



The role of consumer preferences in agricultural production practices from the perspective of food health and safety.

Written by Lourdes Fonalleras, Horrys Friaça and Jaime Romero from IICA

Introduction

In July 2019, the world population surpassed 7.5 billion people, with India and China combined accounting for more than 2.7 billion and being the only two countries with more than 1 billion inhabitants¹. In 2018, the population growth rate was 1.12%, and it is expected that by 2030 there will be more than 8 billion people living in the world². According to data from the World Bank³, in 2018, 55.3% of the world's population lived in urban areas, which shows that migration from rural areas is currently

an unrelenting trend. Population growth and urbanization processes only underline the well-known challenge of food production, where the American hemisphere has a key role to play as a supplier.

On the other hand, urbanization, communication dynamics and cultural patterns are radically changing people's dietary habits and food perception. The opinion of consumers, both in terms of food quantity and quality, has an increasing influence on demand. Productive systems and value chains,

1. World Population Review. 2019. World Population Review (on line). s. n. t. Consulted July 15, 2019. Available at <http://worldpopulationreview.com/>.

2. *Ibid.*

3. World Bank, 2019. Urban population (on line). Washington, D. C., United States of America. Consulted July 15, 2019. Available at <https://datos.bancomundial.org/indicador/SP.URB.TOTL.IN.ZS?end=2018&start=1960&view=chart>.

together with international and national regulations, have dynamically adapted to these changes, leveraging opportunities and addressing the challenges.

The Inter-American Institute for Cooperation on Agriculture (IICA) regularly drafts technical documents on critical matters. This one in particular will address the issue of consumer preferences and their impact on agricultural production practices with a chain focus.

The paradox of consumer preferences and choices

In theory, consumers are free to choose the goods they desire. Rational consumers comparatively organize their consumption possibilities, establish preferences and finally choose the products they can afford, trying to maximize their use⁴.

Consumers, however, are not all alike. Choices will depend on their economic environment: preferences, budget, food availability, prices. A sharp contrast can

be observed between high-income and low-income countries, and between the different socioeconomic levels within them.

The nutritional status of individuals depends on their food choices, and the differences and contrasts mentioned before are reflected in the aggregated indicators of food and nutritional security taken into account for public policymaking and by international organizations. Overall, the global prevalence of undernourishment reported in 2018 was 11%, equivalent to 820 million people suffering from hunger. This problem is mostly concentrated in developing countries, showing strong regional differences: in Africa, the prevalence of undernourishment is approximately 20%; in Asia, 12%; in Latin America and the Caribbean, although it has increased in recent years, it still has not reached 7% and accounts for only 5% of the total⁵. On the opposite extreme, overweight and obesity, referred to as the pandemics of the 21st century⁶, affect almost 2.38 billion people with different prevalence according to age, and affect developing and developed countries alike⁷.

4. Varian, HR. 2010. *Intermediate Microeconomics: A Modern Approach*. 8 ed. New York, United States of America, W. W. Norton & Company, Inc. 806 p.

5. FAO (Food and Agricultural Organization of the United Nations, Italy); International Fund for Agricultural Development, (Italy); WHO (World Health Organization, Switzerland); WFP (World Food Programme, Italy); UNICEF (United Nations International Children's Emergency Fund, United States of America). 2019. *The State of Food Security and Nutrition in the World 2019. Safeguarding against economic slowdowns and downturns*. Rome, Italy, FAO.

6. Meldrum, DR; Morris, MA; Gambone, JC. 2017. Obesity pandemic: causes, consequences, and solutions-but do we have the will? *Fertility and Sterility* 107(4):833-839. doi: 10.1016/j.fertnstert.2017.02.104. Epub 2017 Mar 11. Córdova, JA. 2016. Obesity: the real pandemic of the 21st century. *Surgery and surgeons*. 84(5):351-355.

7. FAO *et al.* 2019. *Op. cit.*

Global trends in consumer preferences in the 21st century

Deciding what to eat has consequences that directly affect health and the survival of our species, but also involves deeply-rooted cultural and social aspects. The current state of things is noteworthy: on the one hand, consumers have never been so concerned about what they eat⁸, and on the other, thanks to global institutionalization (regulations, agreements and organizations), never before has there been so many safe products for consumption.

Consumers, and especially those with no budgetary restrictions, are willing to pay for foods that meet their preferences⁹.

Overall, consumers in the 21st century have changed dramatically. They now demand to know everything they can

about what they consume: who produces the food, how it is produced and how it is distributed. There is a growing desire to know more about the primary production process and to establish a special connection with agriculture. Humans wish to feel safe in every dimension, which also extends to food; ensuring a healthy diet and avoiding foodborne diseases¹⁰ has become the trend. On the other hand, there is an increasing concern for avoiding non-communicable diseases that result from food consumption¹¹, with an estimated 10% of the world population following an exclusion diet and approximately 50% of the world population excluding some of their favorite foods for different reasons¹². Advertising has played a key role in rebuilding consumer preferences. It is indeed surprising that advertising, with not much scientific basis, has affected consumer perception and greatly influenced food demand. It suffices to mention the examples of the bovine spongiform encephalopathy^{13, 14} and the avian flu¹⁵.

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8. Steingoltz, M; Picciola, M; Wilson, R. 2018. Consumer Health Claims 3.0: The Next Generation of Mindful Food Consumption. L.E.K. Consulting. Executive Insights 20(51).
 9. *Ibid.*
 10. Especially those of bacterial origin.
 11. Problems associated with the nutritional characteristics of foods and associated with conditions such as obesity, diabetes, risk for stroke, among others.
 12. Lampert, P. 2017. 10 Food Trends That Will Shape 2018 (on line). Jersey City, United States of America, Forbes. Consulted July 15, 2019. Available at <https://www.forbes.com/sites/phillemper/2017/12/13/10-food-trends-that-will-shape-2018/#73ef4e974104>.
 13. McCluskey, J; Grimsrud, K; Ouchi, H; Wahl, T. 2009. Bovine spongiform encephalopathy in Japan: consumers' food safety perceptions and willingness to pay for tested beef. *The Australian Journal of Agricultural and Resource Economics* 49:197-209.
 14. Jin, HJ; Skripnitchenko, A; Koo, WW. 2004. The Effects of the BSE Outbreak in the United States on the Beef and Cattle Industry (on line). Fargo, North Dakota, United States of America, Center for Agricultural Policy and Trade Studies, Department of Agribusiness and Applied Economics, North Dakota State University. Consulted July 15, 2019. Available at <https://ageconsearch.umn.edu/record/23072/>. 17 p.
 15. Beach, RH; Zhen, C. 2009. Consumer Purchasing Behavior in Response to Media Coverage of Avian Influenza (en línea). In Conference of the International Association of Agricultural Economist (2009, Beijing, China). Consulted July 15, 2019. Available at <https://ageconsearch.umn.edu/record/51742/>. 20 p.

Furthermore, consumers are demanding that organizations dedicate efforts in the areas of nutrition and include issues such as safe foods, healthy diets and environments, among others ¹⁶.

Different studies¹⁷ show that consumers do not settle for just knowing the number of calories or fiber content of a product; they aspire to know more, and want to be assured that the food they consume meets

their health, ethical and environmental expectations, among others. Health and well-being are two key issues; in a sample of 1600 consumers, 93% claimed they wanted to eat healthy at least sometimes, and 63% stated that they consumed a healthy diet. Moreover, food preferences no longer correspond to generic goods (meat, fruits, vegetables), but now revolve around aspects that can be categorized into five groups (table 1):

Table 1. Categories to build food preferences

Category	Aspects
Natural	<ul style="list-style-type: none"> - No artificial ingredients - No preservatives - 100% natural - Organic - No GMOs - Clearly labeled
Ethics	<ul style="list-style-type: none"> - Locally sourced and grown: family farming, child labor, others - Antibiotic- and hormone-free - Animal well-being - Fair trade
Enriched	<ul style="list-style-type: none"> - Rich in protein - Rich in omega 3 and healthy fats - Rich in antioxidants
Less...	<ul style="list-style-type: none"> - Low in salt - Low in calories - Low in substitutes/fat-free - Sugar-free - Low in carbohydrates
Dietary alternatives/lifestyle	<ul style="list-style-type: none"> - Plant-based - Gluten-free - Vegetarian - Vegan - Paleo

Source: Drafted based on Steingoltz *et al.*¹⁸.

16. Lempert, P. *Op. cit.*

17. Steingoltz *et al.* *Op. cit.*

18. *Ibid.*

Challenges for global food value chains and their impact on local agriculture

The notion of food as a fundamental right conflicts with the fact that foods are tradable goods produced, processed and distributed along value chains predominantly made up of private stakeholders. The result of this public-private duality is that chains are managed within the framework of public, national and international institutions¹⁹ and respond to the interaction between public and private regulations.

The concepts of global production networks (GPNs) and global value chains (GVCs)²⁰ and the mechanisms through which value is created, added and captured are part of a profound discussion on what is happening to food and nutrition on the planet. Food production and consumption is dominated and follows the logic of GVCs, as pointed out by the Organization for Economic

Development and Cooperation (OECD)²¹, which states that wheat produced in Australia or Ukraine is processed to have flour available in Indonesia or Turkey, and later exported to manufacture noodles in China or bread in Africa and other places. The possible development- or growth-related benefits of GVCs conflict with the distortions and power of large transnational food corporations, which demand adjustments and public intervention²². The strengthening of institutions, international standards and public policies are therefore essential to benefit farmers and consumers in a fair and equitable manner, starting with GVCs (involving only private stakeholders) and generating GPNs, far-reaching public-private mechanisms. The dynamics of world trade and the analysis of GVCs are a reflection of the recent consolidation of hubs, especially in the People's Republic of China and Germany²³.

Institutions, (GVCs and GPNs), the dynamics of global demand and consumer perceptions place the American continent in a crucial position from a global perspective. The region as a whole is

19. Meza, C; Romero, J. 2013. La inseguridad alimentaria en Latinoamérica: una situación de inequidad desde el acceso. In Dimensiones de la seguridad. Una aproximación desde la ciencia económica. s. l., Editorial Académica Española. ISBN. 976-3-659-06764-8.

20. Henderson, J; Dicken, P; Hess, M; Coe, N; Wai-Chung Yeung, H. 2002. Global Production Networks and the Analysis of Economic Development. *Review of International Political Economy* 9:3, 436-464.

21. OECD (Organisation for Economic Co-operation and Development, France). 2019. Global value chains connect producers to consumers across the world (on line). Paris, France. Consulted July 15, 2019. Available at <https://www.oecd.org/agriculture/topics/global-value-chains-and-agriculture/>.

22. Greenville, J; Kawasaki, K; Flaig, D; Carrico, C. 2019. Influencing GVCs through Agro-Food Policy and Reform (on line). Paris, France, OECD Publishing. Consulted July 15, 2019. Available at <http://dx.doi.org/10.1787/9ce888e0-en>. (OECD Food, Agriculture and Fisheries Papers, No. 125).

23. Greenville, J; Kawasaki, K; Jouanjean, M. 2019. Dynamic Changes and Effects of Agro-Food GVCS (on line). Paris, France, OECD Publishing. Consulted July 15, 2019. Available at <https://doi.org/10.1787/43b7bcec-en>. (OECD Food, Agriculture and Fisheries Papers, No. 119).

interesting in terms of food demand, given the growing income of countries and consumers, the total population of the Americas and its age structure, and the level of urbanization; as food suppliers, on the other hand, the region has much to offer especially in regards to primary production. Furthermore, countries are relevant stakeholders in international decisions from the standpoint of the existing public institutional framework.

Changes in the preferences of a segment of influential consumers, aggregated demand trends and the existence of food GVCs are driving change, with the goal of producing safer and healthier foods. Within this context, different issues arise including good agricultural practices, good manufacturing practices, traceability systems, quality and safety assurance systems, maximum waste levels, labeling and certification.

Additionally, and based on elements that give value to food from the point of view of demand, certain issues have been included that lead to changes in agricultural health services and food safety systems, and also in practices within the productive systems and the value chain. This involves incorporating aspects such as animal well-being, organic production, fair trade, family farming, gender and youth, and environmental sustainability.

The concern for the product's nutritional facts²⁴ calls for research and development of innovations that can be rationally incorporated into production systems and throughout the value chain, for the processing and production of foods, depending on whether these are fresh or processed. Consequently, in addition to research, new public-private systems for provision of goods (inputs) and services (technical assistance) will need to be created to facilitate the adoption of new technologies and ensure the composition of choice for consumers.

Furthermore, certain consumer trends (such as those pointed out in the "dietary alternatives" section of table 1) pose a challenge for farming and food consumption, and contrast with the United Nations Sustainable Development Goals²⁵, in the sense that ending hunger and ensuring environmental sustainability requires an increase in food production and access. The adoption of technological innovations that help increase productivity, the well-balanced inclusion of plant- and animal-based nutrients in the diet and guaranteeing access for all consumers constitutes a global challenge, but an especially important one for developing countries. Increasing the productivity and efficiency of value chains to guarantee access to safe foods, incorporating technology, capital investment, management of natural resources and

24. Categories "enriched and less..." from table 1.

25. United Nations. 2015. Sustainable Development Goals (on line). New York, United States of America. Consulted July 15, 2019. Available at <https://www.un.org/sustainabledevelopment/es/objetivos-de-desarrollo-sostenible/>.

stronger food safety systems, with a chain focus, has become one of the crucial endeavors of the 21st century.

The preferences of influential stakeholders, aggregated demand and GVCs are questioning the practices of primary production, which in many cases are culturally rooted. This poses a challenge that farmers will need to address sooner rather than later, identifying new ways to adapt to this new scenario.

On the other hand, the productive sector in the Americas is comprised of very diverse stakeholders; those at the forefront will have the capacity to spearhead the adoption of technologies in production, and in many cases even their creation. This diversity of stakeholders in the Americas will require the adoption of new production technologies in gradual stages, with some of the stakeholders facing obstacles to fully leverage them and for which they will need support. In this sense, smallholder farmers and family farmers, who constitute a vast majority in Latin America, will require intensive training and resources to be able to adopt these new production practices.

Overall, the power of consumers, especially organized ones, is becoming increasingly influential, to the point where

their demands are heard at international discussions and within the most representative opinion forums. Therefore, it becomes essential to encourage their participation while objectively modulating their positions and providing them with a scientific basis, to create and leverage opportunities and thus incentivize the development of value chains.

The Agricultural Health and Food Safety Program (AHFS), in keeping with the mandates of IICA and pursuant to the guidelines of the current Medium-term Plan (2018-2022)²⁶ has the necessary capacities and vision to support the member countries and help them seize the opportunities and address the challenges brought about by consumer perceptions in the context of global production, trade and food consumption systems.

Firstly, IICA can raise awareness among producers and value chains and help them adapt to changes²⁷ and new consumer requirements. However, the main challenge is still how to accompany consumers and stakeholders within the value chain, paying special attention to primary producers, to ensure technology that is adopted with a scientific basis. This support must also include strengthening agricultural health and food safety systems, not only to leverage

26. IICA (Inter-American Institute for Cooperation on Agriculture, Costa Rica). 2018. Medium-term Plan 2018-2022. San José, Costa Rica. 120 p. (Official Documents Series / IICA, ISSN 1018-5712; no. 102).

27. Díaz, A; Medina, L; Trelles, S. 2010. Manual de capacitación: la convergencia entre salud pública, salud animal y ambiente en las comunidades y territorios rurales: una contribución a los procesos de fortalecimiento de capacidades, al aprendizaje colectivo y a la innovación social para el desarrollo rural territorial (online). San José, Costa Rica, IICA. Consulted July 15, 2019. Available at <http://repiica.iica.int/docs/B2004e/B2004e.pdf>.

technological progress but also to guarantee that the opportunities provided by new consumer demands can be seized to foster development.

Finally, a crucial element in this process is knowledge management, to support science-based communication and help modulate consumer perceptions. Therefore, IICA must be prepared to promote knowledge management, together with the use of strategies and production practices that contribute to

promoting the availability and adoption of technologies, the purpose of which is to increase productivity and sustainability of value chains and produce safe, nutritious foods. Knowledge management must be one step ahead of consumer preferences, and try to modify them when these are not scientifically-based. This is essential due to the fact that producers will follow consumer preferences and will adopt the necessary technologies only if this is beneficial for them from a business perspective.



Inter-American Institute for Cooperation on Agriculture

Headquarters. P.O. Box 55-2200.

San José, Vázquez de Coronado, San Isidro 11101 - Costa Rica

Telephone: (+506) 2216 0222 • Fax: (+506) 2216 0233

E-mail: iicahq@iica.int • Web Site: www.iica.int