

# The competitiveness of Brazilian agribusiness in international trade<sup>1</sup>

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**Abstract** – Becoming globally competitive has proved more and more to be a challenge not only for Brazil, but for all countries. However, knowing the dynamics of international trade, to verify whether the export agenda is in line with the world demand can be a step towards decision-making for the attaining of better efficiency for Brazil's international insertion. The objective of this study was to analyze the insertion of Brazil's agribusiness in the international agricultural trade, and to identify the ranking of its products in comparison with the world, considering the 2005-2007 and 2015-2017 triennia, based on the methodology suggested by Fajnzylber (1991). It was possible to identify that the situation is favorable, since 46.51% of the country's export total value in agribusiness products, in the 2015-2017 triennium, is composed of 150 products classified in an optimum situation, according to the proposed methodological approach.

**Keywords:** export, international market, *market share*.

## A competitividade do agronegócio brasileiro no comércio internacional

**Resumo** – Tornar-se competitivo mundialmente é um desafio não só para o Brasil, mas para todas as nações. No entanto, conhecer a dinâmica do comércio internacional para verificar se a pauta de exportação está de acordo com a demanda mundial pode ser um passo para as tomadas de decisões para a melhor inserção comercial brasileira. O objetivo deste estudo foi analisar a inserção do agronegócio do Brasil no comércio internacional, para identificar o posicionamento de seus produtos, considerando os triênios 2005–2007 e 2015–2017, com base na metodologia sugerida por Fajnzylber (1991). Foi possível identificar que a situação é positiva, pois, de acordo com a metodologia proposta, 46,51% do valor total exportado pelo País no triênio 2015–2017 é formado por 150 produtos em situação classificada como ótima.

**Palavras-chave:** exportação, mercado internacional, market share.

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## Introduction

The Brazilian agribusiness sector has been showing positive results for the country's economy. The Gross Domestic Product (GDP) of agribusiness grew by 3.81% in 2019, representing 21.4% of the total Brazilian GDP in 2019 (Cepea, 2020b). Foreign sales of agribusiness represented 43.2% of the total exported by Brazil, totaling US\$ 96.8 billion in 2019 (Brasil, 2020).

Nonetheless, even with positive results, Brazilian agribusiness faces problems, such as the high tax burden, excess labor charges, logistical cost, exacerbated exchange rate fluctuation, and high-interest rates; these are some of the challenges that refrain the country from sectorial competitiveness. The dependence on export activities in the Brazilian regions called "Agro Regions" also presents itself as an obstacle. For Oliveira & Rodrigues (2020), regional diversification, sustained by trade and services, is the proper way for agribusiness regions to become less vulnerable to the inherent challenges.

As for this diversification, the American economist Markowitz (1952) – winner in 1990 of the Nobel Prize in Economics for his portfolio theory – highlights that putting all eggs in one basket is a dangerous form of portfolio management, as the mentioned strategy can result in an expected return lower than that obtained from the diversification of a portfolio. Paiva (2006, p.91, our translation) adds to it by emphasizing that "diversification is the goal and measure of development." According to him, diversification increases security by reducing uncertainties without weakening the expected profitability.

For that reason, in addition to the concentration (almost 80%) of the products sold being centered on a few production chains (soy, meat, sugar, coffee), it is possible to notice other characteristics related to Brazilian international trade, such as the main commercial destinations. China was responsible for 28.1% of Brazilian products exported in 2019, and soybean was the

main product traded, characterized by a free and lowly restricted market (Brandão & Conceição, 2019).

Thus, this article aims to analyze Brazilian agribusiness's insertion in the international agricultural trade of products, considering its aggregate positioning and analyzing its portfolio and export agenda. The methodology used is based on Fajnzylber (1991), who analyzes exports by comparing the growth of imports from industrialized countries and the growth of exports from a country, classifying products into four categories of insertion, namely: optimum situation, a situation of vulnerability, a situation of missed opportunities, and situation of retreat.

The analysis period covers the 2005-2007 and 2015-2017 triennia. Comparisons are made with the conclusions of the studies carried out by Carvalho (2002) and Santos et al. (2016), who used the same methodology for other periods analyzed. In addition to the studies mentioned above, the theme is relevant as it is possible to understand the Brazilian export agenda and classify it based on the product's performance in the period, with 2017 as the last year of data update available. The aim is to understand how the performance of Brazilian products in the international context develops.

Besides this introduction, the article is divided into four more sections. The second seeks to contextualize the Brazilian agribusiness concisely. The third section presents the research methodology and the database used. The fourth section presents the results' analysis, followed by the last section with the final considerations.

## The Brazilian agribusiness: brief notes

Agribusiness means the set of activities interconnected to agriculture and farming, which, consequently, are divided into four segments, dealing with input suppliers, activities that permeate the sphere of agriculture, processes involving the transformation of agribusiness, and,

finally, operations involving storage, transport, and distribution. Each of these stages in the process involving agribusiness has its functions and is of fundamental importance for the whole that composes the productive and commercial process (Soares & Jacometti, 2015).

Cepea (2020a), the only institution to measure agribusiness GDP in Brazil from the perspective of total Value Added, also needed to coin a concept for it considering market prices (including indirect taxes except for subsidies). Thereby, agribusiness is defined as an economic sector linked to agriculture, whether upstream or downstream, ranging from

[...] the production of inputs for agriculture, production of agricultural raw materials, processing of these raw materials and distribution, and other services up to final consumption or export (Cepea, 2020a, p.1, our translation).

Hence, its measurement discriminates four segments [1) inputs, 2) primary (agriculture), 3) industry (agricultural and livestock-based), and 4) services], divided into two major productive branches (crop and livestock) (Cepea, 2020a).

Contini et al. (2006, p.6) complement that concept with the following:

Agribusiness should be understood as the production chain that involves everything from the manufacture of inputs through production in agricultural establishments and transformation to consumption. This chain incorporates all support services: research and technical assistance, processing, transportation, commercialization, credit, export, port services, dealers, exchanges, and the final consumer (our translation).

From the historical point of view, some economic activities developed internally, which were based on Brazilian agriculture, formed periods known as cycles, in which a particular product was exploited most profitably to obtain financial resources for the Portuguese metropolis and, later, to Brazil as an independent country.

The primary cycles were: brazilwood (1500-1530), sugar cane (mid-16th to mid-18th century), cotton (mid-18th century and early 19th century), coffee (mid-19th century to 1930), and rubber (1866-1913) (Szmrecsányi, 1990; Bacha, 2004; Furtado, 2007). Such period delimitations mentioned are for didactic purposes only, as some activities continued even after losing the importance as a cycle. Concomitantly, domestic productions were made from agriculture and livestock to provide food and clothing.

It was only in the last quartile of the 20th century that Brazilian agricultural production went through a dynamism process that had not occurred in its history until then. From the 1970s, agribusiness provided a substantial expansion through an increase in this sector's research provided by the induced institutional innovation. Based on the appropriation of modern techniques resulting in more from the use of science and technology and less from the expansion of land (which are abundant and of relatively favorable edaphoclimatic conditions), agribusiness has gradually gained prominence concerning economic indicators. With the opening of trade and financial flexibility, the reduction of state interventionism in production and price control, in addition to the monetary stability provided by the Real Plan, the 1990s onwards allowed not only better planning of the decisions of economic agents, but also maximizing productive investment in agriculture (Vieira Filho, 2020).

For Gasques et al. (2018), in the next decade, Brazil will show even more prominence as a global supplier of agricultural products, such as sugar, coffee, corn, soy, orange juice, beef, pork, poultry, and others. The projections for the 2029/2030 biennium point to a grain harvest of 308.5 million tons, showing an increase of 33% to the 2016/2017 harvest. Such growth will continue to occur, above all, via increased productivity. With this evolution, the agricultural activity will contribute not only to national food security (along with energetic security, as ethanol, biodiesel, among others) but also to the

generation of surpluses in the trade balance and control of the inflation rate (since food products are crucial for the Brazilian basic food basket). In this dynamic context, the largest share of national grain production should occur in the Midwest and South of the country, with a robust private role in the dynamics of investments, which must respect the question of economic, social, and environmental sustainability, increasingly crucial in the productive and institutional sphere.

Notwithstanding, there are also problems in Brazilian agriculture. Brandão & Conceição (2019, p.123, our translation), for example, point out that

[...] the greatest obstacle to national competitiveness is what is known as the Brazil cost, in which are high port costs, tax burden, labor costs, excessive bureaucracy, logistical problems, corruption, among others.

These affect the Brazilian economy in general, affecting the competitiveness of the agricultural sector, dependent on the efficiency of the production process in all segments.

Vieira Filho (2020) also highlights as a severe problem that the Brazilian agribusiness must overcome the issue of structural heterogeneity in agriculture, which concentrates in 9% of establishments practically 85% of the gross value of production (as of 2017), while the occurrence is still in force extreme poverty in rural areas, mostly in the Northeast region.

In any case, between challenges and potentialities, and given the projection and importance of Brazil's agribusiness in the international scenario, it is imperative to analyze this sector's insertion in international agricultural trade, aiming to identify Brazilian products positioning in comparison with the world.

## Methodology and database

This research developed in five main stages: the first one (of a theoretical and conceptual character and based on a literature

review on the theme) situated the subsequent analyzes regarding the characteristics that influence international trade, focusing on Brazilian agribusiness.

The second stage was to collect secondary data obtained from official international sources, namely: the Food and Agriculture Organization (FAO, 2020). A total of 416 items from agricultural products available in the Faostat database were contemplated, considering the global import values (US\$) and the Brazilian export values (US\$) for 2005-2007 and 2015-2017 as the scope of analysis.

After data collection, in the third and fourth stages, the database's organization and the application of the model used, proposed by Fajnzylber (1991), were carried out. As a measure of competitiveness, this model assumes the share of a country's exports in world imports. This author evaluated the participation of imports from countries of the Organization for Economic Co-operation and Development (OECD) between 1979 and 1988. Other works used the same method, such as Dussel (2001), Carvalho (2002), Carvalho & Silva (2005), and Santos et al. (2016).

Carvalho (2002) defines that a country's global efficiency in the international trade of a given product depends on the relationship between its participation in the market (efficiency) and the attraction of the market (positioning). That is to say that the positioning will be favorable when the share of the product ( $i$ ) in total imports (market share) in year 1 (in the present work, triennium 1) is greater than or equal to that in year 0 (in the present work, triennium 0). Therefore, the positioning of  $i$  is favorable if  $\Delta S_i \geq 0$  between the two periods analyzed, reflecting on the maintenance or increase of its share in world imports. If  $\Delta S_i < 0$ , the positioning will be unfavorable, reducing the product's share in world imports.

In turn, efficiency is related to the country's relative share (exports) in world trade (imports) of a given product. Therefore,  $S_{ij}$  means the share

of exports ( $X$ ) of the product ( $i$ ) by the country ( $j$ ) ( $X_{ij}$ ) in world imports of product  $i$  ( $M_i$ ).

As Figure 1 indicates, it is necessary to understand two fundamental concepts: positioning and product efficiency.

		Relative position of products	
		Unfavourable	Favourable
Relative efficiency of countries	Low	Situation of retreat	Situation of missed opportunities
	High	Situation of vulnerability	Optimum situation

**Figure 1.** Insertion of a country in the international trade of a specific product.

Source: Fajnzylber (1991).

The combinations of the relative positioning of products and relative efficiency of countries imply four possibilities for the country's insertion in the world market (Carvalho, 2002; Santos et al., 2016) as follows:

- Vulnerability:  $\Delta S_i < 0$  and  $\Delta S_{ij} > 0$ . The product has reduced share in world imports, while the country increases its share in world trade of the product.
- Retreat:  $\Delta S_i < 0$  and  $\Delta S_{ij} < 0$ . The product has reduced share in world imports, while the country decreases its share in world trade of the product.
- Missed opportunities:  $\Delta S_i > 0$  and  $\Delta S_{ij} < 0$ . The product has its share in the world imports increased, while the country decreases its share in world trade of the product.
- Optimum:  $\Delta S_i > 0$  and  $\Delta S_{ij} > 0$ . The product has its share in world imports increased, while the country increases its share in world trade of the product.

At last, the fifth stage was conducted with the analysis of the results.

## Analysis of results

Before the specific analysis of Brazilian agribusiness performance in international trade, a brief appreciation of some international agricultural trade trends is desirable, supported by the methodological tooling suggested by Fajnzylber (1991). It is done in the first part of this section, and the second part analyzes the Brazilian performance.

### Trends in international agricultural trade

Total world imports have increased in recent decades. This increase is reflected in the growth of world imports of agricultural products, which between the 2005-2007 and 2015-2017 triennia presented an annual growth rate of 5.70%. In the same period, the share of world agricultural imports touching total world imports increased from 6.33% to 8.04% (Table 1).

Brazil appears to be assimilating such changes in the world trade scenario, as Brazilian exports of agricultural products have also shown constant growth rates. Between 2005-2007 and 2015-2017, the annual growth rate was 7.43% (in terms of values), which increased from 25.97% to 37.33% of the total product value exported by Brazil (Table 1).

In this context, the positioning of Brazilian agriculture in international trade can be classified as optimum since the market share of agricultural products in Brazil increased from 4.61% in the 2005-2007 period to 5.43% in 2015-2017 (Table 1). In this perspective, Brazilian agribusiness increased its participation in world trade, presenting greater efficiency in the same period, when world imports from this economic sector also increased, thus reaching a favorable position. Hence, it is possible to verify that, according to Fajnzylber's methodology (1991), the classification of Brazilian agribusiness can be defined as demonstrating an optimum situation for both triennia considered.



**Table 1.** Value of world imports and Brazil's exports, 1985-2017.

		Currency	1985–1987	1995–1997	2005–2007	2015–2017	Rate <sup>(1)</sup> (%)
World	Total imports	USD Thousand	6,788,208	16,116,508	37,087,183	50,821,846	3.20
	Agricultural imports	USD Thousand	761,038	1,409,668	2,347,122	4,084,047	5.70
	Agricultural/Total imports	%	11.21	8.75	6.33	8.04	–
Brazil	Total exports	USD Thousand	74,211	147,242	416,983	594,145	3.60
	Agricultural exports	USD Thousand	25,614	43,663	108,301	221,778	7.43
	Agricultural/Total exports	%	34.52	29.65	25.97	37.33	–
	Agriculture market share	%	3.37	3.10	4.61	5.43	–

<sup>(1)</sup> Annual growth rates for the 2005-2007 and 2015-2017 periods.

Source: Faostat database (FAO, 2020).

Regarding the share of agricultural products in world imports, a more detailed analysis is pertinent. Based on the average annual growth rate of total world imports (3.20% between 2005-2007 and 2015-2017) as a reference, it is possible to draw an overview of the positioning of agricultural products in the international market that contributed to the importance of the agricultural sector to increase. Thus, agricultural products that had an average annual growth rate of the market share of total world imports higher than the average growth rate of total world imports were classified as growing products, and products with an average annual growth rate of the market share lower than the average growth rate of total world imports were classified as declining products. Tables 2 and 3 show the results for that classification.

Of the 416 products listed by FAO and considered in the present work, 99 presented annual growth rates of the market share higher than 3.20%, therefore classified as growing products. This product group went from representing 7.99% of world agricultural imports in the 2005-2007 triennium to representing 16.14% of world agricultural imports in the 2015-2017 triennium (Table 2).

Furthermore, of the 416 products listed by FAO, 317 presented annual market share growth rates below 3.20% and were then classified as declining products. From a representation of

92.01% of world agricultural imports in the 2005-2007 triennium, this product group represented 83.86% of world agricultural imports in the 2015-2017 triennium (Table 3).

Among the expanding group of agricultural products, the soybean is noteworthy. The expressive growth of world trade in this commodity results from developing and structuring a market that includes the transactions of the products of its industrial complex. In this context, the consolidation of this product as a source of vegetable protein is also highlighted, given the growing demand from the animal production sectors and technological advances that enable the expansion of production in various world regions (Hirakuri & Lazzarotto, 2014).

In the declining products group, it is necessary first to point out that Food prep nes has presented a positive annual growth rate, that is, the participation of these products in world imports has grown, with a slower speed, however, than the growth in world trade in total products. According to the Observatory of Economic Complexity – OEC (2020), Food prep nes occupy the 52<sup>nd</sup> position in ranking the most commercialized products in the world between 2017 and 2018. Wheat presented an annual decrease rate of 0.72%; as one of the prevailing grains produced and consumed by humans in the world, according to Enghiad et al. (2017), it

**Table 2.** Participation in world agricultural imports, growing products, 2015-2017.<sup>(1)</sup>

Item	Market share		Rate (% per year)
	2005–2007	2015–2017	
1 Soybeans	2.79	4.33	4.49
2 Rice, milled	0.00	1.24	Inserted in the market
3 Rapeseed	0.48	0.79	5.09
4 Oil, sunflower	0.49	0.75	4.29
5 Coffee, roasted	0.42	0.75	5.94
6 Infant food	0.37	0.73	7.21
7 Avocados	0.15	0.37	9.67
8 Wafers	0.07	0.34	17.18
9 Cashew nuts, shelled	0.19	0.31	5.01
10 Offals, pigs, edible	0.17	0.30	6.17
11 Fat nes, prepared	0.17	0.26	3.98
12 Feed, compound nes	0.14	0.24	5.35
13 Dregs from brewing, distillation	0.06	0.24	15.80
14 Fruit, fresh nes	0.15	0.23	4.22
15 Rice, broken	0.00	0.22	Inserted in the market
16 Pepper (Piper spp.)	0.09	0.22	8.80
17 Lentils	0.09	0.22	9.17
18 Oil, boiled etc.	0.09	0.22	8.84
19 Juice, orange, concentrated	0.13	0.22	5.01
20 Cashew nuts, with shell	0.06	0.21	13.52
21 Garlic	0.14	0.21	4.32
22 Nuts nes	0.13	0.21	5.00
23 Cake, rapeseed	0.12	0.20	5.41
24 Sesame seed	0.13	0.19	4.37
25 Cherries	0.11	0.18	4.84
26 Honey, natural	0.11	0.17	4.24
27 Cassava dried	0.11	0.16	4.36
28 Chick peas	0.07	0.16	8.12
29 Meal, meat	0.07	0.13	7.33
30 Cake, sunflower	0.08	0.13	5.53
69 Others	0.82	2.21	10.40
<b>∑ 99 Growing products</b>	<b>7.99</b>	<b>16.14</b>	<b>7.28</b>

<sup>(1)</sup> Growing products have a growth rate higher than the growth rate of total world trade (3.20% per year) in the 2005-2007 and 2015-2017 periods.

Source: Faostat database (FAO, 2020).

**Table 3.** Participation in world agricultural imports, declining products, 2015-2017.<sup>(1)</sup>

Item	Market share		Rate (% per year)
	2005–2007	2015–2017	
1 Food prep nes	4.18	4.31	0.29
2 Wheat	3.43	3.19	-0.72
3 Crude materials	4.05	2.78	-3.68
4 Oil, palm	1.94	2.51	2.60
5 Wine	3.14	2.50	-2.26
6 Meat, cattle, boneless (beef & veal)	2.34	2.43	0.38
7 Maize	2.39	2.43	0.19
8 Beverages, distilled alcoholic	2.56	2.20	-1.50
9 Cake, soybeans	1.96	2.02	0.27
10 Chocolate products nes	1.85	1.94	0.48
11 Pastry	1.90	1.92	0.13
12 Cheese, whole cow milk	2.19	1.85	-1.65
13 Rice - total (Rice milled equivalent)	1.57	1.72	0.91
14 Cigarettes	2.35	1.68	-3.28
15 Coffee, green	1.59	1.58	-0.05
16 Meat, chicken	1.45	1.52	0.48
17 Beverages, non-alcoholic	1.31	1.38	0.52
18 Sugar, Raw Centrifugal	1.25	1.19	-0.42
19 Meat, pork	1.54	1.12	-3.11
20 Fruit, prepared nes	1.13	1.09	-0.35
21 Beer of barley	1.23	1.06	-1.46
22 Bananas	1.22	1.05	-1.41
23 Rubber natural dry	1.51	0.98	-4.20
24 Sugar refined	1.29	0.94	-3.08
25 Cotton lint	1.49	0.93	-4.59
26 Meat, pig	1.03	0.91	-1.28
27 Tobacco, unmanufactured	1.15	0.88	-2.61
28 Pet food	0.89	0.87	-0.22
29 Sugar confectionery	0.89	0.78	-1.29
30 Oil, soybean	0.93	0.75	-2.15
287 Others	36.26	33.33	-0.84
<b>∑ 317 Declining products</b>	<b>92.01</b>	<b>83.86</b>	<b>-0.92</b>

<sup>(1)</sup> Declining products have a growth rate lower than the growth rate of total world trade (3.20% per year) or a decrease, in the 2005-2007 and 2015-2017 periods.

Source: Faostat database (FAO, 2020).



continues to be imported, for the most part, by developing countries. Hence, for Khanfri et al. (2018), the demand continues to grow due to the increase in the world population. Nevertheless, as the total world agricultural imports are growing at a higher speed, the market share for this product showed a reduction in the analysis period.

### **Performance of Brazilian agribusiness**

As explained by Carvalho (2002) and by Santos et al. (2016), the list of Brazilian agricultural product exports remains concentrated in a small number of products, with an increase in dependence on a few products. In the 2015-2017 period, 55.70% of Brazil's agricultural exports corresponded to only four products, namely, in decrescent order of participation: soybeans, sugar raw centrifugal, chicken meat, and soybeans cake. In the same period, 90.31% of exports depended on only 17 products (Table 4). In the 1997-1999 triennium, 50.98% of agricultural product exports were also concentrated in four products (Carvalho, 2002) and in the 2009-2011 triennium, a period in which four products represented 51.49% of exports (Santos et al., 2016).

Potential weaknesses related to a concentrated export basket result from possible external economic shocks. These may cause greater or lesser impacts in terms of losses in countries' export earnings depending on the mix of products exported, i.e., the concentration degree of exports (Seth, 2011). For Brazil, it is even more significant since agricultural exports correspond to 37.33% of total exports (2015-2017 triennium); in other words, there is a marked dependence on a specific sector of the economy.

Concomitantly, the concentration of agricultural exports in a few products stands out, increasing exposure to circumstantial external shocks. Thus, considering the analysis of Brazilian agribusiness's export performance, it is essential to emphasize that a recalibration of the growth strategy of exports condensed into a few products is essential. Besides, national policies to increase resilience to external shocks through

greater diversification of the export basket are also urgent.

After this initial highlight on the concentration of agricultural exports, the following step is analyzing the performance of Brazilian agribusiness regarding the classification of agricultural products according to the methodology suggested by Fajnzylber (1991). Tables 5, 6, 7, and 8 present this information. In the second and third columns of each table, the participation of each product in world imports in the 2005-2007 and 2015-2017 triennia can be seen. The fourth and fifth columns show Brazil's market share in world imports in the same period. If the product showed growth both in world imports and in the country's market share, it was classified as a product in an optimum situation, which is the case with the products in Table 5. As complementary information to the analysis, the sixth column shows the participation of products in Brazil's agricultural exports in the 2015-2017 triennium. Finally, the last column of each table expresses the annual growth rate of the value of Brazilian exports of each product between the two years of analysis.

Of the 416 products considered, 150 were classified as products in optimum condition, which means to say that the Brazilian products in this set increased their share in world imports while world imports of such products also increased. In the 2015-2017 period, these products accounted for an expressive 46.51% of Brazilian agribusiness exports.

Notably, emphasis should be given to soybeans and cake soybeans, which together accounted for 36.89% of Brazil's agricultural exports, holding 37.80% and 19.64% of the market share in world imports, respectively. Regarding soybeans, Santos et al. (2016) had already detected its growing importance, having classified it as in an optimum situation when analyzing the data for the 2009-2011 triennium. Conversely, this importance shows to have gained strength because, in the period analyzed by the authors, soybeans obtained 19.93% of Brazilian agricultural exports and occupied

**Table 4.** World agricultural imports and Brazil's market share, total 2015-2017.

Item	World			Brazil			Market share (%)
	USD	Part. (%)		USD	Part. (%)		
	Thousand	Simple	Sum	Thousand	Simple	Sum	
1 Soybeans	174,695	4.33	4.33	66,033	29.70	29.70	37.80
2 Sugar, Raw Centrifugal	48,177	1.19	5.53	23,225	10.44	40.14	48.21
3 Meat, chicken	61,204	1.52	7.04	18,605	8.37	48.51	30.40
4 Cake, soybeans	81,414	2.02	9.06	15,987	7.19	55.70	19.64
5 Coffee, green	63,816	1.58	10.65	14,999	6.75	62.44	23.50
6 Meat, cattle, boneless (beef & veal)	98,135	2.43	13.08	14,010	6.30	68.74	14.28
7 Maize	98,055	2.43	15.51	13,380	6.02	74.76	13.65
8 Sugar refined	38,050	0.94	16.46	6,264	2.82	77.58	16.46
9 Tobacco, unmanufactured	35,625	0.88	17.34	6,164	2.77	80.35	17.30
10 Juice, orange, concentrated	8,724	0.22	17.56	4,402	1.98	82.33	50.46
11 Cotton lint	37,629	0.93	18.49	3,864	1.74	84.07	10.27
12 Meat, pork	45,309	1.12	19.61	3,813	1.71	85.78	8.42
13 Oil, soybean	30,315	0.75	20.36	3,084	1.39	87.17	10.17
14 Coffee, extracts	20,506	0.51	20.87	1,869	0.84	88.01	9.11
15 Crude materials	112,225	2.78	23.66	1,778	0.80	88.81	1.58
16 Meat, beef, preparations	6,327	0.16	23.81	1,704	0.77	89.57	26.94
17 Meat, chicken, canned	23,528	0.58	24.40	1,631	0.73	90.31	6.93
18 Food prep nes	173,612	4.31	28.70	1,517	0.68	90.99	0.87
19 Juice, orange, single strength	8,904	0.22	28.92	1,319	0.59	91.58	14.81
20 Meat, dried nes	2,884	0.07	28.99	1,165	0.52	92.11	40.38
21 Oil, essential nes	14,251	0.35	29.35	1,027	0.46	92.57	7.21
22 Offals, edible, cattle	11,413	0.28	29.63	999	0.45	93.02	8.76
23 Pepper (Piper spp.)	8,855	0.22	29.85	869	0.39	93.41	9.82
24 Rice – total (Rice milled equivalent)	69,340	1.72	31.57	847	0.38	93.79	1.22
25 Food wastes	29,966	0.74	32.31	578	0.26	94.05	1.93
26 Wheat	128,479	3.19	35.50	572	0.26	94.31	0.44
27 Mangoes, mangosteens, guavas	6,671	0.17	35.66	571	0.26	94.56	8.56
28 Cocoa, butter	15,744	0.39	36.05	540	0.24	94.81	3.43
29 Melons, other (inc.cantaloupes)	5,387	0.13	36.19	466	0.21	95.01	8.65
30 Meat, turkey	7,401	0.18	36.37	456	0.21	95.22	6.16
<b>∑ 386 Others</b>	<b>2,565,724</b>	<b>63.63</b>	<b>100.00</b>	<b>10,629</b>	<b>4.78</b>	<b>100.00</b>	<b>0.41</b>
<b>Agricultural total</b>	<b>4,032,365</b>	<b>100</b>		<b>222,366</b>	<b>100</b>		<b>5.51</b>
<b>Grand total</b>	<b>50,821,846</b>			<b>594,145</b>			<b>1.17</b>

Source: Faostat database (FAO, 2020).

**Table 5.** Brazilian agricultural exports, optimum situation products.

Item	Product share in world imports (%)		Brazil's market share in world imports (%)		Brazil's export share (%)	Δ Rate (%)
	2005–2007	2015–2017	2005–2007	2015–2017	2015–2017	
1 Soybeans	2.79	4.33	28.01	37.80	29.70	14.06
2 Cake, soybeans	1.96	2.02	18.51	19.64	7.19	6.85
3 Maize	2.39	2.43	4.66	13.65	6.02	18.16
4 Meat, dried nes	0.06	0.07	27.60	40.38	0.52	12.28
5 Oil, essential nes	0.30	0.35	5.71	7.21	0.46	10.37
6 Offals, edible, cattle	0.21	0.28	5.89	8.76	0.45	13.65
7 Rice - total (Rice milled equivalent)	1.57	1.72	0.48	1.22	0.38	17.43
8 Food wastes	0.68	0.74	1.14	1.93	0.26	12.67
9 Rice, milled	0.00	1.24	0.00	0.91	0.20	0.00
10 Groundnuts, shelled	0.15	0.19	2.50	5.69	0.19	17.89
11 Waxes vegetable	0.01	0.01	47.91	55.52	0.14	7.78
12 Honey, natural	0.11	0.17	2.54	4.38	0.13	16.60
13 Offals, pigs, edible	0.17	0.30	1.90	2.13	0.12	13.72
14 Lemons and limes	0.20	0.27	2.24	2.33	0.11	9.52
15 Rice, broken	0.00	0.22	0.00	2.77	0.11	0.00
16 Beans, dry	0.24	0.26	0.51	1.70	0.08	20.74
17 Eggs, hen, in shell	0.23	0.26	1.36	1.71	0.08	9.64
18 Oil, palm	1.94	2.51	0.07	0.17	0.08	18.75
19 Fibre crops nes	0.00	0.03	0.00	11.08	0.06	0.00
20 Watermelons	0.10	0.12	1.26	2.01	0.04	12.52
21 Oil, vegetable origin nes	0.13	0.13	0.43	1.17	0.03	17.39
22 Groundnuts, prepared	0.00	0.09	0.00	1.62	0.03	0.00
23 Juice, apple, concentrated	0.00	0.11	0.00	1.23	0.03	0.00
24 Mixes and doughs	0.22	0.23	0.06	0.43	0.02	28.79
25 Avocados	0.15	0.37	0.11	0.16	0.01	20.49
26 Meat, duck	0.04	0.05	1.12	1.18	0.01	8.49
27 Macaroni	0.34	0.35	0.11	0.15	0.01	9.63
28 Fruit, dried nes	0.09	0.10	0.15	0.47	0.01	19.95
29 Flour, cassava	0.00	0.00	0.00	34.77	0.01	0.00
30 Spices nes	0.10	0.12	0.19	0.35	0.01	15.26
120 Others	2.78	4.72	0.01	0.04	0.03	32.01
<b>∑ 150 optimum situation</b>	<b>16.94</b>	<b>23.80</b>	<b>7.95</b>	<b>10.78</b>	<b>46.51</b>	<b>12.98</b>

Source: Faostat database (FAO, 2020).

**Table 6.** Brazilian agricultural exports, products in missed opportunity situation.

Item	Product share in world imports (%)		Brazil's market share in world imports (%)		Brazil's export share (%)	Δ Rate (%)
	2005–2007	2005–2007	2005–2007	2005–2007	2005–2007-	
1 Meat, chicken	1.45	1.52	31.94	30.40	8.37	5.92
2 Meat, cattle, boneless (beef & veal)	2.34	2.43	17.00	14.28	6.30	4.49
3 Juice, orange, concentrated	0.13	0.22	112.47	50.46	1.98	2.67
4 Coffee, extracts	0.48	0.51	11.77	9.11	0.84	3.76
5 Meat, chicken, canned	0.57	0.58	10.50	6.93	0.73	1.80
6 Food prep nes	4.18	4.31	0.93	0.87	0.68	5.62
7 Pepper (Piper spp.)	0.09	0.22	12.08	9.82	0.39	12.88
8 Mangoes, mangosteens, guavas	0.12	0.17	9.07	8.56	0.26	8.66
9 Cashew nuts, shelled	0.19	0.31	14.07	2.80	0.16	-5.34
10 Chocolate products nes	1.85	1.94	1.00	0.36	0.13	-3.91
11 Mate	0.01	0.02	51.39	43.23	0.12	10.81
12 Tobacco products nes	0.34	0.44	1.31	1.23	0.10	7.89
13 Cocoa, powder & cake	0.16	0.22	4.15	2.27	0.09	2.98
14 Pastry	1.90	1.92	0.35	0.25	0.09	2.46
15 Meal, meat	0.07	0.13	3.54	3.22	0.08	12.65
16 Wafers	0.07	0.34	3.78	0.87	0.05	7.18
17 Cocoa, paste	0.15	0.21	2.60	1.03	0.04	-0.17
18 Fatty acids	0.32	0.43	0.81	0.49	0.04	3.64
19 Juice, citrus, concentrated	0.02	0.04	5.98	5.57	0.04	12.32
20 Infant food	0.37	0.73	1.11	0.27	0.04	-1.29
21 Cloves	0.02	0.03	6.48	4.22	0.03	8.33
22 Oil, boiled etc.	0.09	0.22	1.92	0.45	0.02	-0.19
23 Beverages, non-alcoholic	1.31	1.38	0.14	0.07	0.02	-1.22
24 Coffee, roasted	0.42	0.75	0.71	0.12	0.02	-6.12
25 Brazil nuts, shelled	0.02	0.02	9.69	3.45	0.02	-1.80
26 Nuts, prepared (exc. groundnuts)	0.25	0.31	0.37	0.24	0.01	3.44
27 Ginger	0.04	0.06	2.09	0.99	0.01	3.07
28 Food preparations, flour, malt extract	0.42	0.46	0.82	0.13	0.01	-11.14
29 Starch, cassava	0.06	0.11	1.13	0.52	0.01	3.55
30 Figs	0.01	0.01	5.50	3.87	0.01	5.48
54 Others	5.88	7.61	0.27	0.06	0.08	-7.24
<b>∑ 84 Situation of missed opportunities</b>	<b>23.33</b>	<b>27.65</b>	<b>5.59</b>	<b>4.13</b>	<b>20.73</b>	<b>4.56</b>

Source: Faostat database (FAO, 2020).

**Table 7.** Brazilian agricultural exports, products in situation of vulnerability.

Item	Product share in world imports (%)		Brazil's market share in world imports (%)		Brazil's export share (%)	Δ Rate (%)
	2005–2007	2005–2007	2005–2007	2005–2007	2005–2007	
1 Sugar, Raw Centrifugal	1.25	1.19	33.47	48.21	10.44	9.41
2 Cotton lint	1.49	0.93	3.83	10.27	1.74	11.55
3 Meat, pork	1.54	1.12	7.39	8.42	1.71	3.98
4 Crude materials	4.05	2.78	1.14	1.58	0.80	5.43
5 Juice, orange, single strength	0.47	0.22	13.62	14.81	0.59	-0.94
6 Wheat	3.43	3.19	0.14	0.44	0.26	17.99
7 Melons, other (inc.cantaloupes)	0.18	0.13	7.43	8.65	0.21	4.23
8 Juice, fruit nes	0.39	0.31	1.59	2.88	0.16	9.96
9 Beer of barley	1.23	1.06	0.31	0.62	0.12	12.08
10 Feed, pulp of fruit	0.03	0.01	36.54	43.71	0.09	-1.01
11 Oil, groundnut	0.03	0.03	5.58	16.89	0.09	16.38
12 Flour, maize	0.07	0.07	2.93	5.22	0.06	11.88
13 Pet food	0.89	0.87	0.32	0.36	0.06	6.94
14 Wool, greasy	0.30	0.23	0.36	0.87	0.04	12.75
15 Margarine, short	0.19	0.11	1.18	1.81	0.04	4.39
16 Meat, pig, preparations	0.32	0.31	0.42	0.60	0.03	9.21
17 Meat, cattle	0.71	0.57	0.08	0.30	0.03	18.05
18 Cottonseed	0.04	0.02	0.90	5.95	0.02	22.53
19 Juice, pineapple, concentrated	0.05	0.04	1.55	3.01	0.02	10.87
20 Cream fresh	0.20	0.17	0.36	0.61	0.02	9.96
21 Sweet corn prep or preserved	0.09	0.07	1.01	1.36	0.02	6.05
22 Cotton linter	0.02	0.01	4.29	9.12	0.02	8.48
23 Vegetables, preserved nes	0.61	0.51	0.09	0.16	0.01	10.30
24 Cocoa, beans	0.73	0.72	0.03	0.09	0.01	19.47
25 Cereal preparations nes	0.09	0.04	0.60	1.34	0.01	6.00
26 Flour, wheat	0.40	0.39	0.03	0.11	0.01	20.83
27 Wine	3.14	2.50	0.01	0.02	0.01	5.82
28 Rubber natural dry	1.51	0.98	0.01	0.04	0.01	16.63
29 Glucose and dextrose	0.21	0.18	0.18	0.23	0.01	6.52
30 Hides, cattle, wet salted	0.45	0.32	0.03	0.12	0.01	16.05
65 Others	6.57	5.11	0.02	0.04	0.04	12.99
<b>∑ 95 situation of vulnerability</b>	<b>30.67</b>	<b>24.20</b>	<b>2.46</b>	<b>3.80</b>	<b>16.68</b>	<b>8.04</b>

Source: Faostat database (FAO, 2020).

**Table 8.** Brazilian agricultural exports, products in situation of retreat.

Item	Product share in world imports (%)		Brazil's market share in world imports (%)		Brazil's export share (%)	Δ Rate (%)
	2005–2007	2005–2007	2005–2007	2005–2007	2005–2007	
1 Coffee, green	1.59	1.58	24.49	23.50	6.75	5.45
2 Sugar, refined	1.29	0.94	19.62	16.46	2.82	0.88
3 Tobacco, unmanufactured	1.15	0.88	21.29	17.30	2.77	1.06
4 Oil, soybean	0.93	0.75	19.91	10.17	1.39	-3.08
5 Meat, beef, preparations	0.22	0.16	36.89	26.94	0.77	-0.94
6 Cocoa, butter	0.41	0.39	4.90	3.43	0.24	1.72
7 Meat, turkey	0.23	0.18	7.90	6.16	0.21	0.81
8 Sugar confectionery	0.89	0.78	2.50	1.29	0.18	-2.11
9 Milk, whole dried	0.72	0.71	1.55	1.18	0.15	2.96
10 Meat, pig sausages	0.33	0.30	3.52	2.55	0.14	1.65
11 Grapes	0.71	0.67	2.46	0.87	0.11	-5.12
12 Fruit, prepared nes	1.13	1.09	0.62	0.46	0.09	2.42
13 Meat, pig	1.03	0.91	2.97	0.46	0.08	-13.12
14 Papayas	0.03	0.02	13.82	13.05	0.06	3.03
15 Milk, whole condensed	0.09	0.08	6.52	3.94	0.06	-0.50
16 Beverages, distilled alcoholic	2.56	2.20	0.13	0.12	0.05	3.89
17 Apples	0.66	0.59	0.98	0.42	0.05	-3.67
18 Oil, maize	0.11	0.08	2.96	2.32	0.03	0.40
19 Bananas	1.22	1.05	0.42	0.13	0.03	-6.82
20 Cereals, breakfast	0.49	0.45	0.39	0.23	0.02	-0.47
21 Oranges	0.46	0.39	0.42	0.23	0.02	-1.94
22 Oil, cottonseed	0.02	0.01	16.07	6.49	0.01	-8.24
23 Meat, horse	0.07	0.03	6.69	1.77	0.01	-13.88
24 Cigarettes	2.35	1.68	0.13	0.03	0.01	-11.21
25 Juice, grape	0.08	0.05	1.64	0.89	0.01	-4.83
26 Cheese, whole cow milk	2.19	1.85	0.04	0.02	0.01	-3.01
27 Fat, pigs	0.06	0.04	1.55	0.84	0.01	-3.98
28 Malt	0.32	0.28	0.11	0.11	0.01	4.32
29 Onions, shallots, green	0.02	0.01	2.08	1.89	0.00	0.29
30 Grease incl. lanolin wool	0.02	0.02	2.44	1.45	0.00	-1.05
57 Others	7.70	6.16	0.12	0.02	0.03	-11.75
<b>Σ 87 situation of retreat</b>	<b>29.08</b>	<b>24.36</b>	<b>4.65</b>	<b>3.64</b>	<b>16.08</b>	<b>1.57</b>

Source: Faostat database (FAO, 2020).



29.55% of the world market share, inferior results to the situation in the 2015-2017 triennium. Regarding the soybean cake, compared with the results by Santos et al. (2016), Brazil reversed the situation of missed opportunity and occurred for that product in the 2009-2011 period, since it changed its classification to an optimum situation in 2015-2017 triennium.

As per Aguiar & Matsuoka (2016), soybean derivatives are characterized by having higher prices, as they have higher added value, strengthen the processing industry, and generate higher income than soybeans. In this regard, it is possible to conjecture that Brazil would benefit even more from the world agricultural market if it maximized its market share of cake soybeans. Moreover, Souza & Bittencourt (2019) also highlight the concentration of soybeans exports to China, and, consequently, the dependence of this partnership.

In the missed opportunity classification, 83 Brazilian agricultural products received such indication (Table 6), corresponding to 20.73% of agricultural exports. These are products that, despite showing growth in world trade, decreased in Brazil's Market share. In terms of Brazilian agricultural exports, the two most relevant items are chicken meat and boneless cattle meat, with Brazil having 30.40% of the world market share in the first case and 14.28% in the second case. It should be noted that the two products have increased their participation in agricultural exports in Brazil, although not with consistency to increase their presence in the world market.

Table 7 presents the products that were classified as vulnerable. This group has 95

products, which together represent 16.68% of agricultural exports in Brazil. The main product in this class is raw centrifugal sugar, corresponding to 10.44% of the country's agribusiness exports and the export value increasing at a rate of 9.41% per year between 2005- 2007 and 2015-2017. In the same period, Brazil's market share in the world market increased from 33.47% to 48.21%, while the share in world trade decreased for this product, therefore the classification as a situation of vulnerability.

Nevertheless, a warning is necessary on this point; although the share of the product in world imports has decreased (from 1.25% to 1.19%), this reduction is relatively small.

The products classified as a situation of retreat (Table 8) were 87 products in total, representing 16.08% of agricultural exports in Brazil. In this case, a note is also necessary, as the group's most important product, green coffee, which occupies 6.75% of Brazilian agribusiness exports, showed a minimal decrease in the share of world imports (from 1.59% to 1, 58%). In this scenario, following Torga & Spers (2020), world coffee production and consumption, which has been increasing with remarkable expansion in Asia and the Arabian Peninsula, suffers variations resulting from bad harvests in specific periods.

In summary, as can be seen in Table 9, the situation of agricultural exports from Brazil, according to the methodology of Fajnzylber (1991), can be considered favorable because a significant portion of the agricultural exports value is in an optimum situation (46.51%). Furthermore, green coffee and raw centrifugal sugar (the main products of the situation of

**Table 9.** The competitiveness of Brazilian agribusiness in international trade.

Insertion	No. of products	%	Value 1,000 US\$ (2015–2017)	%
Retreat	87	20.91	35,741,769	16.08
Vulnerability	95	22.84	37,101,128	16.68
Missed opportunity	84	20.19	46,090,523	20.73
Optimum	150	36.06	103,432,154	46.51
<b>Total Σ</b>	<b>416</b>	<b>100</b>	<b>222,365,574</b>	<b>100</b>

retreat and vulnerability) showed decreases in their respective shares in relatively small world imports, suggesting that they result from occasional circumstantial variations. Also, products classified as missed opportunities (20.73% of the value of agricultural exports) offer a way for Brazilian agribusiness to continue to improve its performance in the international market.

Seeking better performance, it is also necessary to recapitulate that Santos et al. (2016) identified that 59.89% of the values of the products were classified as an optimum situation, 10.97% as a situation of missed opportunities, 24.33% as a situation of vulnerability, and 4.80% as a situation of retreat when analyzing the changes between the 1999-2001 and 2009-2011 triennia with the same methodology. If compared with the notes by Carvalho (2002), the results of the present study demonstrate a significant improvement in the insertion of Brazilian agribusiness in the international market, but a less favorable scenario than that found by Santos et al. (2016), enabling further discussion and monitoring of the theme by specialists.

## Final considerations

Brazilian agribusiness exports systematically contribute to the country's commercial strength, mainly to avoid the risk of a deficit in the trade balance. This work aimed to analyze the insertion of Brazilian agricultural products in the international context, verifying the performance of exports in this category between the 2005-2007 and 2015-2017 triennia and comparing with the results obtained from previous periods. For this purpose, the methodology proposed by Fajnzylber (1991) was used, which classifies the country's situation and items (products) as optimum, of vulnerability, of missed opportunities, and retreat.

Contrary to the performance of the 1988-1990 and 1997-1999 triennia presented by Carvalho (2002), when the Brazilian agricultural sector presented an unfavorable position, with

less efficiency and vulnerability, a plausible conclusion is that the country is in an optimum situation as it increased its share of world imports of agricultural products, from 4.61%, on average for 2005-2007 to 5.43% in 2015-2017 in the overall amount of Brazilian agribusiness exports. The positive impact of the evolution of global consumption (imports), which increased from 6.33% to 8.04%, confirms this improvement in the Brazilian situation.

In the comprehensive analysis of agricultural products exported by Brazil, what is worth mentioning is the high concentration of exports, a finding that converges with the results found by Carvalho (2002) and Santos et al. (2016), with five products being responsible for 51.48% of the value of exports in 2005-2007 and four products being responsible for more than 55% of the same activity in 2015-2017.

Through data from the Faostat database (2015-17) (FAO, 2020), it was possible to identify that the world imports registered operations for 375 items of agriculture. In the case of Brazil, exports of 276 were recorded in the same period. Therefore, the country had no exports of 99 of these products, which may have favorable and unfavorable international trade positions.

When the Brazilian agricultural agenda products were classified, considering positioning and efficiency, 22.84% of the value of their exports was classified as vulnerable and 20.91% as of retreat. Consequently, almost 44% of Brazilian revenues from agricultural exports came from products with an unfavorable international market position. Products with favorable positioning represented 56.25% of revenues of Brazilian exports, missed opportunities meant 20.19%, and the optimum situation represented 36.06%.

Also considering the categories of insertion in international trade, 36.06% (150 products) of the total items exported by Brazil in the 2015-2017 period were classified as an optimum situation, which means that such products had an increase in world imports and Brazil's market

share increased regarding these products, also indicating high efficiency.

Knowing the performance of the items sold can be a first step towards understanding Brazilian exports' current scenario. There is a consensus on Brazil's need to move towards a more efficient economy, mainly focusing on placing more national products globally. For that, policymakers and trade strategies need to identify opportunities to promote trade openness. Being part of cooperation agreements and facilitating customs rules and procedures are complex but fundamental actions for Brazil's commercial insertion globally and vice versa.

For future works, an analysis of items classified in situations of missed opportunities is suggested, as well as an analysis of factors that can improve the insertion of Brazilian products in the international market, increasing its portfolio with higher added value in the export basket. If Brazil aspires to become increasingly competitive without being in a vulnerable situation, diversifying is necessary!

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