



**BRAZIL:
FOOD SECURITY
AND
SUSTAINABILITY
FOR THE FUTURE
OF PROTEIN
PRODUCTION**

Brazil: Food security in a sustainable and responsible way!



Brazil produced 13,2 million tons of chicken meat in 2019. The country is the second largest producer and also the largest world exporter, representing 35% of the world trade of chicken meat. Of the total production of Brazilian chicken meat, 69% is destined for domestic market and 31% is exported to 150 countries, feeding in average 396 million of people per year.¹

¹ Brazil is self-sufficient to meet internal consumption and also exports to feed 186 million people per year in other countries.



13.2 million tons

Brazilian chicken production

69% Domestic Market

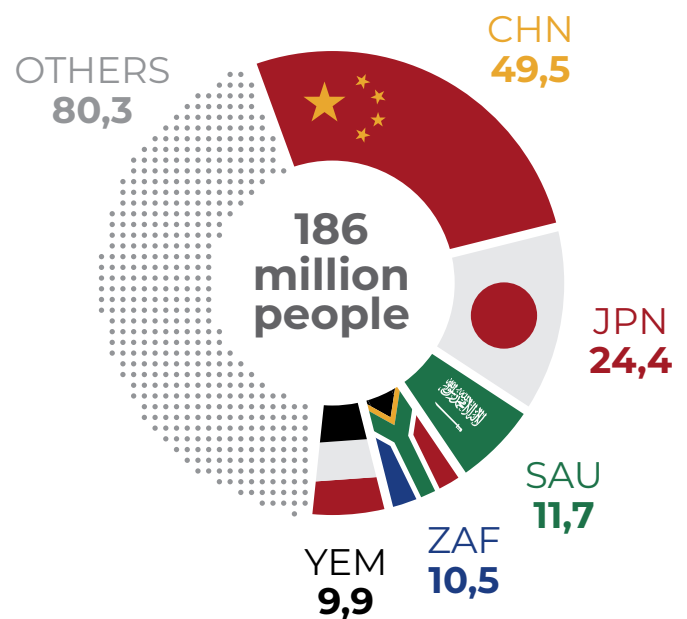
31% Export



Can Feed



Can Feed



Source: Comexstat and USDA (2019)

Chicken meat and pork are one of the most complete foods in terms of nutrients required for a healthy diet. Besides an important source of protein, they also provide all the amino acids essential to a healthy nutrition. Also, they are the main sources of calcium and vitamins A, B12 and D, **the last two are not found in plant sources.**





4.1 million tons

Brazilian pork production

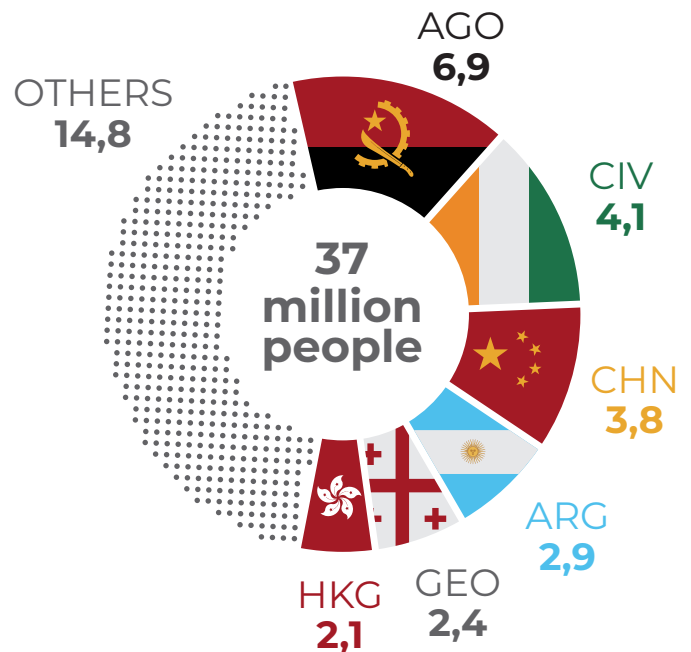
82% Domestic Market

18% Export

Can Feed



Can Feed



Source: Comexstat and USDA (2019)

Regarding pork, Brazil is the fourth largest producer and exporter (representing 8% of the world trade of pork) in the world. The country produced 4.1 million tons in 2019. Of this, 82% is destined for domestic market and 18% is exported to 90 countries, feeding in average 247 million people per year around the world.





Chicken

28g Protein

5,8g Fat

9,8mg Vitamins

Minerals

K 229 mg

Na 75 mg

Mg 29 mg

Zn 1,5 mg

Fe 0,9 mg

Cu 0,04 mg

Mn 0 mg

Amino acids

Histidine 0,8g

Isoleucine 1,3g

Leucine 1,9g

Lysine 2,1g

**Methionie +
Cysteine** 1g

**Plenylalanine +
Tyronise** 1,8g

Threonine 1,1g

Tryptophan 0,3g

Valine 1,2g



Pork

29g Protein

16g Fat

6,2mg Vitamins

Minerals

K 0,08 mg

Na 0,9 mg

Mg 28 mg

Zn 0,01 mg

Fe 312,3 mg

Cu 60 mg

Mn 2 mg

Amino acids

Histidine 1g

Isoleucine 1,2g

Leucine 2,1g

Lysine 2,4g

**Methionie +
Cysteine** 1g

**Plenylalanine +
Tyronise** 2g

Threonine 1,2g









Tryptophan 0,3g

Valine 1,4g

Source: UNIFESP (2019)¹





¹Paulista School of Medicine, UNIFESP. Available at < <http://bit.ly/36RBAQV>>

Additionally, chicken meat and pork are the food with more protein per gram of product and less calories. In order to have around 50g of protein (in a recommended diet of 0.75 grams of protein/kg of body weight) only 179 grams of chicken meat or 172 grams of pork is needed, while for pea or lentil it is necessary more than 500 grams.

| | | | | |
|---|---------------------|-----------------------|-----------------------------|-------------------------------|
|  | Chicken meat | Protein 50g | Calories 398 Kcal | 179g of prepared chicken meat |
|  | Pork | | Calories 471 Kcal | 172g of prepared pork |
|  | Soybean | | Calories 521 Kcal | 301g of prepared soybean |
|  | Corn | | Calories 540 Kcal | 500g of prepared corn |
|  | Lentil | | Calories 644 Kcal | 556g of prepared lentil |
|  | Chickpea | | Calories 932 Kcal | 568g of prepared chickpea |
|  | Pea | | Calories 778 Kcal | 926g of prepared pea |
|  | Eggs | | Calories 567 Kcal | 397g of prepared egg |

The cost of a diet based on the recommended needs of protein is lower if considers meat sources as pork and chicken meat compared with only vegetable sources. Depending on the country of reference, a diet based on chicken meat or pork to satisfy the protein needs may range from \$ 15.9 to \$ 61.7 per month, while in a vegetarian diet these costs range from \$ 48 to \$ 270, which is approximately 3-5 times more.

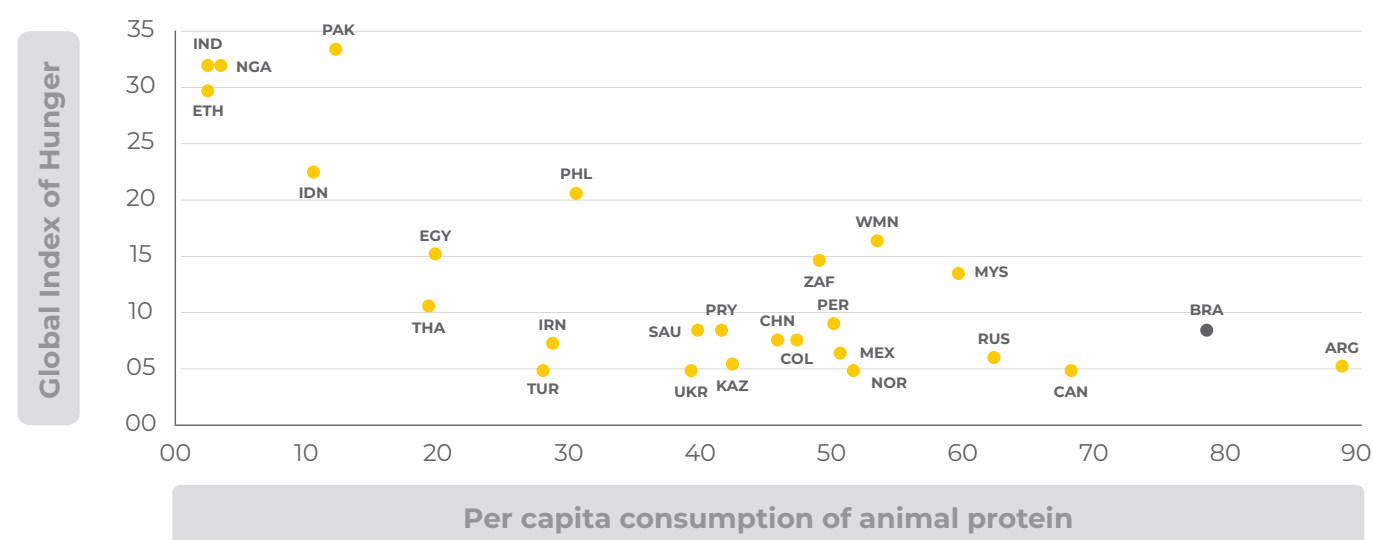
Table 1. Average prices to consume the human needs protein amount from each source in selected countries (US\$/month)

| | Pork | Chicken meat | Soybean | Corn | Lentil | Chickpea | Pea | Eggs |
|---|-------|--------------|---------|--------|--------|----------|--------|-------|
|  | 25,97 | 15,91 | 118,37 | 48,00 | 58,33 | 138,07 | 202,78 | 20,24 |
|  | 41,17 | 40,07 | 84,04 | 193,50 | 150,00 | 129,55 | 116,67 | 33,33 |
|  | 61,71 | 17,14 | 48,80 | 88,50 | 123,33 | 80,11 | 111,11 | 11,90 |
|  | 59,69 | 45,80 | 84,04 | 118,50 | 270,00 | 112,50 | 111,11 | 33,33 |

Source: Based on data from local supermarkets, UNIFESP and carterwings¹

The meat is an important nutritional source, especially to poor countries. There is a correlation between per capita consumption of animal protein and hunger index. The countries with smaller per capita consumption of animal protein are those with higher hunger index.

Figure 1. Global Index of Hunger versus animal protein consumption (per capita)



Source: OCDE, Global Hunger Index and PNUD (2019)

¹ Caterwings. "Meat price index-USD". Available at <<http://bit.ly/36yRFds>>

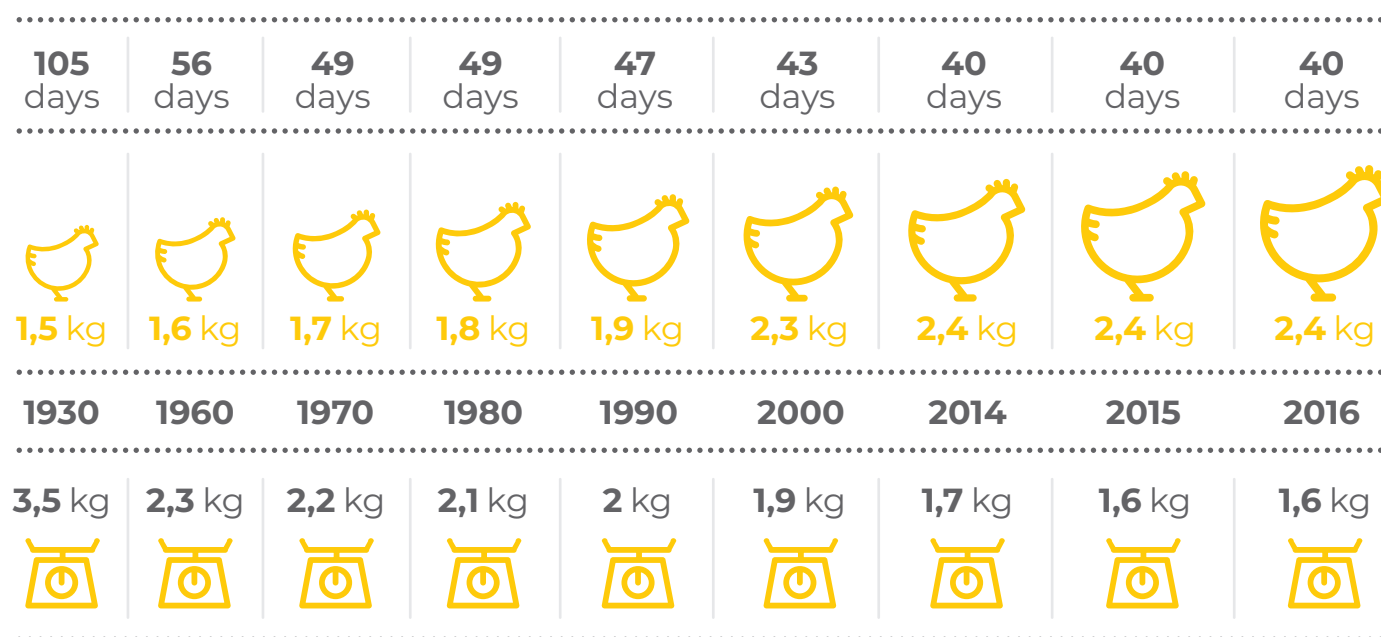
The sustainability of Brazilian chicken and pork production

Brazil has been showed that it is viable to increase the production of chicken and pork with sustainability. Through an increase in productivity and good practices promotion, it is possible to reduce carbon footprint and increase the animal welfare.



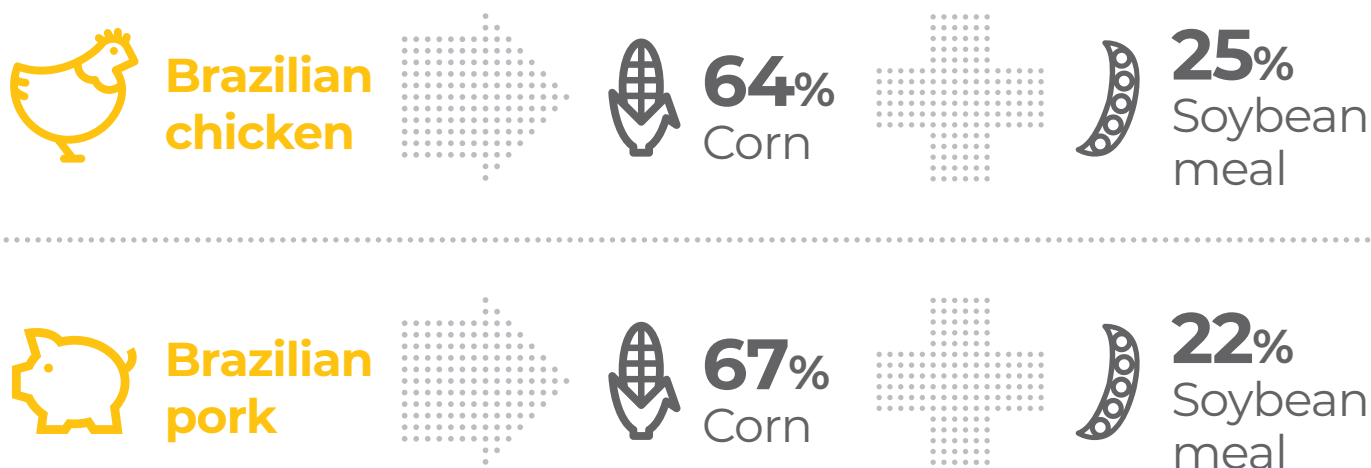
Efficiency gains

Over the years the chicken production chain has achieved real efficiency gains by reducing slaughter time, increasing weight and feed conversion, enabling productivity gains and cost savings for the producers and generating more food.



Source: Based on ABPA (2017)

Besides that, the input for feed production has also become more sustainable. The chicken and swine feed is mainly composed (about 90%) of corn and soybeans. The corn represents more than 60% of the feed and soybean between 22% and 25%.

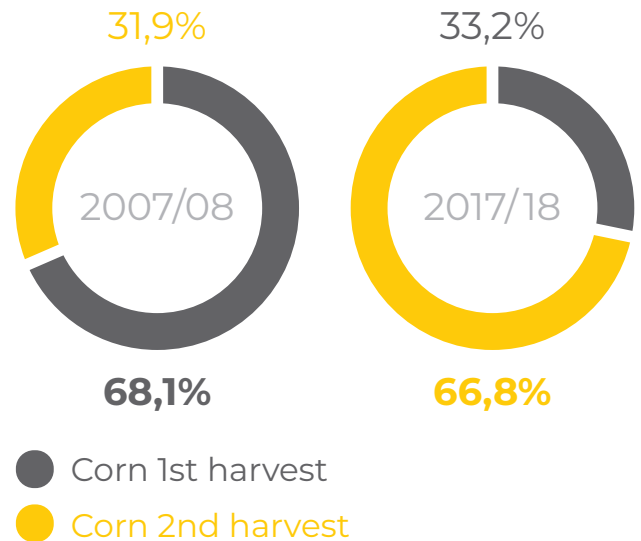


Source: Based on Sindirações (2019)



2nd Crop

In recent years, corn harvesting has been mostly cultivated as a 2nd crop, where corn production is planted after soybean harvest, in the same area, as a winter crop. This fact shows that is not necessary to open new areas for corn expansion. Besides, integration is important for soil health and to control erosion through no tillage system.



The Amazon

The Soy Moratorium was an effort by soy traders to reduce deforestation in the Amazon biome, in which these industries don't buy soy from deforested areas in the Amazon, including legal deforestation. After the signing of the Soy Moratorium in 2006, the average deforestation in Amazon biome decreased from 21.7 Mha to 8.3 Mha, representing an approximate reduction of 62% in this period.



The Cerrado

At the Cerrado biome, the soybean expansion occurred mainly over pasture areas, about 70%. The share of expansion over native vegetation decreased from 32% to 25% between 2000 and 2017.

a) GHG Emissions

The poultry industry is a sustainable production chain, since their emissions are relatively lower than compared with other countries. As a comparison, the Brazilian poultry industry emissions are 45% lower than compared to the British poultry industry. Besides that, total emission of Brazilian poultry industry are 9% less than UK, including transportation of Brazilian products to the UK.

Poultry's emission without transport (t CO₂-equivalent/tonnes)



1.20

Brazilian
poultry
emissions



2.20

British
poultry
emissions

Poultry's emission with transport (t CO₂-equivalent/tonnes)



2.57

Brazilian
poultry
emissions



2.82

British
poultry
emissions

Source: DEFRA (2008)

b) Animal welfare

The agroindustries have been concerned with animal welfare implementing good practices and optimizing animal management.

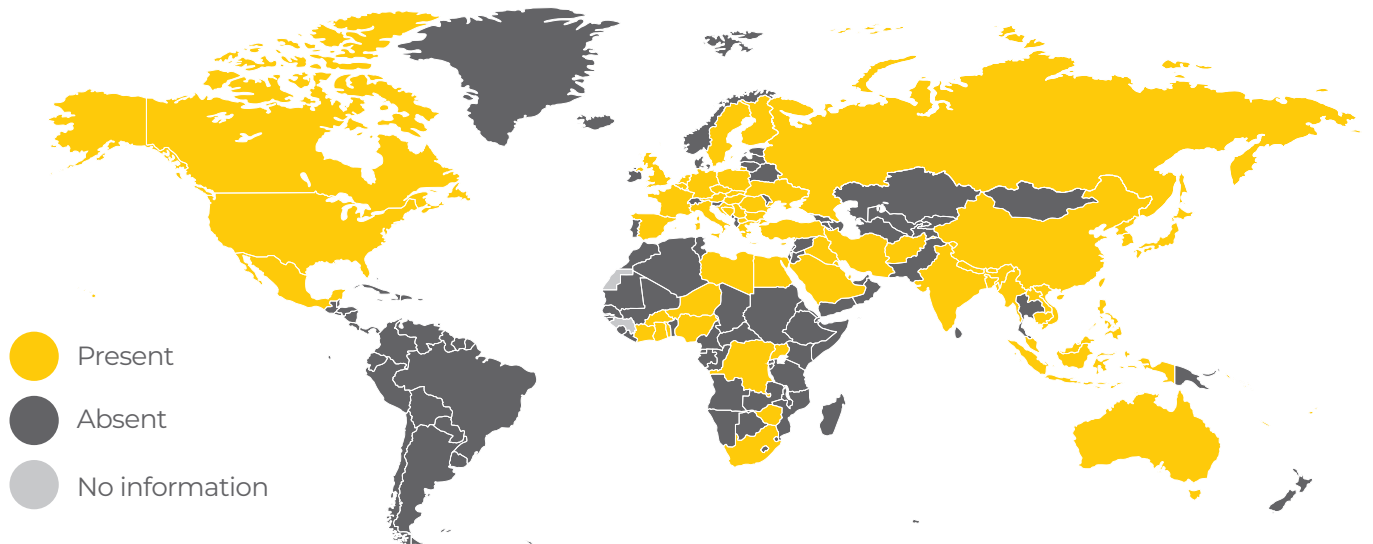
Poultry and Swine welfare

- Cleaning and organization of facilities;
- Proper ventilation and light adequate nutrition to each stage of life;
- Health care;
- Avoid unnecessary suffering to the animal;
- Transport and humanitarian slaughter;
- Adequate food to each stage of development;
- Proper cleaning of the environment;
- Natural light availability;
- Health care;
- Transport and Slaughter Care;
- Proper waste disposal.



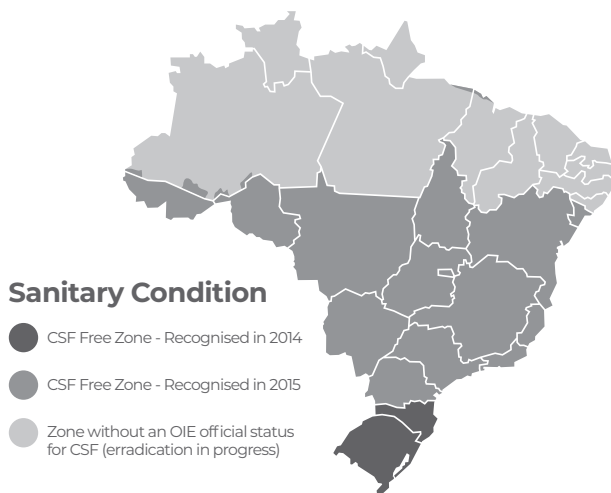
c) Sanitary Status

Brazil is a country free of Avian Influenza - adopting high surveillance over this disease which includes compartmentalization in genetics - with high level of biosecurity in production plants following OIE criteria.



Source: OIE (2018) ¹

¹OIE situation Report for Highly Pathogenic Avian Influenza". Available at < <http://bit.ly/2LTnwgP>>



Source: Brazilian Ministry of Agriculture, Livestock and Supply (2019) and ABPA (2019)

Currently, Brazil has 15 states and the Federal District free of Classical Swine Fever and the remaining 9 states are in the eradication phase. In 2016, a Working Group was set up to elaborate a strategy proposal for the eradication of classical swine fever in the states of northeastern Brazil. Moreover, Brazil is free of African Swine Fever, a severe viral disease that impacts swine production in Asia, Europe and Africa.

Sustainable Development Goals - SDG

Overall, the poultry and pork sector has made significant contributions to the country with regard to the 17 Sustainable Development Goals (SDGs), which includes global actions in different areas, such as poverty eradication, food security, agriculture, health, education, gender equality, reduction of inequalities, among others. Added to that, the Brazilian industry is working according to the International Poultry Council (IPC) guidelines towards prioritizing 5 SDGs: zero hunger, good health well-being, quality education, industry innovation and infrastructure, and, no less important, the climate action.

SUSTAINABLE DEVELOPMENT GOALS

NO POVERTY



4.1 million direct and indirect jobs in the poultry and pork sector. Real wages in industry increased by 34% from 2006 to 2016 and accounted for a gross production value of R\$ 77 billion in the field (R\$ 62 billion in chickens and R\$ 15 billion in pigs).

ZERO HUNGER



Production of 13 million tons of poultry, 45 billions of tons of eggs and 4 million tons of pork.

GOOD HEALTH AND WELL-BEING



Pork, chicken and eggs are important sources of protein, energy, amino acids, vitamin B3, B6 and B12, phosphorus, zinc and iron. Helps prevent cancer, reduce the risk of Alzheimer's, good cardiovascular health, and maintain good thyroid function.

QUALITY EDUCATION



Good nutrition is the base for physical and cognitive development. Paraná state (PR), Santa Catarina state (SC) and Rio Grande do Sul state (RS), concentrate poultry and pork production, where the number of illiterate producers decreased by 29%, while those that completed high school, increased by 48% between 2006 and 2016.

GENDER EQUALITY



Number of establishments with participation of women in cattle raising increased in the municipalities of RS, PR and SC, which concentrate herds of poultry and swine, by 18% from 2006 to 2017.

CLEAN WATER AND SANITATION



Reduction of water use in the agricultural phase due to productivity gain, slaughter age and feed conversion.

In the industrial stage, the adoption of water recycling, reuse and rainwater catchment systems.

AFFORDABLE AND CLEAN ENERGY



Use of biodigester for waste treatment and biogas generation.

GOOD JOBS AND ECONOMIC GROWTH



Real GDP per capita in the municipalities of RS, PR and SC that concentrate poultry and swine herds (with more than 1 mm of animals) increased 40% from 2006 to 2016.

INDUSTRY, INNOVATION AND INFRASTRUCTURE



Higher carcass yield slaughtered in the last 5 years (2013-2018), with growth of 4% for pork (85.9 kg to 89.1 kg) and 7% for chickens (2.22 kg to 2.37 kg) Automation in the industrial part.

CLIMATE ACTION



Each kilogram of chicken in Brazil is produced by emitting almost half of England's poultry CO₂, according to the UK's Department of Development, Rural and Food, DEFRA. In numbers, this means that one ton of Brazilian chicken emits 1.2 t CO₂ equivalent - in the United Kingdom this value is 2.2. If transportation is added, Brazil reaches 2.57, and the United Kingdom goes to 2.82.

PARTNERSHIPS FOR THE GOALS



ABPA, the association that represent the poultry and pork industry, has carried out continuous actions aimed at combating technical and sanitary barriers in several international markets, in order to promote exports and Brazil's representation in global trade.

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