

GREENPEACE

MAKING MINCEMEAT OF THE PANTANAL

THE MARKETS FOR (JBS) BEEF

(Marfrig & Minerva Foods)



Carrefour



PROSTHEAT



meat 2000



JAN ZANDBERGEN



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'The opportunity that we have, with media giving us a break on other issues, is to pass the reforms and deregulate, simplify. So we need to give this a push here, while we are in this moment of calmness in terms of media coverage, because it only talks about COVID, and "pass the cattle" [push things through all at once] changing all the rules, and simplifying regulations.'

Brazilian Minister of the Environment Ricardo Salles, April 2020





'The livestock industry is not a threat to the future of the planet despite Greenpeace and certain other NGO claims. Livestock can deliver biodiversity, socio-economic development, sustainable livelihoods and meet food security goals.'¹

Marcio Nappo, Director of Corporate Sustainability,
JBS Brasil, February 2021

'The need for rapid reduction in GHG emissions from fossil fuels to meet the 1.5° or 2°C targets is widely acknowledged. We show that the same is true for food systems: Even if fossil fuel emissions were rapidly reduced, emissions from the global food system are on a trajectory that would prevent achievement of the 1.5° and 2°C targets. ... [M]eeting the 1.5° and 2°C targets will likely require extensive and unprecedented changes to the global food system.'²

Michael A Clark et al, *Science*, November 2020



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EXECUTIVE SUMMARY:

MAKING MINCEMEAT OF THE PANTANAL

In 2020, thanks to two consecutive years of severe drought,³ some 30% of the Brazilian Pantanal – the world’s largest contiguous wetland⁴ – burned,⁵ with official sources saying that the vast majority of the fires were started by human activity.⁶ In many cases ranchers are suspected of starting fires deliberately,⁷ in defiance of official bans on the use of fire introduced in July by regional governments and presidential decree.⁸

Despite its value as a vital habitat for jaguars⁹ and other wildlife,¹⁰ about 90% of the Brazilian Pantanal is under self-declared land claims, where ownership is not verified by the state.¹¹ As a consequence, these land claims often overlap with Indigenous lands or public conservation units (including federal, state and municipal reserves). In the Pantanal, these land claims overlap with about 28% of Indigenous lands¹² and 58% of public conservation units.¹³ About 80% of the Pantanal is reportedly managed as cattle ranches.¹⁴

Greenpeace International¹⁵ has identified 15

ranchers who are either current or recent (2018–2019) suppliers of Brazil’s leading meat processors, JBS, Marfrig and Minerva, and that are linked to the devastating 2020 fires in the Pantanal, environmental violations and/or property registration irregularities.¹⁶ The fires within the boundaries of the case study properties alone burned more than 73,000 ha – an area the size of Singapore, or about half the size of Greater London¹⁷ – between 1 July and 27 October 2020, and in many cases appear to have contributed to extensive burning far beyond the property limits.

These 15 ranchers were linked directly or indirectly in 2018–2019 to at least 14 meat processing facilities owned by JBS, Marfrig and Minerva which trade globally. Direct trade links have been identified from one or more of these 14 facilities to customers including **Burger King** and **McDonald’s**, Danish **Crown Group**, **Nestlé**, Brazil’s **Pão de Açúcar** supermarket chain (a member of the French **Casino Group**), **Carrefour** and **Walmart-Chile**.¹⁸ According

to shipping data, between 1 January 2019 and 31 October 2020 these 14 facilities collectively exported over half a million tonnes of beef and beef products worth nearly US\$3 billion to markets including Hong Kong (22%), China (21%), the EU-27 and the UK (8%) and the USA (1%). Exports from JBS's Pantanal-linked facilities alone reportedly accounted for almost US\$2 billion over the period, with the EU-27 and the UK representing around 9% of the export volume and over 13% of the value.¹⁹

Exports are a primary source of revenue for the Brazilian operations of JBS, Marfrig and Minerva.²⁰ Despite the chaos and economic upheaval caused by the global Covid-19 pandemic, Brazil's beef exports set a new all-time high in 2020, with volumes reported to have reached 2 million tonnes and revenues some US\$8.4 billion – up 11% over 2019.²¹ The main global revenue source for JBS SA (as for Marfrig²²), however, lies in its North American business units, with the United States accounting for around half of the company's global revenue in the third quarter of 2020.²³ JBS has business interests in every continent except Antarctica;²⁴ customers of the company and its subsidiaries internationally include **Costco, KFC, Lidl, Mars, M&S, Nando's, Nestlé, Pizza Hut, Princes, Sainsbury's, Subway, Tesco, Walmart** and **YUM**.²⁵

As a result of numerous damning exposés, including the 2009 Greenpeace report *Slaughtering the Amazon*,²⁶ JBS, Marfrig and Minerva first promised to deliver 'zero deforestation in the supply chain' by 2011.²⁷ But as this investigation into their Pantanal supply base exposes, the processors still do not have the fundamental procedures in place to guarantee that cattle from rogue ranchers linked to environmental destruction or legal violations are excluded.

Proper product due diligence procedures would mean JBS, Marfrig and Minerva only slaughter cattle where they have established full traceability to origin. This would also mean they could guarantee that they exclude any cattle where there is a risk that they may originate from destruction or degradation of natural forests or other ecosystems, or lands that have been exploited in violation of Indigenous Peoples' rights or conservation laws. When applied to ensure corporate transparency and accountability, due diligence

procedures would mean JBS, Marfrig and Minerva proactively identify and prevent any other adverse human rights and environmental impacts resulting from their own activities, from the activities of the companies they control and from the activities of their subcontractors and suppliers with whom they have an established commercial relationship.

Against this background, the meat processors' current approach to supply chain screening in the Pantanal focuses primarily on the supply ranch, without sufficiently considering practices in the rancher's other operations. This blinkered view enables the most transparent form of cattle laundering – the potential for ranchers to supply cattle from operations that violate law or company policy by passing them through approved intermediary ranches they also own before sending them to slaughter.

Thirteen of the 15 ranchers identified by Greenpeace were 'tier-one' suppliers: they directly supplied one or more of the meat processors from an approved ranch in 2018 or 2019.²⁸ In the majority of instances, the links between the case study properties themselves and the meat processors were indirect – cattle from those properties passed through one or more other ranches before the final sale. However, in most cases, the intermediary ranches were owned by the same individual.²⁹

The supply chain links established by Greenpeace between the ranchers and the big three meat processors predate the 2020 fires. As confirmed by the company responses to Greenpeace regarding the cases laid out in this report, the meat processors deem that all of the ranches that directly supplied them met their policy requirements at the time of purchase. Further, at least 11 of the 15 ranchers apparently remain tier-one suppliers – ie have at least one property approved to directly supply at least one of the meat processors.³⁰

Disturbingly, the processors provided no indication of having imposed meaningful requirements on their Pantanal suppliers in light of 2020's bans on deliberate use of fire, or of any intention to do so despite the evidence provided of supply to approved ranches from problematic ones. In the case of JBS, three of its current tier-one approvals as well as one of its historic (2018–2019) trading relationships appear to violate its sourcing

policy, and its assessment of the suppliers' compliance conflicts with that of Minerva in some instances.³¹ One of Marfrig's historic trading relationships similarly appears to violate its sourcing policy,³² despite the company's assertions about compliance. Marfrig has not indicated that it intends to review these trade relationships more closely.

As for JBS, presented with the summary findings of this report, the company confirmed to an industry journal that for the moment it has no intention to exclude suppliers – tier-one or third-party – that violate its policies. Instead, the emphasis is on getting Amazon suppliers onto a monitoring platform by 2025:

'Right now, we're not going to block them [noncompliant suppliers], we're going to try to help them solve the issue. Sometimes it's paperwork, sometimes they need to put together a conservation plan, sometimes they need to reforest part of their property. We are going to help them and we're hiring people to help these suppliers.'

'We think excluding the property and the supplier is a negative approach. It won't solve the problem because they'll go to the next meat packer and try and sell it. We don't want that because it won't address the issue.'³³

Such an accommodating approach sits uneasily with JBS's claimed 'zero tolerance' to deforestation and certainly fails to send a clear message to the sector that violations come with consequences – they seem to come with bonuses.

Beyond the Amazon, JBS reverts to a simple checklist of official legal findings³⁴ in a country where the government is systematically dismantling environment agencies and undermining law enforcement.³⁵

The profound deficiencies in the meat processors' policies and related enforcement procedures for their Pantanal supply base help explain the sector's failure to end its links to environmental destruction or to close the market to dirty suppliers. These include:

- **Failure to effectively and comprehensively ban and monitor for the deliberate use of fire, legal or otherwise.**
- **Failure to effectively and comprehensively ban and monitor for all new land clearance, not just illegal deforestation and not just within iconic**

regions such as the Amazon.³⁶

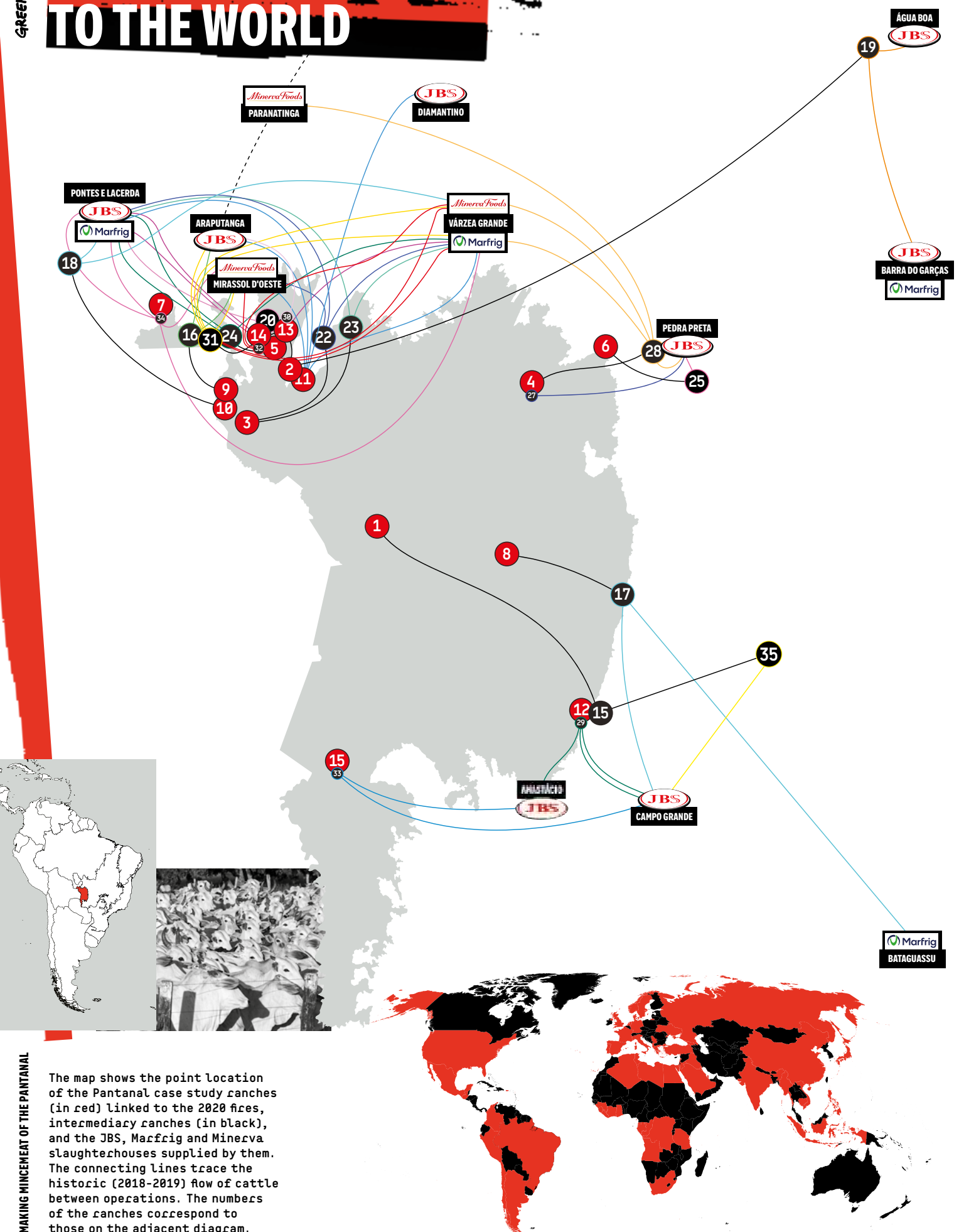
- **Failure to require, as a condition of trade, that ranchers comply with the law and zero deforestation policies across their operations.**³⁷
- **Continued failure to proactively identify and monitor their entire supply base (including indirect supply and third-party suppliers), despite a 2009 agreement to achieve this in the Amazon by 2011.**³⁸
- **Failure to make supply chain transparency a condition of trade (ie requiring ranchers to disclose the suppliers and origins of their cattle) and a model for responsible business (ie ensuring the public availability of data on all ranchers in the company's supply chain, including the locations of their operations, in order to enable independent scrutiny of their impact).**

These failures, underpinned by lack of transparency and traceability, both expose and contribute to the industrial meat sector's continued role as a leading global driver of land-use emissions, biodiversity loss and social injustice. Of particular concern is the potential for cattle linked to deliberate or illegal use of fire to find their way into the international market.

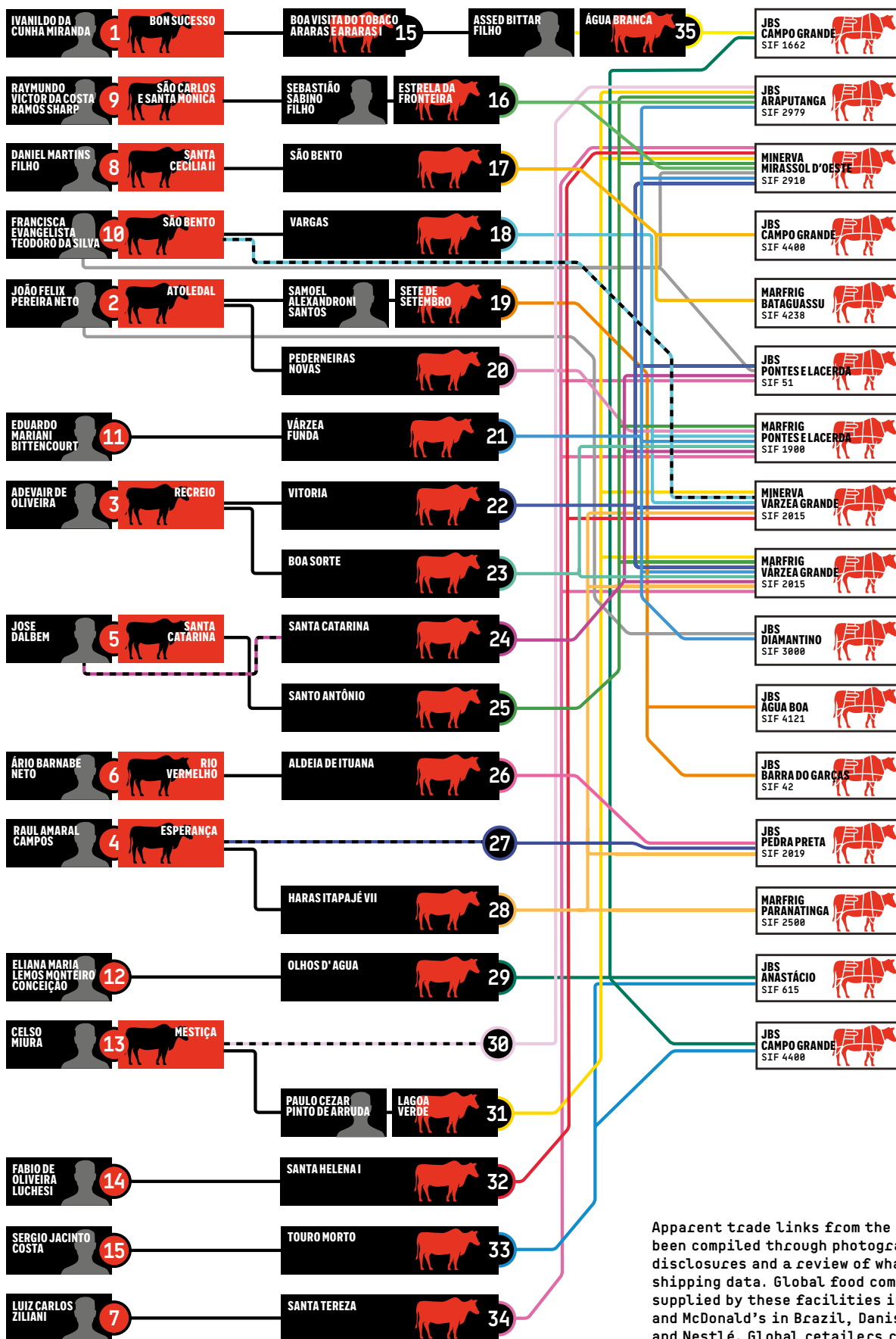
Given such structural failings, it is untenable for international consumer goods companies, supermarkets and fast food companies that claim to have zero deforestation policies to continue to trade with the meat processors named in this report. Further, if trade blocs such as the European Union³⁹ and the United Kingdom⁴⁰ are to end their consumption of products linked to environmental destruction then they must swiftly enact and enforce the necessary laws to ensure that products from these groups find no place in these markets.

The overproduction of meat and dairy is literally costing the earth. To halt and begin to reverse the current crisis, decisive action is needed from governments, finance and consumer companies to shift away from industrial meat and close markets to companies contributing to forest and ecosystem destruction. Without these vital steps our food system will continue to be a driving force of deforestation, climate change and future pandemic risk.

FROM THE PANTANAL TO THE WORLD



The map shows the point location of the Pantanal case study ranches (in red) linked to the 2020 fires, intermediary ranches (in black), and the JBS, Marfrig and Minerva slaughterhouses supplied by them. The connecting lines trace the historic (2018-2019) flow of cattle between operations. The numbers of the ranches correspond to those on the adjacent diagram.



The spider diagram shows how trade from the 15 ranches named in the investigation entered the cattle supply of 14 JBS, Marfrig and Minerva slaughterhouses, often via ranches controlled by the same individual. These slaughterhouses export to markets around the world (shown in red on the world map).

Apparent trade links from the slaughterhouses have been compiled through photographic evidence, company disclosures and a review of what reported in Panjiva shipping data. Global food companies reportedly supplied by these facilities include Burger King and McDonald's in Brazil, Danish Crown in Hong Kong, and Nestlé. Global retailers reportedly supplied by these facilities include the French groups Carrefour and Casino (Pão de Açúcar) in Brazil and Walmart in Chile. Importers of beef from these facilities reportedly include Germany - Frost Meat and Meat 2000; Hong Kong - Kai Bo Frozen Meat Supermarket; Israel - Neto Malinda Trading Ltd and Shufersal; The Netherlands - FN Global Meat and Zandbergen Brothers Bv; Spain - Egatesa, Jucarne Sa, and Montesano.

WHAT'S THE BEEF WITH JBS?

We live in a boom time for the meat industry. Worldwide meat consumption is predicted to rise 76% by 2050,⁴¹ with meat-heavy diets being energetically promoted, including in emerging economies and by fast food companies.⁴² Driven by its insatiable hunger for new markets and for land on which to rear livestock and grow soya for animal feed, the industrial meat sector poses a threat to the global climate, to the wildlife of some of the world's most biodiverse regions, to the human rights of Indigenous peoples and other communities and to the long-term health of populations in the West and elsewhere.⁴³

Global meat giant JBS exemplifies and is a main contributor to this threat. Based in São Paulo,⁴⁴ JBS claims to be the world's largest animal protein company⁴⁵ and the second-largest food company in the world by annual sales (after Nestlé).⁴⁶ It has grown internationally through a series of acquisitions largely funded by the state-owned Brazilian National Bank for Economic and Social Development (BNDES),⁴⁷ which owns more than a fifth of the company.⁴⁸

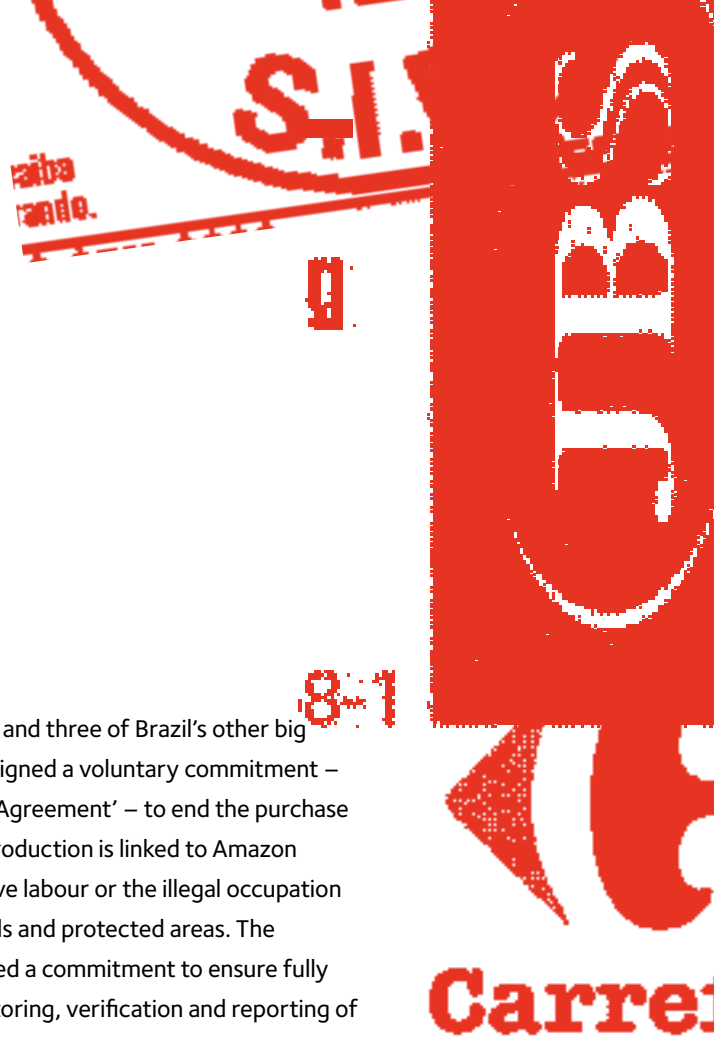
JBS's impacts on the climate and on the ecosystems of South America are profound: its operations have been estimated to produce around half the annual carbon emissions of fossil fuel giants such as ExxonMobil, Shell or BP,⁴⁹ largely as a result of forest clearance linked to its cattle supply chains and the production of soya for animal feed.⁵⁰

The scale of JBS's environmental and social destruction became a global scandal in 2009, when Greenpeace published a report, *Slaughtering the Amazon*,⁵¹ exposing how JBS and other major players in the Brazilian beef industry were linked to hundreds of ranches in the Amazon, including some associated with illegal deforestation and other destructive practices, as well as modern-day slavery. In the wake

of that report JBS and three of Brazil's other big meat processors signed a voluntary commitment – the so-called 'G4 Agreement' – to end the purchase of cattle whose production is linked to Amazon deforestation, slave labour or the illegal occupation of Indigenous lands and protected areas. The agreement included a commitment to ensure fully transparent monitoring, verification and reporting of the companies' entire supply chains (including third-party suppliers) within two years.⁵²

This pledge has not been honoured. For over a decade, investigations by Greenpeace and numerous others have repeatedly exposed JBS's links to corruption, deforestation and human rights violations.⁵³ But despite its failure to implement the terms of its 2009 commitment, as the company plans to seek listing of its international operations on the New York Stock Exchange (NYSE) in 2021⁵⁴ it appears to be attempting to bolster its environmental image and distance itself from its destructive legacy. In response to increasing pressure from its customers and shareholders,⁵⁵ in late September 2020 JBS launched its new 'Together for the Amazon' initiative. As well as setting up a fund to support sustainable development and conservation projects in the region, the company has given itself until 2025 to implement a system for monitoring the supply of livestock to the ranches that directly supply it in the Amazon.⁵⁶ This new supply chain commitment – which in real terms represents a step backward from the 2009 commitments – has numerous failings, chief among them:

- **Failure to explicitly extend the whole of the supply chain policy, including 'zero tolerance for deforestation', beyond the Amazon**
- **Failure to explicitly exclude as suppliers ranchers that use fire deliberately**





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- **Apparent abandoning of the transparency component of the 2009 agreement, notably to ensure fully transparent monitoring, verification and reporting of the company's entire supply chain by 2011**
- **Failure to explicitly require legal and zero deforestation policy compliance across the operations of ranchers who supply the company as a condition of trade**

JBS's 2020 zero deforestation commitment applies solely to the Amazon, ignoring neighbouring regions such as the Cerrado, said to be the world's most biodiverse savannah⁵⁷ (from which, according to the Trase supply chain transparency platform, JBS sources the majority of the cattle it exports⁵⁸), and the Pantanal – both regions where the cattle industry is also driving ecosystem conversion.⁵⁹ While in climate terms the preservation of the Amazon rainforests is a key objective in South America, as the Intergovernmental Panel on Climate Change's 2019 land use report pointed out, the prevention of widespread land use change across all ecosystems is vital.⁶⁰

The incidence of fires in the Brazilian Amazon in the first nine months of 2020 was the highest in a decade, and more fires than ever before were recorded in the Pantanal over the same period.⁶¹ Still, the new JBS initiative makes no mention at all of excluding from the company's supply chain ranchers who use fire deliberately for land management or clearance, despite the announcement of local and federal bans.⁶²

The 2020 commitment delays supply chain mapping in the Amazon beyond the ranches that directly supply it until 2025, 14 years after the original deadline.⁶³ The proposed monitoring platform⁶⁴ itself will be confidential – ie not publicly available for stakeholder review and scrutiny – which abandons the original commitment to a transparent monitoring system.

While the 2020 Amazon commitment reasserts the company's 'zero tolerance for deforestation', which was at the heart of the original G4 Agreement, the company also asserts that the proposed monitoring platform will 'ensure any cattle from producers involved in illegal deforestation cannot enter the JBS supply chain' (emphasis added).⁶⁵

What is clear is that JBS has not immediately extended its 'zero tolerance' to include clearance of natural ecosystems beyond the Amazon. Brazil's current Forest Code allows the clearance of up to 80% of any

land claim in the Brazilian Pantanal and other biomes outside the Amazon.⁶⁶ Across the country, that means some 88 million ha of native vegetation – more than 3.5 times the size of the UK⁶⁷ – could be cleared legally within existing land claims,⁶⁸ despite the huge climate and biodiversity costs.

JBS also fails to require comprehensive monitoring of the ranchers who supply it across their operations and across biomes. While this was not a requirement of the G4 Agreement either, in the years since that agreement was reached understanding of the adequacy of its approach to due diligence within the commodity trade has evolved. In the palm oil sector, for example, it is widely recognised today that if the sector is to be cleaned up, actors at all stages of the downstream supply chain must exclude any suppliers whose operations – including those of subsidiaries or associates – are illegal or environmentally destructive. This puts the appropriate emphasis on the exclusion of rogue suppliers, not just of tainted supplies.

In the case of Brazil's agricultural commodity sectors, including beef and soya, this should mean monitoring the activities of traders, ranchers and farmers across all their operations (that is, beyond the purchaser's immediate supply chain), not just in the Amazon and not just for deforestation but for other forms of ecosystem destruction, deliberate or illegal use of fire, unresolved land disputes and embargoes, outstanding fines and human rights abuses including the use of slave labour.

Considering the urgency of the global climate and nature emergency, initiatives such as JBS's new Amazon supply chain pledge that are based on self-regulation of voluntary commitments are a decade out of date in delivery and scope. They do not represent a decisive contribution to the radical shake-up of the global food system that science demands and that companies, financial institutions and governments need to deliver.

Food industry corporations that continue to source from JBS and financial institutions that continue to resource it are exposing themselves to financial and reputational risk. Worse, they are contributing indirectly to the existential risks faced by South America's iconic biomes and their inhabitants – and by all the inhabitants of an overheating planet – due in large part to the activities of the industrial meat sector. Governments are also stakeholders with exposure to JBS, and to the impacts of the industrial meat sector more broadly, through sovereign investments, trade and trade deals, and the choices they make regarding market and financial regulation.



WHO NEEDS TO DO WHAT

The steps that food industry, financial institutions and governments take in the immediate future in relation to JBS – and the global meat industry as a whole – will be a decisive test of their priorities. Governments and companies must align the economy with biodiversity and climate protection, along with social justice. They must ensure that private and public finance, trade policy and overseas cooperation do not drive further deforestation, but do support nature restoration and a transition to a green, just and resilient economy. This includes:

CLOSING THE MARKET TO ECOSYSTEM DESTRUCTION:

DROPPING FOREST AND ECOSYSTEM DESTROYERS:

End finance for or trade with groups such as JBS whose direct or indirect suppliers are linked to deforestation and alleged human rights violations – this includes ending trade with subsidiaries such as JBS-owned Pilgrim's Pride, which owns Moy Park and Tulip (recently renamed Pilgrim's Pride Ltd).⁶⁹

DROPPING COMMODITIES LINKED TO FOREST AND ECOSYSTEM DESTRUCTION:

Including through the adoption of a law on forest and ecosystem risk commodities (FERCs) and derived products, to ensure that commodities and products linked to deforestation, ecosystem destruction and abuses of human rights are not placed on the market. The legislation should include measures to cover the financial sector, ensure full supply chain traceability and transparency and rules on due diligence.

ENSURING TRADE POLICY ALIGNS WITH CLIMATE, BIODIVERSITY AND SOCIAL JUSTICE GOALS:

This includes refusing to ratify trade deals such as the EU–Mercosur agreement. Trade agreements of this kind are based on an extractive model that commodifies people and nature and is inherently incompatible with forest protection – governments should instead protect forests and other natural ecosystems by adopting policies to decrease meat production and consumption, and addressing their external forest and ecosystems footprint by means of product and supply chain regulations.

TRANSFORMING THE FOOD SYSTEM:

PHASING OUT INDUSTRIAL MEAT: Immediately begin the phase-out of all finance for or trade in industrial meat, with the aim of reducing overall meat and dairy production and sales by at least 50% by 2025 and 70% by 2030 in countries with high levels of meat consumption.⁷⁰

MAKING FULL TRANSPARENCY A CONDITION

OF TRADE: Make full transparency of group operations and the supply chain a condition of finance or trade, requiring open and comprehensive monitoring and reporting systems to be in place.

PRIORITISING HUMAN AND ENVIRONMENTAL

HEALTH: Introduce targets, legislation and fiscal measures to decrease production and consumption of meat and dairy products in countries with high levels of consumption and support a fundamental shift towards ecological farming and healthy plant-rich diets in order to reduce pressure on natural ecosystems.





CONTENTS

ANNEX 1: REPORTED EXPORTS FROM LINKED FACILITIES

PROCESSOR SIF LOCATION	EXPORT VOLUME (TONNES) EXPORT VALUE (US\$)	KEY EXPORT DESTINATION BY COUNTRY AND KEY REGION	TONNES	VALUE (US\$)	VOLUME (%)	RANCHER / CASE STUDY SUPPLY LINKS
JBS BARRA DO GARÇAS (SIF 42)	82,909 442,125,000	China	71,807	383,635,900	86.61%	JOÃO FELIX PEREIRA NETO / ATOLEDAL
		Hong Kong	8,138	43,085,600	9.82%	
		Philippines	845	4,519,600	1.02%	
		Italy	537	2,917,800	0.65%	
		Netherlands	503	2,981,700	0.61%	
		Germany	242	1,316,300	0.29%	
		Spain	131	767,700	0.16%	
		Israel	26	123,000	0.03%	
		Sweden	25	142,000	0.03%	
		United Kingdom	25	123,000	0.03%	
		KEY REGIONS				
		EU 27 +UK	1,438	8,106,500	1.73%	
JBS PONTES E LACERDA (SIF 51)	40,814 223,320,540	Hong Kong	10,922	57,495,400	26.76%	ADEVAIR DE OLIVEIRA / RECREIO JOSE DALBEM / SANTA CATARINA LUIZ CARLOS ZILIANI / SANTA TEREZA FRANCISCA EVANGELISTA TEODORO DA SILVA
		Italy	1,022	10,206,300	4.46%	
		Netherlands	1,386	8,231,600	3.40%	
		Spain	1,211	8,144,600	2.97%	
		Germany	304	2,015,200	0.75%	
		Turkey	201	1,087,000	0.49%	
		United Kingdom	177	1,000,000	0.43%	
		Portugal	52	326,900	0.13%	
		Greece	27	210,000	0.07%	
		Chile	25	123,000	0.06%	
		KEY REGIONS				
		EU27+UK	4,979	30,134,600	12.20%	
		Middle East	22,878	124,953,340	56.05%	
JBS ANASTÁCIO (SIF 615)	21,997 117,276,171	Israel	9,668	49,880,671	43.95%	ELIANA MARIA LEMOS MONTEIRO CONCEIÇÃO / OLHOS D' AGUA SERGIO JACINTO COSTA / TOURO MORTO
		Hong Kong	4,942	25,911,900	22.47%	
		Turkey	432	2,314,000	1.96%	
		Netherlands	28	156,000	0.13%	
		Chile	24	186,000	0.11%	
		KEY REGIONS				
		Middle East	15,235	81,473,371	69.26%	
		Asia	4,942	25,911,900	22.47%	
JBS CAMPO GRANDE (SIF 1662)	44,759 240,803,444	Hong Kong	11,287	59,200,700	25.22%	IVANILDO DA CUNHA MIRANDA / BONSUCESSO ELIANA MARIA LEMOS MONTEIRO CONCEIÇÃO / OLHOS D' AGUA
		Philippines	4,642	24,120,000	10.37%	
		Italy	1,174	6,333,200	2.62%	
		Spain	846	4,680,900	1.89%	
		Germany	810	5,345,700	1.81%	
		Netherlands	689	3,977,194	1.54%	
		Turkey	632	3,564,000	1.41%	
		South Africa	409	594,400	0.91%	
		Chile	197	998,000	0.44%	
		Sweden	62	475,800	0.14%	
		United States	39	218,000	0.09%	
		Portugal	26	134,800	0.06%	
		United Kingdom	13	61,300	0.03%	
		KEY REGIONS				
		EU27+UK	3,619	21,008,894	8.08%	
		Asia	15,929	83,320,700	35.59%	
		Middle East	19,302	106,280,950	43.13%	
JBS PEDRA PRETA (SIF 2019)	14,661 81,980,600	Hong Kong	4,826	25,651,800	32.92%	ÁRIO BARNABE NETO / RIO VERMELHO RAUL AMARAL CAMPOS / ESPERANÇA
		Philippines	1,433	7,511,000	9.78%	
		Italy	828	4,561,000	5.65%	
		Netherlands	584	3,534,200	3.98%	
		Spain	402	2,531,600	2.74%	
		Germany	362	2,204,900	2.47%	
		Israel	196	1,380,700	2.00%	
		Turkey	184	1,030,000	1.25%	
		Chile	75	367,000	0.51%	
		Portugal	40	218,700	0.27%	
		Greece	29	161,000	0.20%	
		KEY REGIONS				
		EU27+UK	2,246	13,211,400	15.32%	
		Middle East	5,133	30,216,200	35.01%	
		Asia	6,260	33,162,800	42.70%	

PROCESSOR SIF LOCATION	EXPORT VOLUME (TONNES) EXPORT VALUE (US\$)	KEY EXPORT DESTINATION BY COUNTRY AND KEY REGION	TONNES	VALUE (US\$)	VOLUME (%)	RANCHER / CASE STUDY SUPPLY LINKS
JBS ARAPUTANG (SIF 2979)	44,119 236,922,800	Hong Kong	11,381	59,607,800	25.80%	RAYMUNDO VICTOR DA COSTARAMOS SHARP / SÃO CARLOS E SANTA MONICA EDUARDO MARIANI BITTENCOURT / VÁRZEA FUNDA JOSE DALBEM / SANTA CATARINA CELSO MIURA / MESTIÇA ADEVAIR DE OLIVEIRA
		Philippines	8,035	42,324,800	18.21%	
		Italy	3,070	18,582,600	6.96%	
		Netherlands	1,508	8,040,600	3.42%	
		Spain	969	5,670,100	2.20%	
		Germany	734	4,311,700	1.66%	
		Chile	221	1,173,000	0.50%	
		United Kingdom	175	978,200	0.40%	
		Portugal	103	531,000	0.23%	
		South Africa	85	482,000	0.19%	
		Lebanon	54	335,000	0.12%	
		Greece	26	148,300	0.06%	
		KEY REGIONS				
		EU27+UK	6,584	38,262,500	14.92%	
		Middle East	12,479	67,968,700	28.29%	
		Asia	19,416	101,932,600	44.01%	
JBS DIAMANTINO (SIF 3000)	38,837 208,392,700	Hong Kong	8,025	42,375,700	20.66%	EDUARDO MARIANI BITTENCOURT / VÁRZEA FUNDA JOÃO FELIX PEREIRA NETO
		Netherlands	1,907	11,452,500	4.91%	
		Lebanon	888	3,464,100	2.29%	
		Italy	860	4,494,000	2.22%	
		United Kingdom	521	3,622,200	1.34%	
		Chile	497	2,572,000	1.28%	
		Germany	375	2,576,600	0.97%	
		Spain	373	1,936,900	0.96%	
		South Africa	344	1,935,000	0.88%	
		Turkey	79	383,000	0.20%	
		Portugal	78	416,700	0.20%	
		Greece	76	409,700	0.20%	
		KEY REGIONS				
		EU27+UK	4,191	24,908,600	10.79%	
		Middle East	22,665	121,292,700	58.36%	
		Asia	8,025	42,375,700	20.66%	
JBS ÁGUA BOA (SIF 4121)	11,913 66,159,200	Hong Kong	3,655	19,322,400	30.69%	JOÃO FELIX PEREIRA NETO / ATOLEDAL
		Italy	1,826	10,434,500	15.33%	
		Spain	1,706	11,991,400	14.32%	
		Turkey	375	2,129,000	3.15%	
		Netherlands	364	1,991,000	3.06%	
		Israel	13	73,300	2.73%	
		South Africa	204	153,300	1.72%	
		Lebanon	131	640,000	1.10%	
		United Kingdom	76	427,000	0.64%	
		Germany	51	268,000	0.43%	
		KEY REGIONS				
		EU27+UK	4,023	25,111,900	33.77%	
		Middle East	2,435	12,952,600	20.44%	
		Asia	3,655	19,322,400	30.69%	
JBS CAMPO GRANDE (SIF 4400)	50,942 369,691,390	Hong Kong	21,463	128,814,500	42.13%	DANIEL MARTINS FILHO / SANTA CECÍLIA II ELIANA MARIA LEMOS MONTEIRO CONCEIÇÃO / OLHOS D'ÁGUA SERGIO JACINTO COSTA / TOURO MORTO
		United States	3,725	18,003,000	7.31%	
		Lebanon	2,131	14,236,900	4.18%	
		Italy	1,396	7,554,000	2.74%	
		Netherlands	931	19,711,400	1.83%	
		Spain	701	3,791,800	1.38%	
		Turkey	436	2,401,000	0.86%	
		Germany	424	2,379,200	0.83%	
		South Africa	357	692,500	0.70%	
		Sweden	319	2,346,500	0.63%	
		Chile	268	1,526,000	0.53%	
		United Kingdom	106	27,794,600	0.21%	
		Portugal	51	309,200	0.10%	
		Greece	50	287,200	0.10%	
		France	31	36,919,200	0.06%	
		KEY REGIONS				
		EU27+UK	4,009	101,093,100	7.87%	
		Middle East	16,350	95,366,700	32.10%	
		Asia	21,463	128,814,500	42.13%	

PROCESSOR SIF LOCATION	EXPORT VOLUME (TONNES) EXPORT VALUE (US\$)	KEY EXPORT DESTINATION BY COUNTRY AND KEY REGION	TONNES	VALUE (US\$)	VOLUME (%)	RANCHER / CASE STUDY SUPPLY LINKS
MARFRIG CAMPO GRANDE (SIF 1900)	16,323 85,450,200	China	8,529	41,978,000	52.25%	FRANCISCA EVANGELISTA TEODORO DA SILVA / SÃO BENTO JOÃO FELIX PEREIRA NETO / ATOLEDAL EDUARDO MARIANI BITTENCOURT / VÁRZEA FUNDA ADEVAIR DE OLIVEIRA / RECREIO JOSE DALBEM / SANTA CATARINA LUIZ CARLOS ZILIANI / SANTA TEREZA
		Hong Kong	4,768	26,220,600	29.21%	
		Turkey	113	635,000	0.69%	
		KEY REGIONS				
		Middle East	2,631	15,525,600	16.12%	
		Asia	13,297	68,198,600	81.46%	
MARFRIG VÁRZEA GRANDE (SIF 292 AND 2015)	62,039 323,085,300	China	33,484	172,623,000	53.97%	EDUARDO MARIANI BITTENCOURT / VÁRZEA FUNDA ADEVAIR DE OLIVEIRA / RECREIO JOSE DALBEM / SANTA CATARINA RAUL AMARAL CAMPOS / ESPERANÇA CELSO MIURA / MESTIÇA LUIZ CARLOS ZILIANI / SANTA TEREZA
		Hong Kong	9,755	50,576,900	15.72%	
		Netherlands	1,217	7,927,800	1.96%	
		Italy	1,210	6,547,000	1.95%	
		Lebanon	727	4,519,900	1.17%	
		United Kingdom	137	775,600	0.22%	
		Germany	130	775,100	0.21%	
		Spain	120	680,100	0.19%	
		Thailand	112	435,000	0.18%	
		Portugal	12	68,500	0.02%	
		KEY REGIONS				
		EU27+UK	2,827	16,782,100	4.56%	
		Middle East	7,199	38,300,600	11.60%	
MARFRIG PARANATINGA (SIF 2500)	4,257 24,224,380	Hong Kong	1,152	6,233,200	27.07%	RAUL AMARAL CAMPOS / ESPERANÇA
		Lebanon	342	2,486,700	8.04%	
		Italy	196	1,097,400	4.61%	
		Netherlands	161	1,106,800	3.79%	
		Spain	34	214,100	0.80%	
		KEY REGIONS				
		EU27+UK	392	2,418,300	9.20%	
MARFRIG BATAGUASSU (SIF 4238)	46,443 253,745,400	Hong Kong	11,659	61,473,500	25.10%	DANIEL MARTINS FILHO / SANTA CECÍLIA II
		United States	2,896	14,074,000	6.23%	
		Netherlands	1,735	11,398,600	3.74%	
		Italy	1,652	8,056,100	3.56%	
		Lebanon	1,628	11,069,800	3.51%	
		Spain	516	3,085,500	1.11%	
		Germany	320	2,050,500	0.69%	
		South Africa	135	765,000	0.29%	
		Sweden	107	706,500	0.23%	
		China	84	414,000	0.18%	
MINERVA VÁRZEA GRANDE (SIF 2015)	9,394 54,532,650	Portugal	67	377,200	0.14%	FRANCISCA EVANGELISTA TEODORO DA SILVA / SÃO BENTO FABIO DE OLIVEIRA LUCHESI / SANTA HELENA I CELSO MIURA / MESTIÇA RAUL AMARAL CAMPOS / ESPERANÇA ADEVAIR DE OLIVEIRA / RECREIO
		United Kingdom	51	299,200	0.11%	
		KEY REGIONS				
		EU27+UK	4,448	25,973,600	9.58%	
		Middle East	23,399	131,857,400	50.38%	
		Asia	14,055	74,042,200	30.26%	
		Turkey	1,163	6,561,000	12.38%	
		Hong Kong	991	5,289,800	10.54%	
		Italy	461	2,604,150	4.91%	
		Argentina	440	2,481,000	4.68%	
		Netherlands	280	1,763,300	2.98%	
		Germany	200	1,395,700	2.13%	
		South Africa	141	793,000	1.50%	
		Spain	70	421,500	0.75%	
		United Kingdom	70	440,200	0.74%	
		Russia	29	137,000	0.31%	
		Portugal	26	145,000	0.27%	
		Sweden	19	105,000	0.20%	
		Norway	12	66,900	0.13%	
		Denmark	9	51,100	0.10%	
		KEY REGIONS				
		EU27+UK	1,147	6,992,850	12.21%	
		Middle East	4,052	23,260,900	43.13%	
		Asia	1,278	6,916,800	13.60%	

PROCESSOR SIF LOCATION	EXPORT VOLUME (TONNES) EXPORT VALUE (US\$)	KEY EXPORT DESTINATION BY COUNTRY AND KEY REGION	TONNES	VALUE (US\$)	VOLUME (%)	RANCHER / CASE STUDY SUPPLY LINKS
MINERVA MIRASSOL D'OEST (SIF 2911)	41,864	Hong Kong	5,860	30,918,700	14.00%	RAYMUNDO VICTOR DA COSTA RAMOS SHARP
	230,630,820	Italy	2,474	13,350,800	5.91%	- SÃO CARLOS E SANTA MONICA
		Indonesia	1,239	6,853,000	2.96%	EDUARDO MARIANI BITTENCOURT
		Turkey	1,223	6,840,800	2.92%	- VÁRZEA FUNDA
		Netherlands	1,064	6,901,700	2.54%	
		Israel	854	4,681,000	2.04%	ADEVAIR DE OLIVEIRA - RECREIO
		Lebanon	660	3,912,300	1.58%	
		Germany	473	3,360,800	1.13%	JOSE DALBEM - SANTA CATARINA
		Spain	240	1,371,100	0.57%	
		United Kingdom	161	989,600	0.39%	CELSO MIURA - MESTIÇA
		Greece	28	158,000	0.07%	
		Portugal	25	115,000	0.06%	FABIO DE OLIVEIRA LUCHESI - SANTA HELENA I
		Denmark	7	40,200	0.02%	LUIZ CARLOS ZILIANI - SANTA TEREZA
						FRANCISCA EVANGELISTA TEODORO DA SILVA
		KEY REGIONS				
		EU27+UK	4,472	26,287,200	10.68%	
		Middle East	13,348	69,639,032	31.89%	
		Asia	9,574	50,807,000	22.87%	

REPORTED LIVE ANIMAL EXPORTS JANUARY 2019–OCTOBER 2020

PROCESSOR LOCATION	KEY EXPORT DESTINATIONS	EXPORT VOLUME (TONNES)	TONNES	VOLUME (%)
MINERVA		59,988		
ABAETETUBA	Turkey		21,165	35.28%
	Saudi Arabia		19,700	32.84%
	Lebanon		17,000	28.34%
	Jordan		2,123	3.54%

REPORTED EXPORTS BY TANNERIES JANUARY 2019–OCTOBER 2020

PROCESSOR LOCATION	KEY EXPORT DESTINATIONS	EXPORT VOLUME (TONNES)	TONNES	VOLUME (%)
JBS	China	39,690	23,543	59.32
CAMPO GRANDE	Italy		6,847	17.25
	India		3,315	8.35
	Mexico		2,359	5.94
	United States		408	1.03
	Spain		396	1
	Portugal		302	0.76
	South Africa		39	0.1
	Japan		19	0.05
	Netherlands		18	0.05
	KEY REGIONS			
	EU27+UK		7,563	19.06
	Asia		29,222	73.63
	North America		2,767	6.97
MARFRIG BATAGUASSU	Italy	168	168	100
MINERVA MIRASSOL D'OESTE	China	2,822	2,307	81.77
	Italy		410	14.54
	Russia		64	2.28
	India		40	1.41

**ANNEX 2:
OPPORTUNITY TO
COMMENT GLOSSARY**

REFERENCES



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ENDNOTES

- 1 Morrison O (2021)
- 2 Clack MA et al (2020)
- 3 Fundación Amigos de la Naturaleza (2020) p7, Hermanson M (2019), Mega ER (2020)
- 4 Banks V (1991)
- 5 As of 27 October 2020 (the period covered by the analysis in this report), 28% of the biome had been consumed by fire; by 22 November 2020, 38% – 4.49 million ha – had burned. Source: LASA website ‘Burned area – Pantanal 2020’.
- 6 Estúdio CBN (2020), Vannoni CE (2020)
- 7 Estúdio CBN (2020), Fantástico (2020)
- 8 See Carvalho D (2020), Instituto Centro de Vida (2020) p1 and Ionova A (2020).
- 9 WCS Brazil website ‘Jaguar status’, citing Paula RC, Desbiez A & Cavalcanti SMC, eds (2011)
- 10 See eg Alho CJR, Camargo G & Fischer E (2011), IPBES (2018) pp223-225 and Tomas W et al (2011).
- 11 Based on data from Ministério da Agricultura, Pecuária e Abastecimento, Serviço Florestal Brasileiro (2020) p44. See below in text.
- 12 Greenpeace Brazil mapping analysis of CAR data shows rural properties cover 124,401 ha of the approximately 443,050 ha within recognised Indigenous lands in the Brazilian Pantanal – two territories are entirely covered.
- 13 Rural properties cover 256,398 ha of the 446,081 ha in public conservation units – principally one national and three state parks – within the Brazilian Pantanal, with two of the three state parks 80% covered and one almost entirely covered (source: Greenpeace Brazil mapping analysis of CAR data). This figure excludes private reserves, which generally fall entirely within registered rural properties.
- 14 Seidl AF, de Silva JSV & Moraes AS (2001)
- 15 In this report, mentions of ‘Greenpeace’ should be read as references to Greenpeace International unless otherwise indicated.
- 16 2018–2019 supply chain links between ranchers and meat processing facilities and other analyses were established through Greenpeace investigations, based on the integration of a number of sources of public data and information including:
Land cover and land cover change
The locations of fire hotspots and burned areas (burn scar)
The location and boundaries of the Pantanal biome, Indigenous lands, conservation units and other public lands
The locations, boundaries, ownership and CAR registration status of cattle ranches
Environmental sanctions linked to ranches and their owners
Meat processor traceability websites
Trade from processing facilities to the global market and/or consumer goods and fast food companies.
Documentation is held by Greenpeace. The sources used for each of these types of data and information are listed in the references section at the end of the report.
Greenpeace provided the meat processors named in this report with the opportunity to comment prior to publication on the historic trade links it had established between ranchers with operations in the Pantanal and specific slaughterhouses, as well as any legal/policy irregularities (eg embargoes, irregular CAR status) it had identified in those ranchers’ operations. The comments have been reflected at all relevant points. The full text of the replies received from each of the meat processors in response to Greenpeace’s opportunity to comment letters can be found in Annex 2.
- 17 The total area of Singapore is 71,900 ha (CIA World Factbook website ‘Country comparisons – area’). The Greater London area covers approximately 159,500 ha (LG Inform website ‘Size of the geographical area – Extent of the realm measurements in hectares in England’).
- 18 Sources include Greenpeace Brazil field investigations conducted in October 2020 and February 2021, Nestlé (2019) p5 and Panjiva Brazil trade data [https://panjiva.com/data/](https://panjiva.com/data/brazil-trade-data)
[brazil-trade-data](https://panjiva.com/data/brazil-trade-data); see also Fregatto E (2018) and JBS (2020a) p129.
- 19 Panjiva Brazil trade data <https://panjiva.com/data/brazil-trade-data>
- 20 JBS (2020b) p14, Marfrig (2020) p8 and Minerva (2020) p1. See also Chain Reaction Research (2020a) pp2-4.
- 21 Reuters (2021); the reported results were in line with end-of-year projections from the Brazilian Beef Exporters Association (ABIEC (2020)).
- 22 Net revenue from Marfrig’s North American operations totalled R\$35.1 billion in 2019; revenue from the company’s South American operations totalled R\$14.8 billion. See Marfrig (2020) pp6,8.
- 23 JBS (2020e) p2
- 24 JBS (2020a) pp16,20-21
- 25 JBS’s Friboi brand supplies big names including Bob’s, Burger King, McDonald’s, and Pão de Açúcar (JBS (2020a) p129). Its Seara subsidiary has global accounts with Burger King, KFC, McDonald’s and Subway, among others, and holds certifications for customers including Costco, Marks, M&S, Nestlé, Walmart and YUM (JBS (2020a) pp196-198). JBS reportedly also supplies corned beef products to UK and European supermarkets including Asda, Carrefour, Lidl, and Sainsbury’s (see Earthsight (2019) and Holmes H (2020)). British subsidiary Moy Park (which JBS sold to another of its subsidiaries, Pilgrim’s Pride, in 2017; see Casey S & Freitas T (2017)) supplies Nando’s and several supermarkets, including Tesco Ireland and Lidl; see Nando’s website ‘FAQs: Our food’, Moy Park website ‘Moy Park chicken’ and Moy Park website ‘Awards’. Moy Park reportedly also supplies several other fast food chains, including KFC and Pizza Hut, and supermarkets such as Marks & Spencer and Sainsbury’s; see eg Belfast Telegraph (2018) and Mulligan J (2017).
- 26 Greenpeace (2009)
- 27 The G4 Agreement’s signatories pledged to exclude from their supply chains any ‘rural property which directly supplies cattle for slaughtering (fattening farms) and is engaged in deforestation in the Amazon biome’ within six months of signing the commitment. This condition was to be extended to all supplies, including third-party suppliers and supplies from rearing and nursery farms, within two years. See JBS-Friboi, Bertin, Minerva & Marfrig (2009) p1.
- 28 These ranchers and the companies they supplied were:
Adevaír de Oliveira – JBS / Marfrig / Minerva
Ário Barnabé Neto – JBS
Celso Miura – JBS
Daniel Martins Filho – JBS / Marfrig
Eduardo Mariani Bittencourt – JBS / Marfrig / Minerva
Eliana Maria Lemos Monteiro Conceição – JBS
Fabio de Oliveira Luchesi – Minerva
Francisca Evangelista Teodoro da Silva – JBS / Marfrig / Minerva
João Felix Peceira Neto – JBS / Marfrig
Jose Dalbem – JBS / Marfrig / Minerva
Luiz Carlos Ziliani – JBS / Marfrig / Minerva
Raul Amaral Campos – JBS / Marfrig / Minerva
Sergio Jacinto Costa – JBS
- 29 Greenpeace identified 37 supply chain links between the case study properties and the big three meat processors, plus a further three rancher-level links not involving the case study properties. Of these 37 links, 23 were indirect. Of those 23, 17 of the links were through ranches owned by the same individual.
- 30 Based on responses to Greenpeace’s opportunity to comment letters; see Annex 2.
Marfrig did not indicate current compliance. Also, JBS failed to comment on the current status of ranches linked to Celso Miura, Francisca Evangelista Teodoro da Silva or João Felix Peceira Neto, who were identified by Greenpeace as tier-one suppliers during the period studied.
The following ranchers all had at least one property that was described as either ‘compliant with [JBS’s] Responsible Procurement Policy’, ‘able to commercialize raw materials with [JBS]’ or ‘listed in Minerva’s database and ... eligible for commercialization’:
Adevaír de Oliveira – JBS / Minerva

- Ário Barnabé Neto – JBS
Daniel Martins Filho – JBS
Eduardo Mariani Bittencourt – Minerva
Eliana Maria Lemos Monteiro Conceição – JBS
Fabio de Oliveira Luchesi – Minerva
Francisca Evangelista Teodoro da Silva – Minerva
Jose Dalbem – JBS / Minerva
Luiz Carlos Ziliani – JBS
Raul Amaral Campos – Minerva
Sergio Jacinto Costa – JBS
- 31 Based on responses to Greenpeace's opportunity to comment letters; see Annex 2. The current approved suppliers that appear to violate JBS's policy are:
Adevaire de Oliveira / Fazenda Boa Sorte
Luiz Carlos Ziliani / Fazenda Santa Tereza
Samuel Alexandrini Santos / Fazenda Sete de Setembro (Santos is an intermediary rancher identified in one of the case studies; this ranch's property registration is currently suspended)
The historic trading relationship that appears to have been in violation of JBS's policy at the time was with Raul Amaral Campos / Fazenda Esperança. JBS failed to confirm the current status of this ranch as a supplier.
Minerva drew different conclusions on the compliance of two of these suppliers (Luiz Carlos Ziliani / Fazenda Santa Tereza and Raul Amaral Campos / Fazenda Esperança).
- 32 The historic trading relationship that appears to have been in violation of Marfrig's policy was with João Felix Pereira Neto / Fazenda Pedernheiras Novas.
- 33 Morrison O (2021)
- 34 JBS (2019)
- 35 See 'High-risk regimes – how the Bolsonaro government has fanned the flames'. See also eg Observatório do Clima (2021).
- 36 Marfrig's latest zero deforestation commitment extends to the Cerrado, but not the Pantanal. See Marfrig website 'Marfrig Verde+.'
- 37 Ranchers (including intermediary ranchers) with identified environmental violations and/or property registration irregularities on one or more of their ranches during the 2018–2019 trade period assessed for this investigation include:
Adevaire de Oliveira (note, the CAR status of Fazenda Recreio is just one of the multiple issues associated with this rancher's operations; it was recategorised as active as of 9 November 2020 but prior to that had been listed as pending since 4 August 2018)
Ário Barnabé Neto
Daniel Martins Filho (note, Filho received a US\$930,000 fine from IBAMA for the illegal construction of levees along the river boundary of Fazenda Santa Cecília II)
Fabio de Oliveira Luchesi (the CAR status of Fazenda Santa Helena I was recategorised as active only as of 17 November 2020; prior to that it was listed as pending)
Ivanildo da Cunha Miranda
João Felix Pereira Neto
Jose Dalbem
Luiz Carlos Ziliani
Raul Amaral Campos
- 38 See JBS-Friboi, Bertin, Minerva & Marfrig (2009).
- 39 As promised by the European Commission. See European Commission (2020) and European Parliament (2020).
- 40 As proposed by the UK Government. See Department for Environment, Food & Rural Affairs (2020).
- 41 Compared with 2012 levels. Source: Godfray HCJ et al (2018), reporting on Alexandratos N & Bruinsma J (2012).
- 42 See eg Business Insider India (2020), Feng E (2017), Khaitan R (2017) and Straits Times (2019).
- 43 Greenpeace (2020a)
- 44 JBS (2020a) p38
- 45 JBS (2020a) p16
- 46 JBS (2020c) p3
- 47 Between 2002 and 2013, BNDES released a total of R\$12.8 billion (US\$5.9 billion) for companies controlled by J&F Investimentos, according to the NGO Contas Abertas. Source: Tognolli C (2019). See also Wasley et al (2019).
- 48 JBS website 'Ownership and corporate'
- 49 ExxonMobil, Shell and BP were responsible for 577, 508 and 448 MtCO₂e Scope 1+3 GHG emissions in 2015, respectively (source: Carbon Majors Database (2017) p15).
In 2016, JBS's Scope 1+3 GHG emissions from processing and production of beef, pork and chicken totalled 280 MtCO₂e, with the vast majority being accounted for by beef production. Scope 1 emissions are direct emissions from company-owned facilities, processing plants and machinery. Scope 2 emissions are indirect emissions related to energy consumption. Scope 3 emissions include all other indirect emissions resulting from the production of a commodity, both upstream and downstream (farm emissions from livestock, food production for livestock, land-use change etc). For fossil fuel producers this includes all emissions related to the burning of the products they sell. Source: GRAIN & ITAP (2018).
- 50 Soya is the second most significant driver of global deforestation after beef, and about 90% of it is used for animal feed. See European Commission (2013) pp21-22, Henders S, Persson UM & Kastner T (2015) p6 and Sharma S, IATP & Schlesinger S (2017) p25.
- 51 Greenpeace (2009)
- 52 See JBS-Friboi, Bertin, Minerva & Marfrig (2009).
- 53 See reporting in Greenpeace (2009) and Greenpeace (2020a).
- 54 Bautzer T, Alves A & Mandl C (2020), Mano A (2020)
- 55 See eg Harris B (2020), Samora R (2020) and Wasley A & Heal A (2020).
- 56 JBS (2020c) pp3-4 and JBS (2020d)
- 57 Ministry of the Environment (2017) p65
- 58 Trace platform 'Brazil – Beef'
- 59 Critical Ecosystem Partnership Fund (2017) pp147-148, Guerra A et al (2020)
- 60 IPCC (2019), Chapter 4
- 61 According to data from the Brazilian National Institute of Space Research (Instituto Nacional de Pesquisas Espaciais, INPE). See Spring J (2020b).
- 62 A federal moratorium was imposed on the use of burning for agricultural purposes in the Amazon and Pantanal in mid-July, extending for 120 days (see Carvalho D (2020) and Ionova A (2020)). Regional prohibitions on dry-season burning were also put in place in Mato Grosso, from 1 July to 30 September, and Mato Grosso do Sul, extending for 180 days from late July; see Instituto Centro de Vida (2020) p1 and Ionova A (2020).
- 63 The G4 Agreement promised 'zero deforestation in the supply chain'. Its signatories pledged to exclude from their supply chains any 'crucial property which directly supplies cattle for slaughtering (fattening farms) and is engaged in deforestation in the Amazon biome' within six months of signing the commitment. This condition was to be extended to all supplies, including third-party suppliers and supplies from rearing and nursery farms, within two years. See JBS-Friboi, Bertin, Minerva & Marfrig (2009) p1.
- 64 JBS (2020c) pp3-4 and JBS (2020d)
- 65 JBS (2020c) p3
- 66 With the exception of Areas of Permanent Protection (Áreas de Preservação Permanente, APPs) and restrictions on the exploitation of wetlands. APPs are areas that have been identified as critical to essential ecosystem functions, such as preserving hydrological resources or biodiversity, ensuring geological stability, facilitating the movement of fauna and flora and protecting the soil. The remaining 20% is classed as Legal Reserve. In areas classified as pantanal wetlands (pantanaís) or flood plains (planícies pantaneiras) – which covers about 16% of the Brazilian Pantanal – permits for clearance may only be issued for activities deemed 'sustainable and ecological', which includes traditional cattle raising. Per Articles 3, 10 and 12 – the full text of the law is available at http://www.planalto.gov.br/ccivil_03/ato2011-2014/2012/lei/l12651.htm. See also WWF-Brazil (2016) p18.
- 67 The area of the UK is 24.4 million ha. Source: CIA World Factbook website 'Country comparisons – area'.
- 68 Soares-Filho B et al (2014)
- 69 Casey S & Freitas T (2017), Mello G & Mano A (2019), Pilgrim's Pride Ltd website 'Our story'
- 70 For details on Greenpeace's vision 'for a healthier life and planet', see Greenpeace (2018).
- 71 Libonati R et al (2020)
- 72 Estimates of the size of the Pantanal vary widely, depending on the source cited. It is variously described as covering between 14 million ha (Keddy PA et al (2009) p43) and 22 million ha (Fundación Amigos de la Naturaleza (2020) p4).
- 73 Estimates of the percentages of the Pantanal located in each of these countries similarly vary; the largest portion (70–80% of the biome) is in Brazil and the smallest (5–10%) in Paraguay, with the remainder located in Bolivia. See eg Ecosystem Alliance (2014) p7 and New World Encyclopedia 'Pantanal'.
- 74 Banks V (1991)
- 75 Couto EG & de Oliveira VA (2010) pp72-73
- 76 Bao F et al (2017)
- 77 IPBES (2018) p225
- 78 Scherer-Neto P, Guedes NMR & Toledo MCB (2019)

- 79 Alho CJR, Camargo G & Fischer E (2011)
- 80 WCS Brazil website 'Jaguar status', citing Paula RC, Desbiez A & Cavalcanti SMC, eds (2011)
- 81 Tomas W et al (2011)
- 82 The Parque Nacional del Pantanal Matogrossense (<https://csis.ramsar.org/cis/602>), the SESC Pantanal Private Reserve of Natural Heritage (<https://csis.ramsar.org/cis/1270>) and the Taiaã Ecological Station (<https://csis.ramsar.org/cis/2363>).
- 83 <https://csis.ramsar.org/cis/1089>
- 84 UNESCO website 'Pantanal Conservation Area'
- 85 Biomass_250mil.zip available under Downloads > vetores at IBGE website 'Biomass'.
- 86 See Ministério do Meio Ambiente website 'Pantanal' and Ministério do Meio Ambiente (2019).
- 87 Greenpeace Brazil analysis based on maps of Indigenous land from FUNAI (http://www.funai.gov.br/arquivos/conteudo/cggeo/pdf/terca_indigena.pdf) and Brazilian Pantanal biome maps from IBGE (<https://www.ibge.gov.br/geociencias/informacoes-ambientais/15842-biomass.html>).
- 88 Banks V (1991)
- 89 BBC (2013)
- 90 Ecosystem Alliance (2014), Guerra A et al (2020)
- 91 Ionova A (2020)
- 92 Ecosystem Alliance (2014), Embrapa website 'Impactos ambientais e socioeconômicos no Pantanal', Ivory SJ et al (2019), Tomas W et al (2019) pp9-11
- 93 Ecosystem Alliance (2014) pp5,13-15,37-39
- 94 Bergier I et al (2018), Marengo JA, Alves LM & Torres RR (2015), Thielen D et al (2020)
- 95 Ministério da Agricultura, Pecuária e Abastecimento, Serviço Florestal Brasileiro (2020) p44. Article 29 of Brazil's Forest Code (full text available at http://www.planalto.gov.br/ccivil_03/ato2011-2014/2012/lei/l12651.htm) requires self-reported registration of all rural properties (including identification of property boundaries), with the aim of georeferencing all the properties and establishing a database to be used for monitoring and enforcement of compliance with environmental regulations, environmental and economic planning, and to combat illegal deforestation. The original deadline for registration was May 2016, but this has been extended several times as not all property owners have complied. Additionally, the self-reported information is not legally verified, meaning that land claims may overlap with public, protected or Indigenous lands.
- 96 Klingler M & Mack P (2020)
- 97 Based on data from Ministério da Agricultura, Pecuária e Abastecimento, Serviço Florestal Brasileiro (2020) p44. See below in text.
- 98 Seidl AF, de Silva JSV & Moraes AS (2001)
- 99 Chain Reaction Research (2020b)
- 100 IBGE SIDRA website 'Pesquisa da pecuária municipal: Tabela 3939 - Efetivo dos rebanhos, por tipo de rebanho'
- 101 The total area of the individual CAR registrations is about 13.9 million ha, but this includes 1.2 million ha of overlap.
- 102 Rural properties cover 256,398 ha of the 446,081 ha in public conservation units - principally one national and three state parks - within the Brazilian Pantanal, with two of the three state parks 80% covered and one almost entirely covered (source: Greenpeace Brazil mapping analysis of CAR data). This figure excludes private reserves, which generally fall entirely within registered rural properties.
- 103 Greenpeace Brazil mapping analysis of CAR data shows rural properties cover 124,401 ha of the approximately 443,050 ha within recognised Indigenous lands in the Brazilian Pantanal - two territories are entirely covered.
- 104 Laboratório de Processamento de Imagens e Geoprocessamento (Lapig) website 'Lapig Maps'
- 105 JBS describes itself as 'the worldwide leader in poultry and beef processing and the second largest in pork and lamb'. See JBS website 'Our business'.
- 106 Defined by Article 3 of the code, the function of these areas is preserving hydrological resources or biodiversity, ensuring geological stability, facilitating the movement of fauna and flora or protecting the soil.
- 107 Some 2.34 million ha of the total land area of 15.1 million ha were cleared for pasture, out of 2.37 million ha cleared for all purposes. Source: MapBiomas Project 'Collection 5.0 of the annual coverage and land use maps series of Brazil'.
- 108 MapBiomas 'Pantanal: Land use and land cover annual evolution (1985-2019)'
- 109 MapBiomas Project 'Collection 5.0 of the annual coverage and land use maps series of Brazil'
- 110 de Campos MM et al (2020)
- 111 Ecosystem Alliance (2014) p15
- 112 Ivory SJ et al (2019)
- 113 Instituto SOS Pantanal, WWF-Brasil & Embrapa Pantanal (2013) p7
- 114 Ministry of the Environment (2017) p65
- 115 Critical Ecosystem Partnership Fund (2017) pp51-52, Gibbs HK et al (2015), Spring J (2018)
- 116 Embrapa website 'Impactos ambientais e socioeconômicos no Pantanal', Ivory SJ et al (2019)
- 117 Embrapa website 'Impactos ambientais e socioeconômicos no Pantanal'
- 118 Of the total land area of 21.76 million ha, 13.16 million ha (60.5%) were cleared, with 9.73 million ha of this (71%) for pasture and a further 2.48 million ha (19%) for agriculture. The natural vegetation of some 783,000 ha - a further 4% of the total land area - had been altered but not entirely converted by human activity. Source: Instituto SOS Pantanal & WWF-Brasil (2015) p54.
- 119 Ecosystem Alliance (2014) p5, European Commission (2016) p9
- 120 Statista website 'Area planted with soybean in Brazil from crop year 2010/11 to 2019/20'
- 121 Ecosystem Alliance (2014) pp11-12
- 122 Schandert S (2020)
- 123 Ecosystem Alliance (2014) pp5,13-15,37-39
- 124 Embrapa website 'Impactos ambientais e socioeconômicos no Pantanal'
- 125 Bergier I et al (2018)
- 126 Nobre AD (2014) pp12-19, Webb J (nd)
- 127 Batista F & Gilbert J (2020). See also Rocha J (2014).
- 128 Against the 1961-1990 baseline. See Marengo JA, Alves LM & Torres RR (2015).
- 129 Thielen D et al (2020)
- 130 Guerra A et al (2020) p7
- 131 See eg Fantástico (2020), Ionova A (2020) and Mega ER (2020).
- 132 Mega ER (2020), Kohagura TC (2020)
- 133 Mega ER (2020), Miettinen J et al (2015)
- 134 Fundación Amigos de la Naturaleza (2020) p7, Hermanson M (2019)
- 135 Mega ER (2020)
- 136 A widespread practice in the region - see eg Fantástico (2020).
- 137 Ionova A (2020)
- 138 Einhorn C et al (2020)
- 139 The federal ban covered the Amazon and the Pantanal; see Carvalho D (2020) and Ionova A (2020).
- 140 Instituto Centro de Vida (2020) p1
- 141 Ionova A (2020)
- 142 LASA website 'Burned area - Pantanal 2020'; see also technical note dated 11/17/2020.
- 143 By 4 August, when just 768,000 ha had burned across the entire Pantanal, the area burned in Bolivia had reached 147,000 ha (19% of the total burned area) and that in Paraguay 86,000 ha (11% of the total burned area). Source: Fundación Amigos de la Naturaleza (2020) p5.
- 144 UOL (2020)
- 145 Einhorn C et al (2020)
- 146 Muniz B, Fonseca B & Ribeiro R (2020)
- 147 Estúdio CBN (2020), Vannoni CE (2020)
- 148 Ribeiro E (2020). Other causes identified reportedly included burning trees to acquire honey, an automobile accident, an accidental fire caused by agricultural equipment and sparks from high voltage electrical wiring.
- 149 Federal Police of Mato Grosso do Sul (2020)
- 150 Greenpeace (2020a)
- 151 Castro A (2020)
- 152 Instituto Centro de Vida (2020) pp7-9
- 153 Camargos D & Campos A (2020)
- 154 Data from LASA (available at LASA website 'Burned area - Pantanal 2020') and MapBiomas (MapBiomas Project 'Collection 5.0 of the annual coverage and land use maps series of Brazil').
- 155 According to MapBiomas, as of 2019 roughly 36.7% of the Brazilian Pantanal was covered by grassland, 19.6% by forest, 15.7% by wetland, 15.4% by pasture, 9.2% by savannah, 3.1% by water and 0.2% by arable agriculture (see <https://mapbiomas-br-site.s3.amazonaws.com/Infograficos/Coletao5/MBI-Infografico-pantanal-5.0-EN.jpg>).

- Some 37.4% of the burn scar was located in areas classified as grassland, 32.8% in forest and savannah and 22.6% in wetland (much of which would have been severely dried out by the drought).
- 156 Estúdio CBN (2020), Ribeiro E (2020), Vannoni CE (2020)
- 157 Escravo, Nem Pensar! (2020)
- 158 Spring J (2020a)
- 159 See eg Fischer L (2020), Pfeifer H (2020).
- 160 INPE website 'Monitoramento dos focos ativos por bioma'. Fire hotspots are thermal anomalies (ie unusually hot areas) detected by satellites. It is important to distinguish hotspots from actual fires - they could represent fires or they could be hot tin roofs, although the occurrence of false positives is relatively low. Within forest areas, accuracy depends on the size of the fire, the density of the canopy and proximity to built-up areas.
- 161 Shalder A (2020)
- 162 Since 2012, when incoming President Dilma Rousseff imposed a hiring freeze on the agency, staffing levels have reportedly dropped from a peak of more than 1,300 to about 600. Source: Savarese M (2020).
- 163 Shalder A (2020)
- 164 Gonzales J (2020a). See also Savarese M (2020). The Chico Mendes Institute for Biodiversity Conservation (Instituto Chico Mendes de Conservação da Biodiversidade, ICMBio) is the branch of the Ministry of the Environment charged with managing Brazil's federal conservation units and protecting its natural heritage and biodiversity. The National Indian Foundation (Fundação Nacional do Índio, FUNAI) is the federal agency responsible for establishing and carrying out policies relating to Indigenous Peoples.
- 165 Gonzales J (2020a)
- 166 Gonzales J (2020a), Savarese M (2020)
- 167 Muniz B, Fonseca B & Ribeiro R (2020)
- 168 Basso G (2020)
- 169 Raoni Rajão, coordinator of laboratory for the study of environmental services management at the Federal University of Minas Gerais, quoted in Goñi U, Cowie S & Costa W (2020).
- 170 Shalder A (2020)
- 171 Boadle A (2020), Soares I (2020)
- 172 Einhorn C et al (2020)
- 173 Fernandes A (2020), Machado R (2020)
- 174 See eg Fantástico (2020), Ionova A (2020) and Vannoni CE (2020).
- 175 Inesc (2020)
- 176 Observatório do Clima (2021)
- 177 Piloto Policial (2020)
- 178 European Commission website 'EU-Mercosur trade agreement'
- 179 Kehoe L et al (2020)
- 180 Gonzales J (2020b), Greenpeace European Unit (2020)
- 181 According to a leaked copy of the negotiation text, published by Greenpeace Germany (see Greenpeace European Unit (2020)).
- 182 Angelo M (2020), Geeretsen I (2020)
- 183 See eg Greenpeace International (2009, 2020a).
- 184 Estúdio CBN (2020), Ribeiro E (2020), Vannoni CE (2020)
- 185 2018-2019 supply chain links between ranchers and meat processing facilities and other analyses were established through Greenpeace investigations, based on the integration of a number of sources of public data and information including:
- Land cover and land cover change
 - The locations of fire hotspots and burned areas (burn scar)
 - The location and boundaries of the Pantanal biome, Indigenous lands, conservation units and other public lands
 - The locations, boundaries, ownership and CAR registration status of cattle ranches
 - Environmental sanctions linked to ranches and their owners
 - Meat processor traceability websites
 - Trade from processing facilities to the global market and/or consumer goods and fast food companies.
 - Documentation is held by Greenpeace. The sources used for each of these types of data and information are listed in the references section at the end of the report.
 - Greenpeace provided the meat processors named in this report with the opportunity to comment prior to publication on the historic trade links it had established between ranchers with operations in the Pantanal and specific slaughterhouses, as well as any legal/policy irregularities (eg embargoes, irregular CAR status) it had identified in those ranchers' operations. The comments have been reflected at all relevant points. The full text of the replies received from each of the meat processors in response to Greenpeace's opportunity to comment letters can be found in Annex 2.
- 186 See Carvalho D (2020), Instituto Centro de Vida (2020) p1 and Ionova A (2020).
- 187 The total area of Singapore is 71,900 ha (CIA World Factbook website 'Country comparisons - area'). The Greater London area covers approximately 159,500 ha (LG Inform website 'Size of the geographical area - Extent of the realm measurements in hectares in England').
- 188 These ranchers and the companies they supplied were:
- Adevaír de Oliveira - JBS / Marfrig / Minerva
 - Ário Barnabé Neto - JBS
 - Celso Miura - JBS
 - Daniel Martins Filho - JBS / Marfrig
 - Eduardo Mariani Bittencourt - JBS / Marfrig / Minerva
 - Elia Maria Lemos Monteiro Conceição - JBS
 - Fabio de Oliveira Luchesi - Minerva
 - Francisca Evangelista Teodoro da Silva - JBS / Marfrig / Minerva
 - João Felix Pereira Neto - JBS / Marfrig
 - Jose Dalbem - JBS / Marfrig / Minerva
 - Luiz Carlos Ziliani - JBS / Marfrig / Minerva
 - Raul Amaral Campos - JBS / Marfrig / Minerva
 - Sergio Jacinto Costa - JBS
- 189 Greenpeace identified 37 supply chain links between the case study properties and the big three meat processors, plus a further three rancher-level links not involving the case study properties. Of these 37 links, 23 were indirect. Of those 23, 17 of the links were through ranches owned by the same individual.
- 190 The full text of the replies received from each of the meat processors in response to Greenpeace's opportunity to comment letters can be found in Annex 2.
- 191 Based on responses to Greenpeace's opportunity to comment letters; see Annex 2. Marfrig did not indicate current compliance. Also, JBS failed to comment on the current status of ranches linked to Celso Miura, Francisca Evangelista Teodoro da Silva or João Felix Pereira Neto, identified by Greenpeace as tier-one suppliers during the period studied.
- The following ranchers all had at least one property that was described as either 'compliant with [JBS's] Responsible Procurement Policy', 'able to commercialize raw materials with [JBS]' or 'listed in Minerva's database and ... eligible for commercialization':
- Adevaír de Oliveira - JBS / Minerva
 - Ário Barnabé Neto - JBS
 - Daniel Martins Filho - JBS
 - Eduardo Mariani Bittencourt - Minerva
 - Elia Maria Lemos Monteiro Conceição - JBS
 - Fabio de Oliveira Luchesi - Minerva
 - Francisca Evangelista Teodoro da Silva - Minerva
 - Jose Dalbem - JBS / Minerva
 - Luiz Carlos Ziliani - JBS
 - Raul Amaral Campos - Minerva
 - Sergio Jacinto Costa - JBS
- 192 Based on responses to Greenpeace's opportunity to comment letters; see Annex 2. The current approved suppliers that appear to violate JBS's policy are:
- Adevaír de Oliveira / Fazenda Boa Sorte
 - Luiz Carlos Ziliani / Fazenda Santa Tereza
 - Samuel Alexandrini Santos / Fazenda Sete de Setembro (Santos is an intermediary rancher identified in one of the case studies; this ranch's property registration is currently suspended)
 - The historic trading relationship that appears to have been in violation of JBS's policy at the time was with Raul Amaral Campos / Fazenda Esperança. JBS failed to confirm the current status of this ranch as a supplier.
 - Minerva drew different conclusions on the status of two of these suppliers (Luiz Carlos Ziliani / Fazenda Santa Tereza and Raul Amaral Campos / Fazenda Esperança).
- 193 The historic trading relationship that appears to have been in violation of Marfrig's policy was with João Felix Pereira Neto / Fazenda Pedreiras Novas.
- 194 Morrison O (2021)
- 195 JBS (2019)
- 196 See also eg Observatório do Clima (2021).
- 197 See Carvalho D (2020), Instituto Centro de Vida (2020) p1 and Ionova A (2020).
- 198 Ranchers (including intermediary ranchers) with identified environmental violations and/or property registration irregularities on one or more of their ranches during the

trade period assessed for this investigation include:

Adevaír de Oliveira (note, the CAR status of Fazenda Recreio is just one of the multiple issues associated with this rancher's operations; it was recategorised as active as of 9 November 2020 but prior to that had been listed as pending since 4 August 2018)

Ário Barnabe Neto

Daniel Martins Filho (note, Filho received a US\$930,000 fine from IBAMA for the illegal construction of levees along the river boundary of Fazenda Santa Cecília II)

Fabio de Oliveira Luchesi (the CAR status of Fazenda Santa Helena I was recategorised as active only as of 17 November 2020; prior to that it was listed as pending)

Ivanildo da Cunha Miranda

João Felix Pereira Neto

Jose Dalbem

Luiz Carlos Ziliani

Raul Amaral Campos

199 The full text of the replies received from each of the meat processors in response to Greenpeace's opportunity to comment letters can be found in Annex 2.

200 See the case study below on Ivanildo da Cunha Miranda.

201 Marfrig's latest zero deforestation commitment extends to the Cerrado, but not the Pantanal. See Marfrig website 'Marfrig Verde'.

202 See JBS-Friboi, Bertin, Minerva & Marfrig (2009).

203 As promised by the European Commission. See European Parliament (2020).

204 As proposed by the UK Government. See Department for Environment, Food & Rural Affairs (2020).

205 Gibbs HK et al (2015b) p39

206 Gibbs HK et al (2015b)

207 Email from Dr. Holly Gibbs, Associate Professor at University of Wisconsin-Madison, to Amnesty International, 29 June 2020. Copy on file with Amnesty International. Cited by Amnesty International (2020) p13.

208 JBS website 'JBS Green Platform'

209 See eg Visipec website 'Home'.

210 See Marfrig (2021b) and Minerva (2021)

211 Visipec (nd) p2

212 The Brazilian Federal Inspection Service (Serviço de Inspeção Federal, SIF), organised by the Ministry of Agriculture, Livestock and Food Supply and overseen by the Department of Inspection of Animal Origin Products (Departamento de Inspeção de Produtos de Origem Animal, DIPOA), is responsible for 'ensuring the quality of edible and inedible animal products intended for the domestic and foreign markets and the suitability of imported products' (Federal Government of Brazil (2017)). The system operates in approximately 5,000 establishments across the country, each identified by a SIF number. The seal on a facility's products is meant to indicate that they are of safe animal origin and meet the criteria required by legislation; it also enables traceability of those products back to the facility where they originated. SIF-registered facilities are able to trade throughout the country (unlike those registered with the state or municipal inspection services, which can trade only locally) and, if they meet additional criteria, export abroad. See eg Alves G (2020).

213 Ministério da Agricultura, Pecuária e Abastecimento website 'Consulta de estabelecimento nacional: Dados do estabelecimento nacional'; details can be found by searching for the SIF number.

214 Ministério da Agricultura, Pecuária e Abastecimento website 'Consulta de estabelecimento nacional: Dados do estabelecimento nacional'; details can be found by searching for the SIF number.

215 Greenpeace Brazil and Repórter Brasil field investigations, October 2020

216 JBS (2021b)

217 Fantástico (2020), Miranda E (2020)

218 IBAMA lists two outstanding embargoes for clearance of native vegetation in Legal Reserves against properties owned by Ivanildo da Cunha Miranda, and he was fined over R\$900,000 (US\$420,000) by IBAMA in 2013. Source: IBAMA website 'Consulta de autuações ambientais e embargos'; details can be found by searching for his name.

219 JBS (2020a) p129

220 See eg Fregatto E (2018).

221 Greenpeace Brazil and Repórter Brasil field investigations, October 2020

222 Mendes L (2020)

223 Greenpeace Brazil and Repórter Brasil field investigations, October 2020.

224 Panjiva Brazil trade data <https://panjiva.com/data/brazil-trade-data>

[com/data/brazil-trade-data](https://panjiva.com/data/brazil-trade-data)

225 Panjiva Brazil trade data <https://panjiva.com/data/brazil-trade-data>

226 Panjiva Brazil trade data show that GST accounted for 2,323 tonnes of the 2,359 tonnes of leather exported to Mexico from JBS's Campo Grande facilities during this period, and all 408 tonnes exported to the USA.

227 GST AutoLeather website 'OEM customers'

228 JBS Campo Grande (see main text), Marfrig Bataguassu and Minerva Mirassol d'Oeste. Between 1 January 2019 and 31 October 2020 the Marfrig facility exported 168 tonnes of leather, all of it to Italy; the Minerva facility exported a total of 2,822 tonnes to China (82%), Italy (15%), Russia (2%) and India (1%).

229 Panjiva Brazil trade data <https://panjiva.com/data/brazil-trade-data>

230 JBS (2020b) p14

231 Marfrig (2020) p8

232 Minerva (2020) p1

233 Reuters (2021); the reported results were in line with end-of-year projections from the Brazilian Beef Exporters Association (ABIEC (2020)).

234 Net revenue from Marfrig's North American operations totalled R\$35.1 billion in 2019; revenue from the company's South American operations totalled R\$14.8 billion. See Marfrig (2020) pp6,8.

235 JBS (2020c) p2

236 Minerva (2019). The deal included Marfrig paying R\$100 million (US\$27 million) to BRF, which has an investor agreement with Minerva covering several operations and which previously controlled the facility in Várzea Grande; see BRF S.A. (2020) p44.

237 Mato Grosso Econômico (2019)

238 Receita Federal website 'Emissão de comprovante de inscrição e de situação cadastral'; details can be found by searching for the CNPJ 67620377008018.

239 Ownership and sizes of properties were established based on data from official sources (CAR website 'Consultar demonstrativo do CAR', IBAMA website 'Consulta de autuações ambientais e embargos', Secretário de Estado de Meio Ambiente de Mato Grosso website 'SIMCAR portal público' and Secretaria Estadual de Meio Ambiente, Desenvolvimento Econômico, Produção e Agricultura Familiar (SEMAPRO) Portal de Informações e Geoposicionamento de Mato Grosso do Sul (PIN MS) website 'Mapa consulta SICAR'). Fazenda Bonsucesso is listed on the Mato Grosso do Sul SICAR website as belonging to the estate of Florêncio da Costa Lima, with Mauri da Costa Lima acting as appointed legal representative - results found using the CAR number MS-5003207-0EFCFC9C1C8949E4 BAB3A867AF21257A as the property code ('código do imóvel'). Mato Grosso do Sul state tax registration (Inscrição Estadual, IE) documents show Fazenda Bom Sucesso, a cattle breeding business with an active CAR registration, as registered to Ivanildo da Cunha Miranda (source: Secretaria de Estado de Fazenda de Mato Grosso do Sul website 'Consulta Pública do Cadastro Fiscal e Emissão do Comprovante de Inscrição Estadual', IE number 287096750); the business is described as being located on the edge of the São Lourenço river in Corumbá, which matches the location of Fazenda Bonsucesso. News reports (eg Fantástico (2020), Ribeiro Jr A (2020)) refer to 'Fazenda Bonsucesso' as one of the sites being investigated by police for possible improper use of fire to clear pasture, with Ivanildo da Cunha Miranda named as the cattle rancher who owns the property. It is assumed the two names refer to the same ranch and that Ivanildo da Cunha Miranda owns, leases or otherwise controls management of that ranch.

240 See Ministério Público Federal, Procuradoria da República no Estado de Mato Grosso do Sul (2018), Miranda E (2020) and UOL (2020).

241 USD equivalents given in this report are approximate amounts, based on the average exchange rates in the years during which the fines were imposed.

242 Ownership and sizes of properties were established based on data from official sources (CAR website 'Consultar demonstrativo do CAR', IBAMA website 'Consulta de autuações ambientais e embargos', Secretaria de Estado de Meio Ambiente de Mato Grosso website 'SIMCAR portal público' and Secretaria Estadual de Meio Ambiente, Desenvolvimento Econômico, Produção e Agricultura Familiar (SEMAPRO) Portal de Informações e Geoposicionamento de Mato Grosso do Sul (PIN MS) website 'Mapa consulta SICAR').

243 Fantástico (2020), Ribeiro Jr A (2020)

244 Fantástico (2020)

245 Data from USGS EarthExplorer (<https://earthexplorer.usgs.gov/>), Sentinel Hub EO Browser (<https://apps.sentinel-hub.com/eo-browser/>) and Planet (<https://www.planet.com/>).

246 Carvalho D (2020). Regional prohibitions on dry-season burning were also in place in Mato Grosso, from 1 July to 30 September 2020, and Mato Grosso do Sul, extending for 180 days from late

- July. See Instituto Centro de Vida (2020) p1 and Ionova A (2020).
- 247 Burn scar analysis by Greenpeace based on data from LASA (27 October 2020) and MapBiomas (MapBiomas Project 'Collection 5.0 of the annual coverage and land use maps series of Brazil').
- 248 Fire hotspot data is from INPE (data from MODIS AQUA_M-T, downloaded from INPE website 'Banco de dados de queimadas').
- 249 Documentation held by Greenpeace.
- 250 IE 287109038. Source: Ministério da Agricultura, Pecuária e Abastecimento, SDA, CSR (nd) p51, accessed 10 February 2021.
- 251 Friboi website 'Garantia de origem'
- 252 Friboi website 'Garantia de origem'
- 253 JBS (2021a)
- 254 The Mato Grosso state registry lists the size of the property as 10,330 ha (see Secretário de Estado de Meio Ambiente de Mato Grosso website 'SIMCAR portal público', CAR number MT70390/2018). For consistency, all figures reported in the text are from the federal registry (CAR website 'Consultar demonstrativo do CAR').
- 255 IBAMA website 'Consulta de autuações ambientais e embargos'; details can be found by searching for his name.
- 256 Companhia de Investimentos do Centro Oeste (2020)
- 257 Documentation held by Greenpeace
- 258 CAR website 'Consultar demonstrativo do CAR', accessed 5 February 2021; details can be found by searching for the CAR number MT-5100201-66E4479246EF4AFD908E43DC92266B32.
- 259 Secretário de Estado de Meio Ambiente de Mato Grosso website 'SIMCAR portal público', accessed 5 February 2021; details can be found by searching for the CAR number MT89179/2017.
- 260 Friboi website 'Garantia de origem'
- 261 Friboi website 'Garantia de origem'
- 262 Secretário de Estado de Meio Ambiente de Mato Grosso website 'SIMCAR portal público', accessed 5 February 2021; details can be found by searching for the CAR number MT69899/2017.
- 263 CAR website 'Consultar demonstrativo do CAR', accessed 5 February 2021; details can be found by searching for the CAR number MT-5102504-4A4408CD2A7D4345B3206B169E5B01AF.
- 264 Link to João Felix Pereira Neto confirmed by IE number 132970899. Source: Marfrig website 'Conheça a origem da nossa carne'.
- 265 JBS (2021a)
- 266 Marfrig (2021a)
- 267 Fazenda Olhos d'Água. See Secretário de Estado de Meio Ambiente de Mato Grosso (2020).
- 268 CAR website 'Consultar demonstrativo do CAR', accessed 5 February 2021; details can be found by searching for the CAR number MT-5102504-89CAE072B3EE459E8856CB4BB71C29E1.
- 269 CAR website 'Consultar demonstrativo do CAR'
- 270 Secretário de Estado de Meio Ambiente de Mato Grosso website 'SIMCAR portal público', accessed 5 February 2021; details can be found by searching for the CAR number MT76021/2017. A previous check on 25 November 2020 showed the registration as active as of 9 November 2020 based on submission of maps in April 2020.
- 271 Documentation held by Greenpeace.
- 272 IE 132310538. Source: Ministério da Agricultura, Pecuária e Abastecimento, SDA, CSR (nd) p85, accessed 10 February 2021.
- 273 Friboi website 'Garantia de origem'
- 274 Secretário de Estado de Meio Ambiente de Mato Grosso website 'SIMCAR portal público', accessed 5 February 2021; details can be found by searching for the CAR number MT101053/2017. A previous check on 25 November 2020 had shown the status as suspended as of 29 October 2020.
- 275 CAR website 'Consultar demonstrativo do CAR', accessed 5 February 2021; details can be found by searching for the CAR number MT-5102504-F298E64294C849C5BAC41806C76318ED.
- 276 Link to Adevaire de Oliveira confirmed by IE number 132712962. Source: Marfrig website 'Conheça a origem da nossa carne'.
- 277 Link to Adevaire de Oliveira confirmed by IE number 13.271.296-2. Source: Marfrig website 'Conheça a origem da nossa carne'.
- 278 Link to Adevaire de Oliveira confirmed by IE number 13.271.296-2. Source: Marfrig website 'Conheça a origem da nossa carne'.
- 279 JBS (2021a)
- 280 Marfrig (2021a)
- 281 Minerva (2021)
- 282 IBAMA website 'Consulta de autuações ambientais e embargos'; details can be found by searching for 'Autuações Ambientais' in his name during this year.
- 283 IBAMA data embedded in shapefiles from <https://siscom.ibama.gov.br>, Dados Geoespaciais > Camadas > Autos de Infração.
- 284 The embargoes are against Agropecuária Itapajé, process number 404633/2018. Source: Secretário de Estado de Meio Ambiente de Mato Grosso (2020).
- 285 Documentation held by Greenpeace.
- 286 The company's partners are Raul Amaral Campos Filho, Doca Nogueiras Amaral Campos, Paula Nogueiras Amaral Campos Pacheco, Raul Amaral Campos, Helena Nogueiras Amaral Campos Perozzo and Roberta Amaral Campos. Source: Receita Federal website 'Emissão de comprovante de inscrição e de situação cadastral' (details can be found by searching for the CNPJ 25309068000188).
- 287 IE 132212579. Other listed ranches linked to Raul Amaral Campos are Fazenda Furninha (IE 132212560), Fazenda Gaivota (IE 132217490) and Fazenda Santa Terezinha (IE 132212560). Source: Ministério da Agricultura, Pecuária e Abastecimento, SDA, CSR (nd) pp75,80,82,85, accessed 10 February 2021.
- 288 Friboi website 'Garantia de origem'
- 289 Friboi website 'Garantia de origem'
- 290 Link to Raul Amaral Campos confirmed by IE number 132212579. Sources: Marfrig website 'Conheça a origem da nossa carne' and Ministério da Agricultura, Pecuária e Abastecimento, SDA, CSR (nd) p88 accessed 10 February 2021.
- 291 Link to Raul Amaral Campos confirmed by IE number 132212579. Sources: Marfrig website 'Conheça a origem da nossa carne' and Ministério da Agricultura, Pecuária e Abastecimento, SDA, CSR (nd) accessed 10 February 2021.
- 292 JBS (2021a)
- 293 Marfrig (2021a)
- 294 Minerva (2021)
- 295 See Ministério da Agricultura, Pecuária e Abastecimento, SDA, CSR (nd) p88, accessed 10 February 2021.
- 296 IBAMA website 'Consulta de autuações ambientais e embargos'; details can be found by searching for 'Autuações Ambientais' in his name during this year.
- 297 IBAMA data embedded in shapefiles from <https://siscom.ibama.gov.br>, Dados Geoespaciais > Camadas > Autos de Infração.
- 298 Process number 275702/2020. Source: Secretário de Estado de Meio Ambiente de Mato Grosso (2020).
- 299 BDO RCS Auditores Independentes (2020) p3
- 300 Documentation held by Greenpeace.
- 301 IE 132896613. Source: Ministério da Agricultura, Pecuária e Abastecimento, SDA, CSR (nd) p69, accessed 10 February 2021.
- 302 Friboi website 'Garantia de origem'
- 303 Friboi website 'Garantia de origem'
- 304 Link to Jose Dalbem confirmed by IE number 132896613. Source: Marfrig website 'Conheça a origem da nossa carne'.
- 305 Link to Jose Dalbem confirmed by IE number 132896613. Source: Marfrig website 'Conheça a origem da nossa carne'.
- 306 Link to Jose Dalbem confirmed by IE number 132896613. Source: Marfrig website 'Conheça a origem da nossa carne'.
- 307 Link to Jose Dalbem confirmed by IE number 132896613. Source: Marfrig website 'Conheça a origem da nossa carne'.
- 308 JBS (2021a)
- 309 Marfrig (2021b)
- 310 Marfrig (2021a)
- 311 Minerva (2021)
- 312 IBAMA website 'Consulta de autuações ambientais e embargos'; details can be found by searching for his name.
- 313 IBAMA website 'Consulta de autuações ambientais e embargos'; details can be found by searching for 'Autuações Ambientais' in his name during the years 2014 and 2018.
- 314 Between 12 September 2018 and 23 July 2019, or soon after, Ácio Barnabe Neto made multiple shipments of cattle from Fazenda Rio Vermelho to Fazenda Aldeia de Itaúna (also owned by him). On 23 October 2018, Ácio Barnabe Neto made two shipments of a total of 242 cattle from Fazenda Rio Vermelho to Fazenda Mata Alta. Subsequent trade to JBS slaughterhouses has not been identified.
- 315 Documentation held by Greenpeace.
- 316 Friboi website 'Garantia de origem'
- 317 Friboi website 'Garantia de origem'
- 318 JBS (2021a)
- 319 CAR website 'Consultar demonstrativo do CAR', accessed 5 February 2021; details can be found by searching for the CAR number MT-5106028-C488D083E51B4436B221ACFBB0586505. A previous check on 25 November 2020 showed a status of 'pending'.
- 320 CAR website 'Consultar demonstrativo do CAR', accessed 5 February 2021; details can be found by searching for the CAR number MT-5106028-1399E75AAB194358864B9DE2039B6502. A previous check on 25 November 2020 showed a status of 'pending'.

- 321 Secretário de Estado de Meio Ambiente de Mato Grosso website 'SIMCAR portal público', accessed 25 November 2020 and 5 February 2021; details can be found by searching for the CAR numbers MT26773/2017 and MT53750/2018.
- 322 Documentation held by Greenpeace.
- 323 Friboi website 'Garantia de origem'
- 324 Link to Luiz Carlos Ziliani confirmed by IE number 132600692. Source: Marfrig website 'Conheça a origem da nossa carne'.
- 325 Link to Luiz Carlos Ziliani confirmed by IE number 132600692. Source: Marfrig website 'Conheça a origem da nossa carne'.
- 326 JBS (2021a)
- 327 Marfrig (2021a)
- 328 Minerva (2021)
- 329 IBAMA website 'Consulta de autuações ambientais e embargos'; details can be found by searching for 'Autuações Ambientais' in his name within this date range.
- 330 IBAMA data embedded in shapefiles from <https://siscom.ibama.gov.br>, Dados Geoespaciais > Camadas > Autos de Infração.
- 331 Documentation held by Greenpeace.
- 332 Friboi website 'Garantia de origem'
- 333 Link to Daniel Martins Filho confirmed by IE number 287715132. Source: Marfrig website 'Conheça a origem da nossa carne'.
- 334 JBS (2021a)
- 335 Marfrig (2021a)
- 336 Listed as Fazenda São Carlos e Santa Monica on the Secretário de Estado de Meio Ambiente de Mato Grosso website 'SIMCAR portal público'; other official documents held by Greenpeace refer to São Carlos only, but the associated property boundaries are the same.
- 337 Secretário de Estado de Meio Ambiente de Mato Grosso website 'SIMCAR portal público', accessed 5 February 2021; details can be found by searching for the CAR number MT37206/2019.
- 338 CAR website 'Consultar demonstrativo do CAR', accessed 5 February 2021; details can be found by searching for the CAR number MT-5102504-6295DE76EB4D439C94DB3662F0A8CB6E.
- 339 IBAMA website 'Consulta de autuações ambientais e embargos'; details can be found by searching for 'Autuações Ambientais' in the name of Raymundo Victor Costa Ramos Sharp within this date range.
- 340 Documentation held by Greenpeace.
- 341 Friboi website 'Garantia de origem'
- 342 JBS (2021a)
- 343 Minerva (2021)
- 344 Documentation held by Greenpeace.
- 345 See Jusbrasil website 'Processo nº 0000352-19.2012.8.11.0013'.
- 346 Link to Francisca Evangelista Teodoro da Silva confirmed by IE number 134544412. Source: Marfrig website 'Conheça a origem da nossa carne'.
- 347 Marfrig (2021a)
- 348 Minerva (2021)
- 349 Receita Federal website 'Emissão de comprovante de inscrição e de situação cadastral'; details can be found by searching for the CNPJ 16.489.312/0001-40.
- 350 Documentation held by Greenpeace.
- 351 Friboi website 'Garantia de origem'
- 352 Friboi website 'Garantia de origem'
- 353 Link to Eduardo Mariani Bittencourt confirmed by IE number 133298264. Source: Marfrig website 'Conheça a origem da nossa carne'.
- 354 Link to Eduardo Mariani Bittencourt confirmed by IE number 133298264. Source: Marfrig website 'Conheça a origem da nossa carne'.
- 355 JBS (2021a)
- 356 Marfrig (2021a)
- 357 Minerva (2021)
- 358 IE 287458490. Source: Ministério da Agricultura, Pecuária e Abastecimento, SDA, CSR (nd) p48, accessed 10 February 2021.
- 359 Documentation held by Greenpeace.
- 360 Friboi website 'Garantia de origem'
- 361 Friboi website 'Garantia de origem'
- 362 Friboi website 'Garantia de origem'
- 363 JBS (2021a)
- 364 Documentation held by Greenpeace
- 365 Friboi website 'Garantia de origem'
- 366 IE 132877287. The other ranch is Fazenda Totora (IE 132877287). Source: Ministério da Agricultura, Pecuária e Abastecimento, SDA, CSR (nd) p69, accessed 10 February 2021.
- 367 Friboi website 'Garantia de origem'
- 368 There are two listings for Fazenda Lagoa Verde on this date. Link to Paulo Cezar Pinto de Arruda and business partners confirmed by IE numbers 132877287 and 134072030. Sources: Marfrig website 'Conheça a origem da nossa carne' and Ministério da Agricultura, Pecuária e Abastecimento, SDA, CSR (nd) p69 accessed 10 February 2021.
- 369 JBS (2021a)
- 370 Marfrig (2021a)
- 371 Minerva (2021)
- 372 CAR website 'Consultar demonstrativo do CAR'; details can be found by searching for the CAR number MT-5102504-70F370ADCE1F4298A8512C7106CCA57D.
- 373 Secretário de Estado de Meio Ambiente de Mato Grosso website 'SIMCAR portal público'; details can be found by searching for the CAR number MT102985/2019.
- 374 Documentation held by Greenpeace.
- 375 Minerva (2021)
- 376 Documentation held by Greenpeace.
- 377 Friboi website 'Garantia de origem'
- 378 Friboi website 'Garantia de origem'
- 379 JBS (2021a)
- 380 Camargos D & Campos A (2020)
- 381 Instituto Centro de Vida (2020) pp7-9
- 382 Camargos D & Campos A (2020)
- 383 Camargos D & Campos A (2020). The burned areas associated with each ignition point were determined by ICV based on analysis of hotspot data from INPE, satellite imagery from the Sentinel-2 and Planet satellites and mapping by NASA; see Instituto Centro de Vida (2020) pp2,7.
- 384 Camargos D & Campos A (2020)
- 385 Campos A & Barros CJ (2020)
- 386 IPBES (2020)
- 387 IPBES (2020)
- 388 For more information, see EcoHealth Alliance (2019), IPBES (2020), United Nations Environment Programme & International Livestock Research Institute (2020) and World Health Organization website 'Zoonoses'.
- 389 Clack MA et al (2020). See also United Nations Climate Change website 'The Paris Agreement'.
- 390 Clack MA et al (2020)
- 391 Amigo I (2020)
- 392 Nobre CA et al (2016)
- 393 Gilbert J (2018), Phillips D (2020), Sax S & Angelo M (2020), UNDP Green Commodities Programme (2020)
- 394 Lovejoy TE & Nobre C (2019), Webb J (nd)
- 395 Calma J (2019)
- 396 Kimbrough L (2020), Reuters (2020)
- 397 Chain Reaction Research (2020c)
- 398 Goñi U, Cowie S & Costa W (2020)
- 399 Shalder A (2020), Voiland A (2020), World Land Trust (2020)
- 400 Hiba J (2020)
- 401 Gonzalez J (2020a), Savarese M (2020), Shalder A (2020)
- 402 Swiss Re (2020) pp3,7,24-27
- 403 Rajão R et al (2020)
- 404 Clack MA et al (2020)
- 405 Askew K (2020)
- 406 Due to its links to deforestation and habitat degradation, industrial meat production contributes to the increased risk of zoonoses - diseases such as Covid-19 that are originally found in non-human animals but jump the species barrier and begin to infect humans. For more information, see EcoHealth Alliance (2019), IPBES (2020), United Nations Environment Programme & International Livestock Research Institute (2020) and World Health Organization website 'Zoonoses'.
- 407 Soya is the second most significant driver of global deforestation after beef, and about 90% of it is used for animal feed. See European Commission (2013) pp21-22, Henders S, Persson UM & Kastner T (2015) p6 and Sharma S, IATP & Schlesinger S (2017) p25. For more on this topic, see eg Greenpeace (2020b).
- 408 For details on Greenpeace's vision 'for a healthier life and planet', see Greenpeace (2018).



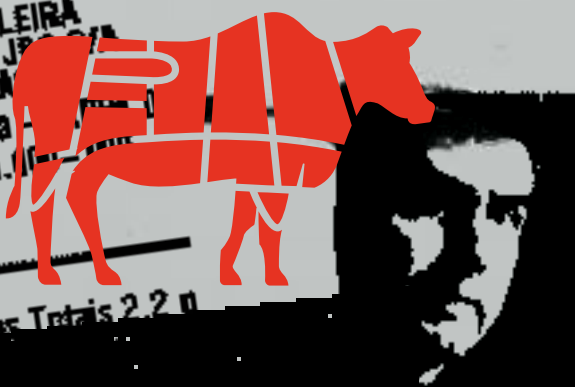
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