



## **Food Production and Quality in Agriculture in 2018 and 2019**

**Belmiro Saburo Shimada<sup>1\*</sup>, Marcos Vinícius Simon<sup>2</sup>  
and Leticia do Socorro Cunha<sup>1</sup>**

<sup>1</sup>State University of Western Paraná, Postgraduate Course in Agronomy, Brazil.

<sup>2</sup>State University of Western Paraná, Undergraduate Course in Agronomy, Brazil.

### **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

### **Article Information**

DOI: 10.9734/JEAI/2021/v43i630707

Editor(s):

(1) Dr. Rusu Teodor, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania.

Reviewers:

(1) Kirill Voinov, ITMO University, Russia.

(2) Boniface N.Wambua, University of Nairobi, Kenya.

Complete Peer review History: <https://www.sdiarticle4.com/review-history/71711>

**Review Article**

**Received 02 June 2021  
Accepted 06 August 2021  
Published 11 August 2021**

### **ABSTRACT**

Food is the basis of human survival, and one of the Brazilian sectors that stands out the most is the agricultural sector, which in 2019 fed about 728,658 million people in the world. Food, which has been taking care to produce quality and safe food. The objective of this work is to carry out a brief literature review on food production and quality in agriculture in 2018 and 2019, describing and characterizing the importance of agriculture in food production and food quality. This study was developed following the methodology based on literature review and relevant research on food production and quality in agriculture in 2018 and 2019, with the aim of characterizing the importance of agriculture in the production and quality of food. Many changes occur in the production of food in agriculture through the adopted technologies, enabling the large production of food that the country has, being one of the largest producers. However, it is still insufficient to supply food for the entire population, making agriculture an essential link for food, but it has been experiencing difficulties in increasing its production, due to environmental and management factors, impacting crop yields, and how the consumer started to demand a higher quality and safer food, care is needed in the production of quality and safe food. Agriculture is essential for feeding the population and the food sector depends on its production, in the years 2018 and 2019 it is clear that crop productivity still has to increase, and due to consumer demands, food production is necessary quality and insurance.

\*Corresponding author: E-mail: [shimada.belmiro@gmail.com](mailto:shimada.belmiro@gmail.com);

*Keywords: Food; consumer; food insecurity; productivity.*

## 1. INTRODUCTION

Human beings depend completely on food for their survival, needing food during their development throughout life, which is important in the prevention of many health problems, in addition to ensuring the individual's well-being, due to the fact that food is linked to many nutritional issues and the search for healthy consumption habits, demonstrating the importance of food for human consumption [1,2].

Food consumption stems from eating, which is an activity that involves many other aspects, not just the act of eating and food availability, as it depends on a production chain, which starts in the field, or rather, in planning, in the preparation of seedlings, inputs, seeds, machines, practices, techniques and other processes, going through cycles, from sowing to harvesting, in which elements of nature and management play a crucial role in the food sector, whether in its quality and amount of production [3,4,5].

In the food sector, Brazil is a very important country, as in the last ten years its share of the world market jumped from 20.6 billion to 100 billion dollars, with emphasis on soy, cotton, corn, meat and forest products that are essential for food [6,1,2].

According to Contini and Aragão [6], in addition to Brazil having a large share of the world market, it is worth noting that the country feeds its entire population of 212.235 million people and is able to supply food to other countries, becoming an important supplier of food to the world.

Brazil is a country with great prominence in the agricultural sector, whether in relation to the food market and its participation in the food of its country and other countries, but it deserves to be highlighted in the growth of its production in the food sector to feed the people of world.

From the food production of all sectors in Brazil, the agricultural sector in 2018 managed to feed approximately 688,007 million and in 2019 about 728,658 million people in the world, standing out with the increase of its agricultural production [6,2].

However, even with this food production in the agricultural sector, the population scenario is worrying, it is estimated that in 2050 it will have a

population of 9.8 billion, 29% more than the current figure in 2017, and this food production will have to monitoring and supplying the population's demand, and agriculture, as it is a major source of food, becomes essential for the food sector, requiring an increase in its production [7,3,1].

In addition to the problem of population growth, according to FAO [8], there is also food insecurity on the part of the population and society, as one in nine people in the world (or about 805 million people) is unable to eat and have a healthy and active life, demonstrating the problems caused by the population increase.

Food insecurity originates from many factors, and according to Lima [9], they are population growth and the growth in demand for food, competition for the use of water and conflicts caused due to the use of natural resources for food production, competition for territory and climate change.

However, to overcome food insecurity and meet the population's demand, it is necessary to use technologies and techniques to help increase crop production and productivity, choosing the best methods in the quest to increase food production in the agricultural sector [4,7,5,3].

In addition to the issue of the importance of agriculture in food production and food insecurity, agriculture is also affected by consumer demand, which is one of the factors that affect the food sector.

According to Morais et al. [10] and Ferreira et al. [11] consumers are not just prioritizing the price and quality of products or services, but considering the good institutional image and responsible social and environmental performance in the market.

Consumers are also affected by changes in eating habits, considering their cultural attributes and values, demonstrating the producer-consumer relationship, through historical aspects, way of life, tradition, concern with food safety and, in general, in the process of production [12].

Thus, it is necessary for producers to seek to meet what the market has been demanding, such as quality, differentiation and sanitary standards and environmental requirements, among others [13,14].

Due to the aforementioned factors, it is important to study the production and quality of food, in order to have knowledge of the agricultural market and the demand of the consumer, highlighting agriculture in its development, its production in 2018 and 2019, its increased productivity and quality of food, being essential to have a base of studies on the production and quality of the agricultural food sector.

The objective of this work is to carry out a brief literature review on food production and quality in agriculture in 2018 and 2019, describing and characterizing the importance of agriculture in food production and food quality, highlighting its production in 2018 and 2019, and seeking to show how agriculture is important for the production of food and to meet the demand of the population, and the essentiality of food quality.

## 2. MATERIAL AND METHODS

This study was developed based on the literature review and relevant research on the production and quality of food in agriculture in 2018 and 2019, with the aim of characterizing the importance of agriculture in the production and quality of food, in order to highlight the its production over the years 2018 and 2019, which were highlighted years in food production and quality, seeking to show how agriculture is important for the production of food and to meet the demand of the population, and how the quality of food is fundamental in the sector agricultural.

It is a work that is based on research, in a systematic way, covering foods, through bibliographical consultations, and with a qualitative character, highlighting and characterizing the mentioned aspects, in order to better dispose of the knowledge on the subject.

## 3. RESULTS AND DISCUSSION

### 3.1 Changes in Food Production in Agriculture

In agriculture, many changes have occurred through the process of modernization and specialization of production systems, causing greater competitiveness in various sectors of the world economy, such as agribusiness [15,16].

According to Silva [17] and Petry et al. [18], with

the modernization of agriculture in Brazil, brought about changes in different aspects, such as labor relations in the countryside, spatial distribution of production, technological standard of agricultural production, formation of agro-industrial complexes and insertion of agriculture in the international market, showing the added effects of modernization in agriculture.

Through the modernization of agriculture in Brazil over the past decades, it has enabled the increase in food production, especially of some types of grains such as corn, soybeans, wheat, and in soybean production, Brazil stands out as the second largest producer of this grain, second only to the United States [19,20].

However, this modernization was necessary for agriculture, as the food supply depends in part on its production, and it played a strategic role in distributing food to urban centers, in addition to labor from rural to urban areas, in the sense of supplying industries, so that urban centers and agriculture would gain from the increase in the agricultural production sector [17,18].

With technological advances in agriculture, it has enabled a significant increase in agricultural production, through innovations such as modifying the genetic code of seeds/crops making them more resistant and reducing production costs, technical advances and investments that allowed for increased production agriculture in certain countries, the use of improved seeds, fertilizers and pesticides, as well as the mechanization of the field [21,22].

This increased production in agriculture through modernization is essential to meet the demand for food, however, in order to produce and be able to feed the world population in future times, technology must be used and correctly managed in favor of production, storage, distribution and transport. of food, expanding resources with greater use and with good results in their production levels, increasing productive gains [23,24].

Thus, with the increase in earnings and greater production in agriculture, food production increased, ensuring the participation of Brazil as one of the main countries that supply the food sector, noting that through modernization, changes have occurred in agriculture, impacting food production in the agricultural sector.

### 3.2 Food Production in Agriculture in 2018 and 2019

Food production is very important in all aspects, whether economic or social, as food is a basic physiological need of human beings, of vital importance and is related to the fact that the individual can eat to survive, and a way of producing food and that is related to the agricultural sector is agriculture [23].

Agriculture, which depends on many factors to produce, underwent several modernizations during the adoption of technology in the field, and since this technology and the evolution of agriculture came with the purpose of supplying food for the population, agriculture has been encompassing and improving, either in the way of cultivation and in what is used to cultivate, always looking for better ways to achieve higher yields and help increase the amount of food [15,16,18].

Of the sectors that make up food, agriculture in Brazil has a great influence on the amount of food available for human consumption in the world, as it makes up a large part of the total food and in 2018 it managed to feed approximately 688,007 million and in 2019 about of 728,658 million people in the world, highlighting the increase in their agricultural production [9,6,2].

Regarding food production in the agricultural sector, Brazil stands out as one of the major producers of agricultural products and has been increasing its production, only in 2018 it produced over 959.4 million tons of agricultural products, in an area of 76 .0 million hectares, and already in 2019 it produced over 968.7 million tons of agricultural products, in a harvested area of 77.9 million hectares, showing the increase in its production in the agricultural food sector [25].

According to IBGE data [25], when analyzing the years 2018 and 2019, there is a variation of 2.4% more in the area used for cultivation and only 0.96% increase in production in tons of agricultural products, showing a small growth in production, which is still little according to the estimate of the FAO [7], which estimates a population scenario of 9.8 billion people, in which it will have to increase its production by 70%.

These data demonstrate the importance of agriculture in the food sector, and how much it

participates in feeding the population, but its production will still have to increase, for this, it must use techniques, practices and means that help to leverage production, along with adopting the technology when possible, to increase and enable greater chances of high production.

### 3.3 Need and Difficulty in Increasing Food Production

In the scenario of population growth, new challenges in food production and consumption have emerged, and for this, efficient means of production that enable the production of a considerable volume of food biomass for the population were adopted [9,26,27].

To feed the population and meet this population demand, the process of agricultural modernization has helped to increase food productivity, being essential to meet population growth, in which 2050 has a population of 9.8 billion, 29% more than current number 2017 [7,21, 28].

However, even with technological advances and increased production, many problems affected crops in the last century, usually caused by climate change, in which climatic factors affected crops and harmed their production, and are still the ones that can most affect the development and adaptability of agricultural crops, temperature and water availability are the main factors responsible for the drop in production [29,30,31].

According to Félix et al. [32], agriculture is directly affected by these climate changes, impacting many economic sectors, causing, for example, the increase in the cost of agricultural and livestock production, the increase in input costs for the food sector and for the purchase of food products, changing economic activity in various sectors, spreading its impact on the economic system [32].

Climate change, which alters climatic factors such as temperature, soil moisture, rainfall and solar radiation, affect agriculture directly affecting production, productivity and crop management, pest and disease control, among others, and systems social and economic aspects of society [31,32].

In addition to the effects caused by climate change, the management involving agricultural practices is also related to the productivity of a crop, and linked to modernization, it has enabled

a large agricultural production, and these effects of environmental factors and plant management are factors that they lead to changes in plant production over time and contribute to different plant organs, affecting final productivity, being important for agriculture and food production [33,34].

Thus, according to Santos et al. [33] and Silva and Silva [35] to enable a crop to have greater agricultural productivity, it is essential to pay attention to environmental factors and crop management, as it will cause changes in plant production during the crop cycle and will contribute in the different organs of the plants, favoring the increase of the final productivity.

### 3.4 Food Quality and Codex

The search for quality and safe food has become essential for consumers due to concerns in the food field, thus the consumer began to want to have knowledge about the product, in relation to the origin and the way it was produced, inserting it in their food consumption in the context of food security [36,37].

According to Soares et al. [38] and Garcia et al. [39] food safety is described as the right of everyone to regular and permanent access to quality food, in the quantity necessary for survival and without compromising other essential needs, with the adoption of health-promoting food practices that respect the various aspects, as culturally, environmentally, economically and socially sustainable.

Food safety (absence of contaminants) along with other aspects, such as freshness, nutritional value, texture, taste, color, aroma and flavor, make up the quality of food, and in addition to knowledge of the production process, the brand, the shopping environment, price and origin guarantee quality and safe food [40,41].

To obtain safe and quality food, it is necessary to go through the context of food safety, which is a set of rules that govern all processes involved in the production, transport and storage of food, in order to guarantee certain characteristics of the products, adapting to biological and physicochemical standards so that these foods are fit for consumption [36].

This set of standards and guidelines is followed worldwide, with the objective that the food meets sanitary and commercial needs to satisfy any

customer anywhere in the world, ensuring the quality and safety of food [36].

In order to guarantee the consumer that the food has quality and is safe, there is the Codex Alimentarius (from the Latin Law or Food Code) which is the most important corpus juris in the aspect of the world trade in food products [3].

Codex Alimentarius was created in 1963, and started at a conference promoted by the Food and Agriculture Organization – FAO and the World Health Organization – WHO, seeking to establish sanitary measures for food safety and safety, to protect the health of consumers and promote fair trade practices between countries [36].

This code has a collection of food standards adopted internationally, presented in a uniform manner, comprising guidelines, codes of practice and recommendations [36,3].

In this way, the codex is linked to the issue of product quality, in the production and commercial parts, highlighting the relationship between food quality and marketing norms and standards, in order to seek quality and safe food.

### 3.5 The Production and Quality of Food in Agriculture

Food production in agriculture is very important for the food sector, in 2018 it fed approximately 688,007 million and in 2019 about 728,658 million people in the world, demonstrating the impact of food production on the population's diet [6,2].

However, despite the high food production in the agricultural sector, it is still insufficient for the entire population, causing food insecurity, to reduce this insecurity, food production must accompany and meet the demand of the population, requiring an increase in their productions [7,3,1].

It is worth noting that not only the issue of food production is important, but the sale of the product and the demand of the consumer, as consumers are not only prioritizing the price and quality of products or services, but also the institutional image and socio-environmental performance responsible in the market [9,10].

In terms of food production, Brazil stands out as

one of the major producers of agricultural products and has been increasing its production, and comparing the two years, 2018 (959.4 million tons) and 2019 (968.7 million tons) there is an increase in its production in the agricultural food sector [25].

Linked to the importance of agriculture in the food sector, in food production and its participation, and also the demands of the consumer, it is clear that there is a search for quality and safe food by consumers due to concerns in the food field, thus, one starts to want to have knowledge about the product, in relation to the origin and the way it was produced, inserting in its food consumption the context of food safety [36,37].

In addition to food safety relating the food and quality part, when it comes to safe and quality food, it is necessary to go through the context of food safety, which is a set of rules that govern all processes involved in production, transport and food storage, in order to ensure certain characteristics of the products, adapting to biological and physical-chemical standards so that these foods are fit for consumption, ensuring healthy, quality and safe food [36,42].

Food safety is governed by the codex guidelines and is linked to the issue of product quality, being essential in the acquisition of quality and safe food, but for that, it is necessary to have agricultural production as it is responsible for feeding a large part of the population of Brazil, becoming a crucial factor in overcoming food insecurity and in the production of quality and safe food.

#### 4. CONCLUSIONS

Agriculture is essential for feeding the population and due to the population scenario, the food sector depends on its production, but even with the growth presented between 2018 and 2019, the quantity is still insufficient in the population estimate for the coming years, being essential the adoption of other methods and practices, together with the adequate use of technology in agriculture, to increase crop productivity.

In addition to food production, consumer demand affects agriculture in terms of production and sale, as the consumer started to seek quality and safe food, which ensure that the food is healthy and can be consumed, but for that, it is necessary for food production to occur, thus

demonstrating the relationship of agriculture with food quality.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

#### REFERENCES

1. Paula MM de, Oliveira Alde, Silva JLG da. Health promotion and food production in family farming. *Interdisciplinary Interaction Journal*. 2017;1(1):50-67.
2. ASCARI JP, BARROS C, Grzebieluckas C, Seabra Júnior S, Mendes IRN. Agricultural, socioeconomic and environmental diagnosis in family farming properties. *Science in Extension Magazine*. 2019;15(3):75-88.
3. Ribeiro H, Jaime PC, Ventura D. Food and sustainability. *Advanced Studies Magazine*. 2017;31(89):185-198.
4. Saath KC de O, Fachinello AL. Growth in world food demand and land restrictions in Brazil. *Journal of Rural Economics and Sociology*. 2018;56(2):195-212.
5. Oliveira NRF de, Jaime PC. The meeting between sustainable rural development and health promotion in the Food Guide for the Brazilian Population. *Revista Saúde e Sociedade*. vol. 2016;25(4):1108-1121.
6. Contini E, Aragão A. Brazilian agriculture feeds 800 million people. *Embrapa*; 2020.
7. FAO. FAO Brazil representative presents food demand scenario; 2017. Available:<http://www.fao.org/brasil/noticias/detail-events/en/c/901168/>.
8. FAO. The state of food security in the world 2014. Food and Agriculture Organization of the United Nations, Home; 2015. Available:<http://www.fao.org/publications/sofi/en/>.
9. LIMA JSG. Food and nutrition security: agroecological systems are the change that ecological intensification does not achieve. *Science and Culture Magazine*. 2017;69(2):49-50.
10. Morais LA de. Siqueira ES, Silva RA. Management and environmental responsibility in the practices of a family farming cooperative: the perception of cooperative members. *Journal Research, Society and Development*. 2020;9(6):1-26.
11. Ferreira NC de F, Duarte JR de M, Oliveira LAB de, Arruda NV, Silva EC da.

- Marketing influence and challenges in Brazilian agribusiness. *Biodiversity Journal*. 2019;18(1):218-226.
12. Estevam D de O, Salvao GIJ, Santos VJD dos. The challenges of formally inserting family farm products into the market. *Redes Magazine*. 2018;23(1):262-281.
  13. Duarte LC, Weber C, Amorim G dos S, Spanevello RM, Lago A. Markets for family farming. *Brazilian Journal of Development*. 2020;6(7):44370-44384.
  14. Radunz AL, Randuz AFO. Arpasul agroecological fair, Pelotas, RS: production, food security and marketing, a case study. *Revista Espaço Acadêmico*. 2017;17(192):17-25.
  15. Artuzo FD, SOARES C, WEISS CR. Process Innovation: The Environmental and Economic Impact of Adopting Precision Agriculture. *Espacios Magazine*. 2017;38(2):6-16.
  16. Santos IAF dos, Diesel V. Farmers' agency at the interface of formal and informal systems of knowledge and innovation. *Redes Magazine*. 2020;25(1):32-58.
  17. Silva MG. Work, peasant agriculture and production of agroecological knowledge. *Inter Action Magazine*. 2017;42(2):347-357.
  18. Petry JF, Sebastião SA, Martins EG, Barros PB DE A. Innovation and technology diffusion in lowland agriculture in the Amazon. *Journal of Contemporary Administration*. 2019;23(5):619-635.
  19. Baroni GD, Benedeti PH, Seidel DJ. Prospective scenarios of grain production and storage in Brazil. *Thema Magazine*. v. 2017;14(4):55-64.
  20. Nascimento SP. Food waste: food and nutritional insecurity factor. *Food and Nutritional Security Magazine*. 2018;25(1):85-91.
  21. Jesus ASS de, Ommati JEM. Food security and the green revolution: current questions about the fight against hunger at the international level. *Journal of Public Law*. 2017;12(3):191-215.
  22. Castro HVde, Chelotti MC. The process of technological modernization in agriculture and the territorial dispute in the Brazilian countryside. *Space in Review*. 2018;20(1):55-65.
  23. Macedo E de FS, Nishizaki Júnior N. The importance of logistical planning with a focus on growing demand in the food production chain until 2050. *Revista Refas*. 2017;3(3):31-45.
  24. Paiva MJM de, Damasceno IA de M. The use of genetically modified foods: main challenges. *Multidebates Magazine*. 2020;4(3):90-96.
  25. IBGE. Systematic Survey of Agricultural Production; 2020. Available: <https://sidra.ibge.gov.br/tabela/6588>.
  26. Caivano S, Lopes RF, Sawaya AL, Domene SMÁ, Martins PA. Conflicts of interests in the food industry's strategies to increase the consumption of ultra-processed foods and the effects on the health of the Brazilian population. *Demetra Magazine*. 2017;12(2):349-360.
  27. Magalhães R. Food regulation in Brazil. *Journal of Health Law*. v. 2017;17(3):113-133.
  28. Hoyos CJC, Agostini AD. Food security and food sovereignty: convergences and divergences. *Nera Magazine*. 2017;20(34):174-198.
  29. Ferreira DS, Ribeiro WR, Gonçalves MS, Pinheiro AA, Sales RA de, Reis EF. Scenario of the central pivot irrigated area in the Triangulo Mineiro, Minas Gerais State, Brazil. *Native Magazine*. 2018;6(6):613-618.
  30. Costa CAda, Guinea R, Belt HE, Costa DT, Costa T, Relative C, Pais C, Gomes M, Aguiar AARM. Family farming and crop protection: traditional approaches and proximity to organic farming practices. *Journal of Agricultural Sciences*. 2018;41:164-173.
  31. Soratto RP, Crusciol CAC, Mello FF. de C. Yield components and yield of rice and bean cultivars as a function of lime and gypsum applied to the soil surface. *Bragantia Magazine*. vol. 2010;69:4:965-974.
  32. Felix A da S, Nascimento JWB do, Melo Dfde, Furtado DA, Santos AM dos. Exploratory analysis of the impacts of climate change on plant production in Brazil. *Magazine on Agribusiness and Environment*. 2020;13(1):397-409.
  33. Santos LA dos, Soratto RP, Fernandes AM, Gonsales JR. Growth, physiological indexes and productivity of common bean cultivars under different fertilization levels. *Ceres Magazine*. 2015;62(1):107-116.
  34. Bernardi AC de C, Bettiol GM, Greek CR, Andrade RG, Rabello LM, Inamasu RY. Precision farming tools as an aid to soil fertility management. *Notebooks of Science and Technology*. 2015;32(1/2):

- 205-221.
35. Silva NG, Silva CV. Rural producers' perception of integrated systems in agricultural production (SIPAs). *Brazilian Journal of Biosystems Engineering*. 2020;14(2):172-186.
  36. Luz ACF da, Oliveira LB de. The implementation of food safety rules as an improvement factor for the animal feed industry. *Journal of Engineering and Applied Research*. 2019;4(1):154-164.
  37. Nascimento SGS, Becker C, Silva FNDA, Caldas NV, Ávila MR de. Agroecological production and food and nutrition security (Brazil). *Journal of Agricultural Sciences*. 2019;42(1):294-304.
  38. Soares KR, Ferreira EE da S, Junior SS, Neves SMA da S. Extractivism and food production as a reproduction strategy for family farmers in the rubber plantation, southern Amazon. *Journal of Rural Economics and Sociology*. 2018;56(4): 645-662.
  39. Garcia JRN, Carniatto I, Grandi AM de. National school feeding program as an instrument to guarantee the human right to adequate food and its contribution to sustainable rural development. *Geo Pantanal Magazine*. 2018;13(24): 147-162.
  40. Vieira EL, Basso D, Kruger NR. Acquisitions of family farming and quality of food supplied in the municipal school network of Catuípe/RS. *Regional Development Magazine under debate*. 2020;10:461-489.
  41. Fuhr AL, Triches RM. Quality of school meals based on the purchase of products from family farming. *Food and Nutritional Security Magazine*. 2017;24(2):113-124.
  42. Possani L, Brandão JB, Dorr AC, Breitenbach R. Access to agricultural markets for produce on the western border of Rio Grande do Sul. *Brazilian Journal of Development*. 2018;4(5):2532-2550.

© 2021 Shimada et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*

*The peer review history for this paper can be accessed here:*  
<https://www.sdiarticle4.com/review-history/71711>