

LUIZ OCTAVIO PIRES LEAL



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# BASIC INFORMATION FOR THOSE INTERESTED IN INVESTING IN BRAZILIAN AGRIBUSINESS

Production:

  
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Nacional de  
Agricultura  
Inteligência em Agronegócio desde 1897

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## Presentation

**T**he internationalization of the [animalbusiness.com.br](http://animalbusiness.com.br) website is a service provided by SNA - Sociedade Nacional de Agricultura (National Society of Agriculture) - founded in 1897, with no commercial purpose, considered of public utility, without political or religious connotation, and financially independent.

Our objective is to collaborate with those interested in investing in Brazilian agribusiness, through independent information.

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# SNA - NATIONAL AGRICULTURE SOCIETY

**I**t is a well-known fact that agribusiness is the most important economic activity in Brazil, both from the point of view of advanced technology, used in the production and industrialization of food, as well as from the point of view of the production of fibers, leather and vegetable fuels, with emphasis on sugarcane alcohol.

We are among the world's largest exporters of grains, mainly soy and corn and animal products. But, both from the point of view of production and productivity, the possibilities for growth are great, as are those for exports.

## **Investment opportunities**

With a large territorial extension, rich in water and communication resources, a favorable climate, availability of advanced technological resources, modern equipment industry, and availability of labor, Brazil represents a privileged opportunity for investment in all areas of agribusiness.

The SNA – Sociedade Nacional de Agricultura, founded in 1897, under private law, considered to be of public utility, with no commercial objective or religious or political connotation, and financially independent, has a technical body ready to provide information on Brazilian agribusiness.

# Basic information for those interested in investing in Brazilian agribusiness

Luiz Octavio Pires Leal - selection and summary of information from renowned specialists in Brazilian agribusiness

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Antonio Alvarenga, president of SNA – National Society of Agriculture

**A**s highlighted by the president of the SNA – National Society of Agriculture, Dr. Antonio Alvarenga, Brazil has one of the most sustainable agriculture on the planet. Areas for agricultural and livestock production represent less than a third of the national territory.

## **Sustainable Agriculture**

In the concept of sustainable agriculture, a technology that combines agricultural production, planted forests and animal husbandry, carried out in the same area, stands out. This is crop-livestock-forest integration (ILPF), which can be implemented in intercropping, rotation or succession.

In fact, there is no single ILPF model. Its application depends on the natural conditions of the rural property, in terms of soil, topography and climate, as well as the local commercialization infrastructure, experience and interest of its owner.

Although it is an old practice, the adoption of integration systems in Brazil is still limited. However, with the improvement of this technology, there is a growth trend, especially in the recovery of degraded pasture areas. It is estimated that we have about one million hectares in these conditions.

The System has been adopted more frequently in the Midwest and South regions. Currently, approximately two million hectares use the different formats of ILPF. The forecast is that by 2030, Integration will be practiced on at least 20 million hectares.

### **Benefits**

In addition to the recovery of degraded areas, the advantages of Integration are the most diverse, highlighting the increase in organic matter in the soil, the reduction in the use of agrochemicals, the conservation of water resources, the promotion of biodiversity, the improvement of well-being animals, carbon fixation, and the reduction of greenhouse gas emissions, among others.

The ILPF constitutes an economic and sustainable alternative to diversify the income of producers, and can be adopted in large, medium and small rural properties.

### **Low carbon agriculture**

The Low Carbon Agriculture Program (ABC), of the Ministry of Agriculture, encourages the implementation of ILPF systems, with financing lines under favorable conditions.

### **Brazil's geography**

The geography of Brazil is very favorable for the development of agribusiness.

Brazil has an area of 8,456,508 km<sup>2</sup>. This territory corresponds to 47% of the total area of South America, and 1.66% of the surface of the globe.

The area of rivers and lakes is 5,545 km<sup>2</sup>. Practically the entire Brazilian territory is located in the Southern Hemisphere and 92% in the Intertropical Zone, with annual average temperatures above 20°C.

Brazil is bathed to the east by the Atlantic Ocean, with a coastline of 7,408 km. It has four time zones, all west of the Greenwich Meridian.

The longest north-south distance is 4,320 km and the longest east-west distance is 4,328 km. Almost the entire national territory (93%) has altitudes below 900 meters.

### **Climate**

Brazil is basically a tropical country. The Equator Line passes, to the north, near the city of Macapá. The Tropic of Capricorn crosses the city of São Paulo.

The South has a temperate zone, constituted by the states of Rio Grande do Sul, Santa Catarina, great part of Paraná, and the extreme south of São Paulo and Mato Grosso.

In a simplified way, Brazil's climate can be divided into five types: equatorial – tropical – semi-arid – high-altitude tropical and subtropical.

The equatorial climate is that of the Amazon region, where average temperatures are high (above 24°C) and the difference between the thermal averages of the hottest month and the coldest month is no more than 2.5°C. This small thermal amplitude, however, only expresses the averages. The daily temperature variation is greater: in Belém, it reaches almost 10°C, and in Manaus, 8.7°C.

Rainfall in the Amazon is generally greater than 1,500 mm/year, and there are regions where it can reach twice that amount.



The tropical climate is characterized by the difference between the dry season and the rainy season. The rainy season usually occurs in the summer. In Brazil, the tropical climate region includes the Central Plateau, the Mid-North and the Eastern Coast (from Rio Grande do Norte to Rio de Janeiro). The amount of rainfall is about 1,500 mm/year. The average annual temperature is 22°C. The thermal amplitude is 5°C. The coldest month is July and the hottest is December or January. The semi-arid climate is that of the Northeast, where it rains less than 700 mm/year. The rainy season is very irregular and, in the region, it is called winter. The dry period can last for a year or more and has dramatic consequences. The rains, when they occur, are short, but very violent. The annual average temperatures are greater than 23°C. In general, the thermal amplitude is small.

### **High altitude tropical climate**

The high-altitude tropical climate is what occurs in Southeast Brazil, on the plateau where the temperature is milder. The temperature averages are around 20°C. But in the coldest month of the year (usually July), frosts can occur.

Although milder because of the altitude, the characteristics of a tropical climate remain. The thermal amplitude is around 5°C and the rains maintain the summer regime and are concentrated between October and March.

The subtropical climate is found in the south, where mild winters occur, although with annual frosts, hot summers in the lowlands and cool in the plateau, and rains generally well distributed. Average annual temperatures are below 18°C. The thermal amplitude can reach up to 12°C.

In the south of the state of Rio Grande do Sul, snowfalls can occur, and in the higher areas of the plateau, temperatures of up to -10°C can occur.

### **Vegetation**

1. Equatorial – is the Equatorial Forest, also called the Amazon Forest, defined as perennial (always green), hydrophilic (always humid), dense, varied and broadleaved (broad-leaved plants).

The Amazon Rainforest is the largest equatorial forest in the world.

2. Tropical – is the type of vegetation known as Cerrado, with shrubs and low vegetation (grass). Alongside the courses of the rivers and in the valleys, where there is more humidity, there are riparian forests.

3. Semiarid – is the vegetation called Caatinga, with thorny shrubs and cactus.

4. Tropical of altitude – it is called tropical forest, dense, extremely varied, closed, but less exuberant than the Amazon Forest. This forest has been very devastated in recent years.

5. Subtropical – is the araucaria forest, also very devastated. Open forest, easy to penetrate and with few varieties. It is the predominant forest in the South region, which, in Rio Grande do Sul, also has the Campos Gerais, where low vegetation, of grasses, predominates.

6. Differentiated vegetation: (a) Complexo do Pantanal, which occurs in the Pantanal of Mato Grosso and is a mixed vegetation of fields, savannahs and caatinga; (b) Mata dos Cocais, in the states of

Maranhão, Piauí and Tocantins, which is a transition between the Caatinga and the Amazon Forest. The dominant plant species is Babaçu (a palm); (c) Mangroves, which are formed by plants that like saline environments and have aerial roots. Mangroves exist in the shallow waters of the bays.

### Environmental impact

The environmental impact is an important item that needs to be considered before implementing any agricultural or industrial development project in Brazil.



### Regions

Brazil is divided into five regions: North, Northeast, Midwest, Southeast and South.

1. **North Region** – includes the states of Acre, Amazonas, Pará, Rondônia, Roraima, Tocantins and Amapá. The region is crossed by

the largest river in the world, the Amazon River, with 7,000 tributaries and 23,000 navigable km. Its economy is based on both plant and mineral extraction. In the 1980s, livestock (raising cattle for slaughter) grew a lot, thanks to the destruction of large areas of the forest for the formation of pastures.

**2. Northeast Region** – comprises the states of Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe and Bahia. In much of this region, dramatic droughts occur that drive residents away to the region's large cities, located in humid coastal areas, or to the largest cities in the country, such as São Paulo and Rio de Janeiro.

Traditional agricultural activities are the production of cocoa, sugar/alcohol and cotton. However, there are large-scale irrigation projects that are giving excellent results in the production of the most varied plant species, including commercially valuable fruits such as mangoes, melons and grapes, among others.

The most typical livestock activity in the region is the extensive raising of cattle for meat production.

**3. Midwest Region** – comprises the states of Goiás, Mato Grosso, Mato Grosso do Sul and the Federal District. The most important livestock activity is the raising of cattle, by the extensive system, for the production of meat. Among the most traditional agricultural activities is non-irrigated rice.

More recently, the soybean crop was introduced – with great success – with the main objective of exporting.

4. **Southeast** – comprises the states of São Paulo, Minas Gerais, Rio de Janeiro and Espírito Santo. It is the most populous and developed region in Brazil. This region concentrates 71% of the total value of the country's industrial production. Agricultural and agro-industrial activities are also highly developed. It is the first producer of coffee, oranges, and sugar/alcohol, in addition to having the main herds in the country, both for meat and milk production.

The most important dairy industries in the country are located in this region.

5. **South Region** – comprises the states of Paraná, Santa Catarina and Rio Grande do Sul. This region received, in the past, a large number of immigrants and is home to cities very similar to those of Europe. Agriculture is highly developed, with emphasis on the production of soy, irrigated rice, wheat, beans, corn, tobacco and fine fruits such as grapes and apples. It is in this region that the important wine industry in Brazil is located.

Poultry farming, which is one of the main agricultural activities in the country, and in the world, is also a strong point in the region.

Pig farming and the swine and cattle industry are other highlights.

Contrary to what happens in most other regions, which breed beef cattle of Indian origin, European breeds are bred in the southern region.

Almost all of the wool produced in Brazil comes from this region.

## **Population**

The population of Brazil is just over 215 million inhabitants, with annual growth of around 2.2%. This population is not evenly distributed across

the different regions of the country. On the contrary, its geographical distribution is extremely uneven.

The variation in population density between different regions is impressive. While in the North Region there are only 2.6 inhabitants per square kilometer, in the Southeast Region, the richest in the country, there are almost 71 inhabitants per square kilometer.

In any case, even this population density – which is the highest in the country – becomes very low when compared to that of European countries, such as Belgium (323), Denmark (119), France (100), Italy (188), the Netherlands (349) and the United Kingdom (231 inhab/km<sup>2</sup>).

The average population density in Brazil is 17.6 inhab/km<sup>2</sup>. In the last decades, there has been a constant movement in the countryside-city direction. The reasons given for this are the difficulties of life in rural areas, which offer lesser opportunities for survival. But there is already an incipient movement of young people to settle in the countryside, thanks to the opportunities created by the advanced technology of agribusiness in Brazil.

About 76% of Brazil's population lives in large cities. This trend has been reducing the quality of life due to the excessive demand for public services, which, in general, have not been able to withstand the pressure.

At the time of writing (August 2022), a complete sense of Brazil is underway, under the responsibility of IBGE = Instituto Brasileiro de Geografia e Estatística.

### **Legislation**

The Brazilian legislation that regulates foreign investment in agribusiness is complex and broad.

Those interested in this subject can contact the specialist Professor Maria Cecília Ladeira de Almeida, from the Technical Board of SNA - National Society of Agriculture, via e-mail: [ladeira.mcecilia@gmail.com](mailto:ladeira.mcecilia@gmail.com)

## **Alfredo Navarro de Andrade**

**B**razil, due to its geographical characteristics, can always grow two corn crops: a summer crop (planted from August to November and harvested in the first quarter of the following year) and a winter crop, or safrinha (planted in the first quarter of the year and harvested from June to September).

### **Soy**

With the genetic improvement of soybean varieties with a shorter cycle and more adapted to the different regions of the country, the migration of this crop to the Midwest, but also to the North and Northeast, resulted in an immense transformation of the profile of the corn crop.

With the advent of soybean no-tillage, the new varieties tolerant to glyphosphate and to a cycle of no more than 90 days, allowed, mainly in the Midwest Region, the planting of corn after the soybean harvest. What was safrinha (summer) became safrinha, and safrinha (winter) became safrinha.

In 2017, the summer crop produced 30.4 million tons (31%), while the winter crop produced 67.3 (69%).

### **Inversion**

In 15 years, there was a complete reversal between the sizes of corn crops. This growth allowed Brazil to go from being a net importer of corn to the second largest exporter on the planet, as the agronomist Alfredo Navarro de Andrade teaches us. MSc and PhD from Purdue University, in the summer, the area planted with corn continues to give way to soybeans, and the increase in the area of soybeans during this period results in excellent conditions for planting winter corn in soybean



straw. There is a great synergy between soy and corn production. The producer knows the need for crop rotation and technological advances, such as no-till farming, which have made this synergy even more important.

The two crops, from the point of view of use, are, in a way, quite similar, despite the large differences in volumes produced.

## Carlos Alberto Magioli

**“F**ew countries have had such expressive growth in international agribusiness trade as Brazil, a result that led the United Nations Conference on Trade and Development (UNCTAD) to predict that the country, in a short period, will be the world's largest food producer” – highlights Professor Carlos Alberto Magioli, Full Academician of the Academy of Veterinary Medicine in the State of Rio de Janeiro.

A World Population Report by the United Nations Department of Economic and Social Affairs (DESA) reveals that the global population, then 7.6 billion, is expected to increase to 8.6 billion by 2030, 9, 8 billion in 2050 and 11.2 billion in 2100.

The United Nations (UN), in the document entitled “The State of Food Security and Nutrition in the World-2017” records that, after a steady decline, for more than a decade, world hunger is once again on the rise, driven by by conflict and climate change.

### Hungry

In 2016, hunger affected 815 million people, or 11% of the world's population, and according to leaders, there is no way to end it by 2030, unless all factors that undermine food security and nutrition in the world are tackled.

In a meeting with Brazilian businessmen, the FAO representative presented an analysis of the evolution of demand for food. According to him, in 2050 the world population will be 29% bigger than the current one, and the biggest growth will be in developing countries. About 70% of the population will be urban and income levels will be higher than the current ones (?). To feed this larger urban population with more resources, food production will need to increase by a staggering 70%.

Cereal production will need to increase to three billion tonnes per year from the current two and a half billion tonnes, and meat production will need to increase by more than 200 million tonnes/year.

Brazil will be one of the main, or the main country responsible for meeting this demand.

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**F**or the United States Department of Agriculture (USDA), with the globalization of the economy, the reduction of sanitary barriers and the increase in trade between countries - the specialist, PhD, Carlos Alberto Magioli draws attention - there is an increase in the risk of the international exchange of etiological agents of diseases transmitted by food, making the control of these products of great importance, starting with inspection and official veterinary services at the borders. This is considered a good defense strategy against the entry of diseases. Based on this concept, it should be considered that border veterinary services, due to the territorial dimensions of Brazil and the extension of its border strips, assume greater importance as a guarantee of maintaining the zoo and phytosanitary "status", for production and export of food.

For the FAO (United Nations Food and Agriculture Organization), imports of agricultural products by Brazil are subject to sanitary and phytosanitary norms, and the Brazilian system is based on risk analysis, which takes into account the origin and characteristics of product.

## **VIGIAGRO**

The International Agricultural Surveillance System of Brazil (VIGIAGRO), subordinated to the Ministry of Agriculture, Livestock and Supply, acts on international barriers, being responsible for the control

and inspection activities of the international transit of animals, vegetables and agricultural products.

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**B**razilian agribusiness, as highlighted by Professor Carlos Alberto Magioli, PhD from the Academy of Veterinary Medicine in Rio de Janeiro, Brazilian agribusiness, accounting for 22.5% of the Gross Domestic Product (GDP), 36.4% of exports and 37 .0% of direct and indirect jobs, represents the great force of the development of Brazil.

### **The strength of business**

The strength of the business community to invest in primary production, in the field, with the certainty that each harvest will produce more and better, and in industrial processing, with a modern industrial park of products of animal and vegetable origin, is worthy of pride and efficiency to the disposal of the Brazilian and global consumer. Allied to all this, as springs that drive progress, are research institutions, public and private, with trained technicians, with the aim of developing advanced technologies.

### **Government structure**

The governmental structure, at its different levels, directly or indirectly linked to agribusiness matters, is a kind of guide, acting in aspects related to the inspection of the quality of products, in addition to general policies, in what is within its constitutional competence.

## Edino Camoleze

**“B**razilian agribusiness is one of the biggest in the world, and the biggest in Latin America, competing with the United States, the European Union and China, in the global leadership of food production”, highlights consultant Edino Camoleze, from the Brazilian Academy of Veterinary Medicine.

Brazil has 22% of the world's arable land, corresponding to an area of 851 million km<sup>2</sup> of useful land. About 101 million km<sup>2</sup> correspond to unexplored lands.

In addition, the country has a high digital technology platform, human resources and agricultural mechanization, which makes Brazilian agribusiness a modern, efficient and competitive activity in the international market.

### **Productivity**

Currently, Brazil uses around 64 million hectares of soil for agriculture, with grain production varying around 190 million tons per year. But, with the use of idle land, this volume could reach 300 million tons per year.

Brazil has commercial relations with more than 150 countries, from all continents, among which China, the United States, Argentina, the Netherlands and Germany stand out.

Agribusiness accounts for around 20% of the national GDP.

Many natural resources explored throughout the national territory are still commercialized in the form of raw material, with little added value.

## Evaristo Eduardo de Miranda

**D**octor in Ecology and researcher at Embrapa Territorial, he says that the definition of nature conservation units varies greatly between countries, and includes several categories of protection.

The natural parks of Europe, for example, are analogous to the environmental protection areas (APAs) of Brazil, where human presence and economic activities are possible.

Protected areas in Brazil have made enormous progress since the enactment of the Federal Constitution in 1988. Until then, there were 248 nature conservation units (UCs). They occupied an area of 10,859,861ha, or 23% of Brazil. In 30 years, that number has been multiplied by about eight. Currently, there are more than 1,800 UCs, including Environmental Protection Areas (APAs). The UCs occupy 18% of the area of Brazil.

## Francisco Turra

**A**s highlighted by Francisco Turra, former president of the Brazilian Association of Animal Protein, and former Minister of Agriculture, agribusiness is the biggest brand of the Brazilian economy, with recurring production records, historical sequences of surplus, in the trade balance, and the leadership in the export of several cultures, such as; sugar, coffee, orange juice, soy, beef and chicken.

The sector is also responsible for more than a third of the country's jobs, that is, the hope and reality of thousands of Brazilian families is in the countryside.

### **Activities**

Agricultural activities, in all their stages – from production to distribution – reflect a Brazil that is renewing itself, without losing its vocation to feed the world. Our share is among the 20 largest markets, with 6.9% of world agricultural trade. Shipments in the segment total, on average, US\$70 billion per year, out of a total of US\$1.1 trillion imported. All over the world. We also have the highest net revenue among all exporting countries, according to the World Trade Organization (WTO).

### **Sustainability**

Contrary to what many think, we are also an example of sustainability. Brazil has 66.3% of its territory preserved – against 9.7% in Central America, 7.6% in Africa, 5.6% in Asia, and only 0.3% in Europe.

Our environmental laws are among the strictest in the world, as well as the regulation, inspection and standardization of pesticides, which is carried out by the Ministry of Agriculture.

## **Technology**

Thanks to technology and training, it is now possible to produce more with much less.

A producer who 50 years ago fed 26 people alone, currently feeds 155. According to the National Supply Company (CONAB), the productivity of Brazilian agriculture, measured by the average of kilos/hectare, has increased by more than 200% in the last 30 years. years, from 1,258 kg/ha to 3,844 kg/ha.



## **Luiz Carlos Correa Carvalho**

**T**he President of the Brazilian Agribusiness Association (ABAG) predicts, for the next 20 to 30 years, “still accelerated with an effective increase of about two billion people in urban areas, important socio-environmental impacts for the physical limits of the Planet. The importance of food security as a priority for each country will grow, as will the world trade in energy and food commodities, among others.”

### **The weather**

The international climate agreements in force will be factors in increasing pressure on the use of natural resources, bringing another wave of global concern about issues involving the process of urban concentration, and the need for greater supply in the face of growing demand for commodities. agricultural and mining industries all over the world.

### **The international bodies**

“Analysis by international organizations” – informs the ABAG President – “such as the United Nations (UN), and the Organization for Economic Cooperation and Development (OECD), indicate, in great detail, their growing concern with the years to come, given the average increase in global per capita income, generating an increase in the consumption of products derived from biomass, in addition to actions aimed at reducing fossil carbon emissions, with greater use of renewable energies.”

The inexorable process of globalization, “which today is undergoing an attempt to weaken, with populist actions, even from the developed world, will remain active and more involving, even for the reasons mentioned in this text, which will also accelerate processes of important changes.”

## **Brazil's role**

“Brazil must prepare itself to be a fundamental part of the food and energy security of countries with strong limitations in natural resources, not only because it is very rich in them, but above all because of its technological development of tropical agriculture, its strong presence in the international market, even with all the barriers of this market, and, without a doubt, due to the high competitiveness of its private productive sector.”

## **Marcelo Vieira**

**A**ccording to the former President of the Brazilian Rural Society, Brazil is today one of the main food suppliers on the planet, being the largest net exporter, with an extraordinary growth potential.

With the growing demand in the world market for income growth, in emerging economies, which are unable to significantly expand their production, it will be very important for the planet's food security that Brazilian production continues to expand at the pace observed in recent decades.

### **The expansion of Brazilian agriculture**

Brazilian agriculture is, in most of its products, a relatively recent activity. Until the 1960s, there was basically subsistence agriculture in the interior, with few products destined for the foreign market, such as sugar, one of our first export items, and coffee, of which Brazil is the main supplier of the market. world, two centuries ago.

In addition to these niches, until the 1970s, there was no technology developed to produce the main elements of the world chain in the tropics.

### **The Green Revolution**

It brought new technologies, which took farmers from traditional regions, mainly in the South, to more tropical areas, where they learned to work in a biome where, until then, grains and oilseeds had never been produced: the Cerrado. These regions had been partially developed, based on a policy of occupation of the territory, initiated by Marechal Rondon, in his March to the West – strategic to bring settlers from other regions and attract investors interested in the real estate value of the land, without focusing on production. This led to the opening of most of these areas to extensive livestock, with some food

production poles on the best land, which generated a view, now outdated, that our agriculture is outdated and environmentally incorrect.

### **The production incentive**

With the reform that suspended taxation on exported products in 1996, there was a great incentive to expand production to supply the world market. Brazil then left a historical model of food imports to become the largest net exporter on the planet, and an important supplier to the world market. It is the largest exporter of coffee, sugar, soy, beef and poultry, orange juice and tobacco, as well as an important supplier of corn, pork and others. We are also the biggest producers of biofuels that most reduce the emission of harmful gases. Our sugarcane ethanol, for example, reduces this type of emissions by 90% when compared to gasoline, being the largest producer of bioenergy, which represents eight percent of our energy matrix.

The intensification of livestock, the expansion of grain production, and other products, in underused pasture areas, and the introduction of new technologies, such as the Crop-Livestock-Forest Integration (ILPF), lead to a continuous increase in productivity, the which means that production still has great potential for growth.

# 'Brazil Has The Universal Currency Of The 21st Century: Food'

**Milton Thiago de Mello** - from the Brazilian Academy of Veterinary Medicine\*

**I**n the last centuries of the History of Humanity, some countries were holders of products that symbolize them and that I call the universal currency for its scope.

For example, in the 19th century, machines, in the 20th century, oil. And now, since the beginning of the 21st century and probably throughout it, FOOD.

It is well known that Brazil is the world's largest food producer. Thus, only now justifying the qualification of the world's breadbasket.

In the year in which two Centuries of Independence of Brazil are celebrated, it is opportune to point out that this condition of the largest producer of food, the universal currency of the 21st century, would allow the country to enjoy an economic condition very different from the current one.

We have not yet reached the point of taking advantage of the resources derived from such a privileged situation symbolized by the words: independence, science and sovereignty, which constituted the motto of the Annual Meeting of the Brazilian Society for the Progress of Science (of which I was one of the founders 74 years ago) .

The obstacles are known: misuse of resources, corruption, politics and bureaucracy. Fortunately, as happened in the countries of previous international currencies: machinery and oil, the food industry is learning to walk largely "on its own legs", thanks to large investors in agribusiness.

Some considerations are necessary to justify the fact that Brazil has the universal currency of the 21st century: FOOD.

Although obvious, it is convenient to point out that human beings, like all other living beings, have food as their basic need to survive.

In the course of human evolution, food types have varied in time and space.

In the 19th century it was MACHINES. They participated in transport, over short and long distances, symbolized by the locomotives and the looms, which manufactured the fabrics. Both locomotives and looms had England as their main stimulator, which spread railroads throughout its colonies and in the countries that imported and developed them. In the case of Brazil, which was almost an English colony in the 19th century, railroads were implemented in the main productive regions, to transport both raw material, mostly what is now called “commodities” such as wood (pau-brasil) , agricultural products (rubber, coffee, sugar), minerals (iron, manganese) and humans (farmers, settlers and slaves). English names abounded (Light, Bond, Great Western, Rio Improvement Company). Even in water transport (Amazon River). All these companies were led by the English and managed by Brazilian natives, most of them slaves. There was even an outline of the march to the West, in the case of São Paulo, to transport coffee, or sugar in the case of Pernambuco. Similar to the US phrase: Go West, youngman, “Go West, young man”.

As for the looms, the organization was similar and the fabric factories were born like mushrooms all over the world, including Brazil; with their English names. Even today, a sewing thread has a chain as its symbol.

Little by little, the hegemony of machines as a symbol was diminishing in parallel with their diffusion throughout the world. Thus, the end of the 19th century witnessed the decline of machines as the international currency of England that characterized the 19th century. And it paved the way for the symbol of the next century, some of the energy needed to run the machines, as well as wood from the colonies and fossil fuels.

In the 20th century the energy that was needed to move the machines symbolized by the locomotives and looms of the 19th century, as mentioned before, was represented by the burning of fossil fuels (coal, coal, oil), which had already started in the 19th century. Mainly one of them, OIL.

The first two decades of the present 21st century are ushering in the prevalence of the universal currency of the century, FOOD. And Brazil owns this currency.

At the same time, very serious events are altering the world's geopolitical balance: the COVID-19 epidemic and the War in Ukraine. They, however, do not significantly alter the number of inhabitants of the planet, which is increasing. Population that has to be fed.

In the transition from the 20th to the 21st century, from oil as a universal currency with US hegemony, to a new currency, food appears as this new currency with the inevitable leadership of Brazil, its largest producer today.

In a book published by the SNA (Sociedade Nacional de Agricultura) together with Antônio Alvarenga, in 2014, with the title Brasil: Potência Alimentar, the reasons for this apparently boastful title were stated.

This privileged situation parallels the existence in the country, at the beginning of the second decade of the 21st century, of 33 million hungry people, according to the official IBGE (Brazilian Institute of Geography and Statistics). This seems paradoxical, but it must be taken into account that, in the early 19th and 20th centuries, the social situation in England and the USA was similar to that in Brazil today. Evidently with the necessary corrections (“mutatis, mutandis”): slums, ghettos, hungry beggars in the streets, gang fights to control territories, police wars against bandits and vice versa, drug trafficking of those times. In the cases of England and the USA, add that two World Wars in the 20th century contributed to the increase in the hegemony of machines and oil and of its biggest holder, the USA.

The list of names of people and companies that have been incorporated into history, as entrepreneurs with little or no interference from Governments, for the prestige of machines and oil is very long. One

example is enough, in the case of oil: Rockefeller, Standard Oil. As for machines, Ford, General Motors, Boeing, with their cars and planes.

At the end of the 20th century and the beginning of the 21st century, a new type of machine was introduced: electronic paraphernalia but without the privilege of a country. Let's get back to food.

Which ones are Brazil leading? First, the ambivalents, which both sustain humans and animals that produce food for humans (meat, dairy, eggs, soy and corn). Then those that practically only feed humans, like coffee and sugar. Rice and wheat are fundamental as staples in the East and Europe but are cultivated on a smaller scale in Brazil, largely replaced by cassava.

The numbers are spectacular and increase annually for vegetables (soy, corn, sugar, coffee) and animals (meat, dairy, eggs).

The explosive growth of production and its export to the whole world takes its toll. Not only in terms of territory to be occupied for cultivation or breeding, but also in terms of inputs, including water and fertilizers. It is clear that the future is bleak in this regard and will be worrying throughout the century, as it is already visible. Those who travel through the interior of the country have the opportunity to see the green oceans of soy, corn, sugarcane and coffee crops, in addition to the fantastic cattle, swine and chicken creations, replacing the original vegetation as happened in Europe and the Midwest of the USA.

At this rate of growth, how will it be possible to make it compatible with the destruction of the environment? Only in the last few decades has the great cerrado biome (20 million km<sup>2</sup>) been practically destroyed, even in the confines of a northern region until recently unknown: MATOPIBA (Maranhão, Tocantins, Piauí and Bahia), the newest agricultural El-Dorado, after of the “arc of deforestation” in the Amazon: the borders of Mato Grosso, Amazonas and Pará.

Future – We are still at the beginning of the second decade of the 21st century. And humanity will continue to grow. Always in need of food.



To maintain the international currency of the 21st century, Brazil will need to increase its food production, as mentioned before, and at the same time reduce environmental destruction, including the always mentioned Amazon with its forests, including animals, rivers and indigenous people. Science must enter the scene. And it's already started.

In the case of animal protein, indispensable for human beings since the time of the caves (hunting and fishing), a new way of obtaining it is already in sight, avoiding the hypocrisy of creating billions of animals (cattle, swine, poultry, fish) , feed them, treat them well and kill them for food.

About 20 or 30 years ago, research was carried out with embryonic cells cultured in vitro that theoretically can give rise to an adult being. In international scientific jargon they were called stem cells or stemcells. A long discussion about ethical problems regarding its use involved even the Pope and the US president.

A few years passed, humanity continued to grow and the extraordinary increase in the population of animals producing essential animal protein continued to grow.

Once again, science intervened when, just over ten years ago, it was verified that cells from adult, non-embryonic animals could revert to the state of stemcells (stem cells) and give rise, when properly chemically "oriented", to various fabrics. They were called pluripotent.

A real gateway to the production of artificial meats of animal origin and not the so-called artificial meats obtained by the simple act of dressing up high-protein vegetables, used for millennia in human food (soy, peas, beans). In Brazil, the expression artificial meat for such products of plant origin is prohibited by law.

The possibility of obtaining artificial meat from pluripotent cells has stirred up the meat industry and big billionaires. It also gave environmentalists hope: It will be possible to obtain real artificial meat industrially, on a large scale. No more raising billions of animals to eat them. When this possibility is mentioned, the food-producing animal

husbandry industry shudders, veterinarians stir, and even lay people worry.

As mentioned before, big billionaires are investing in the sector. Replacement will not be instantaneous. There are eight decades to go until the end of the 21st century, when Brazil's hegemony will end, with its international currency, FOOD. And its billionaires will engage in a new theme: the currency of the 22nd century.

Of course there will be a lot of discussion and a lot of opposing opinions. In the US alone, the issue raised the ire of the entire animal protein production chain. And in Brazil it will be no different.

To conclude: It is necessary for Brazil to make good use of its international currency, including feeding those who are hungry.

\* He was a consultant to the UN, a professor in the United States and in several countries in Central and South America and a member of several international academies.

## **Roberto Rodrigues**

Roberto Rodrigues was the Minister of Agriculture of Brazil, and is Coordinator of the Agribusiness Center at Fundação Getúlio Vargas (FGV), FAO's Special Ambassador for Cooperatives, and President of LIDE Agronegócio.

**A**ccording to Rodrigues, there is no doubt that one of the greatest challenges facing humanity in the 21st century is to make the supply of food and energy compatible with the entire population of the Planet, without destroying natural resources. There is also no doubt that Brazilian agribusiness has a prominent role in this scenario. To confirm this, just go back to the USDA study, showing that in the next 10 years, the world food supply will continue to grow and that Brazil is the country that can increase its production the most, with a projected growth of more than 40%, which is practically double what the world could achieve. In fact, since the beginning of this decade, the UN has been publishing a study according to which, by 2050, when the global population will exceed 9.3 billion people, it will be necessary to increase food production by more than 50%.

### **Maintenance of world peace**

Interesting is the fact that the UN is concerned with food security. Behind this is, of course, an obvious concept: the UN has an explicit responsibility to defend and maintain world peace, in which, by the way, it has faced difficulties. But he knows that there will be no peace where hunger reigns, so food security is also the security of peace. Recent proof of this is the tragic migrations of Asian Africans, and from the Middle East to Western Europe, in search of food and work, which they cannot find in their countries of origin because of the wars.