriate profile of the nutrients in the food, recognizing that it cannot precisely determine how much each individual should consume to maintain their health. Rather, it should inform about the amounts of nutrients in the product. Second, complementary nutritional information seeks to facilitate the understanding of the food's nutritional value and help consumers interpret the nutrient declaration. This information varies according to the population group and the educational policies of the country. Finally, nutritional labeling should not imply that labeled foods necessarily have any nutritional advantage compared to those that are not labeled (Bathrellou et al., 2023).

Conclusions

The growing concern for food safety and public health has highlighted the need to address the consumption of "junk" foods. International organizations such as the FAO and WHO have promoted regulations to ensure the safety and nutritional value of these products, emphasizing the importance of clear labeling. Despite these efforts, high consumption of ultra-processed foods continues to contribute to the rise of chronic diseases, posing a significant challenge to public health. In response, several countries have implemented measures such as mandatory labeling and reduction

of sugars and fats to empower consumers in their dietary decisions. Policies must continue to adapt to the needs of the population and foster effective collaboration between governments, international organizations, the food industry, and consumers to improve public health.

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Conflicts of interest

The authors declare that they have no conflicts of interest.

Author contributions

Wellington D. Gallardo and Mario A. García: Conceptualization, data curation, formal analysis, investigation, methodology, supervision, validation, visualization, drafting the original manuscript and writing, review, and editing.

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