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LOW CARBON BRAZILIAN BEEF PLATFORM

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INTRODUCTION

Emissions of greenhouse gases (GHG) in the world have been of great concern to the scientific community. Emissions of gases, mainly from carbon dioxide, nitrous oxide and methane, are considered agents that drive climate change. Global organizations, such as the UN, through the IPCC, have called attention to precautions and proposed targets to minimize these emissions. Several global colloquia have brought together countries to debate the issue and propose emission reduction targets, especially regarding more industrialized and developing countries.

The ranking of the countries that emit the most presents China and the USA as the largest emitters of GHG, with Brazil in 6th place (1420.58 Mt CO₂e, 2018), when considering the changes in the use of land and forests, represented by deforestation (CLIMATE WATCH, 2021). In Brazil, although agricultural activities represent around 25-27% of total emissions, the estimated enteric fermentation of cattle, derived from agricultural exploitation, represents around 60% and changes in land use values close to 45% of the total of agriculture and livestock, respectively (SEEG, 2021). A great effort has been made to reduce the rate of deforestation in recent years, but it still needs several steps in the legal and operational field to achieve better results.

In view of the continental dimensions of Brazil, and the vastness of the area occupied by pastures and the respective agricultural exploitation, with a contingent of more than 200 million head of cattle, actions in this area are a priority in order to improve production efficiency, with lower emissions per unit of product to be consumed and guarantee of sustainable production.

In this sense, since 2010, with the launch of the ABC Plan (Brazilian Low Carbon Agriculture Plan), by the Ministry of Agriculture, Livestock and Food Supply (MAPA), Brazil has been taking initiatives through public policies, and financial support to producers, who encourage agricultural production in six lines of action. These aim at reducing and or mitigating GHG emissions and include six main activities: the recovery of degraded pastures, the use of crop-livestock and crop-livestock-forestry integrated systems, no-till systems, biological nitrogen fixation, and treatment of residues from animals (ALMEIDA et al., 2012).

As the Plan progressed, and the Paris Agreement in 2015, goals were proposed for territorial areas to be reached and the number of GHG that could be mitigated with the implementation of the ABC Plan. It was estimated that by 2020 these areas should reach about 35.5 M ha and the corresponding mitigation of 133 to 163 Mg CO₂e. However, according to MAPA data, between 2010 and 2018, these technologies were adopted in 52 M ha and mitigated approximately 170 Mg CO₂e, exceeding the target by 15%.

At the time of the execution of the ABC Plan, initiatives in the research area and even in the private sector were stimulated with the objective of proposing the so-called concept brands, with specific,

auditable and certifiable characteristics of agricultural production, which in addition to being in accordance with the rules general aspects of the ABC Plan, could create specific niches for meat production with low carbon emissions.

History of the Low Carbon Brazilian Beef Platform

In the context of global demand for quality products from more efficient, productive agricultural systems and with less environmental impact, associated with the theme of GHG, the Brazilian Agricultural Research Corporation (Embrapa) has been developing protocols for livestock products that attest by means of validated indicators through scientific research, which were the result of systems with mitigation or even neutralization of the GHGs issued. Thus, the brands Carbon Neutral Brazilian Beef - CNBB (ALVES et al., 2015) and Low Carbon Brazilian Beef - LCBB (ALMEIDA; ALVES, 2020) emerged, the first in the world, which triggered initiatives from other countries.

In 2011, Embrapa proposed a major national research project called the Pecus Research Network (<http://www.cppse.embrapa.br/redepecus/>), whose objective was to deepen knowledge and develop technologies for producing low-carbon meat and milk, as well as establishing methodologies, estimating GHG emission parameters in production of meat and milk under Brazilian conditions. Several research actions of the project made a great contribution to the knowledge of these emissions, whether related to methane in the enteric digestion of cattle, emission of nitrous oxide in pastures, according to different cultural treatments, nitrogen fertilization management, etc. The project generated and expanded the installed capacity of knowledge by researchers and technicians, allowing the formation of a structured base of human and material resources for future work and advances in this area of knowledge.

Carbon Neutral Brazilian Beef

An unprecedented initiative by Embrapa, in 2015, proposed the first concept brand in beef production at the Institution, the so-called Carne Carbono Neutro (CCN) or Carbon Neutral Brazilian Beef (CNBB), which has as main objective the production of beef, in the growing and fattening phases, with the total neutralization of methane emitted by grazing animals. The main focus of neutralization lies in planting trees on pastures, in an organized manner in number and spacing, which allow profitable agricultural exploitation, animal comfort and well-being and logging with different plant species in a sustainable manner (ALVES et al., 2015; ALVES et al., 2017). A detailed, auditable and certifiable protocol has been proposed for this purpose. Several Technological Reference Units have been implemented in different locations in the country (ALMEIDA et al., 2016; GONTIJO NETO et al., 2018; ALMEIDA et al., 2019; BORGHI et al., 2020; NOGUEIRA et al., 2020; SILVA et al., 2021) and farms are already starting to enroll in the program, in partnership with national slaughterhouses, in order to obtain a special production seal of the so-called CNBB/LCBB. The CNBB seal was launched in the Brazilian market in 2020, by Marfrig Global Foods, and the certification program is available (<http://ranimal.cnabrasil.org.br/>), as well as, some socioeconomic studies (PEREIRA et al., 2019; ZANASI et al., 2020; SPERS et al., 2021).

Low Carbon Brazilian Beef

This concept brand began its studies in 2018, pioneered by Embrapa, with the participation of dozens of researchers from more than 14 Research Centers in its national network. It is expected that, after the launch of its general guidelines in 2020 (ALMEIDA; ALVES, 2020), the publication in the second semester of 2021, of the requirements for certification at the field level, in order to allow the enrollment of producers in the program, aiming at obtaining the respective concept brand seal. The main objective of this brand is to allow producers of beef cattle to be reared and fattened, comply with a series of legal requirements, good agricultural practices, and reach levels that allow the mitigation, even if partial, of the methane emitted by the cattle. Once the main requirements are met, the main focus is on carbon sequestration in the soil, which must be maintained in ranges considered

adequate, both in terms of content and in stock. The objective is to maintain standards of carbon and soil quality above degraded pasture areas, and even areas with native vegetation, providing in addition to improving soil quality, the maintenance of agricultural production in a sustainable manner. The first results of the protocol validation and socioeconomic studies were presented at this Congress (PEREIRA et al., 2021; SILVEIRA et al., 2021).

Native Carbon

The protocol for the beef production of Carbono Nativo or Native Carbon started in 2019 by Embrapa and is still being concluded. The basis for this concept brand is centered on the silvopastoral systems for GHG mitigation, especially the emission of methane, by the introduction of native or existing trees in the pasture. It aims to enhance the natural landscape and the carbon incorporated by trees of native species (MAURO et al., 2020).

Low Carbon Brazilian Beef Platform

Accounting for the carbon footprint, emissions, mitigation, neutralization of GHG in beef production systems is strategic for consumers, producers and governments looking for business opportunities in the context of sustainability, productive efficiency, climate change, environmental impacts, well-being animal health, food security and international credibility.

With the advent of the creation of different brands, the demand for the creation of other concept brands that aim at different stages of agricultural and livestock creation and by-products has been an increasing demand in the expansion of the brands. The need to align these brands with the tax incentive, credit and benefits policies made the creation of a platform that would house all these ideas a necessity (ALVES et al., 2019; VIEIRA et al., 2020).

Thus, the creation of the Low Carbon Platform in the production of beef cattle, an unprecedented Brazilian initiative, is a set of different concept brands formed with the content of application of current environmental legislation and good agricultural practices, and socioeconomically viable in meat production. Agricultural practices must be certified and cover aspects such as: soil, pasture, animal and tree management, which aim to neutralize or mitigate the emission of GHG for sustainable agricultural production. In figure 1, an example of a flowchart operation of the concept brands for beef and attributions of the parties involved is presented.

After this initiative with beef cattle, Embrapa started studies for the development of low carbon protocols for other products, such as soybeans (NEPOMUCENO et al., 2021), milk and coffee.

These initiatives are in line with the new sectorial Plan for adapting to climate change and low carbon emissions in agriculture with a view to sustainable development from 2020 to 2030, called ABC + (BRAZIL, 2021).

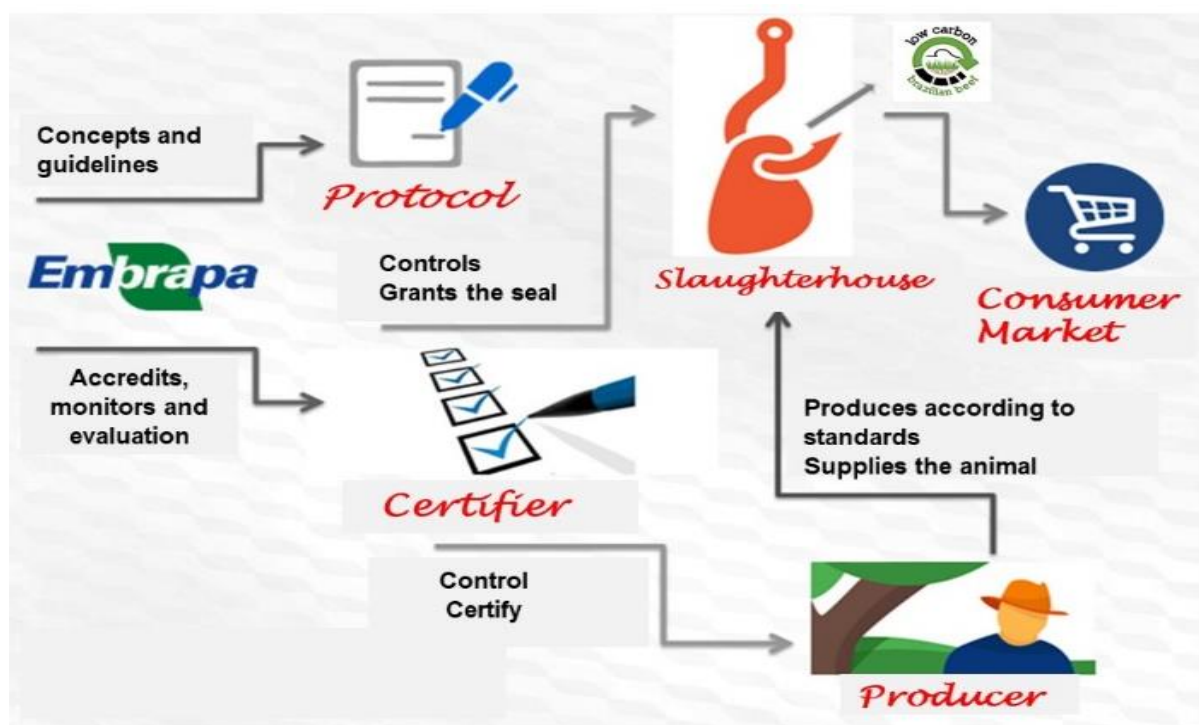


Figure 1. A flowchart operation of the concept brands for beef and attributions of the parties involved.

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