



 **RAPID RESPONSE** #3

[CATTLE]

**Monitoring
deforestation
in Brazilian
supply chains**

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Abbreviations

CAR	Cadastro Ambiental Rural / Rural Land Registry
CNPJ	Cadastro Nacional da Pessoa Jurídica / Brazilian National Registry of Legal Entities
CPP	Compromisso Público da Pecuária / Public Livestock Commitment
DETER	Detecção de Desmatamento em Tempo Real / Real-Time Deforestation Detection
dPaP	Do Pasto ao Prato mobile app and initiative
EUDR	European Union Regulation on Deforestation-free Products
GTA	Guia de Trânsito Animal / Animal Transit Guide
IBAMA	Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis / Brazilian Institute of Environment and Renewable Natural Resources
INPE	Instituto Nacional de Pesquisas Espaciais / National Institute for Space Research
PRODES	Projeto de Monitoramento do Desmatamento na Amazônia Legal por Satélite / Project for Monitoring Deforestation in the Legal Amazon by Satellite
SIE	Serviço de Inspeção Estadual / State Inspection of slaughterhouses
SIGEF	Sistema de Gestão Fundiária / Land Tenure Management System
SIF	Serviço de Inspeção Federal / Federal inspection of slaughterhouses
SNCI	Sistema Nacional de Certificação de Imóveis Rurais / National Rural Property Certification System
TAC	Termo de Ajustamento de Conduta / Conduct Adjustment Agreement
ZDC	Zero Deforestation and Conversion

EXECUTIVE SUMMARY

A new *Rapid Response* investigation found that JBS slaughterhouses, which supplied beef products to major retailers Carrefour, Casino/GPA, Grupo Mateus and Sendas/Assaí supermarkets in Brazil, were linked to nearly 470,000 hectares of deforestation and conversion in the Amazon and the Cerrado between 2009 and 2023. Including Marfrig and Minerva Foods slaughterhouses, the total area destroyed over this period rises above 550,000 hectares. Of this total, 55% is located in the Cerrado biome and 45% in the Amazon.

In partnership with AidEnvironment and Repórter Brasil, Mighty Earth conducted a new investigation using a sample of 1,641 fresh, frozen and processed beef products recorded via the Do Pasto ao Prato (dPaP) mobile app between October 2023 and February 2024 in Brazilian supermarkets. Data was collected from 120 Carrefour, Casino/GPA, Grupo Mateus and Sendas/Assaí stores located in 52 cities across 21 Brazilian states. These products were traced back to 157 slaughterhouses across Brazil. Notably, 45 of these 157 slaughterhouses are located in the Legal Amazon.

Using a sample of Animal Transportation Documentation (GTA) data available in seven states in Brazil, and crossing them with deforestation data, we identified 3,113 direct and 8,433 indirect cattle suppliers to 36 slaughterhouses, 27 of which were owned by meatpacker JBS, four by Marfrig, and five by Minerva. Extrapolating these data to the period between 2009 and 2023, the analysis found 181,167 hectares of deforestation linked to potential direct suppliers and 368,859 hectares linked to potential indirect suppliers to the 36 slaughterhouses, in the Amazon and Cerrado biomes.

Considering both direct and indirect potential suppliers, we found the slaughterhouses most exposed to deforestation are the plants of JBS in São Miguel do Guaporé and Pimenta Bueno, Marfrig in Chupinguaia, and Minerva in Rolim de Moura, all located in the state of Rondônia. All four of the largest retail groups in Brazil (Carrefour, Casino/GPA, Grupo Mateus and Sendas/Assaí) sell beef products from at least one of these high deforestation-risk slaughterhouses.

Some of them also sell meat products coming from slaughterhouses that are not committed to official mechanisms of forest protection, such as the Conduct Adjustment Agreement

About Rapid Response

Mighty Earth, in partnership with AidEnvironment, and using data collected through the dPaP app initiative, and with additional research from Repórter Brasil, publishes this report as part of its Rapid Response program, which aims to monitor recent deforestation in cattle and soy supply chains in Brazil. The goal of this program is to proactively halt deforestation in its early stages by urging companies to cease trading with suppliers involved in recent, visually confirmed fires or land clearing. By rapidly ending business with actors contributing to deforestation or conversion, we can avoid further environmental destruction and prevent hundreds of hectares of deforestation from becoming thousands.

The reports are published quarterly and are used to pressure national and international meatpackers, traders and retailers operating in Brazil to act by sending a rapid response to stop deforestation and conversion. The program also alerts international retailers, public prosecutors, feed manufacturers, financial institutions and other key players to the deforestation risks found in Brazil's beef and soy supply chains and encourages them to take urgent action. 

(Termo de Ajustamento de Conduta, TAC). It means that while some of these retailers demonstrate greater transparency and commitment to zero deforestation, they still engage in risky beef sourcing practices.

This *Rapid Response* report also features five case studies in the Amazon, Cerrado and the Pantanal biomes, totalling 4,651 hectares of recent deforestation and conversion on farms directly or indirectly linked to JBS, Marfrig, and Minerva slaughterhouses, which we found supplied beef products to the four major retailers in Brazil: Carrefour, Casino/GPA, Grupo Mateus and Sendas/Assaí.

Of this total, 74% or 3,447 hectares of new deforestation were found in Fazenda Soberana, one of the rural properties of Claudécio Oliveira Lemes in the state of Mato Grosso, in the Pantanal. This deforestation case detected between October and November 2023 is not the first in Mr. Lemes' history. He is charged by Brazilian authorities for the largest environmental crime ever registered in the state of Mato Grosso: the chemical destruction of 81,200 hectares of forests and native vegetation, resulting in embargoes and fines totalling R\$ 2.8 billion (equivalent to US\$ 521 million). Official investigations confirm that aerial spraying of highly toxic pesticides and herbicides, including 2,4-D, a key component of "Agent Orange" used by the United States during the Vietnam War, was aimed to annihilate trees to grow pasture and raise cattle in the Pantanal.

Asks to retailers and meatpackers

We urge Carrefour, Casino/GPA, Grupo Mateus, Sendas/Assaí and other retailers to drop all direct or indirect business relationships with meatpackers such as JBS involved in widespread and persistent deforestation or ecosystem conversion. We call on these retailers to immediately suspend the slaughterhouses identified in this report as exposed to the highest deforestation rates from 2021 to 2023 until their supply chain is independently verifiably clean. We urge the retailers to immediately disclose on a public platform the volume and origin of their beef products – including details of the slaughterhouses, lists of direct and indirect farm suppliers, and the proportion of beef products sourced from a verified Zero Deforestation and Conversion (ZDC) beef supply chain. In addition, we urge them to submit and publicly track all alleged cases of deforestation, conversion and human rights violations through a public grievance mechanism.

We call on JBS, Marfrig, Minerva and other meatpackers to investigate all our allegations and immediately suspend direct and indirect suppliers involved in deforestation – including the excessive and widespread use of toxic herbicides, which not only deforest, but impact on the surrounding ecosystems, wildlife and communities. Meatpackers should also immediately disclose on a public platform the volume and origin of cattle – including lists of all direct and indirect farms and the proportion of cattle from ZDC farms – and submit all cases of deforestation or of alleged human rights violations through a public grievance mechanism to monitor the progress, engagement and suspension of each non-compliant farm, as recommended by the Accountability Framework initiative (AFi).

LINKS BETWEEN RETAILERS AND SLAUGHTERHOUSES

During the data collection period (October 12, 2023 - February 2, 2024), a team of consumers, volunteers and researchers collected data on 1,641 fresh, frozen and processed beef products found in retail stores in Brazil through the dPaP mobile application. The products were identified in 120 stores owned by French retailers Carrefour (52 stores) and Casino/GPA (22 stores), as well as Brazilian retailers Grupo Mateus (13 stores) and Sendas/Assaí (33 stores).¹ These stores were located in 52 municipalities in 21 states across Brazil.

The stores where the sampled beef products were identified, owned by the following retail groups, are:

- **Carrefour:** Atacadão, Carrefour Bairro, Carrefour Market, Carrefour Express, Carrefour Hiper, Sam's Club, and Todo Dia
- **Sendas/Assaí:** Assaí Atacadista
- **Grupo Mateus:** Hiper Mateus and Mix Mateus
- **Casino/GPA:** Pão de Açúcar

The codes of the Federal Inspection of Slaughterhouses (*Serviço de Inspeção Federal*, SIF) and the State Inspection of Slaughterhouses (*Serviço de Inspeção Estadual*, SIE), both sanitary registries, or the numbers of the Brazilian National Registry of Legal Entities (*Cadastro Nacional da Pessoa Jurídica*, CNPJ) associated with each identified beef product provide information on the meatpacker and location of the slaughterhouse where the meat was processed. Using the codes collected, we were able to link the 1,641 scanned beef products to 157 slaughterhouses operated by 108 different meatpackers across 21 states.

Table 1 shows the number of beef products by retailer linked to slaughterhouses operated by the three major meatpackers and "other" meatpackers.

Table 1. Number of beef products by retailer linked to the meatpackers

Retailer	JBS	Marfrig	Minerva	Other
Carrefour	427	43	15	267
Casino/GPA	61	45	28	67
Grupo Mateus	85	11	2	100
Sendas/Assaí	327	38	2	123
	900	137	47	557
Total	1,641			
	55%	8%	3%	34%

¹ Since March 14, 2024, i.e., after the period studied in our investigation, Casino Group holds 22.5% of GPA's capital (compared to 41% previously), which means it lost control of the company. See: Groupe Casino (2024) *Notice of Meeting, Ordinary and Extraordinary Annual General Meeting*, Groupe Casino: Saint-Étienne, France

Of the 1,641 beef products for which we could trace the slaughterhouses, 900 (55%) are linked to 41 JBS-owned slaughterhouses, 137 (8%) to 16 Marfrig-owned slaughterhouses, and 47 (3%) to seven Minerva-owned slaughterhouses. The other 557 meat products (34%) were linked to 93 slaughterhouses operated by 105 other meatpackers.

Table 2 shows the number of slaughterhouses operated by the three largest meatpackers (JBS, Marfrig, and Minerva) and “other” meatpackers linked to the sampled beef products by retailer.

Table 2. Number of slaughterhouses by retailer linked to meatpackers

Retailer	JBS	Marfrig	Minerva	Other	Total*
Carrefour	37	8	6	63	114
Casino/GPA	22	7	5	22	56
Grupo Mateus	17	3	2	35	57
Sendas/Assaí	36	5	1	46	88
Total*	41	16	7	93	157
In the Legal Amazon	20	3	3	19	45

*As some slaughterhouses are linked to more than one retailer, these duplicates have been removed to calculate the total.

DIRECT AND INDIRECT CATTLE SUPPLIERS LINKED TO THE IDENTIFIED SLAUGHTERHOUSES

The analysis of the links between potential direct and indirect cattle suppliers and the slaughterhouses that produced the beef products found in the stores of the four retailers focuses solely on Brazil’s three largest meatpackers: JBS, Marfrig, and Minerva. To establish the link between the slaughterhouses and direct and indirect cattle suppliers, we used a sample of GTA data available in seven Brazilian states: Goiás, Minas Gerais, Mato Grosso do Sul, Mato Grosso, Pará, Rondônia and Tocantins. This approach resulted in a sample of 36 slaughterhouses considered in our analysis: 27 operated by JBS, four by Marfrig, and five by Minerva, totalling 698 beef products (Table 3).

Table 3. JBS, Marfrig, and Minerva slaughterhouses in the seven Brazilian states covered by our GTA data sample and the number of beef products linked to each slaughterhouse

JBS (27 slaughterhouses)					
Municipality	State	#	Municipality	State	#
Alta Floresta	MT	16	Mozarlândia	GO	29
Anastácio	MS	2	Naviraí	MS	11
Araguaína	TO	16	Nova Andradina	MS	8
Araputanga	MT	33	Pedra Preta	MT	5
Barra do Garças	MT	19	Pimenta Bueno	RO	17
Campo Grande	MS	120	Pontes e Lacerda	MT	29
Colíder	MT	12	Porto Velho	RO	13
Confresa	MT	38	Redenção	PA	18
Diamantino	MT	4	Santana do Araguaia	PA	22
Goiânia	GO	51	São Miguel do Guaporé	RO	43
Ituiutaba	MG	8	Senador Canedo	GO	9
Iturama	MG	5	Tucumã	PA	2
Juara	MT	9	Vilhena	RO	11
Marabá	PA	20			

Marfrig (4 slaughterhouses)			Minerva (5 slaughterhouses)		
Municipality	State	#	Municipality	State	#
Bataguassu	MS	10	Araguaína	TO	1
Chupinguaia	RO	1	Janaúba	MG	1
Pontes e Lacerda	MT	1	Palmeiras de Goiás	GO	14
Várzea Grande*	MT	80	Paranatinga*	MT	8
			Rolim de Moura	RO	12

(*) Since 2019, Marfrig and Minerva have swapped their slaughterhouses in Paranatinga (now operated by Minerva) and Várzea Grande (now operated by Marfrig).

The location of potential direct and indirect cattle suppliers was obtained by cross-referencing official land tenure registration data (SIGEF) with a sample of GTA data from 2017 to 2022. Our analysis identified 16,944 direct cattle suppliers (Figure 1) and 32,270 indirect suppliers (Figure 2) to the 36 JBS, Marfrig, and Minerva slaughterhouses. It is important to note that this sample of direct and indirect suppliers represents only a small proportion of the meatpackers' total suppliers. For example, JBS states that it has 73,000 direct cattle suppliers in Brazil but does not disclose the number of indirect suppliers.²

2 JBS (2023) *People and Planet: The JBS Commitment to Eliminating Agriculture-Related Deforestation*, JBS: São Paulo, Brazil

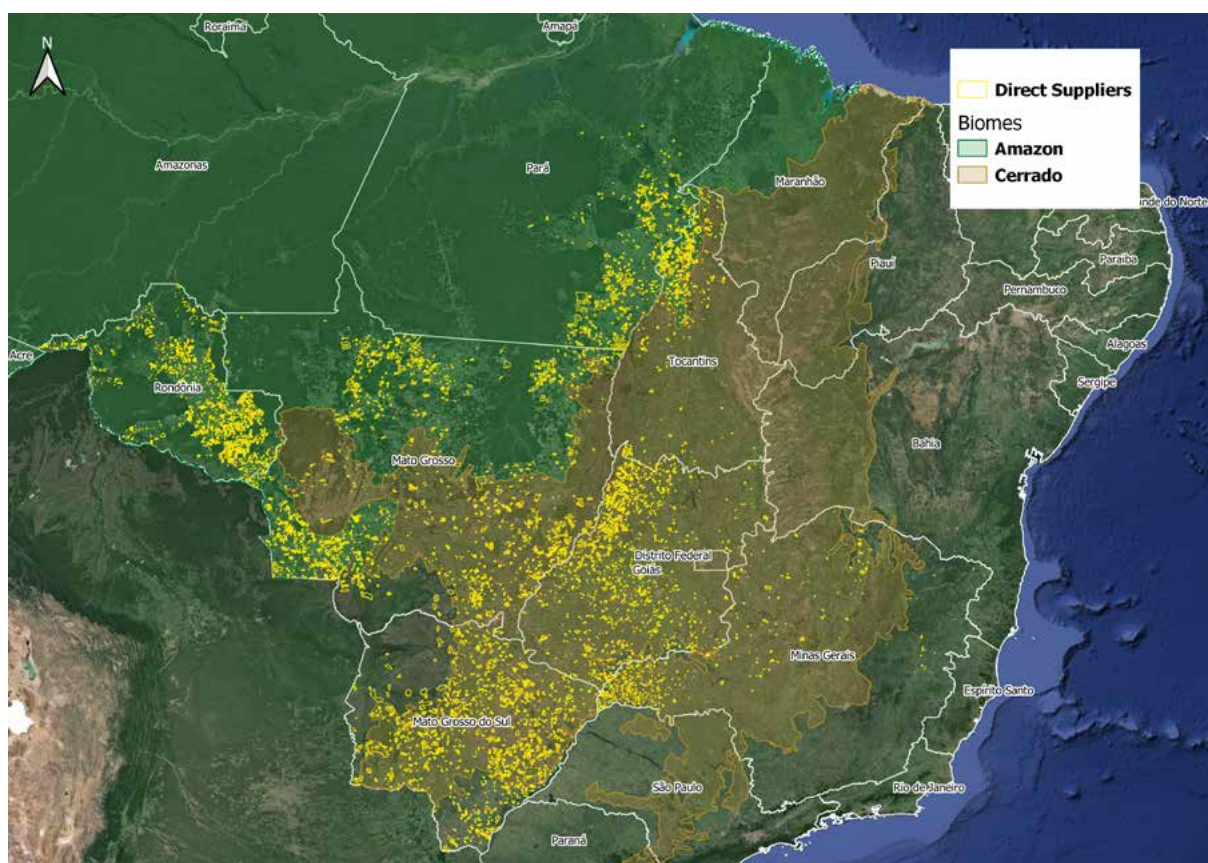


Figure 1. Properties that directly supplied the 36 identified JBS, Marfrig, and Minerva slaughterhouses Source: AidEnvironment (2024).

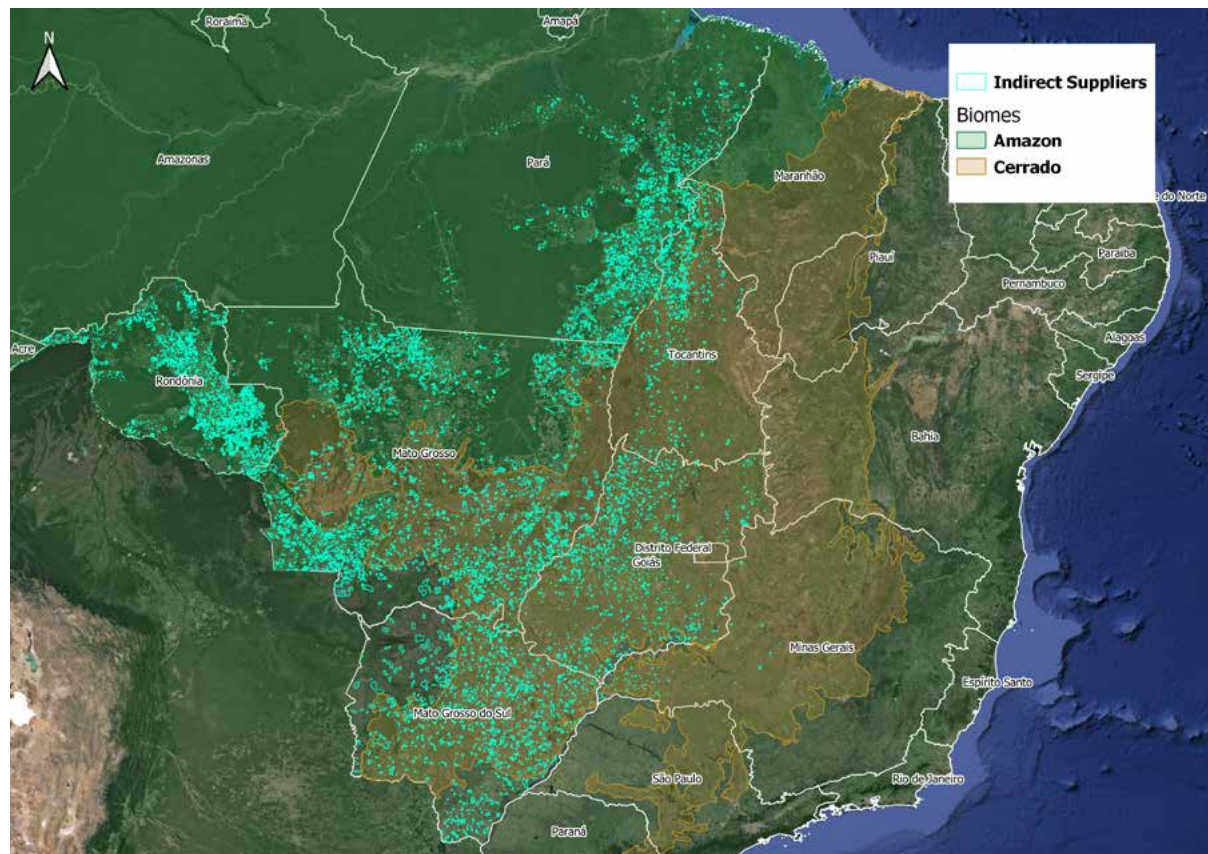


Figure 2. Properties that indirectly supplied the 36 identified JBS, Marfrig, and Minerva slaughterhouses Source: AidEnvironment (2024).

DEFORESTATION ANALYSIS

Direct and indirect suppliers to the identified slaughterhouses

Our deforestation analysis considered a sample of direct and indirect suppliers that have had trade relationships between 2017 and 2022 with the 36 listed slaughterhouses operated by JBS, Marfrig and Minerva (Table 3). After identifying the potential direct and indirect suppliers to these slaughterhouses, we overlaid the deforestation data onto the properties' polygons (areas).

We considered two time periods for calculating the deforestation: between 2009 and 2020 and between 2021 and 2023. The first period, while including both, legal and illegal deforestation, takes into account the deforestation cut-off date of the Brazilian Forest Code, which does not allow illegal deforestation after July 2008. The second period considers the cut-off date of the European Union Deforestation Regulation (EUDR), December 31, 2020. For both periods, we used a combination of data from the Project for Monitoring Deforestation in the Legal Amazon by Satellite (*Projeto de Monitoramento do Desmatamento na Amazônia Legal por Satélite*, PRODES) led by the Brazilian National Institute for Space Research (*Instituto Nacional de Pesquisas Espaciais*, INPE) and MapBiomas Alerta data to assess deforestation (see further details in the Methodology section).

Between 2009 and 2023, for our sample, we found a total of 550,026 hectares of deforestation and conversion in the Amazon and Cerrado biomes linked to 3,113 potential direct suppliers and 8,433 potential indirect suppliers to the 36 JBS, Marfrig, and Minerva slaughterhouses. Of the total deforestation identified between 2009 and 2023, 33% occurred on the properties of direct suppliers and 67% on the properties of indirect suppliers; 45% occurred in the Amazon biome and 55% in the Cerrado biome.

Table 4 summarizes the hectares of deforestation potentially linked to the 36 identified JBS, Marfrig, and Minerva slaughterhouses broken down by the two time periods and by direct and indirect suppliers.

Table 4. Deforestation between 2009-2020 and 2021-2023 on properties owned by direct and indirect suppliers to the 36 listed slaughterhouses operated by the three major meatpackers

Slaughterhouses	Deforestation in a sample of direct suppliers			Deforestation in a sample of indirect suppliers			Direct + Indirect
	2009-2020	2021-2023*	Total (ha)	2009-2020	2021-2023*	Total (ha)	Total (ha)
JBS (27 slaughterhouses)	116,615	34,001	150,617	250,808	67,629	318,437	469,054
Marfrig (4 slaughterhouses)	18,784	5,971	24,755	59,678	12,803	72,481	97,236
Minerva (5 slaughterhouses)	28,961	4,014	32,975	73,629	25,488	99,117	132,091
Total (without overlap)**	142,919	38,248	181,167	296,401	72,457	368,859	550,026

(*) Non-complying with the EUDR cut-off date of December 31, 2020. This figure is underestimated since it does not cover the period between January and July 2021.

(**) For the calculation of the total deforestation (without overlap), duplicate deforestation data for properties supplying more than one slaughterhouse were removed.

According to our sample, we identified the 15 slaughterhouses with more than 4,000 hectares of deforestation exposure from 2021 to 2023 among the sample of direct and indirect cattle suppliers (Table 5). Notably, 11 of these slaughterhouses are owned by JBS. The four slaughterhouses with the highest deforestation exposure are all located in Rondônia state, in the Amazon region.

Table 5. Top 15 slaughterhouses with the highest exposure to deforestation (more than 4,000 hectares) from 2021 to 2023, grouped by meatpacker

Meatpacker	Slaughterhouse (SIF number)	State	Deforestation on properties owned by potential:		
			direct suppliers (hectares)	indirect suppliers (hectares)	Total (direct + indirect) (hectares)
JBS	Pimenta Bueno (2880)	Rondônia	5,169	6,796	11,965
JBS	São Miguel do Guaporé (175)	Rondônia	4,039	5,835	9,873
JBS	Barra do Garças (42)	Mato Grosso	2,096	7,352	9,448
JBS	Alta Floresta (4302)	Mato Grosso	3,490	5,901	9,391
JBS	Redenção (807)	Pará	1,459	6,498	7,957
JBS	Vilhena (4333)	Rondônia	2,258	4,534	6,792
JBS	Porto Velho (4149)	Rondônia	611	4,163	4,774
JBS	Campo Grande (4400, 1662)	Mato Grosso do Sul	2,283	2,197	4,480
JBS	Confresa (3470)	Mato Grosso	1,545	2,791	4,336
JBS	Mozarlândia (4507)	Goiás	2,795	1,341	4,136
JBS	Marabá (457)	Pará	125	4,002	4,126
Marfrig	Chupinguaia (3250)	Rondônia	4,223	10,934	15,157
Minerva	Rolim de Moura (791)	Rondônia	1,462	16,704	18,166
Minerva	Araguaína (1940)	Tocantins	1,540	3,542	5,082
Minerva	Paranatinga (2500)	Mato Grosso	661	4,122	4,783

We assessed the proportion of beef products, identified in retail stores via the dPaP app, which originated from the top 15 JBS, Marfrig and Minerva slaughterhouses exposed to the highest deforestation rates. Among the 485 beef products from JBS, Marfrig and Minerva identified in Carrefour stores, for instance, 36% of products came from these high-deforestation risk slaughterhouses.

Table 6. Percentage of beef products sourced from JBS, Marfrig and Minerva slaughterhouses with the highest exposure to deforestation, by retail group.

Retailer	Beef products originating from JBS, Marfrig and Minerva slaughterhouses (% of beef products from the retailer's sampling)	Beef products originating from the 15 slaughterhouses with the highest deforestation exposure	Percentage of beef products originating from the 15 slaughterhouses with the highest deforestation exposure
Carrefour	485 (63%)	176	36%
Casino/GPA	134 (67%)	38	28%
Grupo Mateus	97 (49%)	32	33%
Sendas/Assaí	368 (75%)	120	33%

In a separate analysis of the total 1,641 beef products sampled across stores of Brazil's major retailers from October 2023 to February 2024, we traced the supply to two high-risk slaughterhouses operated by companies other than the three major meatpackers.

The two slaughterhouses identified are operated by Big Charque Indústria e Comércio Ltda (SIF 4144) from Cacoal, Rondônia, and Frisacre Frigorífico Santo Afonso do Acre Ltda (SIF 3297) from Rio Branco, Acre. We consider these companies "high-risk" because they have not signed the Termo de Ajustamento de Conduta (TAC) of the Legal Amazon region.

What is the Conduct Adjustment Agreement (TAC)?

The first TAC was proposed by the Federal Public Prosecutors' Office (MPF) of the state of Pará in 2009, and then it spread to the rest of the Amazon. The TAC of Pará and the TAC of Legal Amazon are legally binding instruments, signed by the slaughterhouses. They require meatpackers to verify that the cattle farms they do business with are not implicated in illegal deforestation, are not embargoed by IBAMA or State Environmental and Sustainability Secretariat (Semas), do not overlap conservation units and/or Indigenous lands and do not employ workers under slave-like conditions, among other criteria. Imaflores and the MPF launched the Beef on Track¹ initiative, which includes protocols and guidelines for implementing and auditing TAC and other sectorial agreements, such as the Public Livestock Commitment, implemented by Greenpeace in 2009 after the launch of the report "A Farra do Boi na Amazônia" (2009)².

¹ <https://www.beefontrack.org/>

² <https://www.greenpeace.org/static/planet4-brasil-stateless/2018/07/FARRAweb-alterada.pdf>

According to our sample:

- Carrefour (specifically one Atacadão store in the municipality of Boa Vista) and Assaí stores (in the municipalities of Macapá, Boa Vista, and Porto Velho) sold beef products from Big Charque Indústria e Comércio Ltda.
- Grupo Mateus (stores of Mix Mateus in Imperatriz and Açailândia) sold beef products from Frisacre Frigorífico Santo Afonso do Acre Ltda.

The beef products traced to these slaughterhouses originate from the AMACRO (Amazonas, Acre, and Rondônia) deforestation hotspot.

The maps below (Figures 3, 4, 5, and 6) illustrate the links between the retailers' stores where beef products were sampled and the 36 JBS, Marfrig and Minerva slaughterhouses, where we detected deforestation occurring between 2021 and 2023 in a sample of potential direct and indirect cattle suppliers.

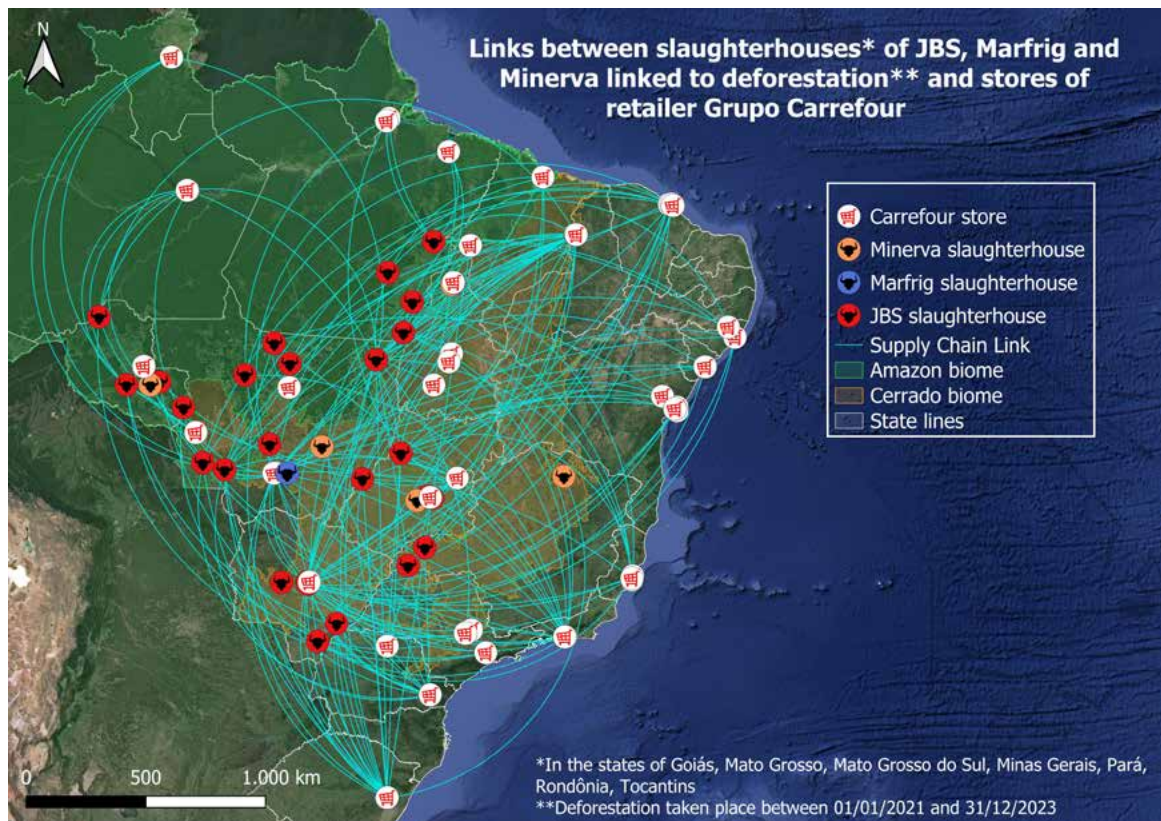


Figure 3. Links between Carrefour stores where the beef products were sampled and JBS, Marfrig, and Minerva slaughterhouses with potential direct and indirect suppliers with deforestation on their properties in Brazil after the EUDR cut-off date Source: AidEnvironment (2024)

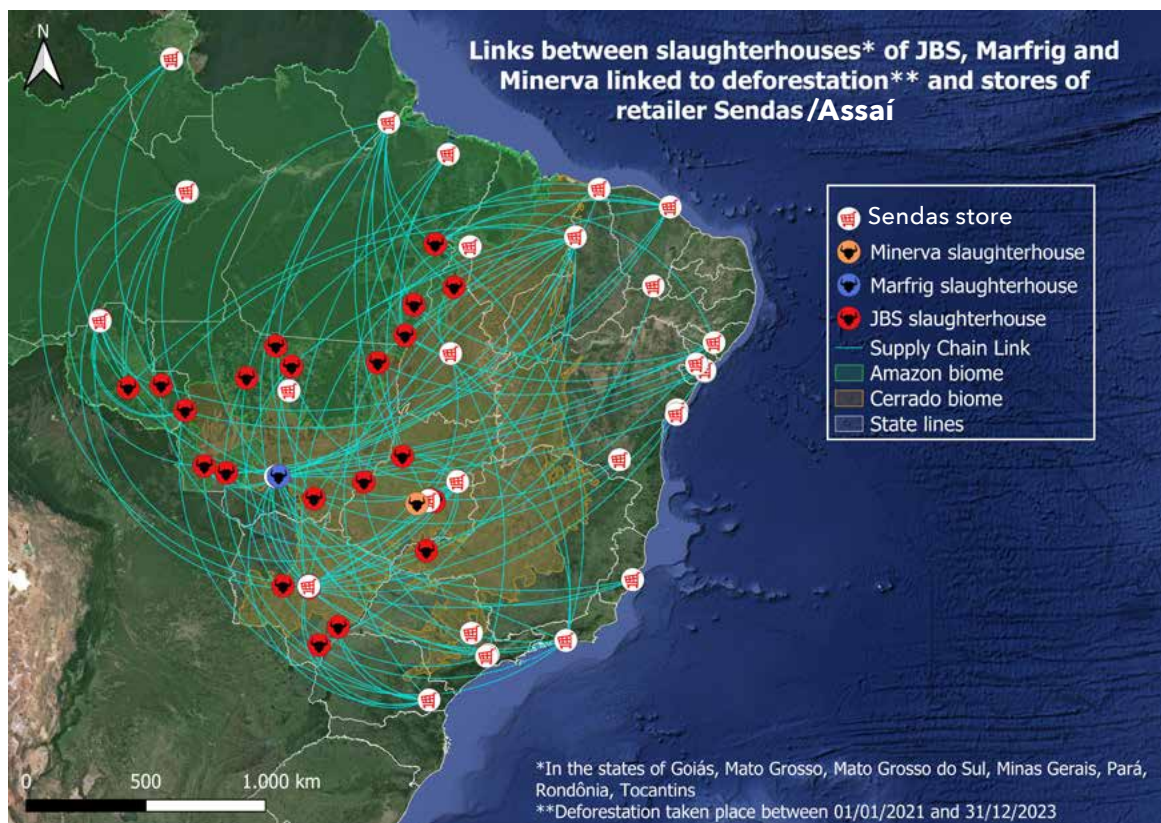


Figure 4. Links between Sendas/Assaí stores where the beef products were sampled and the JBS, Marfrig, and Minerva slaughterhouses with direct and indirect suppliers with deforestation on their properties in Brazil after the EUDR cut-off date Source: AidEnvironment (2024)

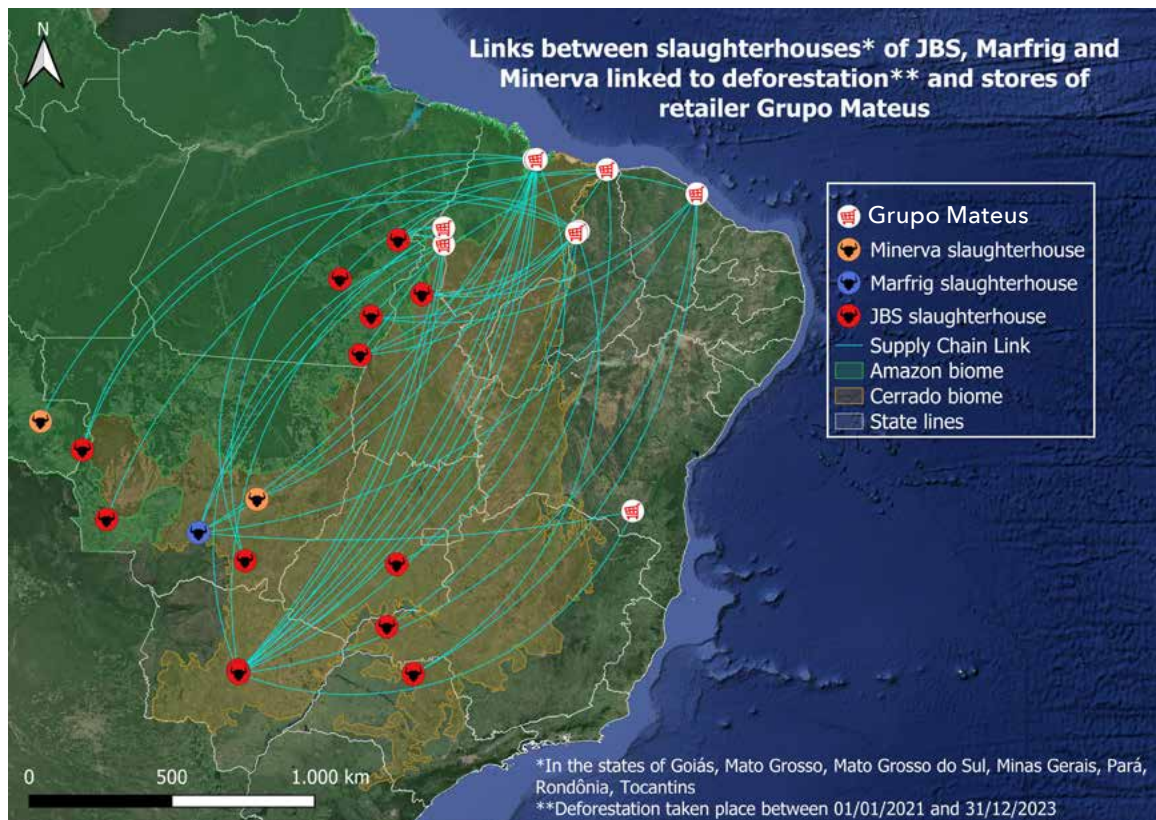


Figure 5. Links between Grupo Mateus stores where the beef products were sampled and JBS, Marfrig, and Minerva slaughterhouses with potential direct and indirect suppliers with deforestation on their properties in Brazil after the EUDR cut-off date Source: AidEnvironment (2024)

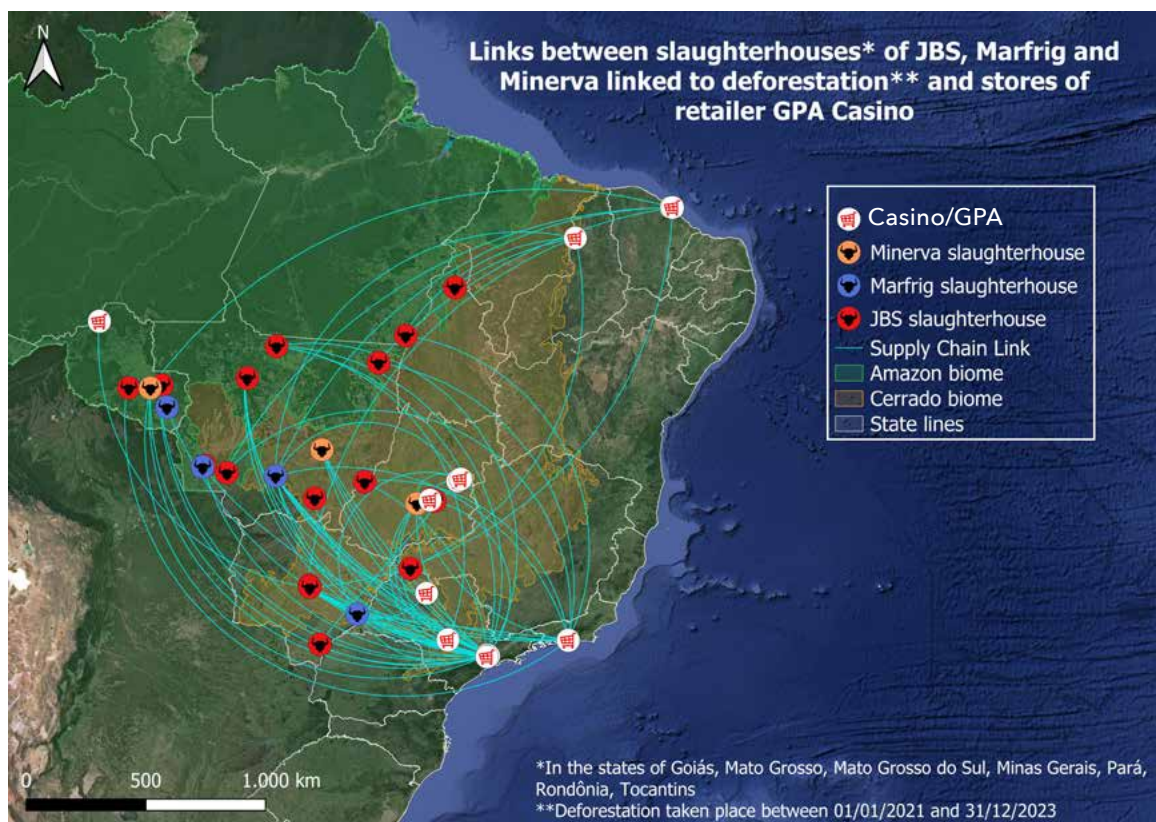


Figure 6. Links between Casino/GPA stores where the beef products were sampled and JBS, Marfrig, and Minerva slaughterhouses with potential direct and indirect suppliers with deforestation on their properties in Brazil after the EUDR cut-off date Source: AidEnvironment (2024)

CASE STUDIES

Recent deforestation in the cattle supply chain

To select the case studies, we considered the potential direct and indirect suppliers of the targeted 36 slaughterhouses linked to the meat products identified in 120 Carrefour, Casino/GPA, Grupo Mateus and Sendas/Assaí stores across Brazil. We reviewed recent deforestation on direct and indirect supplier properties to identify case studies. The analysis first considered deforestation alerts from The Realtime Deforestation Detection system (Detecção de Desmatamento em Tempo Real, DETER) in the Amazon, Cerrado and Pantanal biomes, spanning a period between October 2023 and February 2024. Deforestation alerts were then visually confirmed for the selected case studies, and the hectares of cleared native vegetation were calculated using Planet satellite imagery.³

Below, we present five detailed case studies, including their supply chain links and “Before and After” satellite imagery. These cases were selected based on criteria that allow us to illustrate the recent, diverse and systemic aspect of native vegetation conversion in Brazil. They include fire and deforestation events potentially linked to the country’s leading meat processing companies and retailers, prioritizing the Amazon, Cerrado and Pantanal biomes, as well as direct and indirect cattle suppliers with important native vegetation at risk in the rural property. We found 4,651 hectares of recent deforestation associated with these five case studies.

Table 7. Summary of five case studies linking deforestation to potential direct and indirect suppliers to slaughterhouses and retailer stores

Property	Municipality, state	Meatpacker	Linked retailer	Biome	Deforestation (ha)	Tons of CO ₂ ⁴	Fire alerts	Remaining vegetation (ha)
Fazenda Soberana	Barão do Melgaço, Mato Grosso	JBS, Marfrig, Minerva	Carrefour Casino/GPA Sendas/Assaí Grupo Mateus	Pantanal	3,447	152,932	70	7,190
Fazenda Santa Angelina II	Cáceres, Mato Grosso	Marfrig, Minerva	Carrefour Casino/GPA Sendas/Assaí Grupo Mateus	Cerrado	531	26,538	-	2,533
Fazenda Querência	Aquidauana, Mato Grosso do Sul	JBS	Carrefour Casino/GPA Sendas/Assaí Grupo Mateus	Pantanal	558	27,837	10	15,783
Fazenda São José	Marabá, Pará	JBS, Marfrig	Carrefour Sendas/Assaí Grupo Mateus	Amazon	56	31,969	-	1,260
Lote 68 Setor 07 Gleba Corumbiara	Vilhena	JBS, Marfrig	Carrefour Casino/GPA Sendas/Assaí Grupo Mateus	Amazon	59	26,387	-	1,702
Total					4,651	265,663	80	28,468

³ Planet imagery is accessed through the NICFI Satellite Data Program. Planet Analytic Imagery And Archive, see: <https://www.planet.com/products/planet-imagery/>

⁴ The calculation of CO₂ emissions refers to the “above-ground carbon emissions” according to the cleared vegetation type(s) [Source: Nogueira et al. (2015). *Carbon stock loss from deforestation through 2013 in Brazilian Amazonia*]. The tons of CO₂ emissions are calculated per type of vegetation times the ratio of molecular weight of carbon dioxide to carbon (44/12) times the number of hectares cleared.

Case ID 3.1. Fazenda Soberana – Barão do Melgaço, Mato Grosso

Property: **Fazenda Soberana** Pantanal biome

Barão do Melgaço, MT • **Coordinates property:** -16.8391, -55.5872 • **Area property (ha):** 10,093

CAR: MT-5101605-78362E4B47414745A345A37B2496A6F9 (Under analysis), declared by Claudy Oliveira Lemes (same person in SIGEF/SNCI/SNCR databases) • **SIGEF/SNCI:** 9040230051938

Ownership and other linked properties

Ownership: Claudy Oliveira Lemes • **Company group:** Semel Transportes e Logística Ltda (road freight transport company) registered in Duque De Caxias (RJ), Boituva (SP), Rondonópolis (MT); Auto Posto Comando Diesel Ltda (retail trade of fuel for motor vehicles) registered in Novo Progresso (PA); Comando Diesel Transporte e Logística Ltda (road freight transport company) registered in Duque De Caxias (RJ), Teresópolis (RJ), Rondonópolis (MT), Boituva (SP), Porto Velho (RO), Sapucaia Do Sul (RS), Cambe (PR), Palhoça (SC), Campo Grande (MS), Goiânia (GO), São José dos Campos (SP), Itapissuma (PE), Alagoinhas (BA), Novo Progresso (PA), Fortaleza (CE), Uberaba (MG), Teresina (PI), Mogi-Guaçu (SP), São Luiz (MA), Nossa Senhora do Socorro (SE), and Sinop (MT). • **Linked properties:** Four other properties totaling 25,392 hectares. In Pedra Preta (MT): Fazenda Monique Vale I and II (4,111 ha). In Barão de Melgaço (MT): Fazenda Cerro Alegre (15,393 ha) and Fazenda Bom Sucesso (5,888 ha).

Cleared area

3,447 hectares • 152,932 tons of CO₂ • 70 fire alerts

Clearance Coordinates: -16.88955, -55.56832 • **Clearance period:** October and November 2023

Inside Forest Code's protected areas: Yes - 1,810 ha cleared inside Legal Reserve

Type of vegetation: Seasonal wooded savanna • **Priority for biodiversity conservation:** Very high

Remaining native vegetation : 7,190 ha

Indigenous territories (overlapping or bordering): -

Environmental fines and embargoes

Embargoes: Yes
BRL 2,8 billion
(US\$ 521 million)⁵

Fazenda Soberana is subject to an embargo of 1,370 hectares due to illegal deforestation issued by the Mato Grosso Environment Agency (Sema-MT) in 2020.⁶ Lemes has been issued another seven embargoes issued between 2018 and 2022 due to illegal deforestation in five properties in Barão do Melgaço (MT). The producer is being investigated by the Mato Grosso police since 2022 for deforestation of 81,223 hectares in Barão do Melgaço-MT, including Fazenda Soberana.⁷

Environmental fines: Yes

Lemes faced the largest administrative sanction ever recorded by the Sema-MT for environmental crimes on 11 properties in Barão do Melgaço, including Fazenda Soberana.

Supply chain links

Direct or indirect supplier to: **Minerva Paranatinga (SIF 2500) [direct & indirect], Marfrig Várzea Grande (SIF 2015) [indirect], JBS Pedra Preta, Barra do Garças, Campo Grande, Diamantino (SIFs 2019, 42, 1662, 3000) [indirect]⁸**

Supplying meat to: **Carrefour, Grupo Mateus, Casino/GPA, Sendas/Assaí**

⁵ "Operação Cordilheira sequestra propriedades e aplica multa de R\$ 2,8 bilhões por desmate químico no Pantanal," Camila Molina and Nayara Takahara, *SEMA Secretaria de Estado de Meio Ambiente*, April 15, 2024

⁶ SEMA, Transparência, Áreas Embargadas, Julgamentos de Autos de Infração e Arrecadação de Multas, see: <http://www.sema.mt.gov.br/transparencia/index.php/item/56-fiscalizacao#331-areas-embargadas>

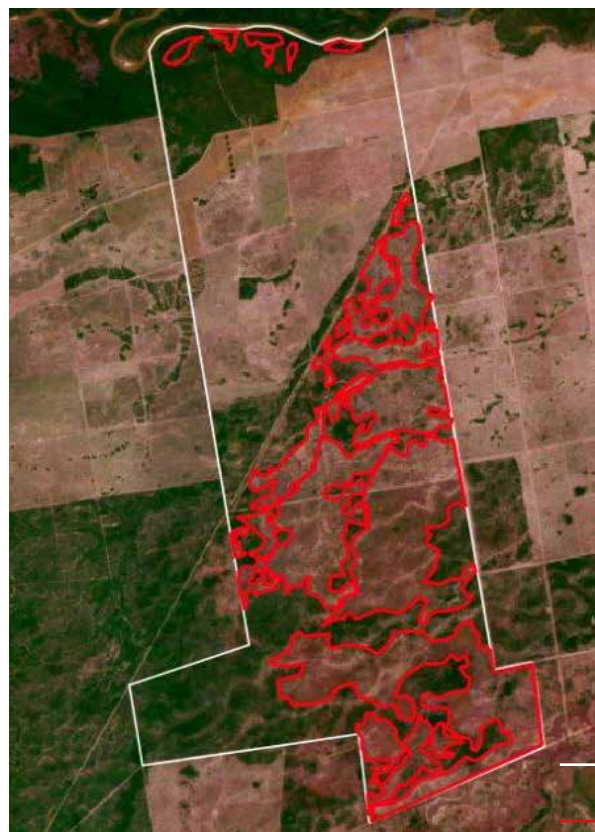
⁷ "Operação Cordilheira sequestra propriedades e aplica multa de R\$ 2,8 bilhões por desmate químico no Pantanal," Camila Molina and Nayara Takahara, *SEMA Secretaria de Estado de Meio Ambiente*, April 15, 2024

⁸ At the time of the transfers we identified, Marfrig was operating the unit in Paranatinga, now operated by Minerva (SIF 2500), and Minerva was operating the unit in Várzea Grande, now operated by Marfrig (SIF 2015).



September 2023

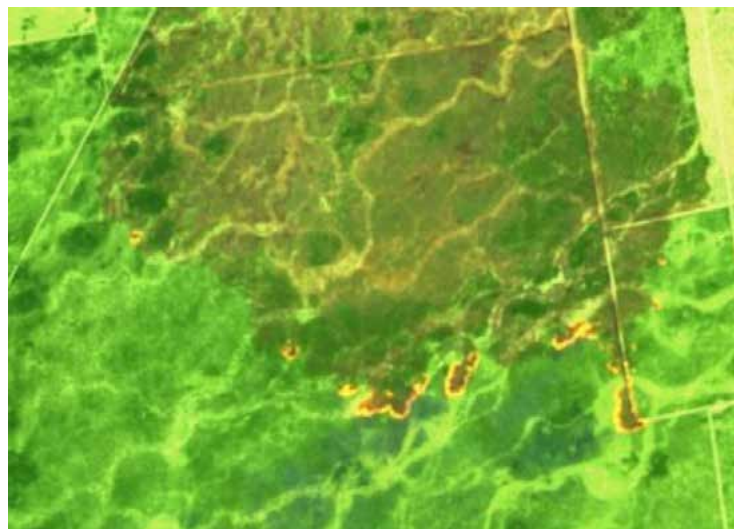
Source: Imagery ©2023 Planet Labs Inc.



November 2023

Source: Imagery ©2023 Planet Labs Inc.

limits of the
property
limits of the
deforestation



Active fires on October 15, 2023

Source: European Union – EO Browser Copernicus Sentinel data 2023



The Pantanal is home to the largest concentration of jaguars in Brazil Photo: Marcus Mesquita



Ranchers move cattle in the Pantanal Photo: Marcus Mesquita

War on nature: Deliberate use of deadly defoliant «Agent Orange» deforests 81K hectares of Pantanal

Claudecy Oliveira Lemes, owner of Fazenda Soberana and 10 other farms in Barão do Melgaço in the Pantanal in Mato Grosso, is charged by Brazilian authorities with **81,200 hectares of illegal deforestation** and of dropping a highly toxic component of 'Agent Orange' – 2,4-D – from planes to defoliate and deforest his land. It's the largest ever case of deforestation recorded in Mato Grosso and equivalent to almost four times the size of Amsterdam.

The devastation on 11 of the cattle rancher's farms has been investigated by police and environmental authorities **since 2022. They claim 25 types of pesticides were aerially sprayed to destroy forests and native vegetation.** The aim was to annihilate the tallest vegetation to expand cattle ranching in the area. Brazilian authorities have confirmed the herbicide **2,4-D** is one of the chemicals used. It is one of the key compounds in the defoliant '**Agent Orange**', known for its destructive potential and used by the United States in the Vietnam War. The extensively deforested area is located in the municipality of Barão do Melgaço in the Pantanal in southwestern Brazil. The 42-million hectare biome is the world's **largest tropical wetland**, part of which has been recognized as a **World Heritage Site and Biosphere Reserve** by UNESCO, and home to keystone species like the jaguar, giant anteater and the maned wolf.

Claudecy Oliveira Lemes also owns Fazenda Monique Vale, located in Pedra Preta, a municipality 232 kms away from where the chemical deforestation was found. A recent investigation by Repórter Brasil found this property sent cattle to two JBS slaughterhouses in 2023. Analysis of data from official Animal Transit Guides (GTAs) accessed by Repórter Brasil show that Fazenda Monique Vale regularly received cattle from other properties owned by Lemes for their final fattening before slaughter. Among the cattle suppliers are the Soberana, Santa Lúcia, Indiana, and Reunidas São Jerônimo farms, four of the 11 properties that suffered chemical deforestation in Barão do Melgaço.

In 2020, the Mato Grosso Environment Secretariat (Sema-MT) embargoed 1,370 hectares of Fazenda Soberana. The embargo came after the agency identified widespread **illegal deforestation on the farm between 2015 and 2019.** Lemes was fined US\$ 1.3 million for the destruction and signed an agreement with the state Prosecutor's Office pledging not to carry out further deforestation on the property. However, a police investigation showed that the agreement was breached and new cases of deforestation were recorded with the use of pesticides. In this Rapid Response report, we show that a **further 3,447 hectares of native vegetation were destroyed on Fazenda Soberana between October and November 2023.**

According to Repórter Brasil, Lemes has also **changed the Rural Environmental Registry (CAR) of one of his properties**, thus excluding from its declared boundaries an area that was illegally deforested according to the Brazilian authorities.

In total, Lemes has been charged numerous times for environmental crimes and has been fined the US\$ 521 million – a record for environmental fines in Mato Grosso.

The chain of responsibilities is not limited to the private sector. A **survey conducted by Greenpeace**, based on public data from the Brazilian Central Bank, showed that the rancher Lemes had access to four loans with subsidized interest rates from the Brazilian government for investment in Fazenda Soberana in the Pantanal. The rural credit, for US\$ 1.8 million, was granted by Banco do Brasil, a mixed-capital banking institution. The first loan was granted to the producer in March 2021, more than a year after Fazenda Soberana was included in the list of properties embargoed for illegal deforestation in Mato Grosso.

Our investigation also found links that cattle from Fazenda Soberana were sold to farms who supplied Brazilian meat giant JBS, Marfrig and Minerva's slaughterhouses, and beef products from these linked slaughterhouses were recently found in Carrefour, Casino, Grupo Mateus and Sendas retail stores across Brazil. Using the 'Do Pasto ao Prato' app to scan labels on beef products in retail stores across Brazil between October 2023 and February 2024, our network of data collectors found:

- **Carrefour** - 37 beef products with the SIF codes 2500 (Minerva Paranatinga), 2015 (Marfrig Varzea Grande), 42 (JBS Barra do Garças), 1662 (JBS Campo Grande) and 3000 (JBS Diamantino) were found in 12 Carrefour stores in 12 Brazilian states
- **Casino** - 27 beef products with SIF codes 2500, 2015, 2019 (JBS Pedra Preta), 42 and 1662 were found in 10 GPA Casino stores in São Paulo, Piauí and Rio de Janeiro.
- **Sendas Assaí** - 15 beef products with SIF codes 2015, 2019, 42 and 1662 were found in nine Sendas Assaí stores in eight Brazilian states.
- **Grupo Mateus** - 5 beef products with SIF codes 2500, 2015, 2019 and 1662 were found in four Grupo Mateus stores in Maranhão.

**The companies' replies to questions from Mighty Earth about Fazenda Soberana and other deforestation cases are available in the "Right of Reply" section of this report.*



Area in the Pantanal affected by chemical deforestation investigated by Operation Cordilheira of Mato Grosso's Specialized Environmental Police Station (Photo: Civil Police and Sema-MT).



Eleven properties belonging to Claudecy Oliveira Lemes are being investigated for chemical deforestation in the Pantanal region of Mato Grosso state (Photo: Civil Police and Sema-MT).



During the investigation, several containers of chemical products and pesticides were found, confirming the cause for the defoliation of trees in the areas of the properties investigated (Photo: Civil Police and Sema-MT).



Area in the Pantanal affected by chemical deforestation investigated by Operation Cordilheira of Mato Grosso's Specialized Environmental Police Station

(Drone images by Civil Police and Sema-MT <https://www.youtube.com/watch?v=ThJqSTAzTvM>)



Area in the Pantanal affected by chemical deforestation investigated by Operation Cordilheira of Mato Grosso's Specialized Environmental Police Station

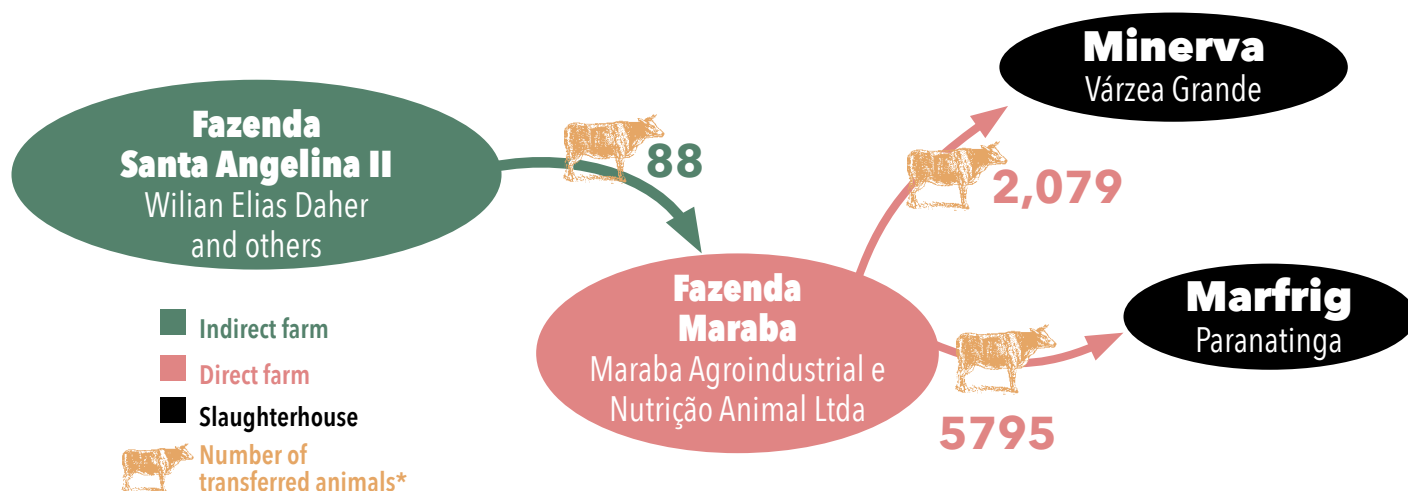
(Drone images by Civil Police and Sema-MT <https://www.youtube.com/watch?v=ThJqSTAzTvM>)

Property: Fazenda Santa Angelina II Cerrado biomeCáceres, MT • **Coordinates property:** -15.9782, -57.1768 • **Area property (ha):** 4,063**CAR:** MT-5102504-6275807181544765B67A1AB83C6305AF (Validated) and MT-5102504-4E062852AEE54C9DA9724A08E690043C (Under analysis), both declared by Willian Elias Daher and others (same person in the Sigef/Snci/Sncr databases) • **SIGEF/SNCI:** 9020120916002**Ownership and other linked properties****Ownership:** Willian Elias Daher and others • **Company group:** Gd Empreendimentos (real estate company registered in São Paulo - SP). • **Linked properties:** Bordering with one other property in Cáceres - MT: Fazenda Santa Angelina I**Cleared area****553 hectares • 26,538 tons of CO2****Clearance Coordinates:** -16.88955, -55.56832 • **Clearance period:** November 2023 to March 2024 (ongoing)**Inside Forest Code's protected areas:** Yes, 43 Ha Legal Reserve**Type of vegetation:** Wooded savanna • **Priority for biodiversity conservation:** Very high**Remaining native vegetation :** 2,533 ha**Indigenous territories (overlapping or bordering):** -**Environmental fines and embargoes****Embargoes:**Yes
BRL 254,708
(US\$ 49,237)

Five environmental fines in December 2003 on the property fazenda Santa Angelina I in Cáceres (MT). Of the five fines mentioned, one was issued for the illegal clearing of 960 hectares of Cerrado vegetation, one was issued for the unlicensed burning of 200 hectares of farm waste, one was issued for the unauthorized clearing of 100 hectares for the exploitation of wood chips, one was issued for the unauthorized extraction and storage of wood chips, and one was issued for the unauthorized construction of a dam on an unnamed stream.

Environmental fines: Yes**Supply chain links****Direct or indirect supplier to:****Minerva Paranatinga (SIF 2500) and Marfrig Várzea Grande (SIF 2015)⁹****Supplying meat to:****Carrefour, Grupo Mateus, Casino/GPA, Sendas/Assaí**

⁹ At the time of the transfers we identified, Minerva was operating the Várzea Grande unit (now operated by Marfrig, SIF 2015) and Marfrig was operating the Paranatinga unit (now operated by Minerva, SIF 2500).

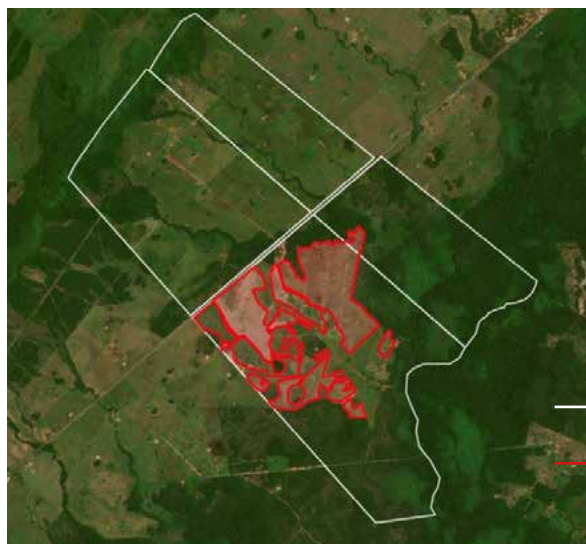


* Year of animals' transfer: 2018, 2019, or 2018 + 2019



March 2023

Source: Imagery ©2023 Planet Labs Inc.



March 2024

Source: Imagery ©2024 Planet Labs Inc.

Property: **Fazenda Querência** Pantanal biome

Aquidauana, MS • **Coordinates property:** -19.3778, -55.4243 • **Area property (ha):** 27,439

CAR: MS-5001102-C3597CFF49CB48788FE56F79A206D241 • **SIGEF/SNCI:** 9070220023720

Ownership and other linked properties

Ownership: Mauro Correa Lima • **Company group:** Santa Rosa Participações Societarias Ltda (non-financial holding company) registered in Campo Grande - MS • **Linked properties:** Two properties in Aquidauana (MS) totaling 6,205 hectares: Fazenda Caldeirão (2,818 ha) and fazenda Futuro (3,387 ha).

Cleared area

558 hectares • 27,837 tons of CO2 • - 10 fire alerts

Clearance Coordinates: -19.39677, -55.40151 • **Clearance period:** August 2023 to February 2024

Inside Forest Code's protected areas: No

Type of vegetation: Wooded savanna • **Priority for biodiversity conservation:** Very high

Remaining native vegetation : 15,783 ha

Indigenous territories (overlapping or bordering): -

Environmental fines and embargoes

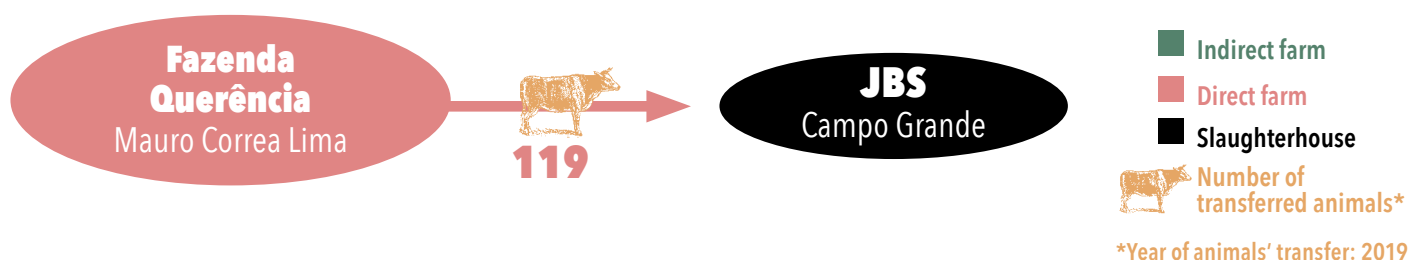
Embargoes: Yes One embargoed area totaling 102.6 hectares at Fazenda Querência for illegal deforestation issued by IBAMA in January 2024¹⁰

Environmental fines: Yes BRL 515,000,00 (US\$ 99,553) Illegal deforestation of 102.6 hectares at Fazenda Querência¹¹

Supply chain links

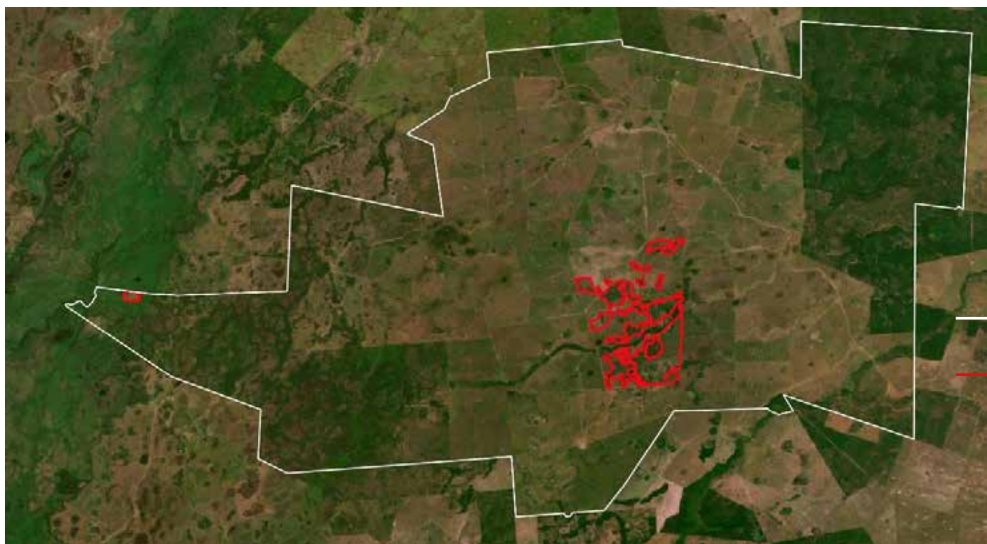
Direct or indirect supplier to: JBS Campo Grande (SIF 1662)

Supplying meat to: Carrefour, Casino/GPA, Grupo Mateus, Sendas/Assaí



¹⁰ Dados abertos Ibama, see: https://dadosabertos.ibama.gov.br/dados/SIFISC/termo_embargo/termo_embargo/termo_embargo.html

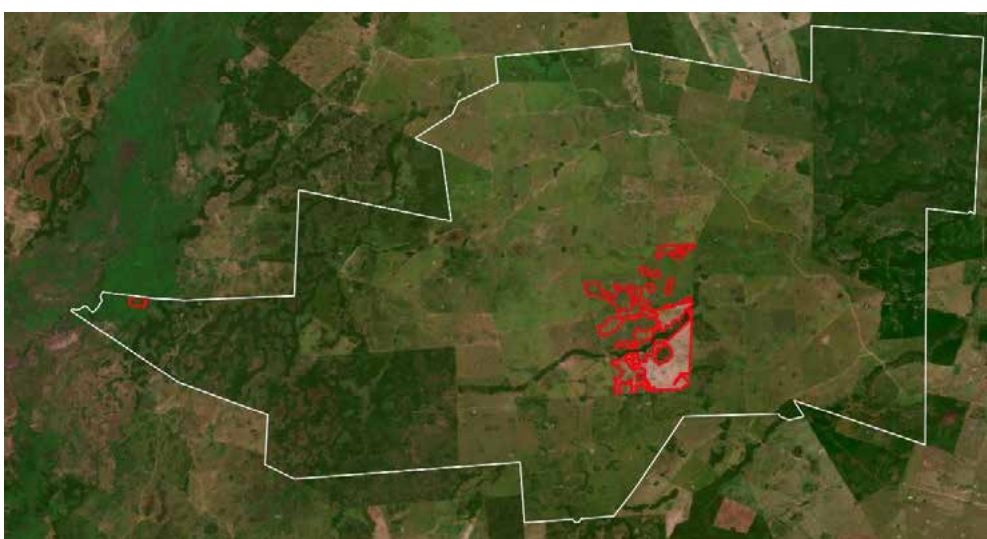
¹¹ Servicos Ibama, Consulta de Autuações Ambientais e Embargos, see: <https://servicos.ibama.gov.br/ctf/publico/areasembargadas/ConsultaPublicaAreasEmbargadas.php> (CPF: 008.319.211-53)



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August 2023

Source: Imagery ©2023 Planet Labs Inc.



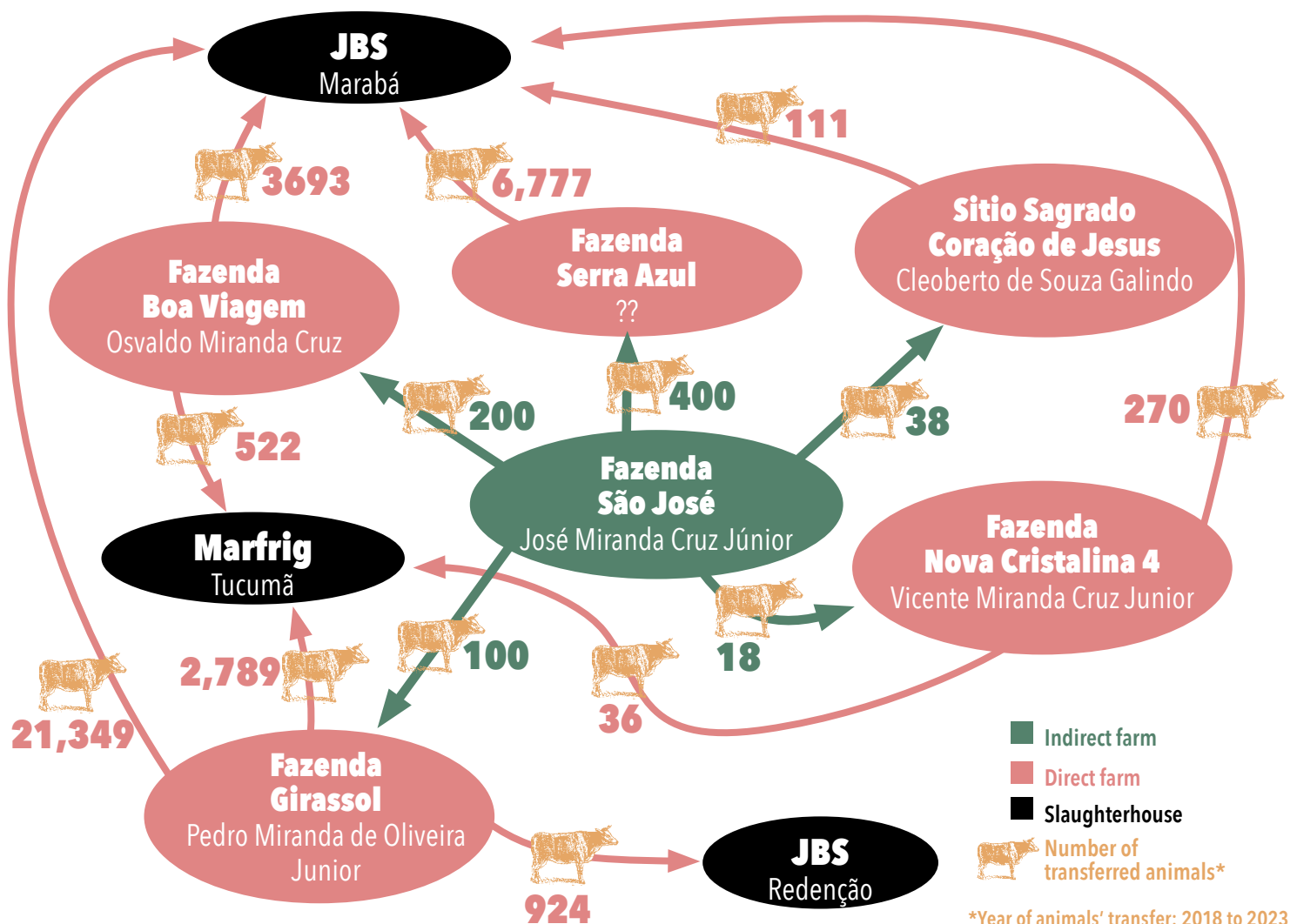
March 2024

Source: Imagery ©2023 Planet Labs Inc.



March 2024

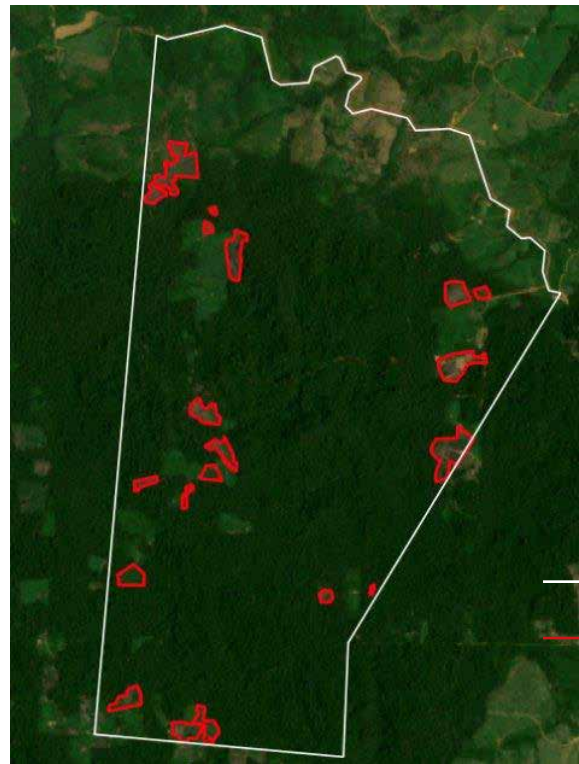
Source: Imagery ©2024 Planet Labs Inc.

Property: **São José¹²** Amazon biomeMarabá, PA • **Coordinates property:** -5.7824, -50.1718 • **Area property (ha):** 1,630**CAR:** PA-1504208-3FF26438B04E413E9313A126534D8FAD (pending), CAR declared by José Miranda Cruz Júnior (same person in Sigef/Snci/Sncr databases) • **SIGEF/SNCI:** 0000196793569**Ownership and other linked properties****Ownership:** José Miranda Cruz Junior • **Company group:** Jose Miranda Cruz Junior - Miranda Textil Ltda (wholesale fabric trade company) registered in Goiânia - GO. • **Linked properties:** No linked properties found**Cleared area****56 hectares • 31,969 tons of CO2****Clearance Coordinates:** -5.774700, -50.185777 • **Clearance period:** October 2023 to January 2024**Inside Forest Code's protected areas:** Yes, 54 Ha Legal Reserve**Type of vegetation:** Dense-canopy rainforest, submontanex • **Priority for biodiversity conservation:** Extremely high**Remaining native vegetation :** 1,260 ha**Indigenous territories (overlapping or bordering):** -**Environmental fines and embargoes****Embargoes:** No**Environmental fines:** No**Supply chain links****Direct or indirect supplier to:** JBS Redenção (SIF 807), JBS Marabá (SIF 457)**Supplying meat to:** Carrefour, Grupo Mateus, Sendas/Assaí¹² "Vara agrária realiza inspeção em fazendas ocupadas na região," *Dol Carajas*, August 12, 2023



June 2023

Source: Imagery ©2023 Planet Labs Inc.



February 2024

Source: Imagery ©2024 Planet Labs Inc.

Case ID 3.5. Fazenda Lote 68 Setor 07 Gleba Corumbiara – Vilhena, Rondônia

Property: Fazenda Lote 68 Setor 07 Gleba Corumbiara Amazon biome

Vilhena, RO • **Coordinates property:** -12.2896, -60.5351 • **Area property (ha):** 2,036

CAR: RO-1100304-68350D8719FE4E6E84F23B2B21C6DB50 • **SIGEF/SNCI:** 9500172614910

Ownership and other linked properties

Ownership: Janet Clenir Sartori Vieira • **Company group:** No linked company identified • **Linked properties:** No linked properties found

Cleared area

59 hectares • 26,387 tons of CO2

Clearance Coordinates: -12.30836,-60.53569 • **Clearance period:** August 2023 to February 2024

Inside Forest Code's protected areas: No

Type of vegetation: Contact between savanna and seasonal forest

Priority for biodiversity conservation: Extremely high

Remaining native vegetation : 1,702 ha

Indigenous territories (overlapping or bordering): -

Environmental fines and embargoes

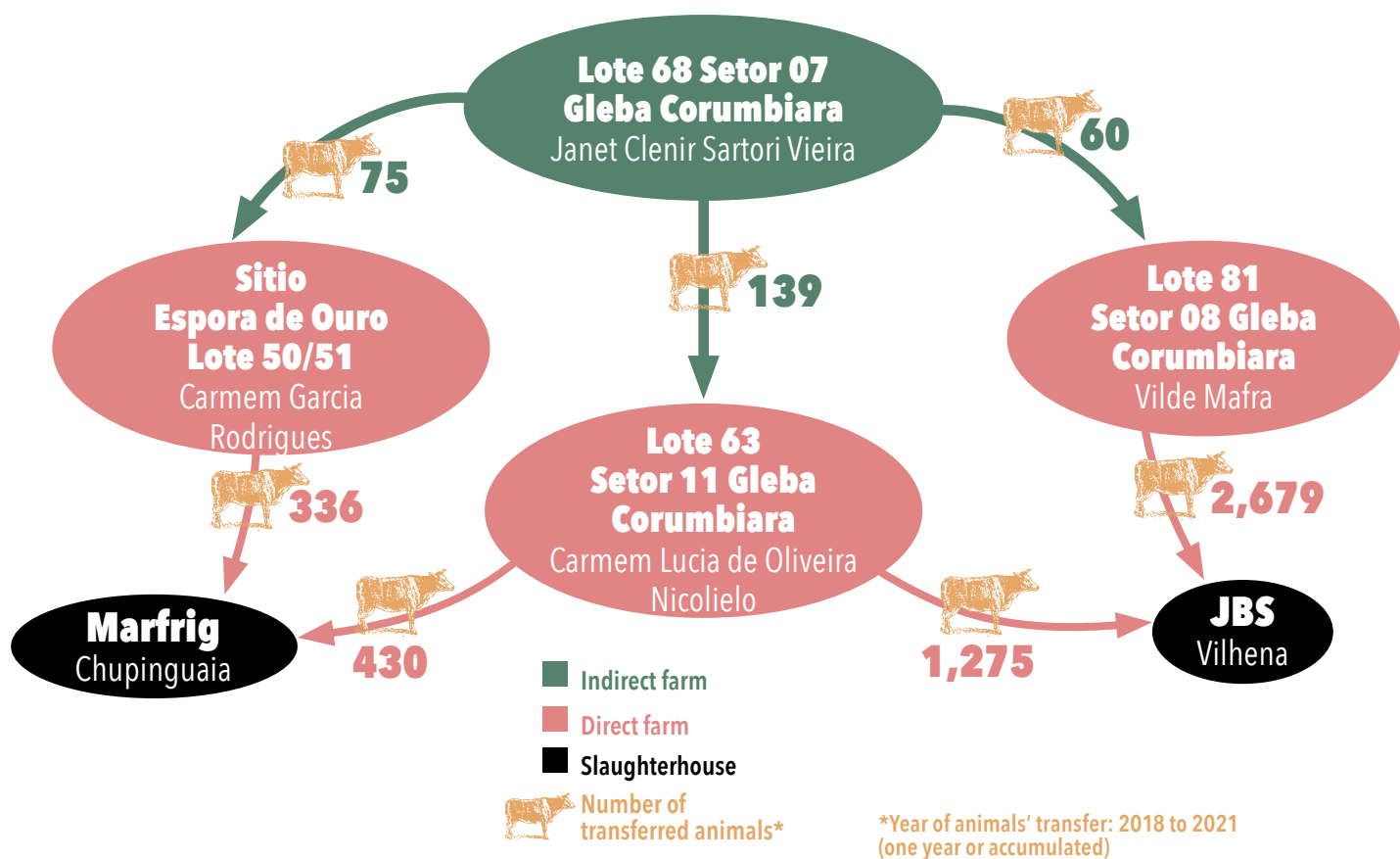
Embargoes: No

Environmental fines: No

Supply chain links

Direct or indirect supplier to: JBS Vilhena (SIF 4333), Marfrig Chupinguaia (SIF 3250)

Supplying meat to: Carrefour, Casino/GPA, Grupo Mateus, Sendas/Assaí



June 2023

Source: Imagery ©2023 Planet Labs Inc.



March 2024

Source: Imagery ©2024 Planet Labs Inc.

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RIGHT OF REPLY REGARDING THE CASE STUDIES

Below are excerpts from the responses from the retailers and meatpackers contacted by Mighty Earth in response to our questions about their links and business relationship to the five case studies above. Full company responses are [available here](#).

Retailers

Carrefour said on May 7, 2024:

"After careful study, we can confirm that none of the five farms mentioned is supplier of the Carrefour Brazil group."¹³

Carrefour said on June 10, 2024:

"Regarding the cases mentioned in your email dated 2nd of May: We confirm that at the date of the grievance, among the 5 cases you submitted to us, 2 were already blocked by Carrefour and 3 were not part of Carrefour farm database. We are unable to provide you detailed information for each case, as this would be a breach of Brazilian regulation. Regarding slaughterhouses' compliance to beef on track and TAC: Carrefour considers TAC as a fundamental step in the compliance process of slaughterhouses. Having a TAC agreement is a mandatory requirement for slaughterhouses supplying Carrefour. This is one of the reasons why Carrefour excluded 12 suppliers from its suppliers in the last 2 years. Regarding TAC audit, it is important to note that TAC audits are conducted 2 years late in the fiscal year (2024 auditing 2022). It therefore gives a photo of the past. We request our suppliers to be audited but we use other tools to further check their compliance, especially geomonitoring. Big Charque Indústria e Comércio Ltda (SIF 4144) does not supply Carrefour."

Casino/GPA said:

Casino said on May 15, 2024:

"In response, please consider that, as you know, proceedings on this matter are currently pending before the Paris Civil Court. (...) Therefore, our Group intends to reserve its responses for the judicial institution, in order to ensure the smooth continuation of the ongoing legal proceedings. In addition, please note that GPA no longer falls within the scope of the French 'Law on duty of vigilance' for Casino, given the recent sale of shares."

GPA said on May 17, 2024:

"With respect to the five CARs questioned by Mighty Earth, we confirm that all of them are fully blocked in our system, as per our Social and Environmental Beef Purchasing Policy."

GPA said on June 13, 2024:

"Reinforcing the previous response, all our meatpackers must fully comply with the Social and Environmental Beef Purchasing Policy and the criteria and guidelines outlined therein

¹³ Original in French : "Après étude, nous vous confirmons qu'aucune des 5 fermes citées ne fait partie des approvisionnements du groupe Carrefour Brésil".

to remain as GPA suppliers. To assess the adherence and accuracy of the monitoring process conducted by the meatpackers, GPA reanalyzes all purchasing batches through the geomonitoring system using the Rural Environmental Registry (CAR) number. Without access to this information, along with other complementary data (city, state, biome, etc.), it is not possible to verify if the farms are in our database and ensure appropriate action when necessary.

Regardless of the location of the slaughterhouses, according to the Social and Environmental Purchasing Policy, we require all of them to have their own geomonitoring system that allows for the assessment of socio-environmental risks based on the farm's location and the cross-referencing of public data for all purchased cattle batches, covering the entirety of the meatpackers production.

For further information, please refer to our Policy (<https://www.gpabr.com/wp-content/uploads/2024/04/GPA-Social-and-environmental-beef-purchasing-policy.pdf>) and Annual Report (https://www.gpabr.com/wp-content/uploads/2024/06/Annual_and_Sustainability_Report_GPA_2023.pdf)

Grupo Mateus: The company did not reply to questions from Mighty Earth.

Sendas/Assaí said on May 16, 2024

"In relation to the farms questioned, we do not have historical commercial relationships with most of them and, when we did, the supplies were in compliance with the legislation and guidelines assumed above. Currently, all farms are blocked from supplying Assaí."

Sendas/Assaí said on June 14, 2024:

"Assaí clarifies that it does not identify any commercialization with FRISACRE (SIF 3297). Our Company adopts strict practices and guidelines to encourage the monitoring of the cattle supply chain, actively interacting with suppliers to ensure that they are responsible for monitoring the entire product chain, including indirect, independent location (Biome) and risk linked to supplies. We are committed to working with the industry so that they evolve with their roles and responsibility for monitoring their supply chain. In relation to the mentioned properties, for a deeper investigation, it would be essential for us to receive the CARs linked to the properties."

Meatpackers

JBS said on May 15, 2024:

"The cases mentioned refer to situations of deforestation alerts that have not yet been consolidated in the Prodes database and also do not appear in the MapBiomass alert system (with information from DETER), both of which are used by JBS for monitoring. Regarding the properties, São José is not registered as a supplier to JBS. The purchases made from the other three properties, as shown by the data that was shared with JBS, were made before potential socio-environmental irregularities were identified."

Marfrig said on May 16, 2024:

"Fazenda Santa Angelina II is not registered in the Marfrig database. Fazenda São José is not registered in the Marfrig database. (...) Considering that the INPE-PRODES Legal Amazon database was last updated in November 2023, there are no deforestation areas with deforestation by PRODES polygons on the Fazenda Soberana. However, the farm is currently blocked to supply Marfrig due to a SEMA-MT (Official Environment Agency in

Mato Grosso State) embargo, which is also one of the criteria contained in the Monitoring Protocol for Cattle Suppliers in the Amazon (Beef on Track Protocol).

The Fazenda Lote 68 Setor 07 Gleba Corumbiara has Prodes 2012 and 2014 polygons and it is blocked from supply to Marfrig because it does not meet the company's socio-environmental criteria. Because this, there is no purchase history from this farm to supply Marfrig. The last purchases of animals from the Fazenda Soberana occurred in 2018 and 2019.

There is no history of slaughter at the Fazenda Lote 68 Sector 07 Gleba Corumbiara, as it is blocked from supplying Marfrig as it does not meet the company's socio-environmental criteria. We would also like to emphasize that in all the purchases of animals for slaughter at Marfrig, the Fazenda Soberana were adhering to the commitments in force on the slaughter dates."

Marfrig said on June 13, 2024:

"The 4 new farms mentioned as direct suppliers (Fazendas Maraba; Boa Viagem; Girassol; and Nova Cristalina) are registered in the Marfrig database, and at some moment supplied animals to Marfrig.

Regarding the indirect suppliers of those 4 farms, based on VISIPEC platform consultation Fazenda Santa Angelina and Fazenda São José were not connected as indirect suppliers. It would be important if Mighty Earth shares the data with Marfrig, so that Marfrig could provide a more detailed assessment of the properties mentioned.

It is worth to mention that the Beef on Track protocol was launched in July 2020, and with that the productivity index has been started. If the productivity criterion of the Beef on Track protocol was applied, all of the farms would be below the maximum limit allowed (up to 3 heads/hectare).

Marfrig has discontinued its operations at Paranatinga and Tucumã facilities in 2019 and 2020 respectively.

Regarding the allegation of deforestation potentially related to the Chupinguaia unit in Rondônia, Marfrig did not have access to the database that led to this estimate. If Mighty Earth wants to share the database used, we can analyze and detail the situation of each CAR involved, as we have always done."

Minerva Foods said on May 13, 2024:

"With regard to the ranches mentioned, Soberana Farm, Barão do Melgaço (MT) - Pantanal Biome and Santa Angelina II Farm, Cáceres (MT) - Cerrado Biome, according to the information provided, there are no records of any of the properties in the Company's database."

Minerva said on June 13, 2024:

"Regarding Luciana and Marabá Farms, a careful search was carried out in the Minerva Foods registration database, using the name of the property, CAR presented and CPF/CNPJ of the owners, to carry out an investigation of the sales made. After the analysis, it was found that the properties met the cattle purchasing criteria adopted by the Company at the time of sales. We emphasize that consultations on the socio-environmental conditions of properties are carried out with each new commercialization, based on historical data and socio-environmental compliance analyses.

We highlight that monitoring indirect suppliers is the biggest challenge facing the entire sector. It demands significant investment in research and technology, effective public policies overseen by the relevant government agencies, as well as the participation of the entire value chain to ensure full traceability of cattle. As already informed in the position sent to Mighty Earth on June 13th."

METHODOLOGY:

From retailers' stores to the direct and indirect cattle suppliers

Cattle ranching is the main driver of deforestation in Brazil, and about 76% of beef production is consumed domestically.¹⁴ This report provides an analysis of Brazil's domestic cattle supply chain by linking deforestation, degradation and fires that occurred in the Amazon, Pantanal and Cerrado biomes to beef products found in the stores of four major retailers operating in Brazil: Carrefour, Casino/GPA, Grupo Mateus and Sendas/Assaí.¹⁵

The starting point of our analysis is data collected from beef products sampled in supermarket aisles. This data is gathered using the dPaP (which means "From Pasture to Plate", dPaP) mobile phone application.¹⁶ This app was developed by Trase, the Stockholm Environment Institute and UCLouvain. Using the dPaP app, a consumer can scan and register information about meat products in retail stores in Brazil. The dPaP data includes the type of product and the registration numbers of the meatpackers such as the Federal inspection of Slaughterhouses (*Serviço de Inspeção Federal*, SIF), the State Inspection of Slaughterhouses (*Serviço de Inspeção Estadual*, SIE) or the Brazilian National Registry of Legal Entities (*Cadastro Nacional da Pessoa Jurídica*, CNPJ) numbers. These registration numbers make it possible to identify the meatpacker and locate the slaughterhouse where the meat product was processed.

We considered dPaP data collected by consumers and a network of volunteers (so-called citizen scientists) and commissioned researchers (paid data collectors) in stores operated by the leading retailers in Brazil, which, according to the Brazilian supermarket association ABRAS, are, in that order, Carrefour, Sendas/Assaí, Grupo Mateus and Casino/GPA.¹⁷

First, the dPaP data made it possible to establish links between beef products found in the retailer's stores and their slaughterhouses of origin. A sample of potential direct and indirect cattle suppliers was identified for the listed slaughterhouses operated by Brazil's leading meatpackers, JBS, Marfrig, and Minerva, which were the focus of our study.

The link between the slaughterhouses and a sample of their direct and indirect cattle suppliers was then established through a sample of records of animal transportation data, the Animal Transportation Documentation (*Guia de Trânsito Animal*, GTA), a mandatory document for the transfer of cattle between farms and slaughterhouses in Brazil. The sample of GTA data used in this report covers suppliers to slaughterhouses operated by JBS, Marfrig, and Minerva, and is available in seven Brazilian states: Goiás, Minas Gerais, Mato Grosso, Mato Grosso do Sul, Pará, Rondônia and Tocantins. This information on links is a partial information that shows the state of commercial relationships at a given time between farms, and between farms and slaughterhouses. Mighty Earth calls for full disclosure of the commercial relationships between slaughterhouses and direct and indirect cattle suppliers, in order to facilitate transparency and thus the fight against deforestation.

Finally, we overlapped PRODES and MapBiomas Alerta deforestation data from August 2009 to December 2023 in the Amazon, Pantanal and Cerrado biomes on properties

¹⁴ Spers EE, Carvalho Burnier P and Lucchese-Cheung T (2021) *Beef Consumption Pattern in Brazil*, in *Meat and Nutrition*, edited by Chhabhi Lal Ranabhat, 2021

¹⁵ For this report, deforestation is defined as the clearing of native vegetation in the Amazon and Cerrado biomes, including forests, grasslands, and other types of vegetation.

¹⁶ See: <https://www.dopastooprato.com.br/>

¹⁷ (2023) *Ranking Abras 2023, SuperHiper*, nº 558, May 2023, ABRAS: São Paulo, Brazil

identified as direct and indirect cattle suppliers to the listed slaughterhouses. This final step allowed us to identify potential links between deforestation on cattle ranches and slaughterhouses and thus, to the beef products found in the retailers' stores in Brazil.

This report also highlights five case studies of deforestation in Brazil's most threatened biomes. These case studies cover cattle ranches that directly and/or indirectly supplied slaughterhouses from which the identified retailers' stores in Brazil sourced the beef products. They provide before-and-after satellite imagery to illustrate real-time deforestation in the Brazilian cattle supply chain, as well as data on compliance with Brazilian environmental regulations and other information on the farms supply chain links.

APPENDIX 1 - METHODS

Monitoring deforestation in Brazilian cattle supply chains



Step 1. In-store beef products scanning using the dPaP app

Consumers, volunteers and commissioned data collectors used the dPaP app to scan and record information about beef products found during a three-month period in the retail stores of the four leading retail groups in Brazil - Carrefour, Casino/GPA, Sendas/Assaí and Grupo Mateus -, located in five Brazilian regions that were previously defined according to their population and presence of the retailers. In most cases, photos were taken. The data is transmitted to the dPaP database. The municipalities are as follows: Manaus, state of Amazonas, Belém and Ananindeua, state of Pará, in the Northern region; Teresina, state of Piauí, Timon, state of Maranhão and Fortaleza and Caucaia, state of Ceará, in the Northeast region; Curitiba, state of Paraná and Porto Alegre, state of Rio Grande do Sul, in the Southern region; São Paulo, state of São Paulo and Rio de Janeiro, state of Rio de Janeiro, in the Southeast region; Cuiabá and Várzea Grande, state of Mato Grosso, Goiânia, state of Goiás and Brasília, Federal District, in the Center-West region.

Using the dPaP app data collectors registered the supermarket locations, and the slaughterhouse registration numbers on the beef products - such as the SIF, the SIE or the CNPJ codes, among others. With the "research version", data collectors also recorded the beef's production data. Whenever possible, pictures of the identified products were taken. The aim was to identify the full range of origins of the different fresh, frozen and processed beef products. This data was added to the dPaP regular database and was processed and analysed using the same methods and criteria.

The dPaP app links the sanitary codes (SIF, SIE or other) or the tax code (CNPJ) associated with a slaughterhouse to the specific establishment the user is located. Leveraging the user's location data, the app generates a list of nearby retail stores, allowing the user to select the one they are currently in. Following this selection, the application securely stores information about the slaughterhouses that supply products to the selected store in its database.

Step 2. Share of dPaP data

dPaP data contains a sample of the identified beef products found in the retailers' stores with the following information:

DATETIME
PLATFORM
REF_NUMBER
REGISTERED
REQUEST_INCLUSION
STATE_TYPE_OF_REF
SUPERMARKET
TYPE_OF_MEET
TYPE_OF_REF
UNI_ID
Cnpj
SIF Code
APP_VERSION
LOCATION_OF_SUPERMARKET
PONTUACAO_SUSTENTABILIDADE
SUPERMARKET_NAME
TYPES_OF_PLACE
LAT
LON
BUSINESS_STATUS
FORMATTED_ADDRESS
STORE_LAT
STORE_LNG
NAME
RATING
TYPES
USER_RATINGS_TOTAL
MUNICIPALITY
STATE
WEBSITE
PRICE_LEVEL
REGIAO
SUPERMERCADO_GRUPO
CARNE_TIPO
PRODUTO
SOURCE
HOLDER

SIF Code: The entries without a SIF code are removed, since without this information, it is impossible to locate the slaughterhouses from where the product originates. In some entries, the SIF code is filled in as the reference number ("REF_NUMBER"), so all entries with a reference number and/or a SIF code are retained.

Type of meat (CARNE_TIPO): all the entries linked to poultry and pork products are removed ("CARNE_TIPO"). All the products linked to beef products are retained.

All the retained entries have a linked "DATETIME", "REF_NUMBER", "CNPJ", "SIF Code", "FORMATTED_ADDRESS", "NAME", "MUNICIPALITY", "STATE", "CARNE_TIPO" and "HOLDER".



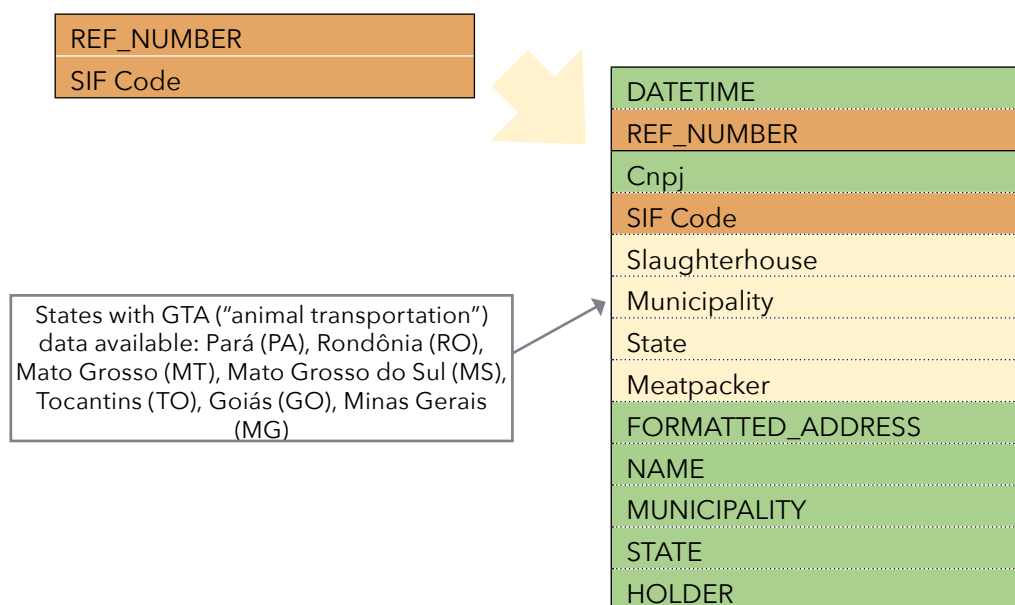
DATETIME
REF_NUMBER
Cnpj
SIF Code
FORMATTED_ADDRESS
NAME
MUNICIPALITY
STATE
CARNE TIPO
HOLDER

Step 3. Identification of slaughterhouses using SIF Codes

From the list of SIF codes, the slaughterhouse of origin is identified using as a reference the official registration data from the Inspection Federal Services ([Sistema de Inspeção Federal - SIF](#)) linked to the Brazilian Ministry of Agriculture SIF database, it is possible to identify the operators of the slaughterhouses, as well as their location (municipality, state).

Considering the list of the identified slaughterhouses, their location, and their operators, we selected only those operated by **JBS**, **Marfrig**, and **Minerva** in seven states (Pará, Rondônia, Mato Grosso, Mato Grosso do Sul, Tocantins, Goiás, Minas Gerais).

The selection of meatpackers and states is shaped by the availability of data on animal transportation retrieved through the GTAs. *Only entries linked to slaughterhouses operated by one of the three meatpackers in one of the seven states are retained in this step.*



Step 4. Identification of the properties that directly or indirectly supply cattle to the selected slaughterhouses

Identifying these suppliers is possible through overlapping a sample of GTA data covering suppliers in seven Brazilian states with the official land tenure registration system SIGEF and SNCI.

The available GTA data is only a sample because the number of GTA records we have access to does not cover the entire Brazilian territory and does not include all GTA records. Our sample includes data for only seven states and the period 2017-2022. It does not cover the entire meatpackers' supply chain. We cannot estimate what exact proportion the sample represents. JBS states that it has 73,000 direct cattle suppliers in Brazil without mentioning the number of indirect suppliers,¹⁸ Minerva reports more than 6,000 suppliers across Brazil¹⁹, Marfrig reports 15,000 direct suppliers registered in the Amazon biome,²⁰ and estimates to have a potential total of 25,000 indirect suppliers in the Amazon biome

18 JBS (2023) *People and Planet: The JBS Commitment to Eliminating Agriculture-Related Deforestation*, JBS: São Paulo, Brazil

19 Minerva (2020) *Sustainability Report*, Minerva: São Paulo, Brazil

20 Marfrig (2020) *Landscape Protection Plan of Marfrig*, Marfrig: São Paulo, Brazil

alone.²¹ Because the data released by the meatpackers is not accurate (it may be outdated, some only cover direct suppliers, some only cover the Amazon biome, etc.), it is difficult to calculate the proportional coverage of the direct and indirect suppliers we found compared to the total meatpackers’ suppliers. Furthermore, our sample only included the 36 slaughterhouses linked to the beef products found in the visited stores.

The most recent and available GTA data was used to join the SIGEF and SNCI records. The states included are: Mato Grosso, Mato Grosso do Sul, Goiás, Minas Gerais, Rondônia, Pará and Tocantins. Only the direct (first tier) and indirect (second tier) suppliers to the targeted slaughterhouses were extracted from the GTA sample.

Once a supply relationship has been established (regardless of the year in which it was identified), we consider that farm to be a direct or indirect supplier. We update this database annually using the most recent GTA and CAR data.

Step 5. Overlay official deforestation data from PRODES data with properties identified as direct and indirect suppliers to the targeted slaughterhouses

Once the supply chain link between the farm and the slaughterhouse has been established, regardless of the year the cattle were transferred, the database recognizes it as a supplier and deforestation data can be overlaid across years. The analysis considered two time periods for calculating the deforestation: between 2009 and 2020, and between 2021 and 2023. The first period, while including both legal and illegal deforestation, takes into account the deforestation cut-off date of the Brazilian Forest Code, which does not allow illegal deforestation after July 2008. The second period considers the cut-off date of the European Union Deforestation Regulation (EUDR), December 31, 2020. We use MapBiomass Alerta data to cover the period between August 2023 and December 2023, which is not covered by the most recent PRODES data. An intersection between the deforestation data and the supplier data was performed to consider only deforestation that occurred within the property boundaries.

Timeline		Source	Details
August 2008	July 2021	PRODES 2009 - 2021	Identified deforestation indicates deforestation (legal and illegal) that occurred between August 2008 and July 2021 in a sample of direct and indirect suppliers. The Brazilian Forest Code does not allow illegal deforestation after July 2008.
August 2021	July 2023	PRODES 2022-2023	Identified deforestation indicates non-compliance with the EUDR (as of December 31, 2020) in a sample of direct and indirect suppliers. <i>This figure is underestimated since it does not cover the period between January and July 2021.</i>
August 2023	December 2023	MapBiomass Alerta	

Since PRODES data cannot be disaggregated by month, deforestation that occurred after December 2020, and that is not EUDR-compliant, is underestimated because the calculations do not include the period between January and July 2021. The identified properties may directly supply one slaughterhouse and indirectly supply another, or even supply more than one slaughterhouse; therefore, the simple totals may include one supplier more than once. To avoid double counting, a “total without overlap” is calculated by removing repetitive deforestation data of properties that directly and indirectly supply more than one slaughterhouse.

21 Marfrig (2020) *Landscape Protection Plan of Marfrig*, Marfrig: São Paulo, Brazil

Step 6. Quantitative and qualitative case study research

The case studies are selected to illustrate the links between recent deforestation on properties that supply slaughterhouses and are the origin of beef products sampled in retail stores. Recent deforestation data from DETER deforestation alerts from October 2023 to February 2024 overlapped with properties that directly and indirectly supply the selected slaughterhouses. Once the case study is selected, satellite imagery visually confirms the deforestation alert and the actual deforestation is calculated using high-resolution Planet GIS.

The criteria used to select case studies are based on information, such as the amount of recent deforestation, amount of remaining native vegetation, proximity to Indigenous territories, the illegality of the deforestation, and a variety of direct and indirect suppliers to the targeted slaughterhouses. Each case study includes quantitative and qualitative data on the farm and ownership, supply chain links to the targeted slaughterhouses, and before-and-after imagery to show evidence of the reported deforestation.

Step 7: Right of reply for the concerned companies

Meatpackers that have had commercial relationships with the selected farms identified by GTAs since 2018 receive a letter from Mighty Earth inviting them to provide a right of reply on the cases identified. Retailers who have sold beef products originating from the affected slaughterhouses also receive a right of reply before the report is released. Responses are published in the same report and as an attachment.

Acknowledgements:

The Rapid Response – Cattle Report is published by Mighty Earth, in partnership with AidEnvironment, using data collected through the Do Pasto ao Prato Initiative, and with additional research from Repórter Brasil. Mighty Earth thanks the designer, the copy editor and the volunteer researchers who worked on collecting data on beef products in several Brazilian supermarkets through the Do Pasto ao Prato app.



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September 2024

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