

THE RISE OF BIG MEAT

Brazil's Extractive Industry



By Shefali Sharma, Institute for Agriculture and Trade Policy (IATP) and Sergio Schlesinger
November 2017

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Foreword and Acknowledgements

This report begins where IATP's Global Meat Complex: The China Series ended—the role that Brazil plays in ever increasing exports of industrial meat and feed grains to China and other countries. Since the 2000s, accelerated growth in consumption of animal protein in emerging countries, especially China, has driven the production of feed grains in Brazil. Moreover, Brazil is one of the largest producers, exporters and consumers of meat and feed grains in the world. This report charts Brazil's rise (through transnational corporations) to the top of the global meat complex.

The global meat complex, as IATP defines it, is a highly concentrated, horizontally and vertically integrated web of transnational corporations (TNCs) that control the inputs, production and processing of mass quantities of food animals. These TNCs play multiple roles. For instance, Cargill is a major producer of meat as well as a dominant grain trader that supplies feed grains for food animal production. Others are linked to TNCs that produce concentrated feed, additives and vaccines. The global meat complex is driven by a particularly relentless industrial model of meat production—striving to produce more, ever cheaper, kilograms of meat (through economies of scale and technological fixes) for ever greater profits for the corporations that fuel it. The complex continues to consolidate and expand at a tremendous cost to the social fabric and ecosystems where it operates. Because of its global nature, it also presents global environmental and public health challenges of the highest order, including the sector's significant contribution to climate change, antibiotic resistance and highly pathogenic strains of influenza and other viruses.

For several decades, foreign-owned transnational corporations have been dominant in Brazil's meat and feed grain production chains as some of the country's leading exporters. What is new in the past decade, however, is the creation of Brazilian transnational meat corporations with substantial financial support from the government. Our analysis, based on OECD-FAO projections, shows that Brazilian exports of poultry and beef may well increase by another 40 percent by 2025 and pork by nearly 30 percent. This is in addition to rising rates of meat consumption in Brazil—already one of the highest per capita consumers of all meat segments. In addition, soy

and maize exports in the coming decade will account for the bulk of production of these feed grains. This means that we must address the Complex as a whole—and not just within national borders.

In the last two years, Brazil's deforestation rate has started climbing again. Moreover, as IATP and GRAIN demonstrate in our ground-breaking publication, *Big Meat and Dairy's Supersized Climate Footprint*, four of the largest greenhouse gas emitters in the meat industry are Brazil-based. In addition to Brazil's JBS being the largest emitter of the industry, its staggering levels of production lead to 280 million tons of Co2 equivalent gases—nearly half of Exxon's emissions in 2015.

The complex hydrological processes that generate rain-clouds from the Amazon, fill up aquifers in the Cerrado and provide water for urban areas are being dramatically disrupted. Pasture, soy and maize are moving into areas outside of zero-deforestation areas with consequences not just for Brazil, but for the entire region. Climate change will compound these effects—with global implications given the importance of the Amazon. Industrial meat production and its consumption play a major role in these developments.

The OECD-FAO's projected growth rate for meat production, however, need not be a fait-accompli. Effective and timely government regulation, including the use of public procurement, sound international trade and investment policy, public awareness, natural events (unforeseen climate related catastrophe), price and currency fluctuations and other circumstances could lead to significant shifts in production, exports and consumption.

JBS and the other companies made headlines this year over graft and other malpractices. JBS CEO and controlling shareholders were arrested over charges of massive corruption. Given the formidable national and transnational power of agribusiness corporations headquartered and active in Brazil, strong coordination between Brazilian and international civil society is urgently needed. The need to bring together institutions that are already active on various fronts—such as social movements, trade unions, consumer, animal, environmental, and human rights organizations, public health associations and other non-governmental organizations

(NGOs) is an important first step. With this in mind, the Industrial Meat Chain workshop was held in Rio de Janeiro in September 2015 to initiate a dialogue among a cross section of these organizations. The workshop was co-organized by FASE, the Brazilian Network for the Integration of the Peoples (REBRIP), the Institute for Agriculture and Trade Policy (IATP), and the Heinrich Böll Foundation's Brazil Office with support from Bröt für die Welt.

As part of that process, Sergio Schlesinger wrote the first version of this report in 2015 in Portuguese. Since then, the industry has continued to grow. The 2017 edition is an expanded and updated version of the original report. It is hoped that these reports inform our collective actions as civil society in confronting these issues, no matter where we reside on this planet.

We are pleased to piece together yet another critical part of the global meat complex puzzle. As usual, the result could not have been possible without the support and insight of several individuals and organizations. IATP sincerely thanks Sergio Schlesinger for his expertise, Maureen Santos (HBS Brasil), Diana Aguiar (FASE), Leticia Tura (FASE) and Adhemar Mineiro (REBRIP) for their efforts and judgement in initiating this effort. Andre Campos and his team at Reporter Brasil deserve special thanks for the painstaking and often dangerous work they conduct to uncover the human rights violations associated with this sector. We appreciate our continued partnership. Christian Rousseau co-wrote the German executive summary of this report, enriching it with relevant information for Germany. Christine Chemnitz (Heinrich Böll Foundation) has also been a close ally and support in this work whose collaboration we value. Last, but not least, IATP staff including the communications team, deserve special appreciation as well as Sharae Gibbs and Brenda Alamilla for the graphics.

–Shefali Sharma, November 2017

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Commonly-used terms and acronyms

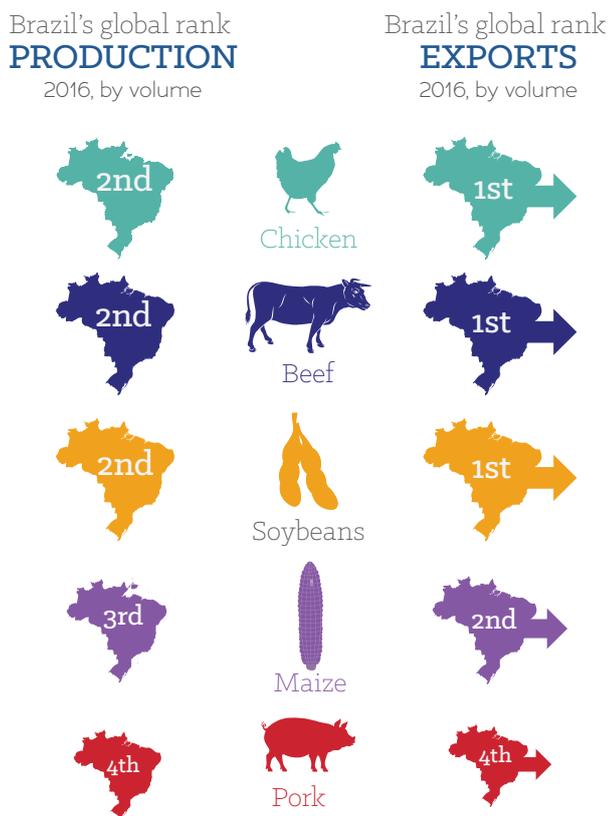
ABCs:	ADM, Bunge, Cargill and Dreyfus	Imaflora:	Institute for Agricultural and Forest Management and Certification
BNDES:	Brazilian National Development Bank (Banco Nacional de Desenvolvimento Econômico e Social)	INPE:	Brazil's National Institute for Space Research
BNDESpar:	BNDES Participações	Mapitoba:	The collective made up of Maranhão, Piauí, Tocantins, and Bahia
CSOs:	Civil society organizations	OECD:	Organization for Economic Co-operation and Development
Embrapa:	Brazilian Agricultural Research Corporation	PPO:	Public Prosecutors' Office
Fiesp:	Federation of Industries of the State of São Paulo)	Rebrip:	The Brazilian Network for the Integration of the Peoples
FAO:	Food and Agriculture Organization of the United Nations	SIF:	Sistema de Inspeção Federal
FASE:	Federation of Organizations for Social and Educational Assistance	SPS:	Sanitary and phyto-sanitary
IATP:	The Institute for Agriculture and Trade Policy	TNCs:	Transnational Corporations
		USDA:	U.S. Department of Agriculture

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Introduction: Brazil's Rise to the Top of the Global Meat Complex

Brazil is the world's leading exporter of soybeans; the second largest exporter of maize; and the world's largest beef trader, exporting more than 20 percent of the world's beef (Figures 1 and 2). It has overtaken the United States to become the biggest exporter of poultry in the world, close to 39 percent of total global exports. With China drastically increasing its pork imports in the last two years, Brazil has also stepped in to meet this demand. The massive expansion in production has had dramatic impacts on Brazilians linked to the supply chain and on Brazil's prized environment, and has additionally made Brazil increasingly dependent on these commodities to maintain a trade surplus.

Figure 1: Brazil's global production and export rank



Source: Information compiled from USDA/FAS <https://apps.fas.usda.gov/psdonline/app/index.html#/app/topCountriesByCommodity>, accessed February 8, 2017.¹

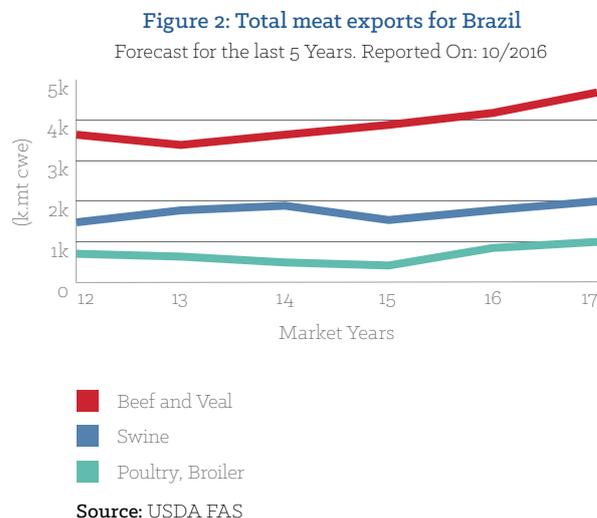
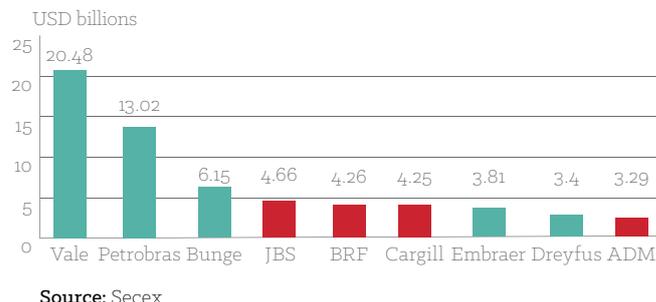


Figure 3: Brazil: the nine largest exporting corporations in 2014



Becoming a leader of the global meat complex has come with a stark increase in the concentration of power to a handful of transnational corporations (TNCs) at every step of the Brazilian meat production chain. This has been achieved in a short span of time—since the turn of this century—and consolidated in just the last ten years.

As Figure 3 illustrates, six of the nine largest exporting companies in 2014 were grain traders and meat packers. The other three, Vale, Petrobras and Embraer, are mining, oil and aeronautical industry giants, respectively. The rise of the meat industry has come with the help of the Brazilian government.

BRAZIL'S “NATIONAL CHAMPIONS” AND THE ROLE OF THE BRAZILIAN NATIONAL DEVELOPMENT BANK

From 2007 to 2013, the Brazilian National Development Bank (*Banco Nacional de Desenvolvimento Econômico e Social* [BNDES]) implemented the so-called National Champions policy. The idea was to select Brazilian exporting companies and transform them into large transnational corporations that bring home large revenues. The beneficiaries, which included some of the largest Brazilian meat packing corporations as well

as oil and mining corporations, absorbed two-thirds of the allocated BNDES resources. These “champions” included JBS-Friboi (known globally as JBS), Marfrig and Brasil Foods (BRF). These companies received large volumes of resources, not only through subsidized loans, but also through the purchasing of debentures and company shares through BNDES’s investment arm, BNDES Participações (BNDESPar). For instance, BNDESPar owns close to 25 percent of JBS’s capital while the Brazilian public bank *Caixa Econômica Federal* owns 10 percent.

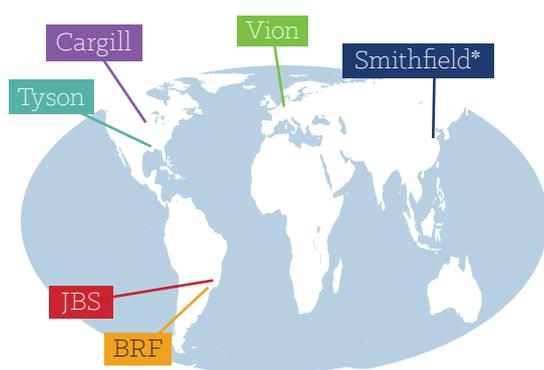
Frequent mergers and acquisitions and consolidation across several meat segments (beef, pork, poultry, etc.) and other parts of the value chain (feed, additives) are key to the meat industry’s strategy in increasing

National Champions and the Global Meat Transnational Corporations

The success of the National Champions policy is clearly visible today: JBS has left all other meat processors behind—becoming the largest meat company in the world and making USD 20 billion more in food sale profits than the U.S. giant Tyson Foods (the second largest meat TNC). BRF leaped from ninth place in 2011 to fourth in 2012, more than doubling its food sales, while Marfrig has managed to retain its position amongst the top ten despite brutal competition from a handful of other companies. For

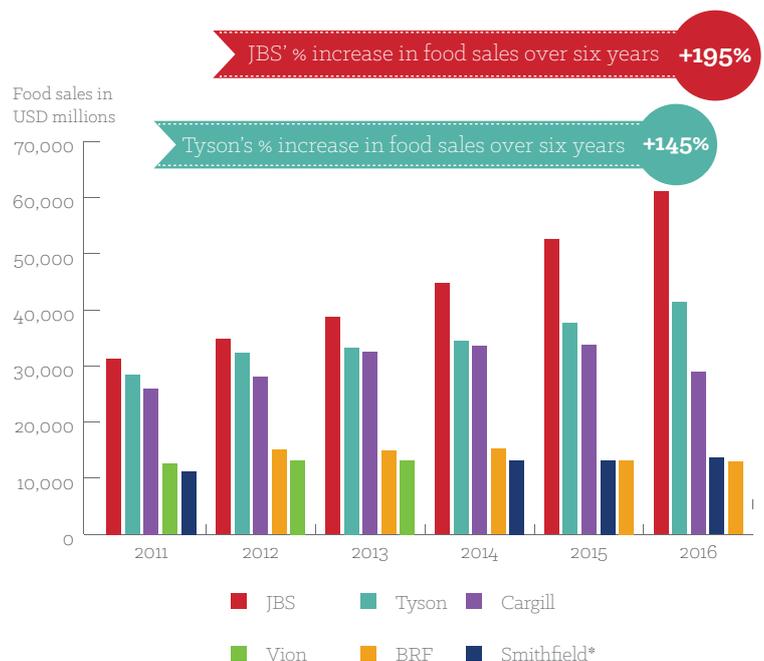
instance, the Chinese company Shuanghui’s acquisition of Smithfield (the conglomerate now known as the WH Group),² Japanese Nippon’s reformulation as NH Foods, and the emergence of the American OSI group have shuffled the global ranks of the top ten TNCs (see Appendix A). It is also noteworthy that the top three TNCs make far more than the others in food sales—illustrating the extreme oligopoly of the global industry. (Figure 4).

Figure 4: Top global meat processing transnational corporations



Headquarters for the top six global meat processing corporations as of November 2017.

Top global meat processing transnational corporations’ food sales over six years



*In 2013, Smithfield was acquired by the WH Group

Source: Compiled by IATP from Food Engineering Magazine’s Top 100 Food and Beverage Companies Annual List.³

profits. In this way, the companies used a large portion of BNDES resources to swallow up small businesses. They continued to rapidly amass power through further mergers and acquisition activities in key meat producing and consuming countries.

Brazil's trade policy already contributes to a path of dependency on exporting land-based, natural resource intensive commodities and importing much more expensive, value-added products with a high technology content. BNDES' use of public resources to exacerbate this trend makes little sense to many Brazilian civil society organizations (CSOs). While the National Champions policy has delivered massive profits to chief executives and shareholders of major corporations, many feel that taxpayers have gained little from large sums of public money being diverted to these large conglomerates.⁴ Instead, their dramatic increase in economic and political might has enabled them to operate above the law. For instance, last year, JBS chairman Joseley Batista was charged with corruption by Brazil's independent public prosecutor in connection to JBS' holding company, J&F Investimentos SA. In February of this year, federal prosecutors mandated that Batista's assets be frozen in connection to fraud related to J&F's involvement with state owned pension funds.⁵ Things continued to get worse in the course of the year (see Tainted meat and reputations).

JBS

JBS' value jumped from USD 1 billion in 2004 to USD 34 billion in 2014, as it expanded from beef to poultry and other products.⁶ JBS now boasts of owning 340 operations that produce products ranging from meat and leather to biodiesel and metal packaging and cleaning.⁷ It is the world's largest exporter of meat, selling to over 150 countries. In the U.S., it is the leading processor of beef, pork and lamb and the second largest poultry producer; it is also the leading beef producer in Canada and the largest cattle-feeder in the world.⁸ It additionally has operations in Argentina, Australia, Mexico, Paraguay and Uruguay.

JBS, in particular, has mastered the art of growth through mergers and acquisitions. In 2013, JBS acquired Seara, the second largest chicken and pork processing company in Brazil. Previously, Marfrig had bought it from Cargill in 2009. In 2015, JBS bought Cargill's largest pork facility in the U.S., and in Europe, it acquired Moy Park, one of the largest European poultry and processed food facilities that belonged to Marfrig.⁹ In Brazil, it also acquired the French subsidiary Frangosul (owned

Tainted Meat and Reputations

JBS had plans to move its headquarters to Ireland in 2016 before BNDES quashed them. The move would have helped JBS avoid taxes in addition to consolidating its presence in the European food market. It then announced plans to launch USD\$1 billion of shares in New York and move the management of its international operations to the Netherlands, while retaining its beef operations in Brazil.¹¹ In March 2017, all four Brazilian beef majors—JBS, BRF, Marfrig and Minerva—were embroiled in a major food safety scandal that reverberated around the globe. "Operation Weak Flesh"—as the Brazilian probe was called—revealed that these global players had bribed health officials into approving the sale and exports of contaminated meat.¹² It was reported food safety inspectors were bribed to allow exports of tainted meat products—including practices such as adding chemicals to meat to conceal rotting odor, adding pigs' heads to sausages, and adding cardboard to processed poultry as filler.¹³

Several regions, including China and the EU, temporarily banned products entering their markets and company shares took a dive. Even as JBS was struggling to move past this scandal, in May 2017, JBS's controlling shareholders Joseley and Wesley Batista reportedly admitted to Brazilian special prosecutors that they paid bribes to nearly 1,900 politicians (including the current and past Brazilian presidents) to acquire companies worth up to 20 billion USD in assets. They reached a record breaking leniency deal agreeing to pay 3.2 billion USD in fines.¹⁴ In the ensuing months, JBS sold its assets in Paraguay, Uruguay and Argentina to pay for the fines, while Brazilian producers saw the biggest decline in cattle prices in 20 years.¹⁵

In September of this year, the two Batista brothers were arrested because they were found to have engaged in insider trading in the run up to the leniency deal. JBS has since named Jose Batista, the 84 year old founder and father of the two implicated in the crimes, as the new CEO.



by Doux) and the U.S. subsidiary Tyson Brazil (from Tyson Foods).¹⁰ JBS' expansion into other exporting countries has allowed the company to avoid food safety restrictions imposed on Brazilian exports—also known as "non-tariff barriers" or sanitary and phyto-sanitary (SPS) restrictions. Frequent outbreaks of Foot and Mouth Disease and other zoonotic diseases in Brazil continue to impose barriers on Brazilian exports. As JBS's foreign investments have grown, such as in the U.S. and Australia, it has allowed the company 50 percent of the world market that would have otherwise remained closed had it remained only in Brazil.

BRF

Corporate concentration in the Brazilian poultry processing sector increased significantly when BNDES financed the merger of two Brazilian giants in the meat processing and frozen foods sector, Sadia and Perdigão, in 2009. Pension funds of two large state enterprises—Petrobras Social Security Foundation (12.49 percent) and the Banco do Brasil Employees' Pension Fund (10.94 percent)—are BRF's largest shareholders.

The company is now the largest international exporter of chicken (20 percent of global exports and nine percent of global trade in animal protein) and the seventh largest food corporation in the world, according to its annual report.¹⁶ Unlike JBS, BRF's key strategy entails the acquisition of small companies in emerging economies that have significant potential for increasing meat consumption.

BRF owns Plusfood in Europe—a poultry processor with plants in England and the Netherlands that sells to major supermarkets in Europe.¹⁷ In 2014, the company expanded its processing plants in Argentina, which now produce poultry, margarine, cheese and beef.¹⁸

Its recent acquisitions in the Middle East and Turkey have also allowed it to become a major processor of halal meat for Islamic markets. In January, BRF consolidated its production of halal meat destined for Islamic countries under a new subsidiary in Dubai called OneFoods. This includes transferring the assets of eight slaughterhouses in Brazil that must export using halal production standards along with grain storage facilities, chicken hatcheries and feedmills.¹⁹ One of the first actions of this new subsidiary was to acquire a 60 percent stake in Banvit, Turkey's largest poultry processing company. The Qatar Investment Authority (a Qatari Sovereign Wealth Fund) will own the remaining 40 percent.²⁰

Marfrig

Marfrig states that it is the second largest beef operator in Brazil, the largest beef processing company in Uruguay, and the largest importer of meat in Chile. With a physical presence in 12 countries and its processed products in over a 100, the company boasts of processing up to 3.8 million head of cattle and 2.3 million head of sheep a year.²¹ Through its ownership of Keystone—one of the largest international suppliers of industrialized foods to large restaurant and retail

chains such as McDonald's, Subway and Wendy's—it also processes 250 million birds and manufactures 580 thousand tons of food every year.²²

CONCLUSION

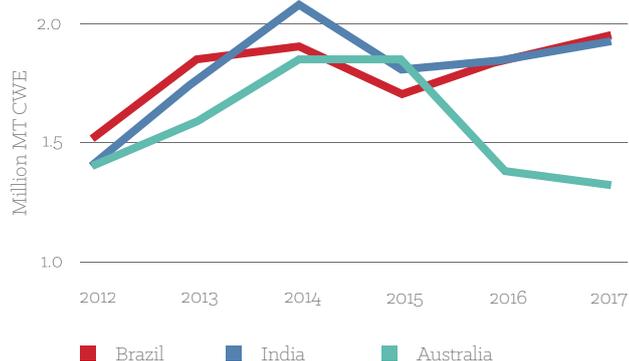
The Brazilian government's initiative to create National Champions has undoubtedly helped JBS, BRF and other corporations rise to the top of the global meat complex. It is also clear that this support has led to enormous profits for the CEOs and shareholders of these companies. From an economic development perspective, there is no compelling evidence that the capital used to acquire meat processing companies abroad and the resulting profits has benefited Brazilian citizens. Moreover, as we shall see in the following sections, the rest of the Brazilian population—as well as others around the globe—have been forced to bear the social and environmental costs of their rise.

Chapter 1: Brazil's Hoofprint

WHERE'S THE BEEF?

Beef production and consumption are highly concentrated in a small number of countries. Together, Brazil, India, Australia, the U.S. and New Zealand account for over 73 percent of beef sold on the world market. India had been the leading exporter since 2012; however, Brazil edged past India for the first time in 2016 (Figure 5) in exporting the most beef. In spite of Brazil's dominant role as an exporter, more than 80 percent of beef produced in the country is sold in the domestic market. It is the second most popular choice of meat (after chicken) for Brazilians. Globally, Brazil is second only to the United States in production.

Figure 5: Brazil Overtakes India and Australia as Top Global Exporter



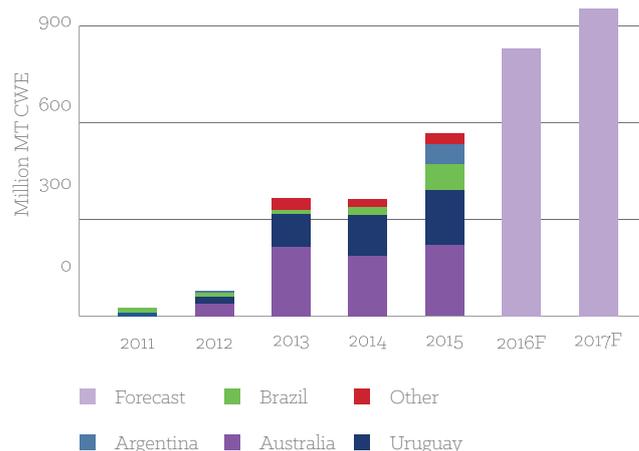
Source: Reproduced from: USDA FAS October 2016. Livestock and Poultry: World Markets and Trade, October

WHO IMPORTS?

In addition to the U.S. and Russia, three Asian countries (China, Japan and South Korea) import a significant share of beef.²³ In the last five years, China has emerged as the second largest importer of beef in the world. In 2016, China's beef imports increased by 50 percent from the previous year—Brazilian beef accounted for nearly all of it. Chinese imports rose sharply after 2011 with Australia as the lead supplier. However, since China approved imports from Brazil and Argentina in 2015, Latin American countries are poised for much greater exports to the nation. The USDA forecasts that China will increase its imports by another 15 percent in 2017,

largely benefiting Brazil, Uruguay and Argentina due to their relatively weaker currencies when compared to Australia (Figure 6).²⁴

Figure 6: China's Beef Imports Surge, Imports from South America Benefit from New Market Access



Modified from: USDA FAS Livestock and Poultry: World Markets and Trade, October 2017
Source: USDA / FAS / PSD and IHS Markit - Global Trade Atlas; Year-to-date trade through August 2016.

THE CHANGING FACE OF BEEF PRODUCTION IN BRAZIL

Over half of the cattle in the world is concentrated in just two countries: India and Brazil. Extensive cattle raising occupies 200 million hectares of land in Brazil and, not surprisingly, is a major cause of the country's land use change-related emissions (see chapter 4).

Brazilian cattle is raised mainly on grazing land. Today, there are over 215 million head of cattle, which surpasses the Brazilian population of 210.6 million people.²⁵ This year, the number of cattle in confinement (i.e. in feedlots rather than pasture) is expected to surpass four million—this is less than two percent of the total cattle herd.²⁶

Unlike the chicken and pork sectors, small and medium-sized beef producers are not vertically integrated with Brazilian meat packing corporations. They

purchase their inputs and sell their products independently. The last Agricultural Census noted that 2.7 million farms, or about two-thirds of all farms, owned at least one head of cattle in 2006.²⁷ The concentration at the hands of the large meat corporations affects cattle raisers, whose bargaining power is weakened when the number of buyers drops.

In 2006, the key actors making up the cattle production chain were a very heterogeneous group; they ranged from cattle ranchers with high levels of capital to resource poor small farmers, and meat processing plants using high levels of technology capable of meeting large international orders to slaughterhouses that barely met minimum sanitation requirements.²⁸ This situation has rapidly changed since the implementation of the National Champions policy.

In 2008, there were 750 meat-processing plants in the country. But, by 2015, more than 600 small and medium-sized meat plants operating in the country were in danger of disappearing, according to Associação Brasileira de Frigoríficos (known as Abrafrigo), the Brazilian beef industries' association.²⁹ This is "due to the brutal domination established in the sector in recent years which continues to grow stronger."³⁰ As a result, the concentration of cattle slaughtering in the hands of the three largest meat corporations rose exponentially. Together, these corporations' share went from 14.3 percent in 2006 to 48.3 percent in 2013. JBS experienced the highest growth in this period: from 6.5 percent to 27.9 percent.

Figure 7: The three largest beef processing companies' share of total slaughtered animals* (head) - Brazil

	JBS	MARFRIG	MINERVA	SHARE OF THE THREE LARGEST TOGETHER
2006	6.5 percent	5.2 percent	2.6 percent	14.3 percent
2010	21.2 percent	9.1 percent	4.9 percent	35.2 percent
2013	27.9 percent	14.6 percent	5.8 percent	48.3 percent

Source: prepared by Sergio Schlesinger, based on data from the IBGE and Santos, 2015³¹

*Animals slaughtered under the federal inspection system (Sistema de Inspeção Federal, SIF)

In Mato Grosso do Sul (the state with the fourth largest cattle herd in the country) concentration in the beef market continues to increase. Studies by the state's agriculture and livestock federation Famasul (Federação da Agricultura e Pecuária) show that between 2012 and 2015, JBS' share of the total meat processing

capacity in the state rose from 47 percent to 61 percent.³² Famasul noted that JBS leased meat processing plants with sole goal of closing them down, thereby guaranteeing the supply of beef to its own facilities.³³

Since the political turmoil that began with President Dilma Rouseff's ouster, meat industry exports (notwithstanding scandal) have benefitted from the depreciation of the Real even as cattle prices have been rising due to limited supply.³⁴ This year, the exchange rate is expected to be volatile, but Brazil's beef exports are nonetheless expected to rise. Despite this, more than 30 packing plants shut down in several states between 2015 and 2016 due to high cattle prices.³⁵

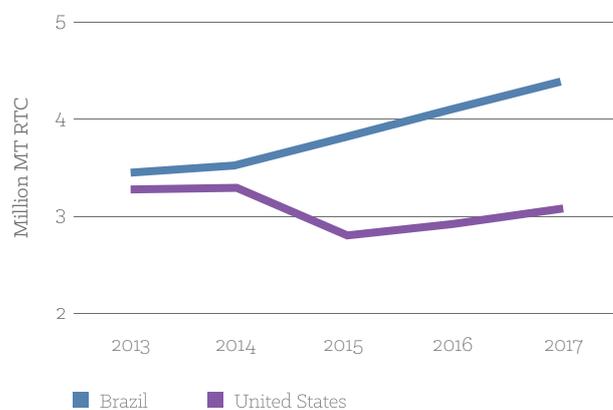
Poultry

Since 2012, Brazil has been the global leader in broiler exports. That lead continues to widen, with the U.S. in second place (Figure 8). The United States produces the most, followed by Brazil, China and Europe, respectively. Just four countries (Brazil, the U.S., the EU and Thailand) account for nearly 90 percent of the world's exports.³⁶

Figure 8: Global Broiler Meat Exports Continue Expansion



Brazil Widens Lead as Top Exporter



Source: USDA FAS 2016. Livestock and Poultry: World Markets and Trade, October.

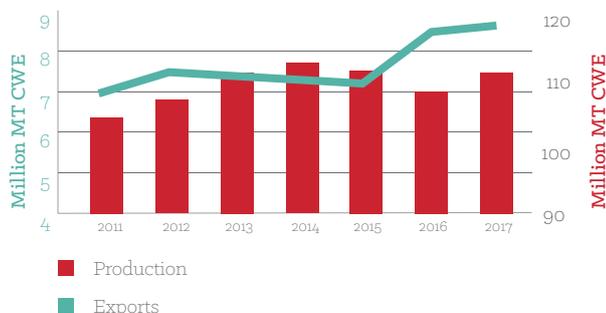
Brazilian broiler exports have been rising steadily for the last decade. According to Brazil's Ministry of Development, Industry and Foreign Trade, 4.1 million tons of poultry were exported in 2014 compared to just 916,000 tons in 2000. This number is projected to increase to 4.4 million tons in 2017.³⁷

The OECD-FAO predicts that by 2020, poultry will beat pork to become the most widely consumed meat in the world. Brazil is the fourth largest consumer of poultry in the world—chicken being Brazilians' favorite meat. More than 70 percent of Brazil's broilers were consumed domestically in 2014.³⁸ Globally, Japan, Saudi Arabia, Mexico and the EU import the largest quantities. Sixty-five percent of Brazil's exports go to just seven countries: China, the EU, Hong Kong, Japan, Saudi Arabia, South Africa and United Arab Emirates. Indonesia seems to be a major new target for exports.³⁹ However, the EU is the prime destination for Brazil's processed poultry with 86 percent of Brazilian sales headed to the Netherlands (47 percent), Germany (20 percent) and the U.K. (19 percent).⁴⁰

Pork

While pork is the most consumed meat globally (43.5 percent of all meats), it accounts for just 13 percent of the meat consumed in Brazil. The increasing availability and low prices of beef (except for the last few years) and chicken; cultural concerns with animal health; and its reputation for being high in fat and cholesterol (as Brazilians increasingly seek healthier foods) may be some factors why pork has been less popular domestically.⁴¹ Nonetheless, three-fourths of what Brazil produces is consumed at home and since 2012, Brazil has been the fourth largest global producer and exporter of pork.⁴²

Figure 9: Global Pork Trade Continues to Rise

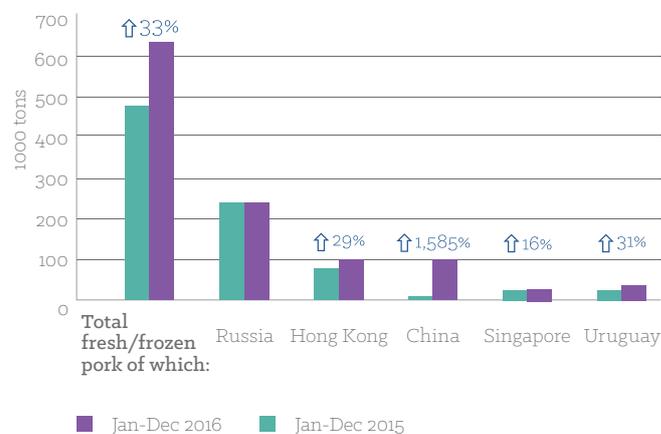


Reproduced from: USDA Fas October 2016. Livestock and Poultry: World Markets and Trade, October

Global pork exports have seen a dramatic rise since 2014. Brazilian pork production has reflected global growth in pork exports (Figure 10). Initially, the Russian ban on European pork diverted the trade to Brazil. In 2015, for instance, 50 percent of Brazilian exports went to Russia.⁴³ In 2016, however, a significant share was diverted to China and Hong Kong as China became the world's largest pork importer for the first time. Thirty-four percent of Brazil's exports went to China and Hong Kong last year and 36 percent to Russia. Brazil's share of global pork exports has risen to nearly 11 percent, up from nine percent in 2014.⁴⁴

JBS has rapidly expanded its pork production since 2012 by acquiring large meat processing plants domestically and abroad.

Figure 10: Brazilian pig meat exports



Source: Graph produced by IATP Europe based on SECEX, HIS Maritime & Trade - Global Trade Atlas data.⁴⁵

CORPORATE CONCENTRATION

The poultry industry is increasingly in the hands of a few meat firms. In 2016, two companies accounted for 52 percent of all slaughtered poultry in the country.⁴⁶ The two corporations were responsible for nearly 75 percent of broiler exports in 2014 (See Figure 11).

Figure 11: Brazil: the five largest broiler corporations in 2014 - millions in slaughtered broilers



Source: AviSite 2015⁴⁷

In pork, the presence of independent producers is greater; however, both sectors are characterized by increasing concentration. Only three companies—BRF, JBS and Aurora—control 50 percent of all slaughtered pork in Brazil.

Chapter 2: Slave labor and injustice in the meat supply chain



André Campos/Repórter Brasil

Chicken processing workers.

The prevalence of slave labor in Brazil's agriculture sector has been well documented. Repórter Brasil, a non-profit Brazilian organization with an objective to combat modern-day slavery and human trafficking in the country, has been at the forefront of such research. Founded by journalists and social educators in 2001, the NGO has consistently publicized human rights violations related to the meat industry. They have sought to explicitly demonstrate the link between the exploitative supply chain to very well-known North American and European supermarkets (Walmart, Tesco), fast food chains (McDonald's), and processed meats consumed by Americans and Europeans.⁴⁸

The group reported that from 2003 to 2010, more than 10,300 workers were released from slavery by cattle owners supplying to major meat processors.⁴⁹ The cattle ranching sector was responsible for nearly 60 percent of all slave labor cases recorded during that seven-year period.

According to the Global Slavery Index that tracks modern slavery across the globe, 161,100 Brazilians were trapped in modern slavery in 2016.⁵⁰

THE CHALLENGES OF ADDRESSING SLAVE LABOR IN THE BEEF INDUSTRY

The Brazilian Ministry of Labor used to publish a "dirty list" of businesses that engage in slave labor. In December 2014, the Brazilian Supreme Court ordered the ministry to stop publishing this list. Using Brazilian Access to Information laws, Repórter Brasil has been publishing a Transparency Register since 2015, highlighting the names of employers caught by federal inspectors for using practices analogous to slavery. The list compiles the names of all persons and companies held liable for this crime in the previous two years. In its last update, 26 percent of the 349 employers



André Campos/Repórter Brasil

Chicken farmworker.

were cattle owners.⁵¹ Companies such as JBS signed the National Pact for the Eradication of Slave Labor, which supposedly bind them to avoid such suppliers; however, monitoring whether these companies live up to these promises and exposing them requires human and financial resources.

In addition, exposing these practices with their link to powerful meat processors has created problems for Repórter Brasil. In 2015, false advertisements maligning the group's founder, Leonardo Sakamoto, were placed online and later found to be linked to JBS.⁵² JBS denies the connection to the ads. The NGO's website that showcased slaughterhouses of prominent meat processors with egregious work practices was also hacked and shut down for a period in 2015 until the organization could retrieve the data and repair the damage.⁵³

In addition to such conditions on farms, the beef industry also subjects workers to poor working conditions in slaughterhouses and meatpacking plants. In 2014, for example, JBS was fined for forcing employees to work up to 20 hours a day and serving maggot-infested meat to them.⁵⁴ Thus far, major retailers of meat have been successful in keeping these stories from European and American consumers.

THE MENACE OF CONTRACT FARMING AND MODERN SLAVERY

Contract farming is dominant in both chicken and pork production in Brazil. There are more than 130,000 family farmers that produce chicken in Brazil.⁵⁵ Most of these small producers (integrated into a supply chain of a major meat processing corporation through a contract) are concentrated in the south of the country. In this model, the farmer bears all the risk and investment costs, buying all inputs from the "integrator" and selling the animals back to the company once they are ready for slaughter.

The states of Parana, Santa Catarina and Rio Grande do Sul accounted for 62 percent of the broiler production in 2015⁵⁶ and nearly 60 percent of pork production in 2016.⁵⁷ In pork, the presence of independent producers is greater; however, both the pork and poultry sectors are characterized by increasing concentration in Brazil, as noted above.

In 2010, the Public Prosecutors' Office (PPO) on Labor Affairs of the state of Santa Catarina found that nearly three-fourths (73 percent) of the producers who worked on contract with BRF's Sadia meat processing unit



André Campos/Repórter Brasil

Enslaved worker marked with hot iron in cattle farm.

actually “paid to work;” in fact, “they fund the operations of Sadia S.A. with their own impoverishment, loss of health, and indebtedness with financial institutions.”⁵⁸

The PPO cited several irregularities including failure of farmers to meet their full costs of production; pressure on farmers to invest more in their infrastructure, despite low prices that made that infeasible; abusive clauses in their contracts; exhausting workdays without a weekly day of rest with pay; failure to comply with health and safety norms; and other issues.

The power imbalance between integrators and contract farmers is such that it motivated a bill to regulate this relationship. The so-called “Integration Law” was passed by the interim government in 2016 and allows for collective bargaining regarding the contracting farmers’ payments—this is intended to make this process more transparent so that contract farmers are less exploited by meat processing firms. Whether the law is effective in addressing these issues remains to be seen.

From small contractors to big factory farms

Due to growing technological sophistication and the rapid increase in the scale of production, factory farms have expanded into the states of Mato Grosso, Goiás and Minas Gerais. The proximity to large-scale maize and soy farms lowers operating costs in these states.⁵⁹ The facilities are generally larger than those located in southern Brazil and are much more profitable than those of the small producers in the south. For instance, 93 percent of the facilities with over 25,000 birds could gain some sort of profit after deducting their total cost of production and recovering their investment costs. The number of producers earning

any amount of profit drops down to anywhere between 36 and 44 percent for those who grow less than 25,000 birds (Figure 12).

Ninety percent of poultry feed relies on maize and soy—with maize comprising 70 percent of the content.⁶⁰ In 2016, the Brazilian maize price was higher than the world market price due to a poor harvest, causing a price surge of more than 88 percent in the crop.⁶¹ Independent chicken producers suffered the most while those who were integrated were supposedly shielded from worse

Figure 12: Percent of Enterprises that are Profitable



Profitable Broiler Enterprises in Brazil, by Size Class in 2010.

Source: Reproduced from Valides et. al. 2015



Figure 13: North American pork, beef and chicken brands owned by JBS

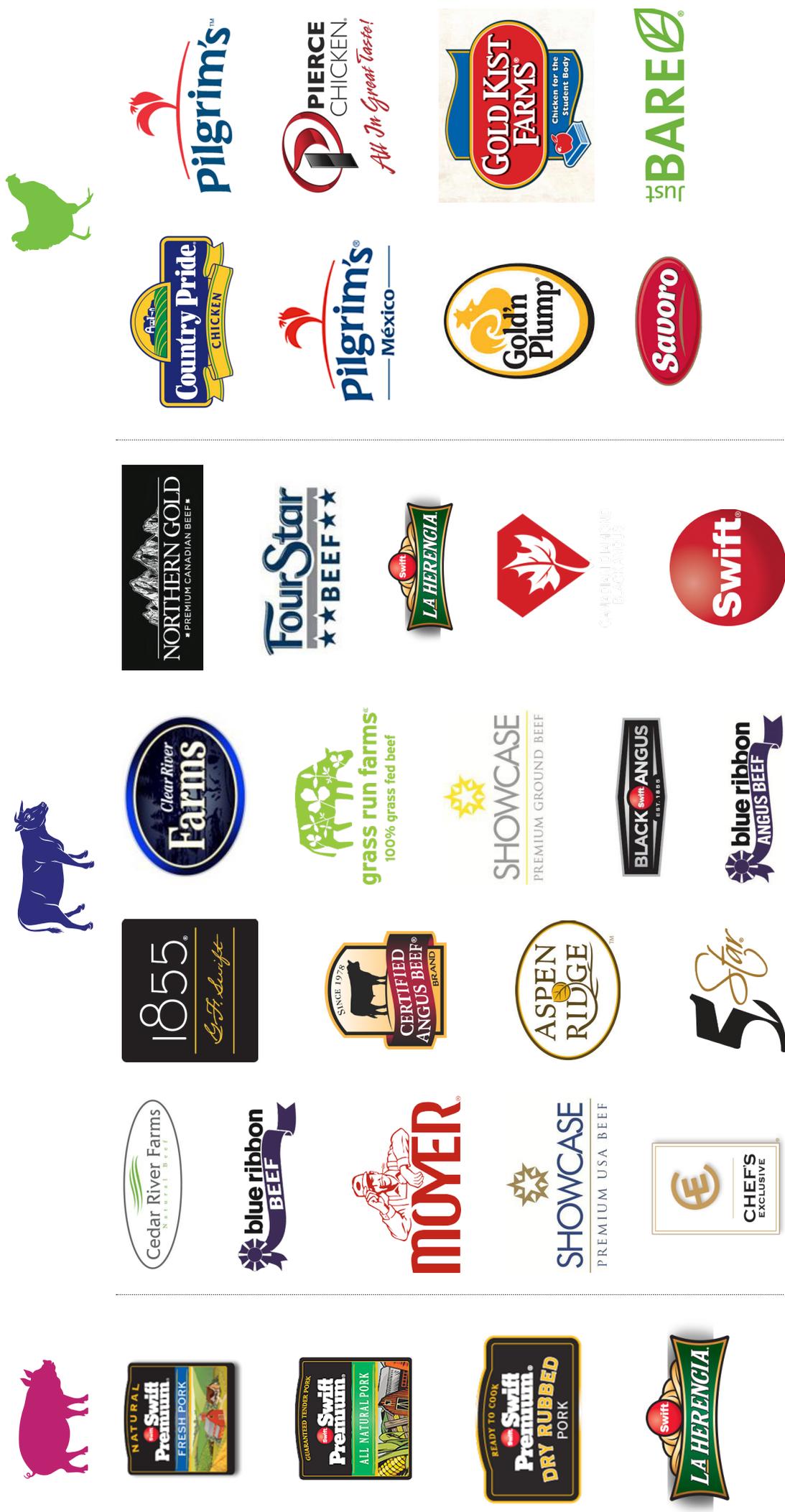


Figure 14: Slave labor in Chicken Nuggets from Edeka, Rewe, Lidl and Aldi



Infographic: Lieferkette von Chicken Nuggets, aus "Sklavenarbeit in Chicken Nuggets", ©CIR.

impacts.⁶² The price volatility in corn also makes it harder and harder to stay outside of the contract system, though contracted farmers have even less control over their profit margins. This is because contract farmers can obtain lower-cost feed from their integrator, who purchases it in bulk. Ventilation technologies (which typically require higher financial investment) seem to be a key factor in keeping a large number of broilers alive in the Brazilian climate. Many small producers simply lack the financial resources to invest in these and maintain them. The high costs ensure that much larger facilities survive, while the smaller producers earn back barely a fraction of their costs.

Slave labor in the poultry sector

In addition to the exploitation of family farmers, slave labor is also endemic in the poultry industry. A minimum of 15 million chickens are transported daily in boxes containing seven to ten chickens. Workers tasked with catching these chickens and transporting them

from farms to slaughterhouses suffer egregious working conditions. A team of about ten workers catches more than 50 thousand chickens a day—often working 12 to 17 hours traveling from location to location. In both JBS and BRF supply chains, Repórter Brasil found slave-like conditions, including withheld wages and/or horrendous living conditions. For example, one middleman housed workers in a disused mine “whose conditions ‘cannot be described in words,’” according to one labor inspection report.⁶³ Many of these workers did not have contracts and the legality of the middlemen contracted by JBS or BRF has also been called into question.

Finally, working conditions in meat processing plants resembles problems in the U.S. and elsewhere. Repórter Brasil documented worker abuse in slaughterhouses owned by the top three Brazilian meat processors (JBS, BRF and Marfrig) in 2011.⁶⁴ According to the group, 750,000 direct jobs were linked to the meat industry in 2011.⁶⁵ They note:

In Brazil, health damages resulting from slaughtering and processing of meat are distinct from the average of other industries. High levels of trauma, tendonitis, burnings and even mental disorders are found there. To face such problems, it is urgent to redesign tasks, introduce breaks, and in some cases to slow down the pace of production lines. Those measures, however, face resistance from the industry's business.⁶⁶

Once again, the products processed in these plants end up in supermarkets in Europe or the U.S. In 2016, the German organization Christlich Initiative Romero (CIR) started a campaign on chicken nuggets targeting major German supermarkets, such as Rewe, Edeka, Lidl, Netto and Aldi (Figure 14). They highlight the slave-like conditions of poultry “catchers” in JBS and BRF’s supply chain.

OTHER IMPACTS OF BRAZILIAN MEAT PRODUCTION

Animal welfare and confinement

One element of Brazilian TNCs integration into the global meat market is their growing susceptibility to public pressure on some animal welfare principles. Recently, BRF and JBS announced that they will put an end to the ongoing use of gestation crates for sows. Banned in the entire EU, eight U.S. states and a few other countries, the crates are practically the same size as the pigs’ bodies, which prevents them from moving around. Corporations have been adhering to general animal welfare principles adopted in these countries

due to pressure from consumers and their organizations, out of concern with maintaining full access to these markets.

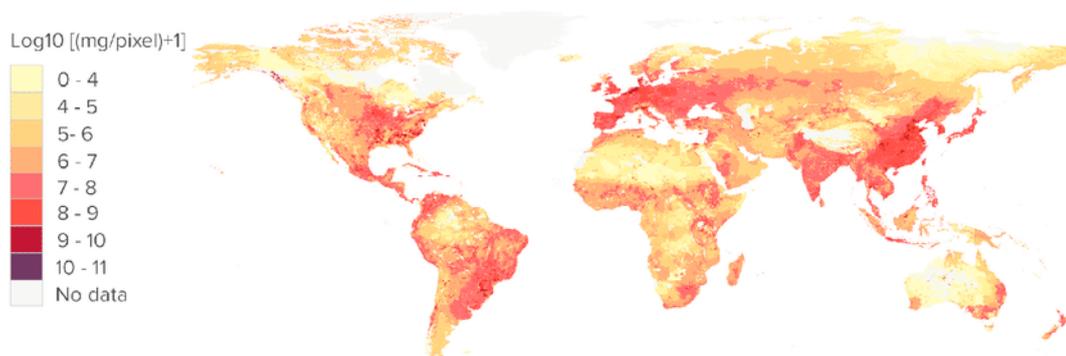
Traditionally raised, free to wander in pasture, cows have not had the same luck. Rather than adopting practices for better animal welfare, giants such as JBS, BRF and Marfrig are increasingly practicing confinement. They offer independent cattle raisers the possibility of using their facilities and other supposed benefits in exchange for guarantees for purchasing the cattle. It is a way of introducing the integration model used in chicken and pig raising into the cattle sector. “That is what our goal is,” affirmed BRF’s cattle manager.⁶⁷

Public health and environmental costs of production

In August 2016, Scientist Magazine reported the appearance of Colistin-resistant bacteria that led to a foot amputation of a 60-year-old Brazilian man.⁶⁸ Colistin is a last-resort antibiotic for human illnesses—but bacterial resistance is being discovered in Asia, Europe and North America. Its presence is heavily linked to the prolific use of antibiotics in industrial meat production (for poultry, pork and beef).

Brazil increased its use of antibiotics by 68 percent from 2000-2010, coinciding with the large increase in meat production. The country does not ban the use of antibiotics as growth promoters (similar to the U.S.) and was the third largest consumer of antibiotics in livestock in 2010—China and the U.S. being the largest. Alarmingly, Brazil is expected to double its use by 2030.⁶⁹ This poses a serious risk of antibiotic resistance in the Brazilian population.

Figure 15: Global antibiotic consumption in livestock (milligrams per 10 km² pixels) 2010



Reproduced from source: Van Boeckel et al. “Global trends in antimicrobial use in food animals” Proceedings of the National Academy of Science U S A. 2015 May 5; 112(18): 5649–5654, accessed September 12, 2017, doi:10.1073/pnas.1503141112.⁷⁰

Finally, chicken and pork raising and processing results in enormous waste, ranging from animal remains, excrement, and water and soil pollution, in addition to high levels of water use. This not only endangers the ecosystem in production areas, but also contributes to greenhouse gas emissions. Producers or the public, rather than the meat corporations, are expected to assume all responsibility and costs for mitigating these environmental problems. The environmental dimension is discussed in more detail in Chapter 4.

Chapter 3: Brazil's Feed Footprint

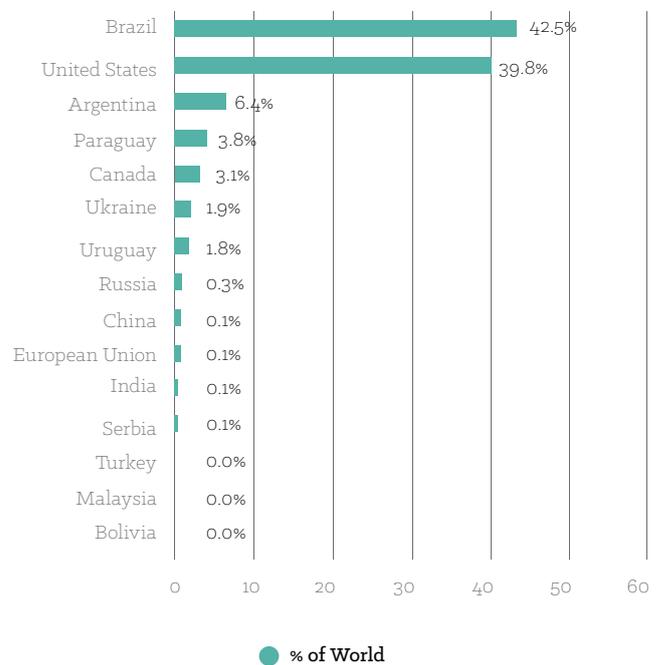
An estimated 90 percent of soybeans produced in the world are used as a protein source in animal feed. The crop is highly concentrated in a small number of countries. This year the U.S., Brazil and Argentina account for 82 percent of global production and 88 percent of global soybean exports (up from 81 percent just two years ago) (see figure 16).⁷¹ While the U.S. is the largest producer in the world, soybean production has been expanding the fastest in Argentina, Brazil and Paraguay. China imports the most, representing nearly two-thirds of all world trade (Figure 16). The EU comes in second place with 10 percent. However, as with beef and poultry, Brazil has been the leading global exporter of soybeans since 2013. This trend is expected to continue in 2017 because of China's continued hunger for oilseed and increased crushing capacity (turning soy into soybean meal).

Maize is the second major feed grain used for intensive food animal production. Once again, only a handful of countries dominate both production and exports. The U.S., China and Brazil account for nearly 65 percent of global production.⁷² The U.S. alone exports nearly 38 percent of the world's traded maize (Figure 17). However, Brazil's maize exports have risen sharply since 2012, making it the second largest exporter globally. Brazil's maize exports demonstrate the precariousness and the extreme volatility of commodity trading (Figure 17) in which world market prices fluctuate widely and supply is vulnerable to climatic changes, which are set to worsen in the region (see next chapter). For instance, due to a poor harvest in 2015-2016, Brazilian maize prices were high and the country was forced to import maize to meet its own growing feed grain demand. This volatility significantly impacts small and increasingly indebted maize and poultry producers.

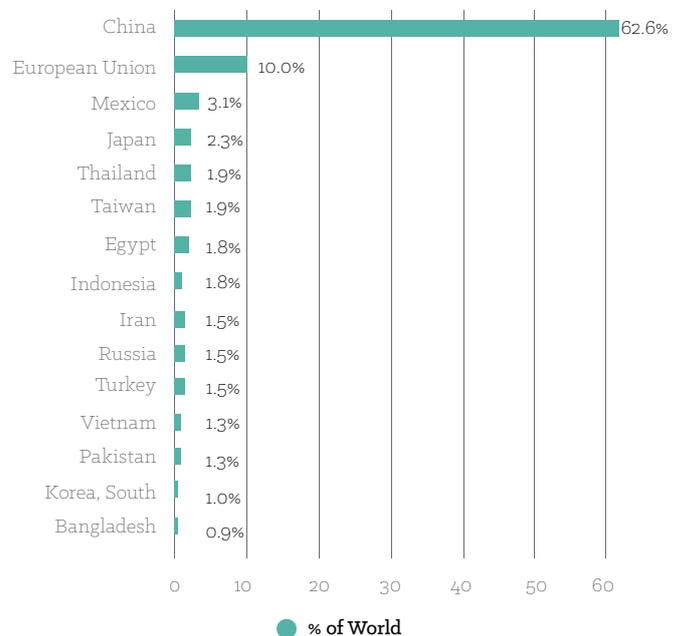
LAND, LAND AND MORE LAND

Soy is expected to cover 33.9 million hectares and maize, 16.7 million hectares in Brazil in 2017.⁷³ Together, that is the equivalent of nearly 506,000 square kilometers (approximately 196,912 square miles), an area slightly larger than Spain. Produced with large-scale monocultures, proprietary seeds and chemicals, growing these feed grains has caused widespread deforestation and land degradation. And yet, production of both soy and

Figure 16: Oilseed, Soybean % World Exports



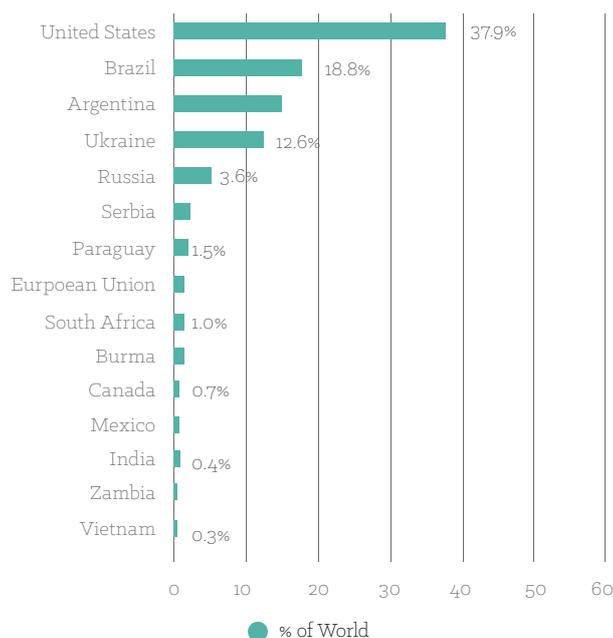
Oilseed, Soybean % World Imports



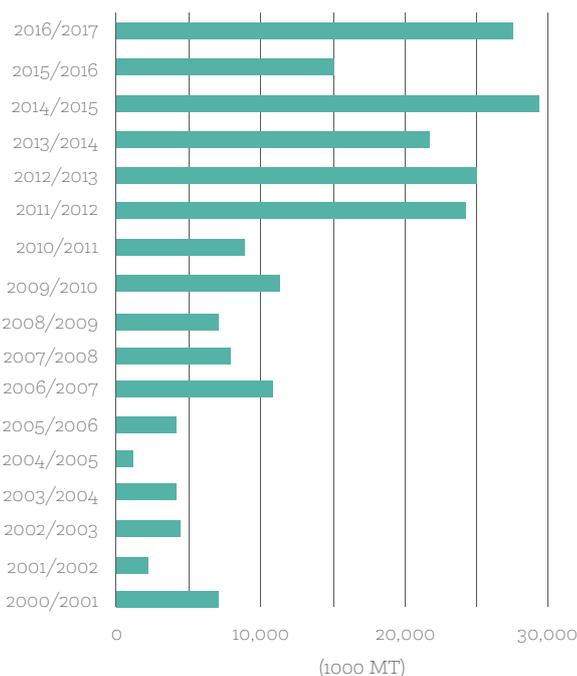
Source: USDA FAS 2017

maize is expected to grow this year with an increase of planted area by 1.6 percent for soy and another 3.2 percent for maize.⁷⁴

Figure 17: Corn % World Exports



Brazilian Corn Exports



Source: Foreign Agricultural Service, USDA PSD 2017, accessed September 12, 2017, <https://apps.fas.usda.gov/psdonline/app/index.html#/app/advQuery>

The beans, meal and oil which make up the so-called “soybean complex” represented 32 percent of the country’s agricultural exports and 10 percent of the total value of exports in 2014. And though Brazil’s agricultural exports declined in value in 2015 (due to low soy and maize prices), they were exported in record volumes—not only making up for low prices, but also increasing the share of agriculture in the trade balance

to a record 46 percent.⁷⁵ The volume of soy exports continues to grow, reaching nearly 60 million metric tons in the beginning of 2017. Despite these high export volumes, Brazil’s meat industry consumes nearly half of the soy and nearly two-thirds of the maize produced.

CORPORATE CONTROL

Until a few years ago, almost 60 percent of Brazilian sales of this feed grain complex were concentrated in the hands of only four large transnational corporations headquartered in the U.S. and the EU: Bunge, Cargill, ADM and Dreyfus (also known as the ABCDs). However, by 2016 Asian transnational corporations had overtaken them. Nearly 47 percent of maize and soy shipments from Brazil were controlled by China’s COFCO, while the ABCDs had 37 percent of the total share.⁷⁶

The presence of Singapore’s transnational giant Wilmar and Japanese firms such as Marubeni and Itochu is also growing in Brazil. Brazilian companies have less weight: Amaggi, Coamo and Caramuru stand out amongst them. The ABCDs still control a large chunk of the infrastructure and logistics in moving the grains. However, COFCO and other Asian firms are increasingly investing in this side of the business as well (see *The Need for Feed*, part of IATP’s China series).

There are both large landowners and small-scale producers of feed grain. Corporations finance the cultivation of soybeans—directly or through intermediaries—from supplies to machinery. For this, they use mechanisms such as “green soybean” contracts, a program where producers sell their soybeans in advance in exchange for seeds, chemical fertilizers and pesticides.⁷⁷

These contracts end up exploiting producers, as at the end of the harvest, their small profit margins do not provide for much more than their subsistence. Consequently, they are trapped into signing new contracts to make ends meet.⁷⁸

Another consequence of this funding modality is that producers buy the pre-designed technology package that determines what machinery and inputs are to be used. This is how the handful of multinationals that manufacture agricultural machinery, equipment and agricultural inputs appropriate a significant portion of the income generated by feed grain growers.

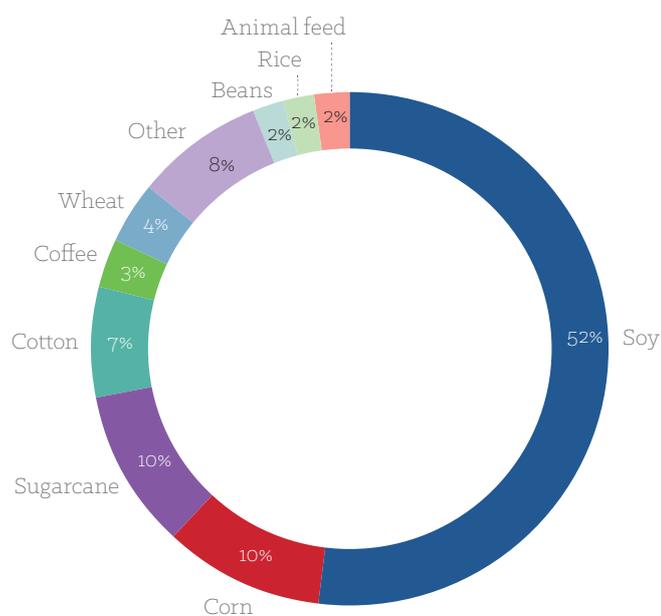
For instance, John Deere and AGCO (owners of the Massey Ferguson and Valtra brands) in the U.S. and Italy’s Case New Holland dominate the farm machinery

business in Brazil. As a major consumer of agrochemicals, Brazil's soybean production accounted for over 52 percent of the agrochemical sales in 2015 (Figure 18).⁷⁹ Six companies—Syngenta followed by Bayer, Dow, DuPont (now merged with Dow), BASF and Monsanto—controlled 76 percent of the global market in 2011.⁸⁰ This concentration is set to worsen significantly with the mergers of ChemChina with Syngenta and Bayer with Monsanto. In Brazil, ten corporations captured over 85 percent of all agrochemical sales in 2015, increasing the level of market concentration from the year before.⁸¹

Brazil is also an attractive market for manufacturing agrochemicals banned in Europe and the United States. U.S.-based FMC, Denmark's Cheminova, Germany's Helme, and Swiss-based Syngenta are all present in Brazil. The fertilizer sector has also been taken over by a private oligopoly formed by three transnational corporations: Hydro/Yara (Norwegian), Bunge/Fosfertil (Dutch) and Cargill/Mosaic (American). Together, they control 90 percent of the Brazilian chemical fertilizer market.⁸²

Finally, as elsewhere, Monsanto, Dupont, Syngenta and BASF dominate the seed market. Due to their presence, genetically modified soybeans as a percentage of total soybean production has reached the 93 percent mark and left farmers with rising seed prices.⁸⁴

Figure 18: Brazil: sales of agrochemicals by crop – 2015



Reproduced from source: Konowalenko, Mariana and Juliana Cruz, "Agrochemicals industry confirms drop in sales," Sindiveg (Brazil's National Union of Crop Protection Industries), March 2016: 2, accessed September 12, 2017, <http://www.sindiveg.org.br/docs/balanco-2015.pdf>.⁸³

Entrenching Inequality

The presence of soybean and maize monocultures has reinforced the inequalities that already marked land ownership in an area that has been historically occupied by extensive livestock raising. Data from the 2006 Agricultural Census on Family Farming of the Brazilian Institute of Geography and Statistics (IBGE) show that the midwest region has the lowest percentage of family farms (only 10.2 percent of the total) in relation to the total area occupied by animal raising in Brazil.⁸⁵

The primary consequences of the occupation of these vast uninterrupted areas of land and the intensive use of agrochemicals can be summarized as follows:⁸⁶

- The concentration of land ownership and use;
- The displacement and marginalization of local peoples, which make it impossible for family farmers, including indigenous peoples and traditional communities, to produce food, whether it be for the local or regional food supply;
- The reduction of the general supply of food on the national level, which results in increases in the prices of basic food basket items at rates that are much higher than the inflation rate for the economy as a whole;
- The poisoning and destruction of food that is affected by agrochemicals or attacked by infestations of new pests or diseases;
- The decline in fishery production, which is also affected by agrochemicals, as the agrochemicals destroy the sources of rivers and cause them to be silted up;
- Various health problems caused by agrochemicals;
- The deforestation of vast areas, soil degradation, loss of biodiversity and the decline in the amount of water available; and
- High greenhouse gas emissions related primarily to deforestation to open up new areas for soybean production. The expansion of this crop is one of the most important factors in the destruction of Brazilian forests.

According to the Ministry of Agriculture, Livestock and Food Supply's (MAPA) 2015 estimates, soybean production will continue to expand more than all other Brazilian crops. MAPA predicts that by 2025, soybeans will cover a territory of 41.2 million hectares—an increase of more than 30 percent in just ten years.⁸⁷ The area used to plant soybeans will increase by expanding into regions where land is still supposedly "available" through occupying existing pasture land and by replacing other crops with soy on existing agricultural land.⁸⁸

The massive increase of hectares planted with soy and maize have dramatically changed the Brazilian landscape. The expansion in the last 16 years has occurred primarily in areas of the Cerrado (savannah) biome in the midwest region, which is the source of several rivers that supply water to three important aquifers and six major water basins in the country. Notably, the areas cited for highest expansion are the eastern sub-region of the Cerrado, known as the “Mapitoba” region for the four states of Maranhão, Piauí, Tocantins and Bahia.⁸⁹ Along with climatic changes brought on by these land use changes and deforestation of earlier decades, the impact has been staggering and will continue to worsen if these trends continue, resulting in the reduction of water available in the region, and ultimately in much of Brazil and Northern Argentina (see Chapter 4).

Chapter 4: Deforesting the Amazon, Degrading the Land



Image used under Creative Commons license via Flickr user cijfor.

Deforestation in Brazil.

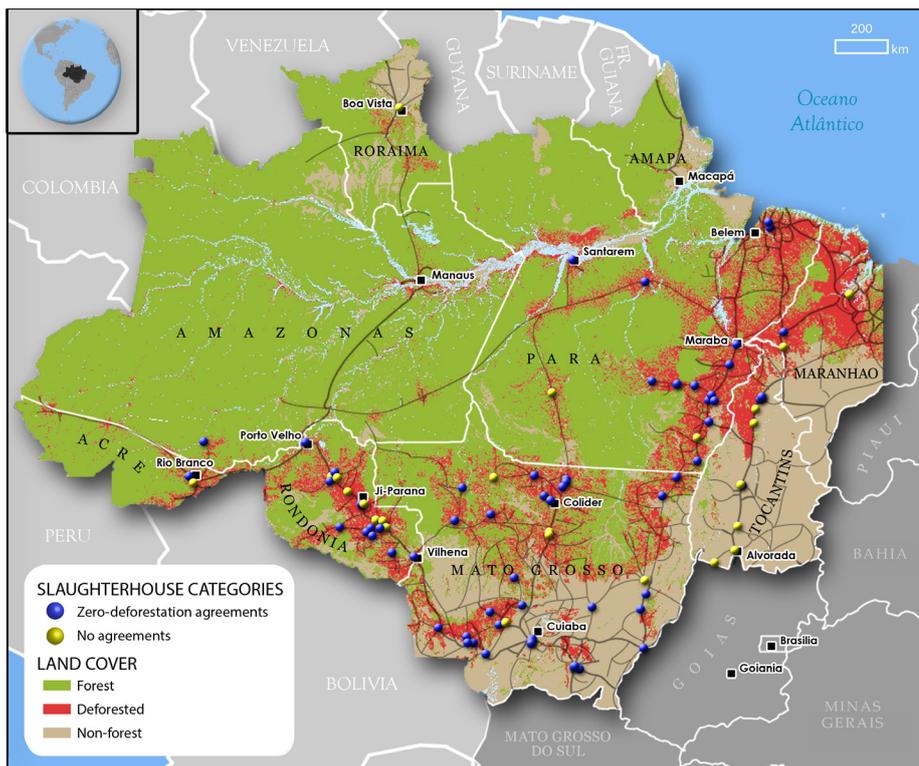
Brazil's National Institute for Space Research (INPE) estimates that 7,898 square kilometers (more than 3,000 square miles) were deforested from August 2015 to July 2016.⁹⁰ This represents a 29 percent spike in deforestation from the previous year (2015-2014). Yet in 2015, deforestation had already risen by 24 percent from the year before (2013-2014). This marks a dramatic departure from the significant decreases in deforestation rates that were witnessed in the years prior.

The global rise of Brazil's meat and feed grain industry has resulted in a massive transformation of the entire Brazilian landscape—from severe intensification and expansion of feed grain production in the southeast and the *Cerrado*, to the displacement of cattle grazing into and then spreading out from the Amazon Rainforest. This chapter demonstrates the impacts of and analyzes the attempts to curtail the damage through two supply chain initiatives: zero-deforestation agreements with meat companies and the Soy Moratorium with grain traders.

ZERO-DEFORESTATION AGREEMENTS AND THE SCOPE FOR CONSERVATION

A first of its kind peer-reviewed study tracked purchasing behavior of JBS slaughterhouses before and after signing zero-deforestation agreements in the state of Para.⁹¹ These agreements, whether signed between the companies and the government or NGOs such as Greenpeace, stipulate that the meatpackers would no longer buy from suppliers that continue to deforest after the agreement. The companies would be required to enlist with the Rural Environmental Register, which tracks properties through satellite technologies. The researchers found that while enlisting into the Register increased significantly and the rate of deforestation decreased dramatically from registered suppliers, the overall scope of these agreements for conservation was limited.

Figure 19: Major slaughterhouses in the Brazilian Legal Amazon that have and have not signed a zero-deforestation cattle agreement



Reproduced from source: Gibbs et al. “Did Ranchers and Slaughterhouses Respond to Zero-Deforestation Agreements in the Brazilian Amazon?” *Conservation Letters* (January/February 2016): 34, accessed September 12, 2017, doi: 10.1111/conl.12175.

Deforestation and land degradation related to meat industry expansion continues with “indirect suppliers,” and “leakage” of beef cattle in and out of the registered supply chain, amongst other causes. For instance, cattle would be transferred from non-compliant to registered suppliers for slaughter or be directly supplied to slaughterhouses that did not fully monitor the supply chain.

Gibbs et al. 2015 note:

Cattle often spend time on multiple properties prior to slaughter, and ranchers can raise and fatten cattle on noncompliant ranches...and then move the animals to a compliant property before sale to the slaughterhouses (“laundering”). Cattle laundering may also happen through “middlemen” who buy cattle from many producers, including those with noncompliant properties, and then sell to slaughterhouses through their own compliant property...ranchers reported that such laundering is a common and accepted practice and pointed to the fact that it is not prohibited by the agreements. ‘The cows are not embargoed, only the land’ was a common sentiment.⁹²

The authors stress that to guarantee full supply chain traceability, individual animals would have to be tracked through ear tags or other devices.

A 2015 case study by Repórter Brasil corroborates such practices. It found that JBS continued to source from a supplier that not only practiced slavery, but who was also cited by the Ministry of Forests and the Environment for environmental crimes, including deforestation.⁹³ To continue both illegal practices, this supplier simply transferred the property into the name of relatives not on any of these government “dirty lists.”

THE “FLYING RIVERS,” THE CERRADO AND THE SOY MORATORIUM

Twenty billion tons of water evaporate every day in the Amazon. In the summer months, the clouds that form through evaporation drift at a height of 3,000 meters to the west, where they are blocked in the Andes and diverted to the south. These currents, known as the “flying rivers of Amazonia” bring rain to southern Brazil via Uruguay, Paraguay and Northern Argentina—carrying moisture from the north to the south (Figure 21).⁹⁴

A square meter of the Amazonian rainforest floor offers eight to ten times the evaporation compared to the same area of pasture. For instance, a tree evaporates up to 300 liters of water a day, compared to 40 liters from pasture. In the past 40 years, an average of three million trees have been cut daily in the Amazon—a jaw-dropping total of 42 billion trees—essentially damming up the flying rivers.⁹⁵ The result: drought in southern Brazil and less rain in central Brazil—the *Cerrado* (Figure 22).

The Soy Moratorium, a voluntary agreement signed in 2006 by industrial players, was intended to stop sourcing from suppliers that deforest or use slave labor

and led to a dramatic drop in the deforestation rate in the Amazon. However, it has had spillover effects on other parts of Brazil where no moratoriums exist.

At the start of the moratorium in 2006, soy continued to expand—a 30 percent increase by cutting down Amazon forests. But by 2013, that number had dropped to nearly one percent. However, soy expansion continued to take place in the *Cerrado*, with 11-23 percent of new farmland cleared from native vegetation each year.⁹⁶ The expansion was even more pronounced in the four states of Maranhão, Piauí, Tocantins and Bahia (Mapitoba region), where 40 percent of new farmland was cleared from native vegetation.⁹⁷

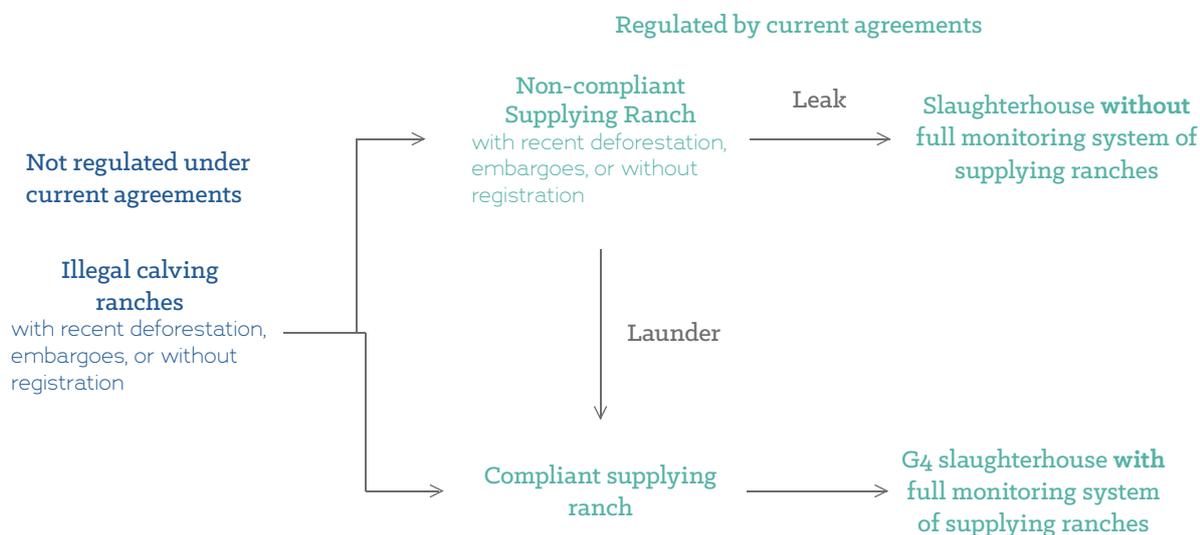
The size and central location of the dry *Cerrado* region are critical for several ecosystem functions. Ten of the twelve most important water catchment areas in Brazil are found in the *Cerrado*.⁹⁸ The region, therefore, serves as the “rain filter” of Brazil, fed by the Amazon’s flying rivers that rain down in the *Cerrado* and are absorbed into groundwater. The reservoirs of groundwater in south and central Brazil are filled through this critical geological filter. Given the dramatic land use change in the region, the *Cerrado’s* soil structure is changing so that both evaporation and erosion rates are increasing. This is decreasing groundwater intake as water is

leached off the plateau. The result: sinking groundwater levels, reduced aquifers, sinking rivers and water deficits.⁹⁹ A critical hydrological system (that of the flying rivers and *Cerrado* absorption) threatens to collapse—affecting Brazil, Uruguay, Paraguay and Northern Argentina.

LAND USE CHANGE, CLIMATE CHANGE

Brazil’s greenhouse gas emissions have been rising since 1970 with direct emissions from agriculture growing nearly 160 percent since then. Livestock has been responsible for nearly 30 percent of that total, according to 2015 estimates by the Institute for Agricultural and Forest Management and Certification (Imaflora).¹⁰⁰ Deforestation and land use change in the Amazon and the *Cerrado* biomes are responsible for a significant part of Brazil’s emissions. When accounting for both the direct and indirect emissions due to land use change, the meat and feed grain sector are responsible for 67 percent of Brazil’s net emissions (Figure 23). This places Brazil amongst the top ten countries with the highest emissions and the second highest emitter of agricultural emissions in the world.¹⁰¹

Figure 20: Monitoring under the zero-deforestation agreement



“Large portions of the beef supply chain are not yet monitored under the zero-deforestation agreements. In practice, the agreements regulate only direct purchases from supplying farms, thus ignoring calving ranches and other indirect parts of the supply chain. Cattle fattened on noncompliant properties with deforestation can leak to slaughterhouses that lack full monitoring systems; these cattle can also be laundered by moving them to a compliant ranch for direct sale to a slaughterhouse.”

-Gibbs et al.

Reproduced from source: Gibbs et al. “Did Ranchers and Slaughterhouses Respond to Zero-Deforestation Agreements in the Brazilian Amazon?” *Conservation Letters* (January/February 2016): 39, accessed September 12, 2017, doi: 10.1111/conl.12175.

Brazil is already suffering from the impacts of climate change and becoming more vulnerable to natural disasters of greater intensity. Per the Brazilian Agricultural Research Corporation (Embrapa), food production in Brazil and in other countries could be affected significantly by global warming, thereby compromising food security:¹⁰²

Areas where maize, rice, beans, cotton, and sunflowers are grown will face a sharp decline in the Northeast region, and significant losses of production. The entire area corresponding to the dry region in the Northeast, which is currently responsible for the majority of the maize production in the region, and the region of the Northeastern savannas - the south of Maranhão, the south of Piauí and western Bahia - will be hit hardest. Soybean and coffee have to deal with the losses.

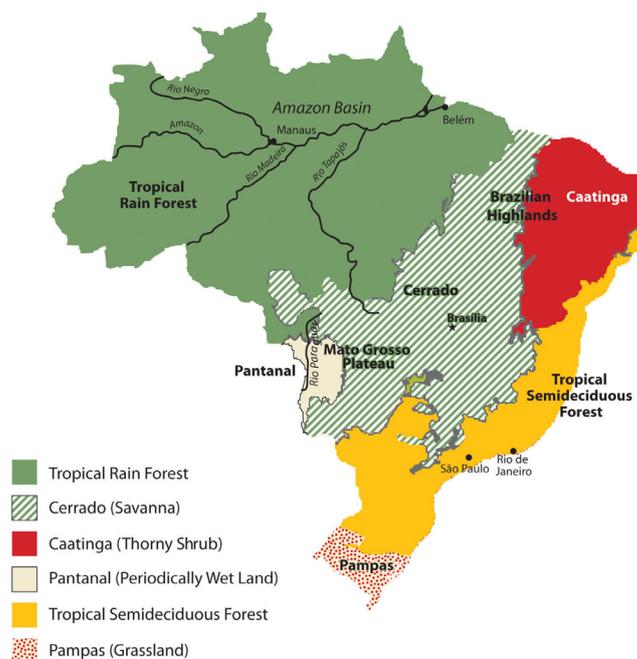
In 2015, when much of the southeast region, including the capital city of São Paulo, was suffering from a massive water shortage, CIFOR's lead researcher on forests and climate change, Dr. Luis Verchot, wrote:¹⁰³

The science is clear, and it goes beyond simple correlation among observations: The mechanisms of water circulation between the Amazon Basin and the southern regions east of the Andes are well established. As deforestation in the Amazon continues, rainfall in the southern part of Brazil will continue to be affected. The Amazonian forest will continue to lose its ability to regulate the climate and ensure a flow of water to the southeastern part of the country. Additionally, deforestation in the Brazilian Amazon will affect northern Argentina, so the problem has an international dimension.

Figure 21: The flying rivers of the Amazon



Figure 22: Natural Vegetation of Brazil



Reproduced from source: "Chapter 6: South America: Rural Amerindian States of Ecuador, Peru, and Bolivia" *Regional Geography of the World: Globalization, People, and Places* (Minneapolis: University of Minnesota Library Publishing, 2016), 390, accessed September 25, 2017, <https://doi.org/10.24926/8668.2701>.

Chapter 5: Point of No Return?



André Campos/Repórter Brasil

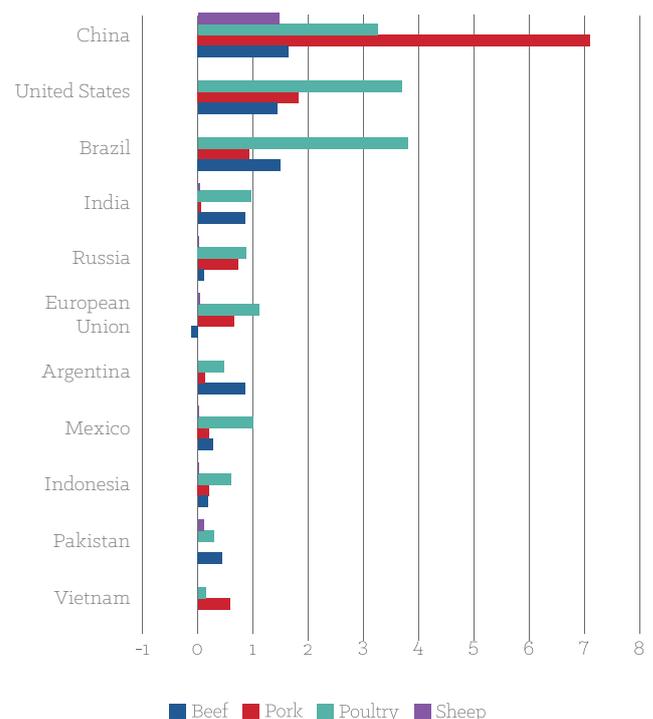
Brazilian beef cattle.

EXPANSION OF MEAT AND FEED PRODUCTION

Despite numerous environmental and social problems, Brazilian meat and feed grain production is expected to increase further between 2016 and 2025. In 2015, OECD-FAO predicted that Brazil's expansion in meat production will come from a strong increase in domestic consumption (of poultry more than other meats), rising exports and considerable increases in prices.¹⁰⁴ Brazil's Ministry of Agriculture and Livestock's projections point in the same direction: total meat production is expected to rise by 31 percent, increasing from 25.8 to 33.7 million tons.¹⁰⁵

These estimates did not take into account the political upheaval that has ensued in Brazil since 2015 and the resulting fluctuation of the Real's value. However, Brazil is projected to continue producing significant quantities of meat in the next decade (Figure 24)—perhaps outpacing the U.S. in poultry production and

Figure 24: Countries with the greatest share of additional meat production by meat type, 2016-2025



Source: OECD Agriculture Statistics (database), <http://dx.doi.org/10.1787/agri-outl-data-en>.

remaining a leader in beef and pork production. Much of this growth will be due to rising exports, hence consumption elsewhere.

EXPORTS AND CONTINUED OVER-CONSUMPTION DRIVE LAND DEGRADATION

Using the latest OECD-FAO projections, IATP has compared total rise in Brazilian poultry, beef and pork consumption compared to the total rise in exports in a ten-year period (2015-2025). Figure 27 shows that by 2025, both poultry and beef exports are projected to rise 40 and 39 percent, respectively, compared to 2015. This is a dramatic rise in exports. Under these projections, domestic consumption of poultry and beef also rises 14 and 17 percent, respectively. Pork's exports and consumption are roughly the same, though even here, the rise in exports is higher at 29 percent compared to a 26 percent higher consumption.

Soy and maize also experience a significant rise in both exports and production. Soy exports increase another whopping 33 percent, while maize exports increase by 26 percent. The production of soy also increases by 40 percent and maize by 25 percent, indicating that exports play a key role in the expansion of feed grain production—for maize, nearly all of it.

In Chapter 3, we saw that soy and maize alone will cover a land area greater than Spain in 2017. If OECD-FAO projections are actualized, the total hectares of soy and maize will expand to 56.77 million hectares (567,710 square kilometers or 219,194 square miles)—an area much bigger than France. Land use change of just an

additional 61,710 square kilometers (more than 23,826 square miles) means further deterioration of the Cerrado and displacement of cattle in the Amazon. This should be cause for global concern.

A word of caution about data: the USDA estimates that Brazil will export nearly 60,000 metric tons of soy in 2017; while OECD-FAO has Brazil reaching that quantity after 2020. The data discrepancy has everything to do with the assumptions behind these projections, but it demonstrates that the exercise of future projection must be taken with a grain of salt. The end result could be much worse if the USDA data is more accurate. On the other hand, effective and timely government regulations, sound international trade and investment policy, public awareness, natural events (unforeseen climate related catastrophe), price and currency fluctuations and other circumstances could lead to significant shifts in production, exports and consumption.

ROOM FOR CHANGE

Brazilians, on average, consume much more meat than the rest of the world—rivaling the U.S. in per capita overconsumption of beef, in particular. The Federation of Industries of the State of São Paulo (Fiesp) estimated that the Brazilian herd will increase at an annual average rate of 0.4 percent.¹⁰⁶ Though official figures vary, Brazil's cattle herd has reached over 215 million head (USDA estimated 226 million head at the end of 2016).¹⁰⁷ If we take the 0.4 percent annual rate of increase seriously, the overall expansion of the herd will have significant environmental ramifications for an ecosystem of vital importance—not just for Brazil, but for the whole planet.

Figure 26: Dataset: OECD-FAO Agricultural Outlook 2016-2025

		2015	2025	change in 10 years	percent increase in 10 years
Poultry (rtc)	Exports	4,229	5,977	1,749	41%
	Consumption	7,173	8,198	1,025	14%
Beef and veal (cwe)	Exports	2,099	2,922	823	39%
	Consumption	9,297	10,865	1,568	17%
Pork (cwe)	Exports	515	663	148	29%
	Consumption	2,986	3,753	767	26%
Soy	Exports	51,451	68,316	16,865	33%
	Production	96,806	135,456	38,650	40%
Maize	Exports	24,923	31,458	6,535	
	Production	81,062	101,200	20,138	

Compiled by IATP on 10 Apr 2017 08:33 UTC (GMT) from OECD.Stat

According to the civil society network, *Observatório do Clima*, “if there is no increase in the efficiency and the intensification of production in areas already occupied by livestock, the tendency is for the additional herd to be located in the states in the Amazon biome.”¹⁰⁸ Yet further intensification of large-scale livestock production will only incentivize further expansion of the industry rather than reign it in, further reducing the cost of meat through economies of scale and through the continued externalization of the environmental, human and public health impacts of meat and grain production. It will also worsen cruelty to animals and increase dependence on proprietary chemical inputs and technologies that take agriculture further away from its agroecological alternative. Dr. Jules Pretty et. al define sustainable intensification as “a process or system where agricultural yields are increased without adverse environmental impact and without the conversion of additional non-agricultural land.”¹⁰⁹ Given the impacts, export flows and current consumption patterns linked to Brazil’s industrial meat chain, a redirection rather than further intensification is urgently needed.

THE WAY FORWARD

Changing Brazil’s productive matrix is a complex matter due to the dominant political and economic classes that see its production and exports as synonymous to progress and development. The social movements and people affected by the expansion of this model either have no visibility or are perceived as remnants of the past and resistant to development. Despite those challenges, there are some next steps that could support efforts for the reform of Brazil’s meat sector:

- Filling important research gaps that paint a clear picture of the impacts of this sector and its value chain on people’s lives would be an important first step in raising awareness and changing mind-sets. For instance, further studies on climatic changes, drought and food security as a result of this value chain and its impacts on Brazil and the world would be a critical contribution.
- Comparing how these TNCs treat producers and workers integrated into their supply chains across different countries is necessary in building pressure to adopt strong standards.
- Stopping free trade deals that further incentivize deregulation and/or prevention of urgently needed social and environmental regulations

The Role of Trade Agreements

In addition to mergers and acquisitions, the meat industry uses trade agreements as an instrument to expand markets and push for deregulation—even if the rules and laws in question may be good for the public. These could be rules eliminating antibiotics as growth promoters in meat production or rules against deforestation or labor laws.

The EU is now eager to conclude the EU-Mercosur free trade agreement, which has been stalled for several years. A key issue will be Brazilian TNCs’ access to the EU beef market. EU Trade Commissioner Cecilia Maelstrom has responded to concerned beef farmers in the EU by saying that without Mercosur getting any improved access to the EU beef market, concluding a deal will be difficult.¹¹⁰ This has been one of the many contentious issues in the U.S.-EU free trade negotiations and between the EU and Canada. European beef producers, who also primarily raise cattle on grasslands, are economically vulnerable and have a higher cost of production than their Brazilian counterparts. The EU-Mercosur deal would hasten their crisis. The deal would further restructure the European market towards ever increasing concentration—further marginalizing European farmers and workers in the meat chain. The same is true for small Brazilian farmers, who are increasingly integrated into the corporate chain.

In 2016, the U.S. opened its market to Brazilian fresh and frozen beef exports, previously only canned or cooked beef was allowed. Under the shared quota with Argentina, Uruguay, Nicaragua and Costa Rica,¹¹¹ JBS, Marfrig and Minerva started exporting unprocessed beef to the U.S. However, the tainted meat scandal resulted in the U.S. banning these imports in June. The ban is likely to be lifted early next year. In the meantime, JBS continues to be a dominant meat packer based in the U.S. Finally, Brazil’s maize exports might also expand if Mexico decides to abandon U.S. GM maize imports because of conflicts with U.S. President Donald Trump, instead increasing GM maize imports from Brazil. Currently, nearly 28 percent of the U.S.’ maize exports go to Mexico.¹¹² Given that Brazil and the U.S. are the leading competitors in maize and soy exports, Trump’s trade policy might result in further trade diversion to Brazil. This remains to be seen.

is critical. Such agreements incentivize cheap exports and more production at the expense of producers, workers, animals and the environment.

- Civil society must begin to think concretely about divestment campaigns targeting these oligopolies that deplete and degrade land and water resources, increase climate risk, impoverish small producers and exploit animals and workers. The limitations of both the soy moratorium and the zero-deforestation agreements make

this clear. Last autumn, leading institutional investors pressed U.S. meat companies to assess the water pollution risks of their operations as a major financial liability. This is a good first step.

In September 2015, the Federation of Organizations for Social and Educational Assistance (FASE), the Brazilian Network for the Integration of the Peoples (Rebrip), Heinrich Böll Stiftung Brazil, Bröt für die Welt, and IATP held a workshop in Rio de Janeiro, bringing together different parts of Brazilian civil society to address these problems and trends. Since then, Brazil has entered a particularly turbulent period of political transition. Even so, some key conclusions emanating from the meeting merit repeating here, particularly for Europeans and Americans. It is hoped that follow up action can begin to take shape in importing countries, even as Brazilian civil society reorganizes itself to respond to their new political reality.

EU and U.S. civil society and citizens can:

- 1.) Support and organize campaigns in close collaboration with Brazilian groups on the impacts of meat production and meat and feed grain exports.
- 2.) Develop new partnerships with a cross-section of groups working on different social, environmental and public health impacts of this production and trade.
- 3.) Organize targeted corporate campaigns in close collaboration with Brazilian groups to contest the double standards of TNCs. This could include campaigns targeting transnational retailers, such as McDonald's and Burger King, and supermarkets. Retailers must begin to pay fair prices and require that their suppliers establish fair and transparent production contracts; enforce international labor standards; eliminate prophylactic use of antibiotics in food animals; and end the destruction of ecosystems, including through deforestation, land degradation and the use of dangerous agrochemicals.
- 4.) Demand that their governments:
 - implement and enforce strict regulations of methane and nitrous oxide from factory farms and include emissions from imports of meat and feed in their own accounting of greenhouse gas emissions (especially from direct and indirect land use change

resulting from expanded meat and feed operations);

- establish strong labeling requirements for raw and processed meat and feed in terms of country of origin and additives used; and
- close loopholes on the use of antibiotics for disease prevention with the aim to eliminate all routine use of antibiotics in food animal production.

MEETING PARTICIPANTS CONCLUDED THAT BRAZILIAN ORGANIZATIONS SHOULD:¹¹³

- 1.) Raise public awareness and mobilize public opinion by:
 - Organizing public debates on the role of BNDES and the state enterprise pension funds in using public money to support corporations such as JBS, BRF and Marfrig.
 - Promoting campaigns on the impacts of meat production and seeking to develop new partnerships with other sectors of civil society. Warning people about the harm to health from excessive meat consumption and making people aware of the power of marketing used by these TNCs and thereby giving greater value to the cultural dimension of food.
 - Denouncing slave labor and other precarious working conditions in the meat supply chain, including meat plants where migrants work in conditions of extreme poverty and with no social organization to represent them or guarantee their rights. In Brazil, these migrants come mainly from the Northeast region of the country, Africa, Haiti and Islamic countries.
 - Promoting dialogue with international networks, including raising awareness on how key provisions in trade agreements further expand markets and the power of transnational meat and feed corporations. Addressing the harmful impacts of these TNCs on climate change and setting up a

regional and international North-South coordinating body to address these issues.

- Identifying information gaps on the impacts of the Brazilian meat supply chain. For example, how many family farmers left milk production in recent years? How many meat processing plants have been closed? What condition are Brazilian rivers in and how is the ecosystem (including fisheries) affected? What are the impacts of agrochemicals on the rural population?
- Seeking to win support of urban consumers. A communication strategy is needed, especially since a large majority of Brazilian news agencies have close ties to agribusiness, which provides significant revenue through advertisements.

2.) Demand changes in government policies that expand industrial meat and feed production by:

- Eliminating all public forms of subsidies for agribusiness corporations and remove the state as a shareholder of their capital. Encouraging careful use of public resources. Public funds should be directed to agroecological family farming.
- Supporting meat production by family farmers and small meat processing plants and stimulating their potential to produce healthier food that promotes human rights and is free from animal cruelty. Defending changes to sanitary inspection rules that unjustifiably exclude small producers from the market.
- Establishing a roundtable with representatives from civil society, the government and, perhaps, the agriculture industry to debate these issues.

3.) Create an effective civil society mechanism that builds on the insights from these discussions and develops next steps.

For a full report of the meeting and Sergio Schlesinger's 2016 Portuguese edition of this study, see: Cadeia Industrial de Carne: Compartilhando ideias e estratégias sobre o enfrentamento do complexo industrial global de alimentos

<https://fase.org.br/wp-content/uploads/2016/08/Livro-Cadeia-Industrial-da-carne.pdf>

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Appendix A

Data for figure 1: Brazil's rank in global production and exports in 2016 (by volume)

	Production	Exports
Beef	2nd	1st
Soybean	2nd	1st
Chicken	2nd	1st
Maize	3rd	2nd
Pork	4th	4th

Source: Information compiled from USDA/FAS <https://apps.fas.usda.gov/psdonline/app/index.html#/app/topCountriesByCommodity>, accessed February 8, 2017!

Data for figure 4: Top 10 Global Meat Processing Transnational Corporations

Food Sales in USD millions	2011	2012	2013	2014	2015	2016
1	JBS: 31,285	JBS: 34,770	JBS: 38,675	JBS: 44,700	JBS: 52,580	JBS: 61,110
2	Tyson Foods: 28,430	Tyson Foods: 32,246	Tyson Foods: 33,278	Tyson Foods: 34,374	Tyson Foods: 37,580	Tyson Foods: 41,373
3	Cargill: 26,000	Cargill: 28,000	Cargill: 32,500	Cargill: 33,500	Cargill: 33,700	Cargill: 28,900
4	Vion: 12,565	BRF: 15,040	BRF: 14,928	BRF: 15,260	Smithfield: 13,221	Smithfield: 13,602
5	Smithfield: 11,203	Vion: 13,190	Vion: 13,190	Smithfield: 13,221	BRF: 13,185	BRF: 12,880
6	Marfrig Group	Marfrig Group	Smithfield: 13,094	NH	NH: 12,108	NH*: 11,218
7	Nippon Meat Packers	Smithfield.	Marfrig: 12,825	Vion	Vion: 10,975	Hormel Foods: 9,264
8	Danish Crown	Nippon Meat Packers	Nippon Meat Packers: 12,815	Danish Crown	Danish Crown: 10,550	Danish Crown: 8,825
9	BRF: 7,850	Danish Crown	Danish Crown: 10,310	Marfrig	Marfrig: 9,580	Marfrig: 7,560
10	Hormel Foods.	Hormel Foods.	Hormel Foods.: 8,231	Hormel Foods.	Hormel Foods.: 9,316	OSI: 6,100

*NH Foods previously Nippon Meat Packers

Source: Compiled by IATP from Food Engineering Magazine's Top 100 Food and Beverage Companies Annual List.3

Data for figure 10: Brazilian pig meat exports 2015, 2016

	JAN-DEC 15	JAN-DEC 16	CHANGE YEAR OVER YEAR
	000 TONNES		%
Total fresh/frozen pork of which:	472.7	628.7	+33
Russia	236.5	236.9	+0
Hong Kong	84.6	109.0	+29
China	5.2	87.6	+1576
Singapore	28.0	32.6	+16
Uruguay	21.0	27.5	+31

Source: SECEX, HIS Maritime & Trade—Global Trade Atlas, <http://www.thepigsite.com/swinenews/42933/brazilian-pork-exports-increase-by-a-third-driven-by-asian-demand/>, accessed Feb 2, 2017

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