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Articles

Provisioning the slave ships: Charque and mortality in the South Atlantic slave trade, 1758-1815

El aprovisionamiento de los navíos negreros: tasajo y mortalidad en el comercio de esclavizados del Atlántico Sur, 1758-1815

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Abstract. During the transition from the 18th to the 19th century the slave trade from Africa to the Americas surged, driven by the economic momentum of the Industrial Revolution. A crucial factor of this process was the survival of the enslaved during the Middle Passage. This article investigates the meanings and outcomes of the consumption of *charque* (salted meat) on Luso-Brazilian slave ships, particularly those departing from Rio de Janeiro, during the late 18th and early 19th centuries, in order to assess its relevance within a broader framework. It draws on quantitative data from the Codices of Ship Entries of Rio de Janeiro, qualitative descriptions of the Middle Passage found in speeches from the Royal Academy of Sciences of Lisbon, and visual analysis of archaeological artifact reproductions. Therefore, it advances the studies of the materiality of the slave trade by combining quantitative and qualitative data, situating the article at the intersection of Economic History and Cultural History. On one hand, substituting salted fish with salted meat lowered transport costs and reduced mortality among the enslaved due to its physical characteristics and price. On the other hand, beef held symbolic value in the traditions of Central-West Africa,

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the predominant embarkation region at the time. Through this lens, this study argues that the exploitation of the culinary work performed by enslaved women was both an important factor in the maintenance of the slave trade by reducing mortality rates on ships, and a symbolic battleground, given the metaphysical value that beef held among Central-West African peoples.

Key words: transatlantic slave trade; women's history; food history; jerked beef.

Resumen. Durante la transición del siglo XVIII al XIX, el tráfico de esclavizados africanos hacia las Américas experimentó un fuerte incremento, impulsado por el dinamismo económico de la Revolución Industrial. Un factor crucial en este proceso fue la supervivencia de los esclavizados durante la Travesía. Este artículo examina los significados y consecuencias del consumo de carne salada en los barcos esclavistas luso-brasileños, particularmente aquellos que partían de Río de Janeiro a fines del siglo XVIII y comienzos del XIX, con el fin de evaluar su relevancia en la dinámica general del comercio transatlántico de esclavizados. Se utilizan datos cuantitativos provenientes de los Códices de Entradas de Barcos de Río de Janeiro, descripciones cualitativas de la Travesía contenidas en discursos de la Real Academia de Ciencias de Lisboa, y análisis visuales de reproducciones de artefactos arqueológicos. El análisis contribuye a los estudios sobre la materialidad del comercio de esclavizados combinando fuentes cuantitativas y cualitativas, situando el artículo en la intersección de la Historia Económica y la Historia Cultural. Por un lado, la sustitución del pescado salado por carne salada redujo los costos de transporte y disminuyó la mortalidad de los esclavizados debido a sus características físicas y su precio. Por otro lado, la carne de res tenía un valor simbólico en las tradiciones de África Centro-Occidental, la región predominante de embarque en ese período. Desde esta perspectiva, se sostiene que la explotación del trabajo culinario realizado por las mujeres esclavizadas fue tanto un factor clave para mantener el comercio transatlántico al disminuir la mortalidad a bordo, como un espacio de disputa simbólica, dado el significado metafísico de la carne de res en las culturas de África Centro-Occidental.

Palabras clave: tráfico trasatlántico de esclavos; historia de las mujeres; historia de la alimentación; tasajo.

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Introduction

Atlantic slavery was a network of multiscalar violence. The capture, the separation from the communities, the loss of children, the theft of vital energy from African polities, the whips, the chains, the anti-hygienic conditions, the fear –literal and metaphorical– of being devoured, the fear of starvation, the spiritual disrespect. The kinds of coercion –physical, symbolic, psychic– to which the Mbundo, Imbangala, and Ngangela people were subjected were so numerous that trying to name them all would perhaps be only another form of epistemic imperialism. Therefore, historiographical practice demands specific frameworks.

The first is the ship itself. One focus of this article will be on the provisioning of the slave voyages from the second half of the 18th century to the first two decades of the 19th century, which will be understood as a colonial effort to construct –via military, economic, and ecological power– a space that could function as a monad of the capitalist ecology (Ferdinand, 2022). A fragment, relatively autonomous, at least during the Middle Passage, where the metabolism between human and non-human nature was realized toward capital accumulation, through the expropriation of labor and nature, both converted into *cheap labour* and *cheap nature* (Moore, 2022). The second focus is the specific metabolism of preparation and consumption of salted meat. In the second half of the 18th century, Rio de Janeiro became one of the major Atlantic slave *entrepôts* in the world and the most prominent intra-colonial slave port of the Center-South of Portuguese America (Marques, 2023; Santos, 2020). Two factors were central in this process: first, the purchasing of salted meat from the South frontier of America at low prices, produced by enslaved people, and second the exploitation without compensation of the culinary labor of enslaved women aboard the slave ships (Vargas, 2013, pp. 65-70). *Charque* –as jerked beef was called in Portuguese America– was the product of the exploitation of enslaved people in the Southern Luso-Brazilian frontier, while its cooking was the synthesis of enslaved women's exploitation aboard the ships. Together, they were part of the material conditions for the acceleration of the slave trade in the Age of Atlantic Revolutions.

This double lens is aimed at surpassing a double selective silencing. On one hand, attributing a central place to food and nourishment in the slave trade avoids a unilateral approach to the study of the plantation complex. After all, if the *salto mortale* of the plantation economy occurred during the export of its produce, which was consumed by free individuals in the core of the capitalist world economy, it is also true that slave traffickers and proprietors made a sustained effort into keeping the enslaved people alive during the Middle Passage. The survival of the enslaved individuals was the primary condition for the realization of the capital invested on the voyages, which connected slave ports, plantation zones, and the hinterlands of the Americas. If inside the plantations time was driven out of life-making activities, in the slave ships that kind of work was central (Paton et al., 2023, p. 743). Thus, it is necessary to observe the making of the ancillary commodity chains without which the slave trade would be impossible, as well as the labor exploited in their consumption. This way, we can enhance our understanding of the entanglement between peripheral landscapes of the world economy, where such items were produced, and the plantation complex, avoiding the mirage of economic autonomy, as such regions were actually deeply connected to the broader Atlantic world (Alencastro, 2000; Carney & Rosomoff, 2009 p. 65; Mariutti et al., 2001).

On the other hand, highlighting enslaved individuals' nutrition brings women and life-making labor to the center of the narrative. If the historiography of slavery's capitalism successfully demonstrates the connections between economic practices and transformations in Europe –such as modern finances, industrialization, and massified consumption–, and the renewed slavery in the New World in the nineteenth century –known as Second Slavery– it is still true that gendered experiences are underexplored (Paton et al., 2023, pp. 587-588). A closer look at the different dimensions of economic life, especially consumption, reveals the centrality of labor that could sustain life. The history of commodities, enslaved food, and *charque*, more specifically, demonstrates that women's labor was not only part of the history of capitalism but a major factor. It was not by chance that around 40% of all enslaved people trafficked through the Atlantic were women, who were responsible for the culinary work aboard slave ships (Carney & Rosomoff, 2009, p. 72; Paton et al., 2023, p. 610).

Hence, it is necessary to examine how the economic integration of various regions occurred through the concrete labor of individuals who crossed the sea (Hicks, 2025, pp. 14-17, 179-180). This is a fruitful way to conceive the "Atlantic as a historical space" (Tomich, 2004). As such, it becomes viable to avoid "methodological nationalism" and comprehend how labor practices at sea made distinct geographical realities flow together into a dialectical unity formed in the different moments of historical capitalism. In this regard, shifting the focus away from agroexportation does not mean ignoring the making of an Atlantic market but understanding it as both a producer and a product of practices that did not only produce commodities but also consumed them (Rodrigues, 2023, p. 82). As a result, temporalizing the role of gender in culinary work counterposes the violence of capital's abstraction, which tried to converted humans and non-humans into the common metric of exchange value.

In order to address these questions, the following text is divided into two sections, in addition to this introduction and the conclusion. In the first section, I will examine the slave ships which pierced the South Atlantic from the end of the eighteenth century to the beginning of the nineteenth century, focusing on their material culture and culinary practices related to the consumption of *charque*, as a means to better understand its cultural and material determinants. I will analyze qualitative descriptions of the Middle Passage found in speeches from the Royal Academy of Sciences of Lisbon and visual records of archaeological artifact reproductions. In the second section, I will shed light on the context at the end of the 18th century and the reconfiguration of the transatlantic slave trade that occurred under the pressures of industrializing Europe, seeking to understand the effects of *charque* consumption on the mortality of enslaved individuals during the Atlantic crossing. To do so, I will mobilize quantitative data from the *Codices of Ship Entries of Rio de Janeiro*. The conclusion is that the exploitation of women's labor shaped the conditions for the consumption of *charque* aboard Luso-Brazilian slave ships, and integrated these culinary practices with the cycles of systemic capital accumulation, reducing mortality in the slave trade, and thereby facilitating the expansion of commodity frontiers in the Americas.

Fire in the Tumbeiros

The specter of hunger was ever-present during maritime crossings in the Early Modern period. In Naval voyages or merchant fleets, both free and enslaved individuals had to be sustained to prevent deaths. Failures in provisioning resulted not only in death for the passengers and punishments for the captains but also in enormous financial losses for the capitalists who invested on these voyages. The significant risks involved made the human trafficking business –which was the material foundation of the social reproduction of transatlantic colonial empires and the broader capitalist world-economy– a highly volatile and speculative venture (Florentino, 1997, pp. 125-128, 140-145). Even a single supply crisis or an outbreak of a nutrition-related disease could wipe out the fortunes of slave traders.

During the eighteenth and nineteenth centuries, in Lisbon, the *Armazém da Repartição dos Mantimentos da Marinha* (Navy Provisions Department Warehouse) and the *Armazéns Reais de Guiné e Índia* (Royal Warehouses of Guinea and India) were responsible for provisioning fleets departing from the city. Lisbon was an important entrepôt with a longstanding tradition dating back to the early stages of the invasion and colonization of the Americas (Rodrigues, 2023, pp. 82, 84-87). However, South Atlantic slave voyages were marked by the contradiction of the commodity form itself: between the overcrowding of ships and the effort to load the smallest possible amount of

provisions –in both quantity and value– transporters eagerly sought to reduce maintenance costs and increase profit margins. They were pressured by the financiers of the trade, who paid fixed rates to feed the captives, incentivizing the reduction of investments in food. It was not uncommon for transporters to simply reduce the amount of food supplied to the enslaved individuals.

The governor of Pernambuco, Luís Diogo Lobo da Silva, wrote to the *Secretaria de Estado e Ultramar* (Secretariat of State and Overseas Affairs) in 1758, stating that for the journey from Pernambuco to Angola, 42.5 *arrobas* of food should be allocated per 100 enslaved individuals for the 29 to 30-day voyage. He argued that this quantity "yields more and sustains better than double the amount of fresh food." However, slave traders often provided only 12.5 *arrobas* and supplemented the journey with salted fish.[1] In the Luso-African city of São Paulo de Luanda, in present-day Angola, the *terreiro público* (the public grain market) was established in 1764 to supply slave traders. Nevertheless, abolitionist critiques of the time continued to highlight poor provisioning as a key cause of mortality during the Middle Passage (Miller, 1988, pp. 351-353, 424-428).

Within this context, Luiz Antônio de Oliveira Mendes, a lawyer at the *Casa da Suplicação* (Court of Appeal) born and deceased in Bahia, submitted a paper to the Royal Academy of Sciences of Lisbon in 1793. His *Memória* (Memoir) discussed the transatlantic slave trade, its material conditions, and the exploitation involved in its operations. Addressing the issue of food, he emphasized the shift from fish to beef in provisioning for the Angola slave trade between 1760 and 1770, initiated by Raimundo Jamalá, administrator of the *Companhia de Comércio de Pernambuco e Parahyba* (Company of Commerce of Pernambuco and Parahyba) in Angola.

> For variety, they are often given savelha, which, being a small and cheap fish – much cheaper than sardines here – also causes harm to their health due to its unwholesomeness [. . .]. He [Jamalá] incurred greater expenses to purchase fresh, larger fish, said to be akin to our corvina here. He observed that this measure completely prevented the occurrence of hemorrhages. [. . .]. For the sake of economy, he also arranged for the same company to procure salted, dried meat from Pernambuco, called sertão meat, which is boneless and costs between 6 and 8 hundred réis per arroba. . . (Mendes, 1812, p. 25, translated).

The consumption of *savelha* posed a contradiction: it was inexpensive but seemed to cause hemorrhages. This fish was likely *Ethmalosa fimbriata*, identified by Sarah Wallis Bowdich Lee and Thomas Edward Bowdich in 1825.[2] *E. fimbriata* is a small fish, typically 25 cm but reaching up to 46 cm, with a compact, silvery body. It inhabits both fresh and saltwater along the West African coast, from Mauritania to Angola (Charles-Dominique, 1982, pp. 373-374; Charles-Dominique, Albaret, 2003, pp. 27-29). Its presence in Luanda, where the climate favors its reproduction, is therefore unsurprising (Abowei, 2009). Portuguese military Elias Alexandre da Silva Corrêa, in is *História de Angola*, written from 1787 to 1799, described the fish as the "ordinary sustenance of almost all of Angola" and noted its affordability among the "cheapest types of dried, sun-cured fish" (Corrêa, 1937, p. 134, translated).

[1] Arquivo Histórico Ultramarino, Conselho Ultramarino, Avulsos de Pernambuco, Cx. 87, d. 7128. Recife, 11 de novembro de 1758, translated. All the following translations are my own.

[2] *FishBase*, https://www.fishbase.se/Summary/SpeciesSummary.php?id=1594&lang=portuguese

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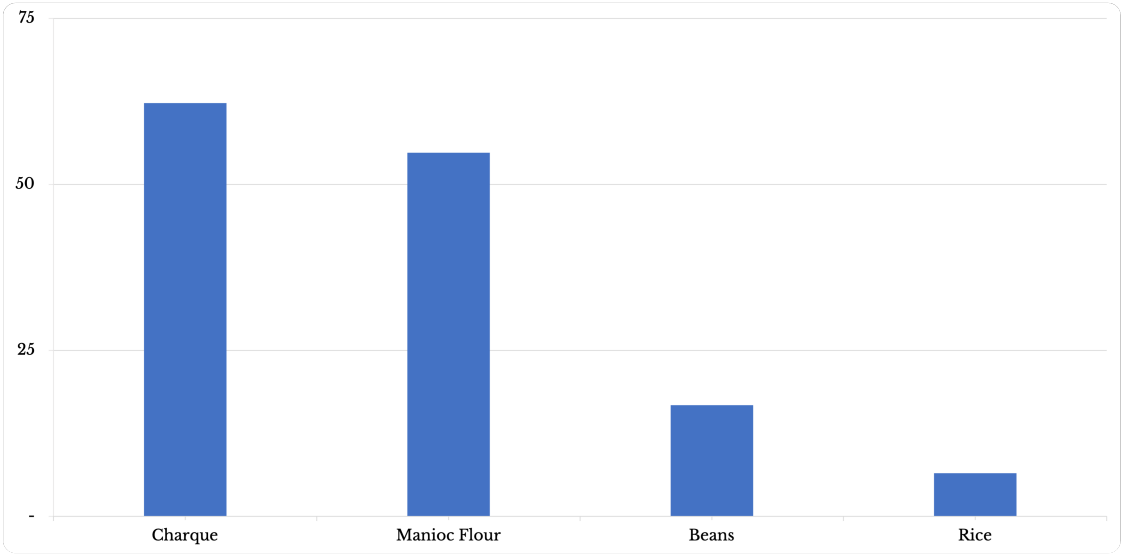
Despite being "very cheap," *savelha* was described as a "fish resembling a large sardine with many bones" by the French cleric Rafael Bluteau and the Brazilian lexicographer Antônio de Morais Silva (Silva & Bluteau, 1789, translated). According to Bluteau's dictionary, the fish had numerous needle-like bones, which likely contributed to the internal bleedings. Its rapid perishability and tendency to become rancid due to its high fat content, especially when improperly stored after drying, further complicated its consumption (Ojimelukwe et al. 2017, pp. 111-112). *Charque* (dried salted beef) emerged as a potential solution. On one hand, it was less hazardous than *savelha*, while also being relatively inexpensive, thus sparing slave traders from higher transportation costs associated with larger, fresh fish like *corvina* (Vargas, 2013, pp. 65-70). My estimate is that *charque* offered the cheapest calories aboard slave ships, as evidenced by the declared prices from the owners of the ship *Andorinha*. It was followed by cassava flour and, at a significant cost difference, beans and rice (see Graph 1).[3]

Graph 1. Kilocalories per real (galera Andorinha, 1812)



Source: Elaborated by the author. ANRJ. Real Junta do Comércio, Agricultura, Fábricas e Navegação. "Depoimento do vassalo português Simão da Rocha Loureiro, comandante da galera Andorinha, apresada por navio britânico e implicada no tráfico de escravos da África para o Brasil por trazer 270 cativos a bordo. Rio de Janeiro, 6 de outubro de 1812" (Real Junta do Comércio, Agricultura, Fábricas e Navegação., cx. 372, pct. 3).

The organization of ships during the transatlantic slave trade was heavily influenced by the spatial arrangements required for food preparation. Enslaved individuals were separated by gender and age –women and children were housed in the upper cabins, while men were confined to the lower decks. This spatial division was directly linked to the social division of labor on board. The food preparation area, located on the upper deck, was deliberately kept separate from the men in

[3] I utilized the measurements described by the governor of the Captaincy of Pernambuco in 1758. I converted them to the International System of Units using the equivalences presented by Lara (2000), calculated the densities, and finally converted them to grams of protein per liter, according to the *Tabela Brasileira de Composição de Alimentos-TACO*, prepared by NEPA-Universidade Estadual de Campinas. (2011). See Lara (2000); NEPA-Universidade Estadual de Campinas (2011); AHU, Pernambuco, Cx. 87, D. 7128, fls. 25 and 28.

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the hold to prevent them from accessing tools and utensils, which could potentially be used in an uprising (Carney & Rosomoff, 2009, p. 73; Miller, 1988, p. 412). This arrangement was depicted by Portuguese contemporaries as offering women and children relatively better conditions for survival, as they benefited from "free and open air," which Mendes described as making them "the best portion of the enslaved population" (Mendes, 1812, p. 31).

However, this placement served as a means of controlling women's bodies. Beyond placing them away from men, the proximity of women to the deck enabled their labor to be more easily supervised and facilitated their exposure to sexual violence. Such separation produced spatialized work. Carney (2009 & Rosomoff, p. 73), analyzing visual records of slave voyages, noted that enslaved women were often depicted performing tasks such as grain husking in open areas of ships in the late eighteenth century. This practice likely extended to other activities, such as preparing meat. Therefore, rather than prioritizing their well-being, the placement of women on the upper deck functioned primarily as the establishment of a controlled workspace.

In Portuguese ships, cooking was predominantly done in metal *caldeiras* (cauldrons), typically made of copper. Despite being banned in decrees from 1808 and 1813,[4] which favored iron cauldrons for their efficiency, copper cauldrons remained widely used in the slave trade. In 1810, Antonio de Saldanha da Gama, Count of Porto Santo and a member of the Finance Council in Rio de Janeiro, wrote to Dom Francisco de Almeida de Melo e Castro about refining regulations for the slave trade following the 1808 decree (Viotti, 2016, pp. 1776-1779). While he advocated for measures to ensure traders' profits –such as lifting restrictions on carrying other goods alongside enslaved individuals– he supported the prohibition of copper cauldrons.[5] He argued iron cauldrons required less wood to heat compared to copper ones, thus proving more economical. According to Bluteau (1728, p. 54, translated), a cauldron was described as a "large vessel made out of copper or other metal used for heating or cooking something, or in which dyers prepare dyes." The specific mention of copper before "other metal" suggests its prevalence and importance in colonial material culture related to food preparation in the 18th century. Despite the legislation, copper cauldrons continued to be used, underscoring the persistence of culinary traditions within the enslaving economy. For example, a "Copper Cauldron" was listed among the equipment of the slave ship *Andorinha*, captured by the British in 1812 for participating in the transatlantic slave trade.[6]

Although detailed accounts of work around cooking cauldrons on ships are scarce, some parallels with sugar mills cauldrons can be drawn. The use of cauldrons in sugar mills, often described as infernal by observers like Father Antônio Vieira in 1633 and the Jesuit André João Antonil in 1711, suggests harsh and dangerous working conditions. Antonil likened the sugar-mill furnace houses to Vesuvius, Purgatory, and Hell, calling them a "prison of perpetual fire and smoke" (Schwartz, 1988, pp. 131-132; Souza, 2023, pp. 17-20, translated). On ships, cauldrons presented significant risks, as boiling contents and steam could easily cause burns, particularly in the unstable environment created by ocean waves (Miller, 1988, p. 413).

The surviving structure of a copper culinary cauldron from the English ship *Henrietta Marie* –discovered by archaeologists in waters between Florida and Cuba– reinforces the dangers of spills during shipboard cooking. Dating to approximately 1697-1700, the cauldron hung from a chain

[4] For the 1808 act, see, Rio de Janeiro, cx. 244, docs. 48, 49. AHU. For the 1813 act, see https://www2.camara.leg.br/legin/fed/alvara/anterioresa1824/alvara-39697-24-novembro-1813-570258-publicacaooriginal-93372-pe.html

[5] Rio de Janeiro, cx. 248, doc. 23. AHU.

[6] Junta do Comércio, cx. 372, pacote 3. ANRJ.

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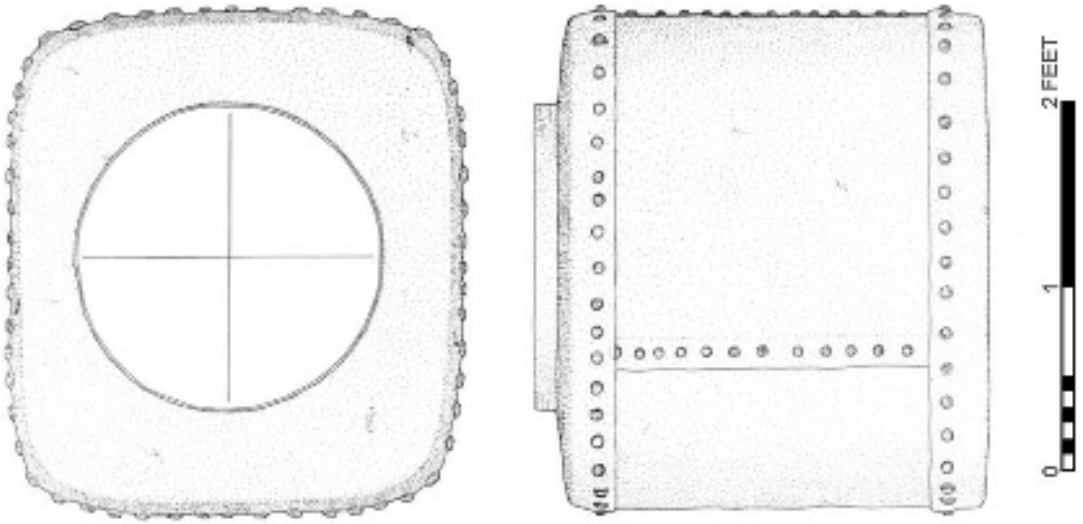
above its heat source. Its design, featuring a narrow mouth compared to the broader circumference of its body, likely aimed to minimize spills (Moore & Malcom, 2008, pp. 34-36). This contrasts with the wide openings of sugar mill cauldrons, which had obtuse angles. The difference in design reflects their distinct contexts of use: one optimized for the challenges of cooking at sea, the other for stationary land-based operations (see Figure 1).

Figure 1. Reproduction of Henrietta Marie's cauldron, 1723



Source: "Cooking cauldron from the slave ship Henrietta Marie", *Slavery images: A visual record of the African slave trade and slave life in the early African diaspora*, accessed November 26, 2023, https://www.slaveryimages.org/database/image-result.php?objectid=791

Therefore, if the cauldrons on land composed an infernal setting –a strong characterization when used by colonizers who perceived the world through a Catholic repertoire– the ship's kitchen can be conceived as a specific infernal circle, with its own particular torments. However, to unilaterally point out the violence and the attempt to control women's bodies is, in a way, to reproduce the limitations of the archives, which were constructed to preserve the memories of nations built upon the material gains of the human trafficking trade. The temporality of the unwritten, as part of the historical possibilities which are almost impossible to recount, is powerful in presenting relationships with multiple meanings, unrepresented in colonial texts (Hartman, 2020, pp. 27-28). Thus, the question that arises is: what were the sociocultural meanings of culinary practices that can help deepen our understanding on the shared experiences during the journey?

By the late eighteenth century, the slave trade ventures departing from Rio de Janeiro began to focus on capturing people from Central-Western Africa. Most captives brought their cultural repertoires from Luanda, Benguela, its hinterlands and interiors (Cândido, 2013, pp. 144-147; Florentino et al., 2004, pp. 93-98; Silva, 2013, pp. 113-118;). The text *Noticia da Cidade de*

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S. Filippe de Benguella, e dos Costumes dos Gentios Habitantes Daquele Sertão –written by the retired Portuguese colonel Paulo Martins Pinheiro de Lacerda in 1797– contains important information regarding the role of cattle in the landscape of that portion of Africa. Describing the relationship of the region's peoples with cattle, he noted that its meat held a special significance, relevant to "gentilic funerals," and that it was not consumed daily, only during rituals (Lacerda, 1845, p. 487, translated).

In summary, cattle meat seemed to create a link between the living and the dead through its consumption in "funeral" rituals that produced "memory." This assertion is reinforced by anthropological research conducted in the southern region of Angola, where, through oral traditions, Salokoski identified that meat played a sacrificial role in rituals, as it would guarantee the opening of channels to the spiritual world. Indeed, its function gave cattle a ritual value equivalent to that of human beings, making the animal the most valuable sacrifice to offer to an ancestral spirit, which often occurred in death rituals (Salokoski, 2006, pp. 73; 157-158). In this sense, the presence of women and children around the ship cauldrons, cooking beef, can perhaps be thought as a link between those departing and their lineages (Slenes, 2011, pp. 151-157).

In the communities of southern Central-Western Africa, fire also held a sacred character, as its ever-burning flame kept the past alive in the present. "If cattle served as a link to the supernatural realm, this was also the case for fire in that region" (Salokoski, 2006, p. 160). Historian Robert Slenes (2011, pp. 246-256), studying the family relationships of enslaved people in southeastern Brazil in the nineteenth century through their demographics, reached the conclusion that most of African-born among were embarked from West-Central Africa. Given the traditions of the Mbundo-speaking people, who inhabited the region, he argued that the fire present in their houses had the cultural meaning of perpetuating their lineage.

In this sense, the cooking flames may have held a deep meaning of connection with their lineage for enslaved women from the Central-Western African hinterland. Thus, despite the apparent paradox –fire as an element of resistance and symbolic sharing and the ship's kitchen as a space of danger– it seems possible to outline a contradictory unity in the scene of the *tumbeiros* (slave ships). The hell of smoke, fire, abuse, and separation was confronted through the possibility of reinterpreting the meaning of death, loss, and mourning via the ritual symbols of flame and meat.

The act of cooking might also have redefined an overly salted food like *charque*. After all, salt, in the colonial period, was part of the baptism of Christians, despite being scarcely used in West Central Africa. Its excessive consumption was even considered a form of spiritual aggression for the peoples of the region. Therefore, it is possible to think of the culinary reordering performed by the women as giving a new meaning to this food, which, on the one hand, was close to the ritual universe of the captors through salting, but, on the other hand, could be inserted into the enslaved people's cosmology through appropriate rituals (Franco & Campos, 2004, pp. 26-27; Slenes, 2011, pp. 197-199, Smallwood, 2007, 139-142). It is no surprise that captives preferred it "seasoned in their country's style," a method taught by "*ladinas*" to "*boçais*", in the words of Mendes (1812, pp. 54-55, translated). This semantic separation between *ladinas* and *boçais* in the lawyer's description indicates a diversity of interactions among Africans, Luso-Brazilians, and Luso-Africans. Women with greater cultural insertion into the colonial universe (*ladinas*) could share their experiences and present narratives and descriptions about the landscapes of the Americas to their recently arrived fellows in captivity (*boçais*).

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Therefore, enslaved culinary labor overlapped with the unpaid labor of instruction, whether in culinary arts, the invader's language, or Luso-Brazilian habits. Around the fire, women who spoke both Portuguese and Mbundo languages might have provided their captive companions with some information about the sugar fields, cattle pastures, port markets, *quilombos*, sugar mills, and coffee plantations. In conclusion, a fragile and fleeting network of solidarity around the fire during the journey might have been woven by these women, who reproduced life by preparing food for nourishment and reproduced culture by transmitting and reinventing the funeral and food traditions they inherited. In the midst of hell, perhaps their strength could give rise to solidarity.

Death at the sea

Following the intensification of production rhythms, given the industrial demand for vegetable fibers and stimulants, at the end of the 18th century, Atlantic slave zones were being reorganized towards the production of commodities to supply the expanding capitalist market (Carrara et al., 2023). In terms of capital-labor, this meant a renewed and intense demand in the human trafficking business for the cultivation areas in the Americas. From the market logic perspective, a sharp increase in the price of enslaved people stimulated slave traders to ship more and more people to satisfy the plantations and the productive circuits developing within their orbit. The issue was that supply, pressured by the resistance of African peoples and the growing abolitionist sentiment that was emerging in the public debate, did not precisely meet the demand, a divergence that raised prices more rapidly than the quantity of people disembarked (Eltis & Richardson, 2003, pp. 19-21; Miller, 1986, pp. 43, 51-53; Pintaude, 2024, pp. 59-64).

The Luso-Brazilian traffickers responded to the price trends with a cruel strategy: they embarked younger and more health-debilitated people, which resulted in an increased frequency of epidemics aboard the ships. This movement ended up overvaluing the recovery of the enslaved, putting more pressure on the work of the women on board, whose hands transformed animal carcasses into food (Miller, 1986, p. 62). Interestingly, among the English, French, and later U.S. traders, the losses of lives in transit showed downward trends.[7] The most common explanations focus on the immunological gains from prolonged forced contact caused by colonization, punctual improvements in infrastructure in some African kingdoms, the introduction of new types of ships, such as the Brigantine, naval technologies for capturing rainwater, and the copper sheathing of ship hulls (Haines & Shlomowitz, 2000, pp. 262-263). However, some specific factors, at least in the case of the English, the main competitors of the Luso-Brazilian traders in quantitative terms, must be considered.

First of all is the expertise in the trade with African authorities. Commerce with as African political leadership required knowledge of ritualistic trading practices. The *sobas* and other authorities in Africa, when possible, gave business dealings the cosmological time of their spiritual experiences, whether out of conviction or because that way they could impose –within the limits of negotiation– barriers to Europeans wishing to enter their territories. A relative understanding of African rituals and demands could guarantee a shorter time in transit on the coast, which, in general, would reduce mortality rates. A shorter stay was particularly relevant for the British after 1790, both in terms of their specialization in trade (as the British flag was behind much of the

[7] "The Trans-Atlantic Slave Trade Database" https://www.slavevoyages.org.

negotiations) and regarding the number of people embarked. Also, as British merchants began to embark fewer people, time spent on the coast decreased, which, in turn, led to a drop in the mortality rate (Haines & Shlomowitz, 2000, pp. 264; Thornton, 2004, pp. 99-103).

However, it wasn't just the time until departure that increased mortality. Injuries, diseases, and malnutrition caused by the capture and forced march in Africa could be important causes of death aboard the ships. The results of those conditions could appear weeks or months later. Additionally, the waiting time in the barracks, fortresses, and ships produced its own suffering, such as physical punishments, sleep deprivation, lack of food, sexual abuse, etc. In reality, the travel time to the coast often lasted longer than the Atlantic crossing (Klein & Engerman, 1997, p. 38). Food along the route was also a field of disputes: one of the strategies of the enslaved people was to refuse to eat in order to provoke their own death and avoid being turned into merchandise. The lack of appetite could also be caused by the apathy brought on by malnutrition (Miller, 1988, p. 426; Smallwood, 2007, 47-49).

Variations in capture conflicts were yet another variable of mortality. The forms of war, with firearms, spears, and daggers, or even stealthy captures, had different impacts on the health of these people. Furthermore, the scarcity of food in Africa, correlated with the disruption of production chains due to conflicts with the slave traders, could be an important factor causing the enslaved to arrive at the coast already in a weakened state (Cândido, 2013, pp. 76-78; Klein et al., 2001, p. 95; Manning, 1990, pp. 56-59). Moreover. these conditions did not affect only the enslaved individuals. The crews of the slave ships also died more frequently than those of ships used in other mercantile trades. The diseases aboard, although affecting the crew less intensely than the enslaved people, certainly put their lives at risk, especially when considering those of lower status aboard, who received smaller quantities and lower quality food than officers did (Klein et al., 2001, p. 105; Rodrigues, 2023, pp. 92-93). Even so, the percentage of mortality in transit among English slave traders also decreased throughout the 18th century, from 20% between 1711 and 1770 to 14% between 1771 and 1793 (Behrendt, 1997, p. 52).

A first milestone to highlight is the Dolben Act of 1788, which required the presence of surgeons on British ships, a practice that had already been relatively common before the regulation. The formalization, however, introduced bonuses for captains and doctors who arrived with records of low mortality: they would be paid monetary prizes for voyages with mortality rates lower than 3%. Now, it is not difficult to conclude that part of the data presented was an attempt by the traffickers to falsify the counts in order to obtain financial gains. Therefore, the effectiveness of these measures is, unsurprisingly, debatable (Klein et al., 2001, p. 104). Still, considering the slave traders' interest in the commercial success of their ventures, it was also profitable to keep the enslaved individuals alive.

Thus, the application of health restoration techniques to the trafficking of enslaved people can be explained. If organizational novelties and new healing practices were applied under the intense care of doctors and surgeons, it is possible and necessary to read them in terms of the realization of value (Klein & Engerman, 1997, p. 44). It is under this perspective that, in the second half of the 18th century, the supposed efficacy of the men practicing healing arts, progressively transformed into medical sciences, was synchronous with the accumulation of slave capital. After all, knowledge of how to keep humans alive in adverse situations had already been tested in England, in prisons and hospitals (Haines & Shlomowitz, 2000, p. 280).

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The procedures introduced by these authorities, with the approval of the captains, were relevant causes of reduced mortality. They were not theoretical abstractions, but very practical knowledge: isolation and supervision of the sick, proper rationing of food and fresh water, daily cleaning, drying, construction of spaces for the evacuation of excrement, physical exercise, use of incense, and better ventilation (Haines & Shlomowitz, 2000, p. 272). Such activities became routine and were directly related to survival. The argument is reinforced by the empirical demonstration of Behrendt, who found a negative correlation between mortality and the presence of surgeons aboard British ships between 1790 and 1797. Finally, it is important to remember that the instructions of the medical authorities were not only written but also read. The authors cited also sought to demonstrate, through references and citations, that the writings of the period circulated and perpetuated a certain notion of hygiene, linked to the order of medical discourse, shared later by Victorian reformers (Haines & Shlomowitz, 2000, pp. 275-277).

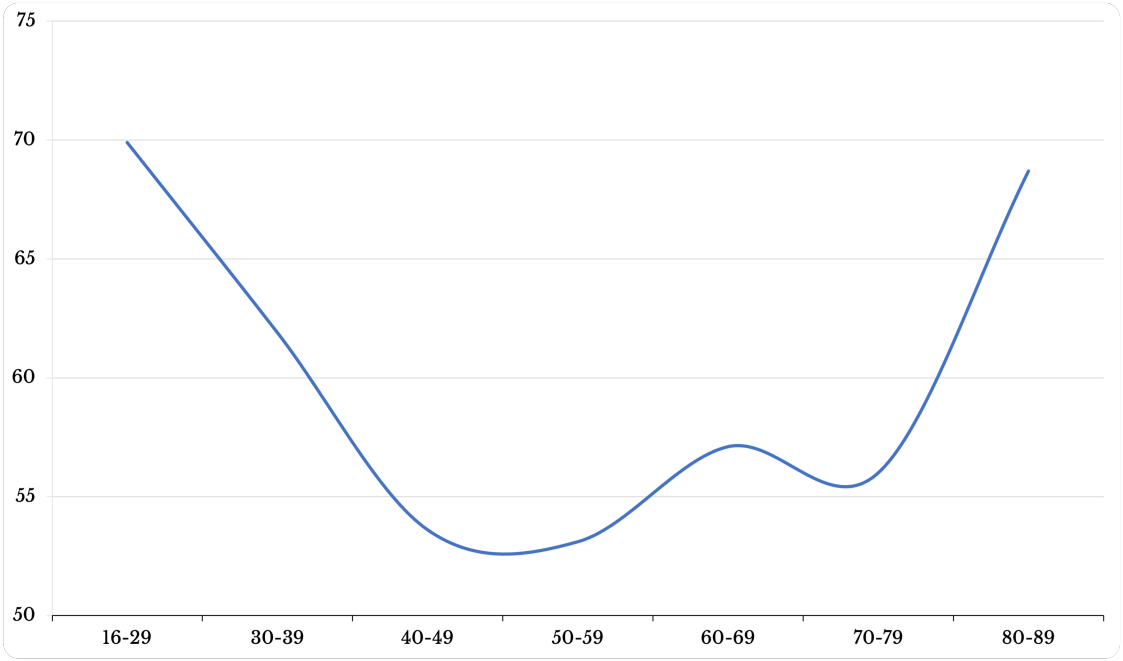
The relevance of sanitary techniques is reinforced by the consensus that the duration of the voyages was not a factor that directly increased mortality rates. In short, the frequency of death decreased over the course of the voyage, so that the mortality rate was lower on longer voyages, but not because the slave traders treated the enslaved with less violence, but because they intentionally tried to keep them alive, and a longer crossing time allowed for more time for feeding and care, usually better than in the barracks. This point holds for both the enslaved and the crew's mortality; that is, the decrease in travel time is not a sufficient factor to explain the reduction in either case, since other variables, such as the ports of departure, are more relevant, and the statistical evidence does not support the correlation between high mortality rates and long voyages, except for particularly extensive voyages (Behrendt, 1997, p. 52; Klein et al., 2001, pp. 95, 100; Klein & Engerman, 1997, p. 43).

Analyzing Graph 2, the U-shaped format is easily discernible for the range between 16 and 89 days, a common travel time between Brazil and Angola, which reinforces the argument that "Constraints on the amount of food and water that could be carried on board meant that particularly long voyages could create significant problems" (Klein et al., 2001, p. 100). In this sense, the periods of departure were particularly critical, and as time passed, the frequency of deaths decreased until it reached its minimum, between 50 and 59 days, and from then on began to rise again. That is, on the one hand, the slave traders were probably better prepared for medium-length voyages, in which they would have time to enforce recovery techniques on the enslaved. On the other hand, extremely long voyages were dangerous, as they challenged the greedy calculation of supplies allocation (Miller, 1981, pp. 398-399).

The decrease in the frequency of deaths as the journey progressed points to the centrality of life-sustaining work aboard the slave ships. The fact that mortality began to rise only after many weeks had passed was interpreted by Miller as an indication that delays were lethal on the voyage, as once food and water resources were exhausted, death would take over the ships (Miller, 1981, p. 388). Even though deaths from dehydration and malnutrition did not make up the majority of death records –unlike deaths from diseases– some considerations need to be made. It does not seem reasonable to disconnect death from illness from the issue of supply, as it was sometimes done, because the ability to resist disease is directly linked to the quality of the food routine on board.

Furthermore, in explicitly claiming that the enslaved people died from lack of food shipmasters could risk tarnishing their reputation. After all, it would imply poor preparation for the voyages, which could affect future investments from coastal traffickers in expeditions run by masters and

Graph 2. Mean death rates of slaves per month by length of voyage (rates per 1 000), 1676-1850



Source: Elaborated by the author based on Klein et al. (2001, pp. 93-118, and Table IV, Column "All Years", p. 114).

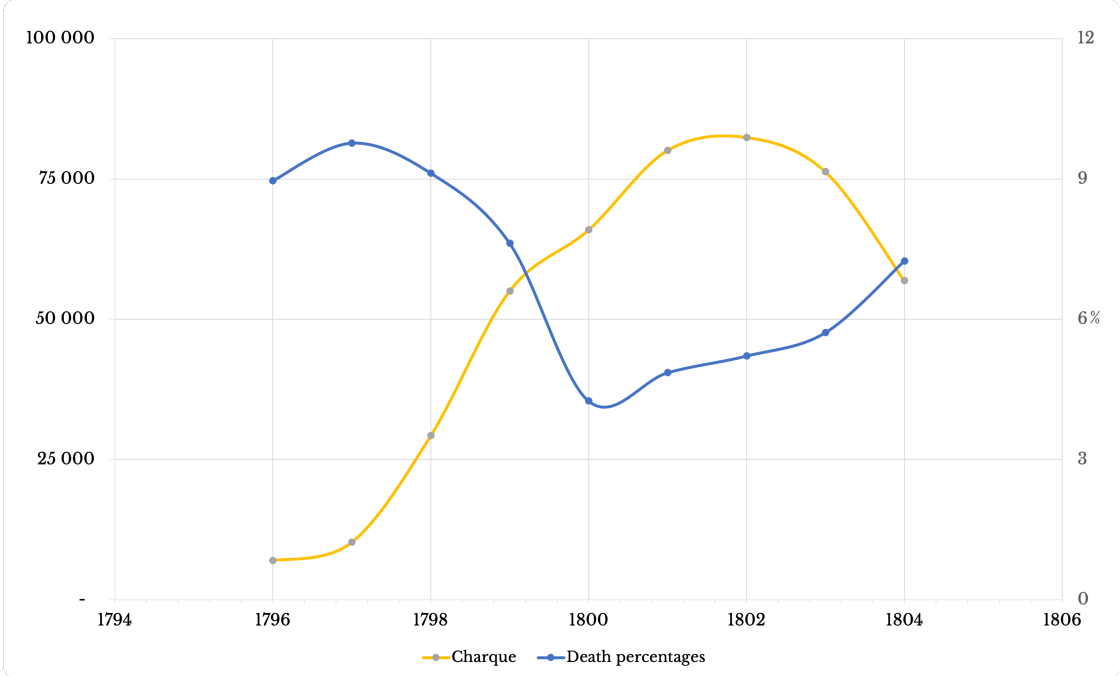
captains whose voyages failed due to lack of resources, as the latter were generally responsible for purchasing supplies. Therefore, it was in the captains' interest not to register malnutrition as a cause of death, which may have led to underreporting (Klein et al., 2001, p. 103). In other words, while diseases were the apparent causes of death at sea, the silent factors of poor nutrition and improper storage of drinking water were part of the entangled causes of the health fragility of those who succumbed to said diseases (Riley, 1981, p. 428). Afterall, insufficient supplies aboard the ships would end up facilitating the more widespread establishment of maladies (Riley, 1981, p. 438).

The purpose of presenting these arguments is twofold: first, to complicate the simple observation that food crises were not the written causes of most deaths; second, to reaffirm that if there was a decrease in mortality after the first few weeks, this was only possible if a well-structured system for circulating food supplies was put into operation. It is not to say that food was the sole cause of the decline in mortality rates, but to point out that it was a necessary factor. And, considering the enslaved women's labor in preparing the meat, which was one of the main sources of nutrients, the exploitation of this labor made this dynamic possible. In conclusion, the circulation and consumption of ancillary goods were the conditions necessary for the reproduction of the plantation complex and slavery itself.

The arrival of meat in the port of Rio de Janeiro in the late eighteenth century reinforces the argument. Looking at the curves of Graphs 3 and 4, it's not hard to see the inverse relationship between the *charque* imports and the mortality rate in the slave trade. In the two decades that make

up the series the periods with lower mortality rates were synchronized with moments of larger meat imports. Said *charque* was produced by enslaved people in the southern border of Portuguese America. The increased quantity of meat in the port of Rio de Janeiro and in the city's, stores helped lower the shipping costs for the tons of jerked beef that would make up the enslaved people's diet. When meat became scarce in the warehouses, its price became a barrier to purchasing it, and malnutrition once again claimed lives during the crossing.

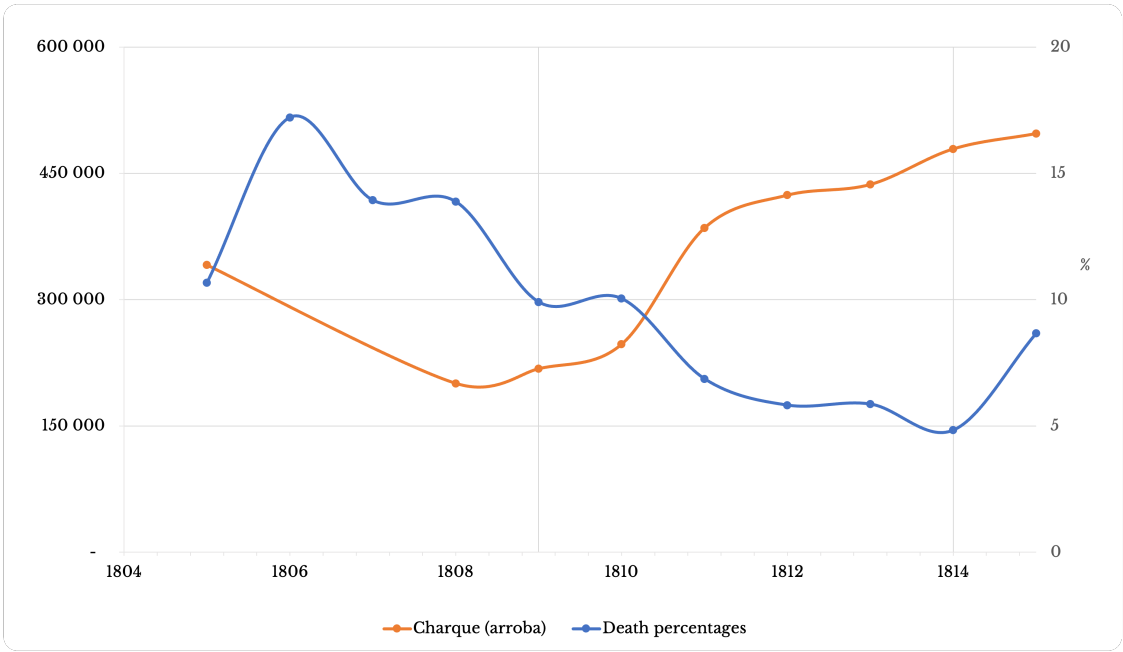
Graph 3. *Charque* imports from Rio Grande de São Pedro to Rio de Janeiro and deaths in transit in the Rio de Janeiro slave trade (three-year averages, 1795-1802)



Source: Elaborated by the author. For the charque imports see AGCRJ, Fundo Câmara Municipal. Série Embarcações. "Este Livro ha de Servir, para os termos das Entradas das Embarcaçoens, que entram neste Porto, e Vay numerado e Rubricado e com a minha Rubrica D. Silva, de que uso neste Lugar de Juiz de Fora, e Prezidente do Senado de Camara. Rio de Janeiro, 29 de Outubro de 1792". Códice 53-3-5, Embarcações. Termos de entrada no Porto do Rio de Janeiro, 1792-1802. AGCRJ, Fundo Câmara Municipal. Série Embarcações. "Este Livro ha de servir para os ttermos das entradas das Embarcaçoens que entrão neste Porto e vay numerado e Rubricado com a minha Rubrica que diz Cardozo de que uzo neste lugar de Juiz de Fora pella Ley, e Prezidente do Senado da Camara. Rio de Janeiro, 5 de Mayo e 1801". Códice 57-3-6, Embarcações. Termos de entrada no Porto do Rio de Janeiro, 1802-1806. For the deaths in transit see "The Trans-Atlantic Slave Trade Database" The Slave Voyages Consortium (2021, https://www.slavevoyages.org/voyages/uyXYlGXw).

The argument developed here is related, but transversal. One of the few points of consensus regarding the issue of overcrowding is that, by using more space to traffic people, slave traders sacrificed part of the area reserved for provisions, reducing the amount of nutrients per enslaved person. The jerked beef has a protein density that is relevant to the discussion. If we accept Miller's argument that beans were the main source of protein on the slave ships, the comparison between the densities can be revealing of the ability to store protein by volume on the ship (Miller, 1988,

Graph 4. *Charque* imports from Rio Grande de São Pedro to Rio de Janeiro and deaths in transit in the Rio de Janeiro slave trade (1805-1815)



Source: Elaborated by the author. For the charque imports see AHU, Rio Grande do Sul, cx. 11, doc. 668, "Ofício do governador da capitania do Rio Grande de São Pedro do Sul, Paulo José da Silva Gama, ao [secretária de estado da Marinha e Ultramar], visconde de Anadia, [João Rodrigues de Sá e Melo], enviando relações do comércio de 1803, 1804 e 1805, e a relação das casas que têm sido construídas em Porto Alegre desde 1803, demonstrativas do progresso comercial da capitania"; ANRJ. Real Junta do Comércio, Agricultura, Fábricas e Navegação. "Rezultado deduzido dos Mappas de Importaçaõ & Expotação que vierão das Capitanias abaixo indicadas, respectivos a os anos de 1808 & 1809"; "1810 – Mapa de Importação & Exportação do Rio Grande do Anno de 1810, Recopilado no ano de 1810"; "Rezumo da Importação, e Exportação de todos os gêneros que entrarão e Sahirao pela Barra da Cap.na de São Pedro do Sul no anno de 1811"; "Rezumo da Importaçaõ, e Exportaçaõ dos gêneros, q' entrataõ e sahiraõ pela Barra da Capitania de S. Pedro do Sul no Anno de 1812"; "Anno de 1813 – Importação do Rio Grande no Rio de Janeiro"; "Rezumo da Importação, e Exportação dos Generos, que entrarão, e Sahirão pela Barra da Capitania do Rio Grande de São Pedro do Sul no anno de 1814"; "Mappa – Exportação das Produçoens da Capitania de São Pedro em 1815". cx. 448, pct. 1. For the deaths in transit see "The Trans-Atlantic Slave Trade Database" https://www.slavevoyages.org/voyages/uyXYlGXw

p. 414). My estimate is that, at best, beans provided just over 95,71 grams of protein per liter, while jerked beef totaled 190 grams.[8] Despite not being the most caloric food by volume, as that role was filled by manioc flour, jerked beef allowed more protein to be allocated per cubic meter, which could reduce the space used and, thus, reduce the frequency of deaths, since it allowed for an increase in both the number of people embarked and the amount of protein.[9]

[8] This dynamic is also important for understanding broader patterns. The debate over the number of people aboard the ships is still a lively one, considering the arguments that support a relationship between overcrowding on the ships and mortality rates, and those who claimed that –although this overcrowding was a factor that made mortality aboard the slave ships higher than on other ships– the relationship between a higher number of people and higher mortality rates within the limits observed in the transatlantic slave trade was limited (Duquette, 2014, pp. 536-544; Klein et al., 2001, p. 103; Klein & Engerman, 1997, p. 45; Martins, 2017, pp. 5-7; Miller, 1981, p. 388). See footnote 3.

[9] For an analysis of manioc flour in the Atlantic World, see Santos (2022).

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In conclusion, jerked beef consumption was a strategy deployed by slave traders in the Portuguese empire to reduce the mortality of enslaved people during the Middle Passage. In a moment of competition for profits –based on the acceleration of commodity exports and the consequent intensification of the trade– reducing transatlantic losses ensured the continuity of the mercantile slave trade for the subjects of the Portuguese Crown. From 1780 to 1815, compared to other traders, they were those with the highest number of people transported, and in the face of British competition, which was based on a reduction in mortality, their efforts to use salted beef seem to have been central to maintaining their prominent position as traders of human beings.

Conclusion

The history of capitalism is, to a large extent, a history of enslaved labor; this fact is widely accepted among the historiography specializing in historical capitalism. Yet the gender dimension and the interaction between humans and non-human animals have had little presence in the construction of this narrative. The solution proposed in this text was to study the relationships of nourishment, as they reveal the dynamics of capitalist appropriation of women's labor and the bodies of non-human animals.

It has become evident that the history of Britain's industrial revolution depends on the study of slavery that produced American cotton, which, in turn, was sustained through the life-sustaining work of enslaved women. However, it is important to remember that the history of slavery as a whole can only be told if the slave trade is investigated (Paton et al., 2023, pp. 587-588). This operation, in turn, was carried out through the culinary work of women on the ships and the death of non-human animals. In short, industry fed on slavery, and the enslaved were nourished with bovine bodies preserved in salt.

It is important to note that, while I emphasized the role of enslaver strategies to sustain the lives of the enslaved during the Atlantic crossing, this in no way diminishes the brutality of the voyages. The captains and investors practiced a cruel and bloodthirsty economic rationality in relation to the commodification of human beings, which included keeping their victims alive until they could be exchanged for money. The mercantile fruit of the plunder of African homes and communities depended on these choices to be realized, pocketed, and reinvested by the invaders of the Americas. The slave war was a war of capture, involving both European weapons, which killed the warriors who tried to defend their people, and the techniques of surgeons and shipmasters, who extended the life of those who had been shackled (Miller, 1988, p. 420).

In this bloody scenario, the death of cattle was a central performance. After all, their bodies would be the vital energy that nourished the imperial enterprise. The Iberian colonies, due to the violence of labor routines and the high mortality of the enslaved individuals, depended on an intense flow of trafficked people. This trade, in turn, increasingly sustained itself on the consumption of bovine corpses on the ships, converted into food through the unpaid labor of enslaved and commodified women.

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ANRJ Arquivo Nacional do Rio de Janeiro, Rio de Janeiro, Brazil.
AGCRJ Arquivo Geral da Cidade do Rio de Janeiro, Rio de Janeiro, Brazil.
AHU Arquivo Histórico Ultramarino, Lisboa, Portugal.

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