

The Ox from the Four Corners of the World: The Historic Origins of the Brazilian Beef Industry

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Abstract

During the twentieth century, Brazil developed its beef industry, acquiring in the last decade great importance in the international market. This article considers four exotic factors that contributed to its moving from importer of beef to the largest exporter: the raising of cattle of Iberian origin, since the sixteenth century; the Zebu breed brought from India at the end of the nineteenth century; the grass brought from Africa, for the cattle to graze; and barbed wire, invented in the United States, which deepened land concentration in the country. Each factor has distinct geographical origins, but all acted together, like the four 'legs' that sustain this immense bovine, to enable its adaptation to Brazilian lands. These four factors, before obtaining success and hegemony, encountered resistance and created controversy, not only for ideological and technical reasons, but also the conflicts of interest that their arrival represented.

Keywords

Brazilian beef industry, cattle farming, Zebu, land concentration, African grass

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Introduction

By the first decade of the twenty-first century, Brazil became the biggest exporter, the second producer, and the third consumer of beef in the world (ABIEC 2012). One hundred years ago, however, the scenario was different. Brazil's exports of beef were almost ten times smaller than the imports of *charque* (salt beef), or almost equal to the amount of preserved beef imported. The imported produce would come from Paraguay, Argentina and, above all, Uruguay (Brasil 1917). Barbosa da Silva reveals that, at the end of the nineteenth century, Rio de Janeiro, then the capital of Brazil, and other main cities, such as São Paulo and Recife, were also receiving raw beef from Rio da Prata and frozen beef from Australia and New Zealand.

How did Brazil shift its position from beef importer to the world's main exporter of the product in one hundred years? The increase in the demand for beef by the international market and the installation of foreign cold-storage companies, especially after the First World War, are certainly important elements, but are not sufficient to explain the whole process that occurred in Brazilian cattle farming throughout the twentieth century. This article will highlight the importance of four other external factors that decisively contributed to the rise of what can be called a 'beef industry' in Brazil. These factors, with distinct and distant geographical origins, have worked together as the four legs that support this immense bovine, which, despite being exotic, has adapted itself quite well on Brazilian soil. The four factors are:

1. Livestock of Iberian origin was the basis of cattle farming in Brazil, which introduced this economic activity in the first century of the colonial period, configuring extensive production and contributing to territorial expansion. Such expansion defined the regions of Brazil, which remain roughly unchanged until today.
2. Zebu cattle, brought from India, particularly at the end of the nineteenth century, left its genetic influence in over 80 per cent of the herd, a revolution that enabled large-scale production of beef in Brazil, due to its size and adaptability to most of the environmental conditions found in the territory. This element ensured Brazil's entry into the world market.

3. Grass from Africa and other continents also gave a new dimension to the economic activity, providing feeding support to the expansion of the Brazilian herd, previously left to feed mainly in natural grassland, substituted today by planted pastures, which represent almost two thirds of the total.
4. Barbed wire, invented in the United States, not only enabled the enclosure of planted pastures, so as to avoid unwanted cross-breeding and facilitate genetic improvement of the herd, but also constituted an important instrument for land concentration: properties above 500 hectares account for more than half of the national cattle herd and total of pasture land, as well as almost 60 per cent of planted pastures (IBGE 2007).

When stepping onto Brazilian territory, each of these ‘legs’ faced resistance and created controversy before obtaining success and hegemony, not only due to ideological and technical issues, but also conflicts of interest brought about with its arrival, as discussed below.

To contextualise this discussion, it is worth briefly to reflect on another issue raised by the success of the Brazilian beef industry and its relevance in the international economic scenario. The North-American environmental historian, Alfred Crosby (1986), highlights the success obtained by what he calls the ‘Neo-Europes’—countries like Canada, the United States, Argentina, Uruguay, Australia, and New Zealand, whose current populations originated predominantly in that continent and which, though having different native biota, are mainly situated in temperate zones of the planet. These countries were responsible, in 1982, for over 30 per cent of the world’s total agricultural export volume. ‘In exports of fresh, chilled, and frozen beef and mutton, the Neo-Europes also lead [led] the world, as well as in a number of other foodstuffs’ (Crosby 1986: 4). The skill to produce exportable surpluses, according to Crosby, has attracted ‘the attention—the unblinking envious gaze—of most of humanity’ (*ibid.*: 3). The success of the Neo-Europes is related to the fact that settlers expanded demographically due to the transposition, not always intentional, of plants, animals, and pathogens associated to humans. Crosby (*ibid.*: 170) adds that:

weeds were crucially important to the prosperity of the advancing Europeans and Neo-Europeans. The weeds, like skin transplants placed over broad areas

of abraded and burned flesh, aided in healing the raw wounds that the invaders tore in the earth. The exotic plants saved newly bared topsoil from water and wind erosion and from baking in the sun. And the weeds often became essential feed for exotic livestock, as these in turn were for their masters.

Crosby affirms that ‘the success of their animals was, generally speaking, their success’ (*ibid.*: 172). As such, both the Iberian and English herds had great capacity to adapt to the temperate regions of North and South America, multiplying and naturalising themselves as ‘wild herds’, but they did not have the same success in the tropical areas of Brazil, Colombia, and Venezuela. In this sense, this article both questions and reaffirms the ideas defended by Crosby. It questions the notion that the world would necessarily come to depend on the production of food by the Neo-Europes; notwithstanding that the United States is the biggest producer of beef and Australia the second biggest exporter, the importance of Brazil and other tropical countries is a clear counterpoint. It questions also the emphasis given by Crosby to the importance of weeds and animals originating in the Old World, particularly from Europe, to the world’s production of food, since we are speaking, in the Brazilian case, of cattle originating in India and grass in Africa. On the other hand, it is necessary to agree with Crosby as to the difficulty of adaptation of plants and animals from Europe, or, more broadly, from the temperate regions of the Old World, to the tropical areas of their American colonies; hence the need to exchange species with regions that have more proximate environmental characteristics, such as Africa, Asia, and Oceania. In this sense, if we can speak of Neo-Europes, would it be also possible to speak of ‘Neo-Tropics’? The discussion of the trajectory of the Brazilian beef industry and the controversy around its development certainly helps to answer this question, as it shows that the debate was indeed a contraposition between these two paths, the second alternative becoming hegemonic.

Iberian Cattle Sets Hoof on Brazilian Soil

There was no beef cattle in Brazil before the arrival of the European settlers at the beginning of the sixteenth century, and there is no precise information about when the first animal disembarked. The first heads of

cattle were brought from the islands on the west coast of Africa (Madeira, Azores, Cape Verde), or even Portugal. 'The dispersion of the cattle in Brazilian territory was carried out from three points: Bahia and Pernambuco, in the Northeast, and São Vicente, in the Paulista [Southwestern] coast' (Valverde 1985: 196, *our translation*). This path of penetration was directed both to the south, until it reached the border between Uruguay and Argentina, and to the west, where it encountered the cattle brought by the Spanish to the region of present-day Paraguay. The expansion front from the Northeast, through the São Francisco River Valley, reached the borders of the Amazon Forest.

Cattle farming, together with gold and gemstone mining, was responsible for Brazil's current territorial configuration, contributing to the destruction and/or expulsion of hundreds of indigenous peoples ever more towards the interior and to the breach of the boundaries established by the Treaty of Tordesilhas, which, in 1494, had divided the lands discovered, and to be discovered, between the kingdoms of Portugal and Spain.

Cattle, however, did not represent an important colonial product, serving, primarily, the internal market. The production of sugarcane was, during the sixteenth and seventeenth centuries, the principal economic activity in Brazil, concentrated on the coast of the Northeast Region. The Italian Jesuit André João Antonil (1649–1716), one of the first to describe the cattle farming activity in detail, already indicated, in 1711, that cattle was one of the 'enemies of sugarcane', because 'the oxen and the horses at first eat the eyes and then knock them down and step on them' (Antonil 1923: 111, *our translation*). Although cattle farming was already concentrated in the interior, conflicts around such episodes contributed to the decree of a Carta Régia, in 1701, prohibiting cattle breeding less than ten leagues from the coast, thereby conforming a clear specialization between the two activities.

Cattle farming was to supply dry beef, leather, and carrying animals to the sugar mills and, later, to the villas that emerged around mining, but was not to mix itself geographically with these other two important export activities from the colonial period, nor with the coffee estates that emerged during the nineteenth century, when Brazil was already independent from Portugal. These regions in the countryside where cattle farming predominated, called '*sertões*', were formed by open landscape, designated as *Caatinga* and *Cerrado*, which corresponds to a savannah-like vegetation. It was there that farms measuring thousands of hectares

emerged, where the cattle found favourable environmental conditions for the multiplication of the herds. The biggest producers of cattle hired a number of workers to whom they delegated the administration of the farms, with the help of their families and some indigenous or African slaves, since they could not depend on any other type of labour in the *sertão*, still sparsely populated by the colonists. José Viera Couto (1752–1827) observed, in 1801, in the region near mining, that in ‘the entire *sertão*, the farm owners pay, of four heads, one to the so-called Amos, those who manage the farm, continuously walk the fields, guard the cattle against wild animals and take care of all with regards to the livestock’ (Couto 1904: 118, *our translation*). The care required for cattle which is raised freely is minimal, as pointed out, in that same period, by the French botanist August de Saint-Hilaire (1779–1853): ‘[d]uring part of the year, the cowboys go to the pastures only from time to time, to check if any cattle has gone missing, or if there are any sick or wounded. When the cows give birth, the care required by the cowboys becomes more necessary, which is when they inspect the herd daily’ (Saint-Hilaire 1975: 313, *our translation*).

The livestock of European origin had to adapt to extensive production and conditions adverse to survival, feeding on natural pastures and licking salt from marsh swamps. The cattle originating in the Iberian Peninsula, during the colonial period, yielded various ‘creole’ or ‘national’ breeds, which had as ancestors the reddish brown Portuguese breeds, the Barrosã, Mirandesa, Minhota, Alentejana, and Arouquesa. As Mariante and Calvacante (2006: 76, *our translation*) note,

[t]hus, almost with no human interference, and relying basically on the goodness of the soil, the cattle of different origins thrived here, adapting to the diverse tropical ecosystems. The differences in size, proportion and behaviour that emerged in the process of adaptation, which perpetuated for several generations, ended up configuring the different Brazilian breeds. This spontaneous process, which occurred by natural selection, in which survive those who are most adapted to the different environments, gave rise to animals which are as resistant as they are less demanding.

This study, published by the Brazilian Agricultural Research Agency (*Empresa Brasileira de Pesquisa Agropecuária*, EMBRAPA) highlights, among these cattle breeds, the Curraleiro breed, adapted as much to the *Caatinga* of the Northeast Region as to the *Cerrado* of Central Brazil,

where also present are the Caracu, Mocho Nacional, and Boi Patuá; whereas on the marshy areas of the borders with Paraguay, the Boi Pantaneiro predominates and in the South, on the Catarinense Highlands, the Crioulo Lageano.

In another study, also conducted by EMBRAPA, regarding the marshland breed, the following factors were indicated as contributing to hindering the growth of European cattle: infectious and parasitic diseases; unbalanced diet, high on fibres and low on nutritional content; and the hot climate. Due to the latter factor, the European breeds, varying in accordance with the environmental conditions to which they were subjected, became lower, wider, thicker, and shorter through the generations. As observed by Mazza et al. (1994: 33, *our translation*), '[i]t appears to be a tendency to become cube-like in form to increase its surface area in relation to its volume, so as to gain more capacity to lose heat'.

Brazilian cattle farming developed, therefore, since the arrival of the colonists, during nearly four centuries, in an extensive manner, with low costs, based on a long process of adaptation of Iberian cattle to the environmental conditions of different breeding regions, specialised in supplying meat and leather to the internal markets and, secondarily, milk, derivatives and other products, such as fat, used in the making of soap. This activity, with such characteristics, was the basis for the development of the beef industry, which would emerge in the beginning of the twentieth century, with production oriented to export, especially meat; however, it needed to overcome some important limitations to establish itself in the international market, giving rise to fervent debates between breeders and intellectuals of that period.

One of the main competitive fetters was to be found in the low productivity of the Brazilian herd, as pointed out by Lyrio Ferdinand, in his book, *The ox or the complete treatise on the raising, fattening, reproduction, improvement, mating, selection and diet of vaccum cattle*,¹ published in 1893 (Ferdinand 1983: 3, *our translation*):

Until now it has not been possible to give any development to the beef industry of our country, which keeps declining perceptibly while the breeds themselves degenerate. In the European states the best means are sought every day, all processes are applied to give volume to the ox's body and enhance the production of milk and the qualities of the meat...In the Brazilian states, however, the cattle is regressing and the time has come to look abroad for beef to feed ourselves and milk for our consumption, because these products,

already of bad quality, supplied by the breeders, have a tendency to worsen due to the lack of care and bad treatment dispensed to the cattle. We have an example from the herds that come from Minas Gerais, a breeding state, to the federal capital: they are rough, sick, thin and with meat of unpleasant taste, which day by day gets worse.

He proposed that the republican regime, recently implanted, encourages the development of such industry, by promoting 'honour awards' and 'animal exhibitions' aiming for an 'improvement of the domestic breeds', and adds: '[f]or the beginning of these benefits, the government itself should even establish and supply freely to the breeders *marruás*, shepherds or pure bulls, of breeds that would be good reproducers, to mate with the cattle of the private breeders'. He recommended, however, in a liberal perspective, the suspension of such measures as soon as good results were reached, because it 'paralyses and hinders the industry that produces good reproducers to sell or reproduce' (Ferdinand 1893: 15, *our translation*). This was not a new preoccupation though: in 1839, Carlos Augusto Taunay, in his *Brazilian Agricultural Manual* ('Manual do Agricultor Brasileiro'), one of the first publications of the kind in the country, already recommended that rich farmers 'search at all cost the parents of the most beautiful breeds of mules and horned cattle, to improve their offspring' (Taunay 2001: 257, *our translation*). Such initiative would be debated in two fronts: which Brazilian breed should be used in this improvement and, considering the importance of mating with other breeds, from which country should animals be brought towards this end.

The Brazilian breeds, even though still poorly defined, both in terms of historic origins and characteristics, were preferred in this national debate by different scholars and breeders based on regionalist evaluations, considering the environmental conditions of the main producer states of Brazil's immense territory. Lyrio Ferdinand (1893: 27, *our translation*) affirmed that, after having studied the Brazilian breeds, 'it is the cattle of the South that is the closest result to an improvement by selection'. He indicated that the English breed 'Devon is the most suitable, in case of necessity, for mating with our bovine breed. It is very old and robust, endures all climates and accustoms itself to all terrain without modification in its physique or morale' (*ibid.*: 11, *our translation*). The producer and scholar of world animal husbandry, Eduardo Cotrim, one of the founders of the Brazilian Society of Agriculture, in his book, *The*

modern farm: A guide for bovine livestock breeders in Brazil (A fazenda moderna: Guia do criador de gado bovino no Brasil), published in 1913, agrees that this breed, in particular, the North Devon one, is the ‘most appropriate in our country, above all in the common pastures of the states of the North, whose livestock needs urgently a transformation urgently in order to raise its poise and supply meatier offspring’. He further indicated that when crossed ‘with creole cattle, the North Devon yields well-made calves, strong and that fatten well, obtaining a very good price in the market’ (Cotrim 1913: 165, *our translation*).

Urbino de Sousa Vianna defended the Curraleiro, bred in his own region, highlighting, in 1927, that this cattle is ‘the “parent of the caracú”, indeed, the same curraleiro of the pastoral zones of good pastures and best kept husbandry’. After advancing several arguments, he concluded that it is ‘a cattle possessing qualities to be developed and perfected, above all endurance and meekness, as well as superior meat—which is unmatched—and the good services which it provides as excellent draught power’ (Vianna 1927: 40, *our translation*). His intention was that the Curraleiro serve ‘as the basis for the improvement by selection or cross-breeding, with the chosen breeds for this end being of Swiss origin (Schwitz Brune) or Limousine (R. Aquitania), Devon, Jersey and others’ (Vianna 1916: 215, *our translation*).

Jesuino da Silva Mello (Mello 1903: 55, *our translation*), in 1903, observed, for 40 years, that various varieties of beef ...

have visibly degenerated, except the caracú, that remains stable. We, therefore, recommend once again to breeders that all care is taken, all the hard work done, so that this beautiful breed, which is our own victory, is perpetuated in the plenitude of its excellent qualities.

This breed was, without doubt, the one which received the most attention, in particular by intellectuals, breeders and authorities of the state of São Paulo, already at that time one of Brazil’s main agricultural and livestock producers.

Fernand Ruffier, another advocate of this breed of livestock, due to its adaptation to Brazil’s Central Highlands region, stands out as the main enthusiast of the possibilities of this breed becoming the most important reference for Brazil’s beef industry. In his words (Ruffier 1924: 312, *our translation*):

[I]uck would have it that a Paulista doctor and biologist, the illustrious Dr Luiz Pereira Barreto, would be enthused by the ‘golden beast’ and, with great patriotic conviction, devote all his time and all his efforts, enhanced by his personal prestige, his wise competence, his high social position and his complete lack of economic interest, to making the Caracú the great national bovine breed, superior to everything that has been produced abroad. Tirelessly, for over thirty years, on all newspapers, magazines and other means within his reach, Dr Pereira Barreto campaigned in favour of the Caracú, aroused the interest of the public, convinced a great number of breeders of the Central States, and especially of São Paulo, congregated sparse energies and, finally, saw his publicity crowned with its most complete success, by the official adoption of the Caracú by the Government of São Paulo, and the creation of the Selection Post of Nova Odessa during the term of Dr Carlos Botelho at the Secretariat of Agriculture. Today, the Caracú is an acquired fact and constitutes a well defined breed, even though still not definitively characterised.

The Selection Post of Nova Odessa, established in 1910, tried to perfect, ‘by pure selection and rational diet, the primitive type of the creole Caracú’ (Ruffier 1924: 314, *our translation*). In 1916, the Brazilian Association of Breeders of Caracú (*Associação Brasileira de Criadores de Caracú*, ABCC) was founded in São Paulo, when the Herd-Book of the breed was also initiated, which in just three years received 2,155 entries (Athanassof 1947). Fernand Ruffier believed that the most practical way of improving the Caracú was by cross-breeding the cows with pure bulls of the French breeds Garoneza or Limousine, ‘to transmit immediately to the native herd all the qualities that the European live-stock acquired in the four centuries in which ours lived in abandonment and promiscuity’ (Ruffier 1924: 318, *our translation*).

Cattle from India: From Cattle Farming to Beef Industry

The doctor and politician Joaquim Carlos Travassos, in his *Agricultural monographs* (‘Monographias agrícolas’), of 1903, criticises the introduction of the Limousine breed, realised by the Government of the State of Bahia, because he believed that ‘in no sense this breed, like any other from the opposite climate, could acclimate itself in the scalding climate’

of that state of the Northeast of Brazil (Travassos 1903: 213, *our translation*). Joaquim Carlos Travassos is considered to be a precursor in the defence of the introduction of the Zebu breeds into Brazil, being the ‘first Brazilian zootechnician to describe meticulously the Zebu and its role in the agriculture of the great Asian nation’ (Santiago 1985: 117, *our translation*). At first, he was cautious about this breed for fear of its ferociousness, but one fact changed his opinion. In his own words (Travassos 1903: 257, *our translation, italics in original*):

[c]onvinced as we were, and still are, of the impossibility of acclimation of the good European bovine breeds enhanced to improve our indigenous breeds, above all in warm regions so contrary to the zones in which they originated, and already disheartened, our only solution was to appeal to *selection*, always time-consuming and difficult in a country in which the elements of zootechnic science are unknown, when a friend, Mr Coronel João Alves Brito, former federal deputy, who is, perhaps, the only Brazilian subscriber to the *Tropical Agriculturist* of Ceylan, which is undisputedly the best journal of tropical agriculture published in the world, and who has the complete collection since the first edition, showed us a series of published articles from that Journal, about the breeding farm founded and kept by the government of Ceylan, in Colombo, which has yielded the best results. It surprised us that, being the workers of Ceylan and its government English, and being, above all, the farm manager a professional hired in England, they had not, nonetheless, introduced there just one sample of the infamous English breeds and that they had only populated it with *Indian cattle*.

He became a scholar of the Zebu breeds, researched a vast bibliography in India and England on the matter, disseminating the results of his research in an article in the *Journal of Commerce* (‘Jornal do Commercio’) under the title, ‘The problem of breeding resolved’ (‘O problema da criação resolvido’), ‘which was fully and enthusiastically received by a large number of breeders in the State of Minas Gerais and by the government itself of the State of Bahia, who promptly went to the Crashiey house requiring detailed information in order to acquire reproducers for their pastoral establishments’ (Travassos 1903: 259, *our translation*). In his book, Travassos (*ibid.*: 258–59) emphasises that his studies resulted in the...

knowledge of the existence, in India, of countless breeds of cattle, some of which of great weight and good production of milk, breeds which, although

not able to rival the European, improved for over a century, in esthetic beauty, in meat and milk, have for us the immense advantage of rusticity and, by the more or less identical climatic conditions, found almost naturally acclimated in the country, able perfectly to resist to the parasitic persecutors, such as ticks, fleas, flies and other pests existent in the tropics, which does not occur with the European breeds that, save in the extreme south and high altitudes, do not acclimate in our country.

Zebu cattle had already been introduced in Brazil in the first half of the nineteenth century. According to Barbosa da Silva (1947: 128):

[i]t is said in Bahia that having entered that port an English ship, for reasons not well explained this ship was put up for auction, with all its cargo, for the payment of debt. In that auction also appeared a couple of Zebus coming from the Malabar Coast, that also became part of the auction, being acquired by a cattle breeder. (Barbosa da Silva 1947: 128)

This cattle, originated in the environs of the Portuguese trading posts of Damão and Goa, became known as ‘Malabar’, a designation still in use today. They were also brought from that country to Rio de Janeiro to be used as service animals: in 1839, Carlos Augusto Taunay (2001: 265, *our translation*) had already affirmed that:

[t]he ox from India (*Bos indicus*), transported here, has been producing by its union with the European breed (*Bos taurus*), already naturalized amongst us for a long while, this courageous and very beautiful breed, with edges so smooth and regular, and a sleek look, whose pairs are frequently found in town.

It was, however, in the last decades of the nineteenth century that several imports of Zebu cattle occurred, especially the Ongole and Guzerate breeds, via Brazilian, English, and German importing firms based in Rio de Janeiro, then the capital of the country, when even a couple of Zebu was acquired, in 1875, from the London Zoo (Santiago 1985). This province was primarily dedicated, at the time, to agriculture, especially to the cultivation of coffee, such that the breeding of Zebu became restricted to a few farms, although it was from these that the breeds were introduced into Brazil’s Central Highlands, where cattle farming was the predominant activity (Barbosa da Silva

1947, Santiago 1985). According to Valverde (1985: 204–05, *our translation*):

[t]he introduction of Zebu breeds in Central Brazil began in 1875, by the initiative of farmers from the Mineiro Triangle and south Goiás. Amongst them predominate in increasing order of importance: the guzerá, the gir and the nelore. There, the cattle was selected (creating a type considered by some as a new breed: the indubrasil or induberaba), becoming much superior to the cattle from India, for in that country there is no selection, given that the bovines do not have commercial value.

The city of Uberaba, situated in the Mineiro Triangle, was the pioneer in its acquisition, and the ‘huge sums of money spent by farmers from this municipality on cattle of the Zebu breed, gave way to much reporting about this breed in the press of Rio de Janeiro’, according to a group of farmers in a local newspaper in 1893, in response to the criticism received. After describing the unfavourable conditions of the pastures and the climate of the region, they evaluated one by one the so-called ‘national breeds’ and the Dutch, showing the disadvantages of each towards the factors indicated and clarified that: ‘[i]n the Zebu breed, however, we found all the good qualities required, and conforms perfectly to our conditions. It is a beautiful animal, with fine and shiny hair, a regular with milk, very strong for travelling and carts and very heavy’. They affirmed they were ‘true giants, evaluated at 50 arrobas’, ‘it breeds in an admirable manner’, ‘its meat is excellent...chosen as a luxury object for aristocratic banquets. The flea does not persecute it, nor do the mosquitoes bother it’. The authors conclude the article affirming: ‘[i]t is, therefore, the breed that suits us’ (Cunha et al. 1893: 275, *our translation*).

In a few decades, that region, in particular the city of Uberaba, became the radiating centre of Zebu cattle to the whole of Brazil. In 1913, the municipality exported ‘annually 10,000 heads of reproducers to the States of Goiás, Mato Grosso, São Paulo, Paraná, Santa Catarina, Bahia, Sergipe, and ultimately Pará and other towns in Minas’ (Brasil 1918: 498, *our translation*). Ten years later, Brazil already exported Nelore and Guzerá reproducers to Mexico and later on, many of them were taken to the United States. The selling of reproducers repeated itself, above all, from the 1940s onwards, not only to several countries in the continent, but also to Africa (Santiago 1985).

The growing interest in this cattle and its constant valorization impelled breeders and merchants to organize journeys to India to fetch the Zebu from its native land. From 1893, truly epic journeys were made to bring dozens of heads of cattle, to the point that, in 1906, an expedition was organised by the *Journal of the Agriculturalists* ('Jornal dos Agricultores'), in which its subscribers could contribute to acquire a minimum of 50 reproducers (Santaigo 1985). Until the final prohibition, by the Brazilian government, of the importation of cattle from India, in 1962, around six thousand heads of Zebu had been brought over, notwithstanding the prior suspension of imports between 1930 and 1950.

Fernand Ruffier (1924) states that the prices paid for bulls and cows of this breed caused astonishment when compared to the prices paid in India and the costs of travel, which could reach 50 times higher. However, he reckoned, when calculating the results obtained, with a good reproducer, in terms of calves, the profit was 40 to 70 per cent of the capital invested. He went on to recommend (Ruffier 1924: 351, *our translation*):

[f]or those who wish to make purchases directly, we say that there occur, in India, regular cattle fairs, in each province, as well as regional fairs in almost every village. The most important fairs are those of Amritsar, Lyallpur, Sonepur, Sitatnarhi, Agar [sic], Batesar, etc. There is not, however, regular export trade, as this has happens in England, and direct purchases are impossible because of the thousand religious superstitions of the Hindus. Those who wish to make purchases, therefore, should do it through reliable agents that walk the fairs (the local fairs happen monthly, in certain regions, weekly).

These imports were more of an initiative of the big producers of Uberaba and other regions than a public policy oriented towards improving the herds. On the contrary, as Orlando Valverde observed, the 'attitude of the Triangle farmers won the fierce opposition of theoretical agronomists and veterinarians, especially of the Ministry of Agriculture' (Valverde 1985: 205, *our translation*).

José Mendonça (1974), in his *History of Uberaba* ('História de Uberaba'), highlights that the Zebu suffered, at that moment, 'a tough and severe campaign', led, in particular, by the great advocate of the Caracú cattle, the

illustrius [sic] Mr Dr Luís Pereira Barreto, man of righteous prestige in the intellectual and scientific world of our fatherland, doctor, positivist

philosopher and sociologist. Through the press and the courts, in speeches and conferences, he took to the extreme the fight against the Indian cattle.

José Mendonça affirmed that ‘the Zebu does not possess economic value, because its meat is hard, it is not milk cattle (its production of milk is inferior to that of the European breeds) and it is a rude and savage animal. Furthermore, the meat is musky’. This campaign influenced ‘a number of farmers and even the governmental spheres of the country’ (Mendonça 1974: 152, *our translation*), to the point of the cattle not being accepted in some exhibitions.

Urbino de Sousa Vianna, advocate of the Currealeiro breed, considered the Zebu as a ‘detestable product introduced by ignorance and maintained by commercial greed’ (Vianna 1916: 215). In his *Historical monograph of Montes Claros* (‘Monographia histórica de Montes Claros’), dated 1916, he was already claiming that the ‘Zebu, unfortunately, invaded the municipality by the awful direction that the industry took since the beginning; but as the reproducers introduced were half breeds, the degeneration came faster than it should have, and the discrediting of the breed occurred by itself’ (Vianna 1916: 235, *our translation*). Weighty opinions, such as of Eduardo Cotrim, also were expressed against the introduction of this cattle, regarding it temporary ‘until the painful experience of time proves to our breeders, who became fanatical over this Hindu idol, existent in India for centuries and always incapable of improvement, how harmful, for Brazilian breeding, was its importation’. And he simply omitted these breeds in his book, affirming that ‘we will not consider other than the breeds or groups of animals descendents of *Bos taurus*, which is the domestic ox of western civilisation, to which we belong by origin, by nature and by customs’ (Cotrim 1913: 135, *our translation*).

This debate, as can be seen, at certain moments exited the zootechnic sphere to gain political and cultural dimensions: Álvaro da Silveira, in 1922, considered this a prejudice against Indian cattle, because ‘if the Zebu were European, certainly there would be less iniquitous yelling in its respect’ (Silveira 1922: 427, *our translation*). Ezequiel Ubatuba, in 1916, agreeing with him in a conference at the National Society of Agriculture, suggestively entitled, ‘The *sertão* and cattle raising: the economic role of Zebu cattle’ (‘O *sertão* e a pecuária: papel economico do gado Zebu’), spoke of the ‘hatred against this poor breed’ and compared it to the *caboclo* and the African slave, who made a ‘monumental work of cutting down the

forests, where today endless views of green seas of coffee can be seen, which enrich us' (Ubatuba 1916: 41, *our translation*):

The Zebu is among cattle what the poor negro was among men: '*jack-of-all-trades*' ['*pau para toda obra*']. The Zebu walks in front, exerts himself in the carrascal, the catinga, the macegal, the capões, the woods, the forests, gets lost in the marsh, the swamps, the spaces in between and reappears further on, strong, healthy, happy and without any impairment!

African Grass Takes Root in Brazilian Soil

It is possible to identify a similar controversy in that period regarding the formation of pastures and the preference for forage species in Brazil. Lyrio Ferdinand (1893: 126) calls 'true patriots' the Brazilians that 'sacrificed their capital and labour in the cultivation of foreign and better quality forage'. Eduardo Cotrim, after visiting Argentina as part of his study, highlights the improvement in its fields, 'colonized by grass and legumes softer and more appropriate, a transformation that took place almost with the tread of the cattle themselves and the occasional intervention of seeds of new species and grasses and clovers of European origin' (Cotrim cited in Brito 1918: 4, *our translation*). In his book of 1913, after presenting various species employed in natural and artificial fields, a detailed analysis of alfalfa is given, inasmuch as he considered that 'amongst the plants that produce hay and that are especially cultivated for that, none presents more interest than the *alfalfa*, *lucerne* or *medicago sativa*' (Cotrim 1913: 113). It originates in southwest Asia, was first grown in Persia, from where it was taken to Greece and, later, introduced in Italy and Spain by the Moors. Its name, in Arabic, means 'the best food', being regarded as the 'queen of the forage plants', by the array of qualities that distinguish it from the others (Otero 1961).

The Government of the State of Minas Gerais carried out successful research with this leguminous plant at the beginning of the twentieth century, in Pedro Leopoldo and on the laboratory field and model farm of Gamelleira, in Belo Horizonte (Jacob 1911). Later, in 1924, it distributed '16,200 kilos of alfalfa seeds partly gratuitously and partly by sale' (Silveria 1926: 332, *our translation*).

Its introduction, together with other foreign plants, in Brazil, was also criticised by some scholars of the time, amongst them Joaquim Carlos Travassos (1903: 51, *our translation*), the pioneer in the defence of the Zebu, in his *Agricultural monographs* ('Monographias agrícolas') says:

[i]t was only after persevering work on all this exotic forage, and the comparative study with national forage, that we realized that we were in the position of the *rich*, the millionaire, extending a hand to the poor, begging for charity, but the vice which is in us, Brazilians, of supposing that all that we possess is no good, that something is good only if it comes from abroad, drove us to these studies, which were not a waste.

This position ended up prevailing and more recent works concluded that the leguminous plant, due to adverse climatic conditions, soil, *etc.*, remained restricted to the states of the South Region of Brazil (Otero 1961). Several grasses that Joaquim Carlos Travassos calls 'national forage', as he himself admits in some cases, originated in Africa and were, for long, acclimated in Brazil, appearing in different studies from the period as 'native'. However, as Valverde (1985: 202, *our translation*) noted,

the greasy grass or molasses grass (*Melinis minutiflora*, Beauv.) was introduced to Brazil before 1812; the slender Guinea grass (*Panicum maximum*, Jacq.) arrived here before 1820; the para grass (*Brachiaria mutica*, (Forsk.) Stapf) came before 1823, and the jaragua grass (*Hyparrhenia rufa*, (Nees) Stapf) could already be found here in 1829.

There is doubt whether the introduction of these species was the work of chance or the result of the intentional action of some individuals who noted its capacity to sustain large mammals native to the African continent and would be, as such, part of the exchange between Brazil and Africa, including an intense trade in slaves and various goods, whereby many species ended up crossing the Atlantic both ways. Summarizing existing research on the matter, Araujo *et al.* (2008) conclude that the introduction of the slender Guinea grass is not precisely dated, possibly having been transported along with African slaves, in the beds used in the slave ships, establishing itself naturally in the places where the ships unloaded, thereafter being disseminated by the wind, birds, and humans. 'Once in Brazil,

it spreaded and adapted itself so well that, today, it is regarded as native to many regions of the country' (*ibid.*: 65, *our translation*).

The French botanist Saint-Hilaire, in a visit to the Brazilian province of Minas Gerais in 1817, observed that, according to information obtained, the greasy grass would have been brought 50 years earlier, by 'a religious man who, in service to the country, brought this grass as fodder, being that, for a long time, it was named the grass of Frei Luís, after this religious man' (Saint-Hilaire 1975: 91). Another European traveller, Gardner, noted, 20 years later, its proliferation through the countryside of Minas and, just like Saint-Hilaire himself, defended another possibility regarding its expansion: 'the seeds were evidently brought from this region [east of Minas] by the cattlemen that passed by towards Goiás' (Gardner 1975: 215, *our translation*). Fires and continuous cultivation contributed to the expansion of the greasy grass through degraded areas; Saint-Hilaire noted that in the *sertão* its proliferation was much lesser in comparison to the east of the province, although its presence was observed in that region as well. In the words of Valverde (1985: 202–03),

[a] second batch of African pastures comes later, that is, in the interwar period of the twentieth century, coinciding, therefore, with the pastoral boom of the Central Highlands. Then introduced were: the elephant grass (*Pennisetum purpureum*, Schumach), identified for the first time in Brazil in 1920; the kikuyu grass (*Pennisetum clandestinum*, Höchst), which might have arrived in 1923, and the pangola grass (*Digitaria de cumbens*, Stent.), coming later to Brazil after 1955.

If there are doubts over the intentionality of the introduction of African grasses, in the twentieth century its cultivation became a preoccupation among breeders and scholars. The First National Conference of Cattle Raising, held in 1917, by the National Society of Agriculture, already pointed out the need to create experimental stations for forage plants, as indicated by Dr E.C. Sousa Brito of the School of Higher Education for Agriculture and Veterinary Medicine, author of 'Notes on our main native and planted forage' ('Apontamentos sobre as nossas principais forragens nativas e cultivadas'), edited the following year by the Ministry of Agriculture, Industry and Trade, one of the first specialized publications on the matter. The Agrostology and Animal Feeding Section of the Ministry of Agriculture, through its fields in Deodoro, Rio de Janeiro,

contributed to the experimentation and diffusion of forage species amongst farmers of various Brazilian states in the 1920s and thereafter (Otero 1961). In the first half of the twentieth century, 'Agrostology fields were disseminated by the research institutes and schools of Agriculture in the country'. Nonetheless, 'from the botanic surveys and collection of native species, few positive results could be obtained for the enrichment of useful agrostological flora', surmising that the 'great reserve of tropical/subtropical forage grasses is located in Africa and it was in that continent that originated the totality of species that populate our planted pastures in the tropical/subtropical regions' (Rocha 1988: 14).

A real 'agrostological revolution' occurred in the 1960s, with the '*Brachiaria* genus, initially represented by *B. decumbens* from Pará', in the North Region of Brazil, 'a species that, at first, was destined for the poor soils of the savannah areas, then began to be used indistinctly in various types of land', becoming one of the grasses with the longest success in national cattle farming. 'The success obtained with *B. decumbens* produced, obviously, a search for new species and (or) ecotypes in African soil, introducing: *B. ruziziensis*, *B. humidicola*, *B. brizantha* e *B. arreata*' (Rocha 1988: 21).

The introduction of these forage plants contributed, between 1950 and 1980, to an increase in the animal population in Brazil from 0.41 to 0.72 animals per hectare, or 1.75 times. The bovine herd increased by 2.75 times, certainly based on the expansion of the planted pasture areas by 4.29 times in the same period, while the growth factor for the natural pastures was just 1.15 (Rocha 1988). Between 1980 and 2006, the date of the latest Agricultural Census in Brazil, the area of natural pastures was reduced by half, while planted pastures grew 1.67 times. The total area of pastures accounts for around 75 per cent of the surface occupied by agriculture and cattle farming in Brazil, putting the country in fourth place in the world scenario, after China, Australia and the United States, where a large part of the pastures is native, situated in desert areas.

The breeding of beef cattle is the agricultural activity that involves the greatest number of establishments in Brazil (1,572,301), more than half of them specialized in this production, which is concentrated, as already pointed out, in properties above 500 hectares. These represent 1.9 per cent of the total rural establishments, but own 55.6 per cent of the whole of the occupied areas, demonstrating a highly concentrated land ownership structure.

American Wire Encloses Brazilian Latifundia

The expansion of the beef industry during the twentieth century contributed decisively to aggravate land concentration in Brazil and the introduction of the wire was a decisive enabling factor in this process. Traditionally, the fences in Brazil, as in other parts of the world, aimed to protect the cultivated areas from the entry of herbivores, among them, beef cattle itself. Thus, making use of the trees produced by the clearing of forests, the farms were enclosed with wood, in different shapes, but could also be enclosed by trenches, stone walls, hedges, and, more recently, by straight or barbed wire (Athanasoff 1947). The latter was invented in 1873, and patented the following year in Illinois, in the United States (Burlingame 1942), spreading rapidly to various countries.

Its introduction to Brazil was also marked by controversies involving the same interlocutors as regards the preference for national cattle breeds and the importation of beef cattle and forage from abroad. Eduardo Cotrim (cited in Brito 1918: 5, *our translation*) believed that the investments made in acquiring the wire were of great relevance:

[a]nother important point about the pastoral problem is that which concerns the subdivision of pastures. In this case, the Argentinian breeders have been taking every care in keeping their winter and breeding grounds perfectly closed, employing until now a voluminous amount of capital in pastures and wire, which constitute their endless field divisions. With the construction of fences dividing the fields into pens, the work of corralling and inspection of the livestock is facilitated, promiscuity, which is a great inconvenience in breeding cattle, is avoided, and the preparation of the pasture can be done, making way for forage renovation in the pens from where the herd is temporarily removed.

Joaquim Carlos Travassos took a completely opposite position, claiming, in 1903, as American breeders had done in the past, that the barbed wire fence was the ‘most diabolical of inventions’ because it caused wounds on the cattle and then concluded: ‘[t]here is no one who has not regretted using the fences, due to the damages caused’ (Travassos 1903: 108, *our translation*). This position, however, was not shared by other advocates of the introduction of the Zebu breeds, as they believed that the wire was important to enclose the ‘formed pastures’, which should ensure a rapid growth of their herd. They cited examples of success in the

fattening of the cattle using good pastures: a ‘farmer from the town of Araxá carried out an identical experiment and simple half pure cross-breeds after wintering weighed 518 and 519 kilos, in three years; fattening on jaraguá and catingueiro, four months later, they weighed, respectively, 571 and 574 kilos respectively’ (Ubatuba 1916: 34, *our translation*).

The wire was even more important in avoiding the ‘promiscuity’, to which Eduardo Cotrim referred. Although the introduction of the Zebu breeds could only produce beef cattle of larger size through crossing with national breeds, they nevertheless had to be controlled, which was not possible in open areas of common use. This preoccupation with unwanted cross-breeding had already been expressed, in 1916, by Dr Ezequiel Ubatuba (1916: 45, *our translation*), in his defence of the cattle from India:

the employment of cross-breeds is not the single cause of degeneration, in the case of the zebu, as in any other breed. The lack of preponderant elements in any livestock conduces largely to this evil, which is easy to avoid. Among others, that which stands out is the raising of livestock in common on fields totally open, with great loss for the animals and for the breeders. And the reason is the exorbitant price of the wire for fencing in the *sertão*, costing almost three times as much than its real intrinsic value.

Francisco Fortes de Pinho (1957: 9, *our translation*), 41 years later, in his book, *The fences* (‘As cercas’), was still indignant with the high cost of the wire...:

[s]uffice it to say that, in Central Brazil, a roll of barbed wire, with 400 metres, is sold for Cr\$420.00. More than Cr\$1.00 per metre! Considering that, above all, it is necessary to have fences of 10 to 12 cables, for small animals, we can deduce how high would be the amount reached in metres of wire, and its correspondent value in money.

This type of fence, utilised by breeders of small animals, became prohibitive and reinforced the idea of exclusion by the peasants, whether in fencing their herds or guaranteeing the ownership of their lands. They saw themselves prejudiced by the Civil Code, Law No. 3,071, of 1 January 1916, and its later amendments, which determined in article 588, paragraph 3, that ‘[t]he obligation of fencing the properties to maintain within their limits domestic fowl and animals, such as lambs, pigs

and sheep, which demand special fencing, is due exclusively to the proprietors and holders'. Known as 'law of the four wires', it determined in its preceding paragraph that the division of the land should impede only the 'passage of large animals, such as horned cattle, horses and mules', which meant that peasants, as owners of small animals, would have to keep the latter confined, so that they would not eat the crops of their neighbours, while farmers could restrain their herds using only wire fences.

The high cost of wire did not prevent its acquisition by the big Brazilian proprietors: from 1901 to 1923, the country imported 537,468 tons, which would permit the construction of 13,000 kilometres of fence. The great expansion in the use of this resource may also be explained by the new legislation on 'devolved lands' (*terras devolutas*, or public lands that never belonged to an individual), whose administration, after the founding of the Republic, devolved to state governments which thereafter organized their own institutions to manage the measurement, demarcation, concession, and sale of these lands.

The large majority of the lands, especially in the interior of the country, as in the State of Minas Gerais, did not have legal documentation or, when it existed, it was limited to a small part, generally the areas farmed, while the fields and forests, without fences, remained in common use, whether by the big farmers or smallholders. The latter, when looking to regularize their titles, had to bear the costs of measurement and demarcation, as well as the high cost of the wire; thus, as Cabral (1985: 46, *our translation*) notes,

to decrease the costs, they would ask the surveyors to diminish their lands, which would provide the opportunity to others to increase theirs...For this reason, from the 1920s to the 1940s, divisions after divisions were promoted in the whole of the northern region of Minas. (Cabral 1985: 46)

Conclusion

The above changes continued throughout the twentieth century, varying in every region of Brazil, modifying not only the breeds of cattle raised and the system of cattle management, but also the organization of the land. The raising of cattle 'in open fields', known as 'loose' or 'wide', was and in certain areas remains, the traditional system of managing cattle, which is

articulated in a complementary way to agricultural production and other activities integral to the social reproduction strategies of many rural families. Many abandoned their communities and migrated to nearby towns or to the metropolitan regions, but some still resist, organising movements of struggle for land and for their way of living. Such a process presents similarities to that discussed by Marx, in chapter 14 of *Capital*, with respect to the expropriation of peasants at the dawn of capitalism, in his famous analysis of primitive accumulation.

The result of such a process in Brazil translates into the Gini Index of land ownership—an indicator of inequality often used to ascertain the degree of concentration ranging from 0 to 1, whereby the closer to 1, the higher the inequality of distribution. In 1920, it was 0.804, rising until reaching 0.850 in the 1970s (Pereira 1984), thereafter remaining relatively stable around 0.854, according to the latest Agricultural Census (IBGE 2007). As such, Brazil's land concentration is classified as 'strong' to 'very strong' (0.701 to 0.900), as formulated by Câmara (cited in Alcantara Filho & Fontes 2009), but approximating the level of 'very strong' to 'absolute' (0.901 to 1.000).

Brazil obtained great prominence in the world market as a producer of meat, as well as grains, to rival the 'Neo-Europes', identified by Alfred Crosby as 'the bread basket of the world'. However, it must be emphasised that, already in 1980, while some of these countries presented a land concentration classified as 'medium', with a maximum Gini coefficient of 0.400 (Canada, United States, Australia, and New Zealand), or 'strong', with a maximum of 0.500 (Argentina and Uruguay), Brazil already had much higher figures (Pereira 1984).

The so-called 'conservative modernisation' of Brazilian agriculture, promoted, above all, in the period of the Military Dictatorship (1964–85), represented a break with the prior project of rural development through land reform. After re-democratisation, the politics of land, which developed under intense pressure from social movements, with occupations of farms and public buildings, has been marked by piecemeal land distribution through the creation of settlements in areas of greater conflict, without altering, nonetheless, the grave state of concentration of rural property. Meanwhile, agricultural policy continues to favour agribusiness, based on large farms and production for export, in detriment of millions of peasants and landless workers, who struggle for agrarian reform and for government action in support of their own production.

Yet, family-based agriculture in Brazil constitutes 84.4 per cent of the rural establishments and even with one-fourth of the land, employs around three-quarters of the rural workforce, is responsible for 40 per cent of agricultural production and holds 30 per cent of the beef herd (DIEESE 2011), as well impacting less on the environment. Under such unequal land distribution, there occurred, just in 2010, 1,186 conflicts, involving 559,404 people (DIEESE 2011). This was yet another year of a historic series of conflicts over land, in which indigenous peoples, quilombola communities, formed by afrodescendants and peasants, resisted against the threats of expulsion from their lands. Also, in many of these conflicts, the big farmers, as is common, have let their cattle loose to feed on the fields of the peasants, as a way of making it impossible for them to stay on their land.

The cow, in India, is a sacred animal. In Brazil it has become a symbol of power and oppression.

Note

1. Translated from original title: 'O boi ou tratado completo sobre a criação, engorda, reprodução, melhoramentos, cruzamento, selecção e regimen alimentar do gado vaccum'.

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