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The Evolution of Cattle Farming in the Municipality of Juara (Mato Grosso - Brazil): An Analysis Based on Agricultural Census Data

A Evolução da Pecuária Bovina no Município de Juara (Mato Grosso - Brasil): Uma Análise a Partir dos Dados dos Censos Agropecuários

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Leticia Gabrielle de Pinho Silva: Universidade Estadual de Mato Grosso. MT, Brazil

Rosemary Matias: Universidade Anhanguera Uniderp, Programa de Pós-Graduação em Meio Ambiente e Desenvolvimento Regional. MT, Brazil.

Victória Mathias Souza da Cunha: Universidade Anhanguera Uniderp, Programa de Pós-Graduação em Meio Ambiente e Desenvolvimento Regional. MT, Brazil.

José Antônio Maior Bono: Universidade Anhanguera Uniderp, Programa de Pós-Graduação em Meio Ambiente e Desenvolvimento Regional. MT, Brazil. E-mail: bono@cogna.com.br

Abstract

The objective of this article is to analyze the evolution of cattle ranching in the municipality of Juara (MT) between the 1990 and 2017, based on official data and historical records from the agricultural sector. The analysis also aims to contextualize these changes within the territorial, economic, and environmental dynamics of the region. This study examines the development of bovine livestock farming in Juara (MT) from three perspectives: Agrarian Geography, Rural Economics, and Rural Development, considering its impacts on local production and socioeconomic structures.The research adopts a qualitative, exploratory, and descriptive approach, based on primary data (direct observation, field records, and geospatial databases) and secondary data (academic literature, technical reports, and official statistical sources). Quantitative data were systematized into tables and graphs to provide visual support for the theoretical discussion and a better understanding of the agrarian and productive dynamics of the municipality. To this end, data from 1995/1996, 2006, and 2017 agricultural censuses were used. The results indicate that the cattle herd in Juara grew by 161.34%, increasing from 368,818 head in 1995 to 963,851 in 2023. With a growth rate of over 160% in the herd between 1995 and 2023, Juara stands out as the "cattle capital," making a significant contribution to both regional and national agribusiness. The evolution of cattle ranching in Juara (MT) reflects the economic and territorial transformation of the region, driven by colonization policies, rural credit, and productive modernization. The municipality has consolidated its position as a strategic center for cattle ranching in the state of Mato Grosso, while also facing environmental and social challenges.

Keywords: Mato Grosso. Arinos Valley. Agricultural Production. Territorial Transformations. Socioeconomic Dynamics.

Resumo

O artigo teve como objetivo analisar a evolução da atividade pecuária bovina no município de Juara (MT) entre da década de 1990 e 2017, com base em dados oficiais e registros históricos do setor agropecuário. A análise busca, ainda, contextualizar essas mudanças no âmbito das dinâmicas territoriais, econômicas e ambientais da região. Este estudo analisa a evolução da pecuária bovina em Juara (MT) sob três perspectivas: Geografia Agrária, Economia Rural e Desenvolvimento Rural, considerando seus impactos na produção e na estrutura socioeconômica local. A pesquisa adota abordagem qualitativa, exploratória e descritiva, com base em dados primários (observação direta, registros e bases geoespaciais) e secundários (literatura acadêmica, relatórios técnicos e bases estatísticas oficiais). Dados quantitativos foram sistematizados em tabelas e gráficos, proporcionando suporte visual à discussão teórica e à compreensão das dinâmicas agrárias e produtivas do município. Para isso, foram utilizados dados obtidos por meio de pesquisa nos censos de 1995/1996, 2006 e 2017. Os resultados indicam que o rebanho bovino no município de Juara cresceu 161,34%, passando de 368.818 cabeças em 1995 para 963.851 em 2023. Com um crescimento de mais de 160% no rebanho entre 1995 e 2023, Juara destaca-se como a "capital do gado", com forte contribuição ao agronegócio regional e nacional. A evolução da pecuária bovina em Juara (MT) reflete a transformação econômica e territorial da região, impulsionada por políticas de colonização, crédito rural e modernização produtiva. O município se consolidou como polo estratégico da bovinocultura mato-grossense, enfrentando desafios ambientais e sociais.

Palavras-chave Mato Grosso. Vale do Arinos. Produção Agropecuária. Transformações Territoriais. Dinâmicas Socioeconômicas.

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1 Introduction

Cattle ranching is one of Brazil's main economic activities, playing a fundamental role both in food production and in the socioeconomic development of the regions where it is well established. Historically, this activity has been associated with the occupation and expansion of Brazilian territory, having been introduced by the Portuguese Crown in the 16th century as a way to strengthen the colony's productive base. Initially focused on supplying meat, cattle raising gradually came to perform multiple functions, such as draft power, fertilization, and transport, especially on plantations in the semi-arid Northeast, a region marked by sugarcane cultivation (Moutinho, 2018).

Far from being a marginal activity, cattle ranching became one of the structural pillars of the colonial system and gained new momentum in the 19th and 20th centuries with the introduction of cultivated pastures, becoming an important component of agricultural modernization in the country.

From the 1960s onward, Brazil's Central-West region underwent a significant expansion of cattle ranching, favored by factors such as the availability of extensive pasture areas, the presence of the Cerrado biome, and the region's strategic location (Teixeira; Hespanhol, 2014). In this context, states such as Goiás and Mato Grosso began to concentrate a large share of the national cattle herd,

although slaughtering was still carried out mostly in São Paulo (Brisola, 2020).

In northern Mato Grosso, colonization projects promoted by private companies contributed to the emergence of new urban centers such as Sinop, Juína, Porto dos Gaúchos, Colíder, and Juara, consolidating cattle ranching as a key driver of territorial occupation.

Currently, the state of Mato Grosso has the largest cattle herd in Brazil, with around 33,994,004 head in 2023, and has ranked since 2017 as the country's second-largest exporter of beef (IBGE, 2020). However, dairy cattle farming still plays a limited role in the state economy, reflecting low productivity—around 35% below the national average—and climatic constraints that hinder the raising of specialized dairy breeds (Michetti *et al.,* 2022).

It is within this context that the municipality of Juara (MT) is situated, often referred to as the "capital of cattle" due to the strong presence of bovine livestock in its territory. The activity represents not only an important component of the local economy, but also one of the main foundations of regional development, supported by a trajectory of growth and modernization.

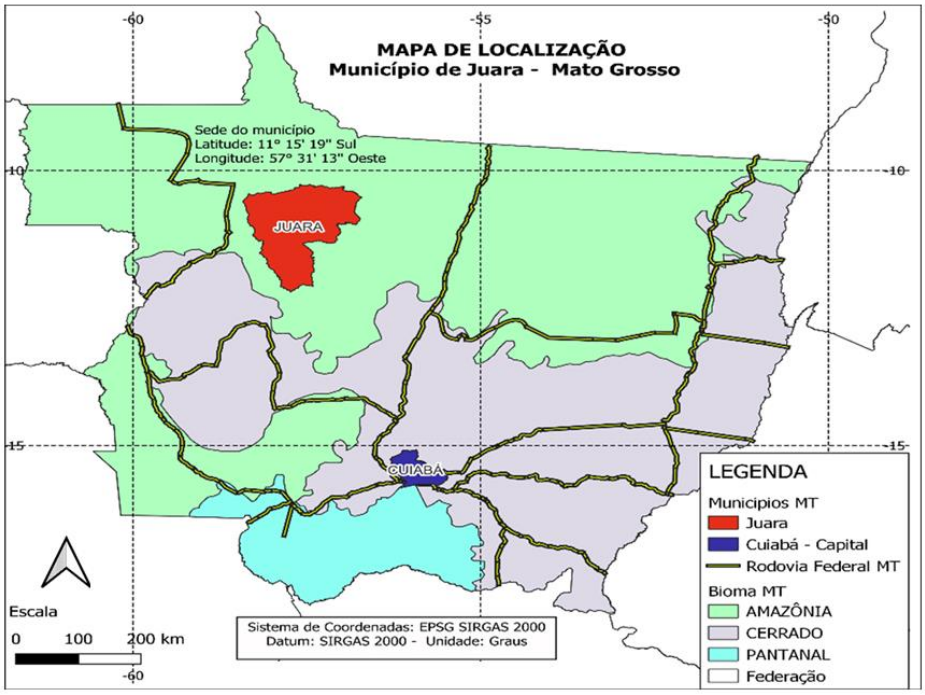
Understanding the evolution of cattle ranching in Juara requires a detailed analysis of both quantitative and qualitative aspects of the activity over time. The Agricultural Censuses of the Brazilian Institute of Geography and Statistics (IBGE) are an important data source for this type of assessment, making it possible to monitor herd growth, landholding structure, and the adoption of production practices.

This study aims to analyze the evolution of cattle ranching in Juara between 1995 and 2017, with updates through 2023, combining IBGE data with the literature on Agrarian Geography and Rural Development in order to understand the territorial transformations and the socio-environmental limits of the productive model that has been adopted.

2 Material and Methods

The municipality of Juara is located in the northwestern portion of the state of Mato Grosso, approximately 730 kilometers from the state capital, Cuiabá (Figure 1). With a territorial area of about 22,622.35 km², it stands out as the most populous municipality in the Immediate Geographic Region of Juara, hosting, according to IBGE estimates (2023), around 34,906 inhabitants. The area is part of Mesoregion 127 and Microregion 522 – Arinos, and is located on the Northern Residual Plateau of Mato Grosso, with an average elevation of approximately 292 meters (IMEA, 2017).

Figure 1 - Location of the municipality of Juara, situated 628 km from Cuiabá, the capital of Mato Grosso, and the three biomes of the state



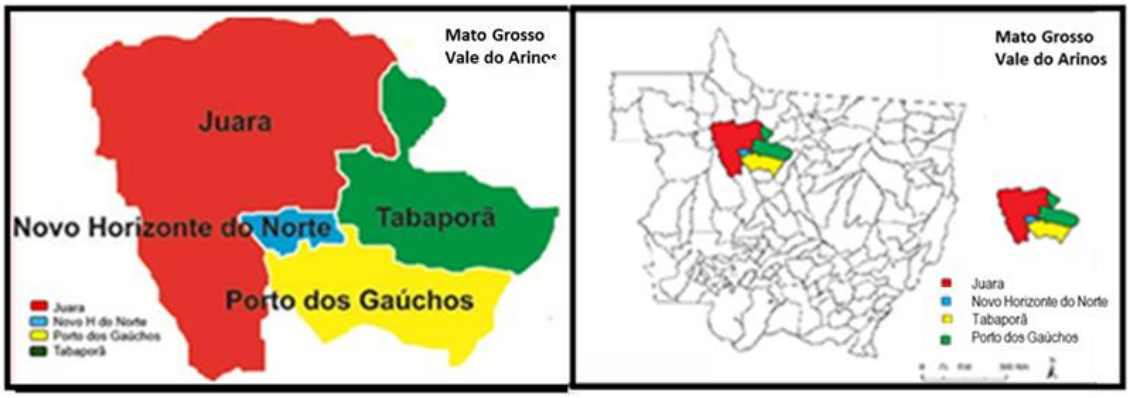
Source: the author.

The municipality of Juara has a predominantly hot and humid equatorial climate. This climatic condition is characterized by heavy rainfall concentrated between the months of January and March, while the dry season usually occurs between June and August (Nóbrega, 2010). From an edaphological perspective, latosols and argisols predominate—well-developed and naturally fertile soils that are suitable for agricultural and livestock activities. Currently, land use is marked by the predominance of pasture and cropland, interspersed with remnants of native vegetation.

Local biodiversity includes typical elements of both the Amazon and Cerrado biomes, which converge in the region. Water resources, such as the Arinos River, play an essential role in sustaining local ecosystems, promoting interactions between aquatic and terrestrial environments and contributing to the maintenance of biological diversity.

The study area focuses on the evolution of cattle ranching in the municipality of Juara (MT), located in the northwestern part of the state of Mato Grosso, in the region known as the Arinos Valley, which also includes the municipalities of Novo Horizonte do Norte, Porto dos Gaúchos, and Tabaporã (Figure 2). With a total area of 22,632.713 km², Juara is situated in a transition zone between two important Brazilian biomes: the Cerrado and the Amazon. This location gives the municipality diverse environmental characteristics, combining areas of typical cerrado vegetation with Amazonian forests, which directly influences productive activities, especially livestock farming and agriculture

Figure 2 - Location of the municipalities of Juara, Novo Horizonte do Norte, Tabaporã, and Porto dos Gaúchos, Mato Grosso



Source: adapted from the Health Consortium of the Arinos Region (2022).

Given this context, understanding the evolution of this productive activity based on data from the Agricultural Censuses of the Brazilian Institute of Geography and Statistics (IBGE) becomes essential for assessing its impact on the territory and its socioeconomic implications.

The study is grounded in Agrarian Geography, as it analyzes the evolution of cattle ranching over time, combined with Rural Economics to understand herd growth and productive transformations in the activity. Complementarily, the perspective of Rural Development makes it possible to evaluate the impacts of this expansion on the socioeconomic structure of the municipality of Juara, highlighting the relationships between production, territorial organization, and local dynamics.

The research adopts a qualitative approach, with an exploratory and descriptive character, using data from primary and secondary sources. The primary sources include direct observation and the analysis of institutional documents and geospatial databases, while the secondary sources comprise a literature review, technical reports, and statistical databases from official agencies such as IBGE, INCRA, and MAPA. The data were processed through content analysis, with thematic organization in accordance with the research objectives, and the quantitative information was systematized in tables and graphs to support the interpretation of the results.

3 Results and Discussion

3.1 Evolution of Cattle Ranching in Juara

The process of occupation of Juara is part of the broader movement of private colonization in northern Mato Grosso, driven by policies aimed at territorial integration. Initially characterized by extractive activities, the municipality gradually structured its economy around cattle ranching, an activity that proved more stable in the face of the region's climatic and logistical constraints.

According to IBGE (1996), cattle ranching was already the main local economic activity in the

1990s. Access to rural credit and the availability of land favored the expansion of the herd, consolidating livestock production as a structuring axis of territorial dynamics.

3.2 Historical and Economic Context of Juara

The municipality of Juara is known for its strong role in livestock production. Its development not only reflects a history linked to economic factors, but also encompasses environmental issues associated with the expansion of agriculture and livestock in the region.

At first, due to its location and the characteristics of the transition zone between the Cerrado and the Amazon rainforest, the main economic activity was timber extraction. Over time, and with the consequent depletion of timber resources, cattle ranching became predominant, earning Juara the title of "capital of cattle" due to the large number of heads of this type of ruminant on local properties.

In recent years, the quality of the municipality's lands has favored a notable expansion of grain cultivation, boosting the growth of agribusiness in the region. In the last decades, livestock farming in the municipality has undergone significant changes, both in terms of production growth and in its environmental repercussions (Almeida, 2020; Rosa, 2020; Silva; Melz, 2014).

The growth of cattle ranching in Juara has been driven by factors such as the expansion of pasture areas and the increase in the bovine herd. Although this has brought economic benefits, dairy farming in the municipality faces low productivity, a lack of public policies, and limited infrastructure. It has also raised concerns about environmental impacts, such as deforestation, soil degradation, and greenhouse gas emissions (Beckmann; Santana, 2017; Micheletti *et al.*, 2022; Moi *et al*., 2020).

According to Gomes (2019), although Brazil's agricultural sector has undergone, since the mid-20th century, a modernization process and a significant increase in productivity, this progress has also been accompanied by various negative environmental impacts, such as soil erosion and the contamination of water and air resources.

In this context, studies that address not only the numerical growth of the cattle herd, but also its effects on the environment, become essential. Recent research indicates that Juara is part of one of the clusters with the highest levels of environmental degradation in the Central-West region, as a result of agricultural intensification and the use of chemical inputs (Galhart; Crestana, 2010; Santos; Lisbinski, 2023; Vilela *et al*., 2011).

The adoption of sustainable practices, such as integrated production systems and technical assistance, is fundamental to balancing production and environmental conservation in the region, promoting rural development with lower ecological impact. Studies by Assis *et al.* (2015), Costa *et al.* (2015), Gil *et al*. (2015), and Reis *et al.* (2020; 2023) demonstrate the economic and environmental feasibility of integrated systems.

According to Sant'Ana (2010), coffee cultivation was the first agricultural initiative promoted by colonizers in the region. However, due to the unsatisfactory results of this activity, the company responsible for colonization began to encourage the production of other crops, such as rice, guaraná, and cocoa. Despite diversification efforts, these new attempts were also unsuccessful, largely because of the absence of adequate technical planning, such as prior analysis of soil fertility and suitability. In the face of these difficulties, the local economy began to seek alternatives outside the agricultural sector, turning to new possibilities such as logging.

The municipality of Juara is known as the "capital of cattle." However, it is rapidly moving toward the expansion of grain cultivation for agribusiness, particularly soybeans and corn, with the planted area of these commodities increasing every year. Some companies are establishing themselves in the municipality, and there is great expectation for the expansion of soybean cultivation in the coming years.

It is important to note that both extensive cattle ranching and soybean cultivation generate significant environmental impacts, as they require the clearing of large areas of forest. In addition to causing soil degradation, these activities contribute to river siltation, and environmental laws are often not respected. Deforestation also occurs in headwater areas, leading to their destruction, and in riparian forests, which causes severe environmental damage. "Cattle, in the absence of riparian vegetation, trample the protective riverbanks, leading to their collapse, which facilitates water runoff and causes the siltation of watercourses" (Oliveira et al., 2012).

The historical analysis of cattle ranching in Juara highlights its strategic relevance for local economic development, sustained mainly by landowning producers and consolidating the municipality's reputation as the "capital of cattle" in Mato Grosso.

3.3 Historical Data and Growth of Cattle Ranching in Juara

Based on the analysis of data from the IBGE/SIDRA System, presented in Table 1, it is observed that, in 1995, the municipality of Juara had 839 rural properties dedicated to cattle ranching. Of these, 820 (97.74%) belonged to the producers themselves, 15 (1.79%) were leased, and 4 (0.48%) were classified as occupied properties (IBGE, 1995/1996). The predominance of owner-operated properties suggests that land acquisition took place mainly through direct purchase or other formal negotiation mechanisms. The significant increase in the bovine herd in Juara largely reflects the credit policies implemented in recent decades. According to Macedo (2005), the availability of credit was essential for the growth of livestock activity, with particular emphasis on the loans offered by PRONAF (National Program for Strengthening Family Agriculture), which were fundamental to the modernization of production.

Table 1 - Evolution of agricultural establishments and number of establishments with cattle ranching from 1995 to 2017 in Juara, Mato Grosso

Condition of Producer	Number of Producers						Percentage (%)		
	Agricultural Establishments			Cattle Establishments					
	1995	2006	2017	1995	2006	2017	1995	2006	2017
Owner	1074	1106	1617	820	943	1398	97,7	93,8	96,8
Tenant without title	-	68	-		34	-	-	3,4	-
Tenant	20	28	43	15	23	37	1,8	2,3	2,56
Sharecropper	-	2		-	1	-	-	0,1	-
Borrower	-	-	4	-	-	4			0,28
Occupant	12	8	23	4	4	6	0,5	0,4	0,41
Producer without land	-	-	1	-	-	-	-	-	-
Total	1106	1212	1689	839	1005	1445	100	100	100

Source: IBGE - Agricultural Census Data (1995/1996).

According to Law No. 6,015 of December 31, 1973, the condition of "owner" is defined by the legal possession of land and the right to use it for productive purposes, such as agriculture or livestock farming (Brazil, 1973). The strong presence of owners among livestock establishments reveals a consolidated production model, whether family-based or corporate, generally with greater access to credit and public support policies. In contrast, the existence of leases, loaned land (comodato), and occupations without formal title exposes the persistence of inequalities in access to land and in land regularization (Nascimento et al., 2010). In this context, legal insecurity over land tenure is one of the main obstacles to the consolidation of agroecology in Brazil, since the absence of land regularization limits access to public policies, credit, and technical assistance. Although viable, agroecology depends on legal guarantees over land in order to effectively promote social justice and environmental sustainability in rural areas (Souza *et al.*, 2022).

In the 2006 Agricultural Census, the bovine herd of the municipality totaled 894,127 head, distributed across 1,005 establishments and occupying an area of 937,155 hectares. The data analysis reveals a process of significant expansion of livestock between 1995 and 2006: the number of properties with livestock activity grew by 19.79%, the area occupied increased by 4.91%, and the bovine herd rose by 142.43% in the period (IBGE, 2006).

The category "settler without title" mentioned in Table 1 refers to families included in agrarian reform projects holding a Land Use Concession Contract (CCU), in accordance with INCRA Normative Instruction No. 99 of December 30, 2019. Access to the Domain Title (TD) is conditional upon compliance with the contract clauses and demonstrated capacity for productive use of the land.

Beginning with the 2006 edition of the Agricultural Census, the category "producer without area" also started to be recorded. This includes beekeepers, extractivists, livestock raisers along

roadsides or riverbanks, as well as practitioners of shifting cultivation (Atlas of Brazilian Rural Space, 2020).

Recent studies indicate that the high proportion of private properties in the region may be related to the lack of effective land regularization policies and the slow pace of land titling. This hinders access to land by family farmers and agrarian reform settlers, reinforcing land concentration and limiting sustainable rural development (Silva *et al.,* 2014). Land tenure insecurity also undermines the adoption of sustainable practices and restricts access to credit and technical assistance, which are essential elements for the modernization of family farming.

Table 2 presents 2017 data on agricultural establishments in Juara, showing that 1,617 units (95.74%) belonged to owners, of which 1,398 (96.75%) were engaged in cattle ranching. The other tenure conditions—such as tenants (2.56%), borrowers/comodatários (0.28%), and occupants (0.41%)—represent a statistical minority. The absence of data for settlers without title in 2017 may indicate either the nonexistence of this tenure profile or gaps in the records.

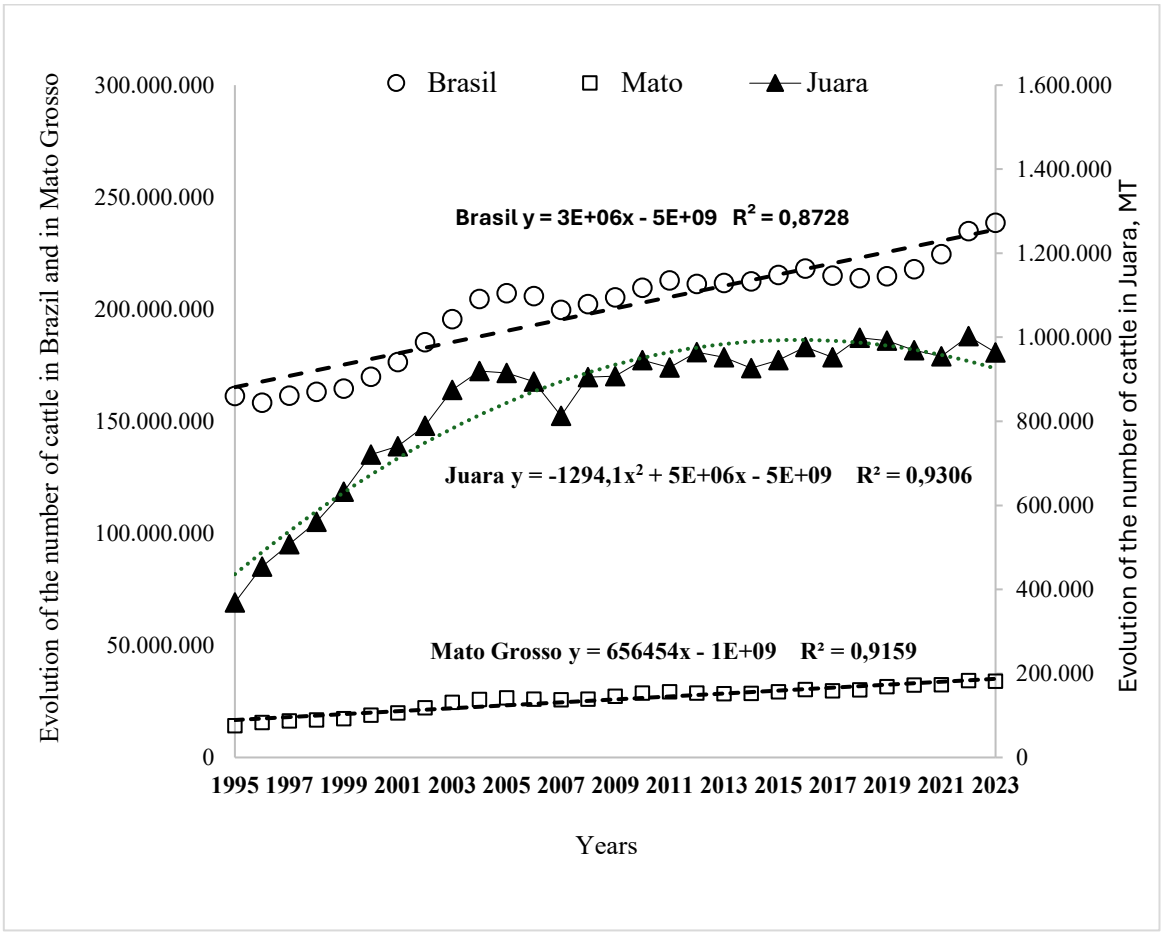
Of the total 1,689 agricultural establishments in 2017, 1,445 (85.55%) carried out activities involving cattle and other livestock, which confirms the centrality of cattle ranching in the local productive matrix. According to IBGE (2017), Juara had 952,395 head of cattle distributed across 1,445 properties, occupying a total area of 1,521,652 hectares.

Between 2006 and 2017, Juara's livestock indicators showed remarkable growth: the bovine herd increased by 6.52%, the number of properties with cattle activity rose by 43.78%, and the area allocated to livestock expanded by 62.37%. These figures reiterate the strategic importance of cattle ranching in the region's economic dynamics.

Figure 3 below shows the evolution of the number of cattle in Brazil, in the state of Mato Grosso, and in the municipality of Juara (MT) between 1995 and 2023. The analysis makes it possible to identify different growth dynamics among the three geographical levels, with particular emphasis on the municipality's performance in relation to the state and national contexts.

At the national level, there is a linear trend of growth in the bovine herd over the period analyzed. The trend line equation ($y = 3E+06x – 5E+09$) and the coefficient of determination ($R^2 = 0.8728$) indicate an average increase of approximately three million head per year, with a good degree of fit between the curve and the historical data. This behavior reflects the stability of cattle ranching as one of the main activities of the Brazilian agricultural sector and reinforces its position as one of the core economic activities of the country's agribusiness.

Figure 3 - Temporal comparison of the bovine herd (number of head) in Brazil, in Mato Grosso, and in Juara (MT), from 1995 to 2023



Source: the authors (2026)

In Mato Grosso, the largest cattle-producing state in Brazil, herd growth follows a continuous and statistically consistent trajectory. The trend equation (y = 656,454x – 1E+09) and the high coefficient of determination ($R^2 = 0.9159$) indicate an average annual increase of approximately 656 thousand head of cattle, highlighting the consolidation of the state as one of Brazil's main agricultural frontiers. The estimated growth of more than 650 thousand head per year confirms the expansion of livestock activity, especially in agricultural frontier areas, reinforcing Mato Grosso's leading role on the national stage.

In the municipality of Juara (MT), known as the "capital of cattle," the trajectory between 1995 and 2023 was equally significant, although marked by fluctuations. The herd grew by 161.34%, rising from 368,818 head in 1995 to 963,851 in 2023, according to the Municipal Livestock Survey (IBGE). In 1995, Juara already held second place in the state ranking, with 368,818 head, behind only Cáceres (480,000) and ahead of Vila Bela da Santíssima Trindade (316,167). A phase of rapid growth is observed between 1995 and 2005, followed by a period of stabilization from the 2010s onward, indicating possible productive maturity but also structural, environmental, and economic constraints.

Fluctuations became more evident from 2011, when the herd fell from 945,249 head in 2010 to 927,828 in 2011 (–1.84%), recovering in 2012 with growth of 3.92% (964,213 head) and registering new declines in 2013 (–1.26%) and 2014 (–2.67%). According to the Municipal Livestock Survey (IBGE, 2011), the global economic crisis affected exports of meat and hides, increased the culling of cows, and put pressure on domestic prices.

In 2012, the rising costs of inputs such as corn, soybeans, and veterinary products negatively affected the activity (IBGE, 2012); in 2013 and 2014, prolonged drought reduced the supply of animals and pushed prices up (IBGE, 2013; 2014). In 2015, Juara returned to growth, with an increase of 2.05% (945,566 head), while Mato Grosso grew 2.70% (29,364,042 head) and Brazil 1.34% (215,520,508 head) (IBGE, 2015). Between 2016 and 2020, Brazil recorded a decline of 0.16% in its herd and Juara a drop of 0.76% (from 976,404 to 968,950 head), while Mato Grosso grew 6.74% (32,338,031 head), in a context of fluctuations in exports and an increase in the slaughter of females (IBGE, 2016–2018). In 2021, the Brazilian herd grew 3.11% (224,601,992 head), Mato Grosso increased 0.27%, and Juara fell 1.49% (954,545 head) (IBGE, 2021). In 2022, there was a national recovery of 7.5%, with Mato Grosso reaching 34,246,313 head (14.58% of the national total) and Juara 1,002,350 head (2.93% of the state herd) (IBGE, 2022).

The growth observed in Juara was driven by rural credit policies, such as PRONAF, and by the consolidation of private properties, expanding both the occupied area and the number of establishments. However, land inequalities persist, limiting productive inclusion and access to public policies. The sector's sustainability depends on the incorporation of technological innovations and compliance with socio-environmental requirements (Grisa; Schneider, 2015; Aquino; Schneider, 2015).

Studies point to environmental impacts associated with the expansion of livestock, such as soil degradation and pressure on natural resources (Galharte; Crestana, 2010; Vilela et al., 2011), in addition to specific challenges faced by dairy farming in Mato Grosso, whose productivity is about 35% lower than the national average (Michetti *et al.,* 2022), reflecting uneven modernization (Beckmann; Santana, 2017).

Recent research indicates that agricultural intensification is putting pressure on sensitive areas of the Cerrado and the Amazon ecotone (Leandro; Rocha, 2019; Silva et al., 2019), placing Juara within clusters of higher environmental impact according to the Environmental Degradation Index (IDA) (Santos; Lisbinski, 2023). The tensions between productive intensification and environmental conservation are widely discussed by Cohn *et al.* (2016) and Gil *et al.* (2018), while Assis *et al.* (2015) and Costa *et al.* (2015) highlight the Crop–Livestock–Forest Integration (ILPF) system as a sustainable alternative. Studies by Reis *et al.* (2020; 2023) reinforce the economic and environmental feasibility of integrated systems in the agricultural frontier.

Thus, although Juara has achieved herd growth of more than 160% over the period analyzed, the future of the activity will depend on balancing production, technological innovation, land regularization, and environmental conservation.

4 Conclusion

The historical and statistical analysis of cattle ranching in Juara shows that the municipality plays a strategic role in agribusiness in Mato Grosso, combining a strong productive tradition with territorial expansion. Between 1995 and 2023, the significant increase in herd size and in the area occupied demonstrates the strengthening of livestock activity, driven by public policies and a consolidated land tenure structure. However, this growth has not occurred without environmental costs, such as deforestation and soil degradation.

The study also highlighted inequalities in access to land and structural limitations that compromise long-term sustainability. To address these challenges, it is urgent to implement land regularization policies, continuous technical assistance, and incentives for sustainable production, reconciling economic development with environmental preservation and social justice—essential requirements for consolidating Juara as a resilient and competitive territory.

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