

# Life cycle analysis of animal protein produced in Brazil: carbon footprint impact on the chain

Alexandre Yorikuni Kavati<sup>1</sup>, Claudia Veiga Jardim<sup>1</sup>, Beatriz Cristina Koszka Kiss<sup>2</sup>, Matheus Fernandes<sup>2</sup>

<sup>1</sup> JBS S.A. <sup>2</sup> Center for Sustainability Studies (FGVces) at the São Paulo School of Business Management, Getulio Vargas Foundation (FGV EAESP), Brazil

## INTRODUCTION AND GOALS

JBS is a global leader in the food industry, with 235 thousand employees in more than 20 countries; it owns well-known brands such as Friboi, Seara, Swift, Moy Park, Pilgrim's Pride and Primo and others. As agricultural activities represent a significant portion of Brazil's greenhouse gas emissions (GHG), as they require pasture and grain for feed production, the project's goal was to measure and understand the actual environmental impacts of certain animal protein products and their value chains, incorporating Life Cycle Thinking (LCT), using the Life Cycle Assessment (LCA) technique with a specific Climate Change approach.

## MATERIALS AND METHODS

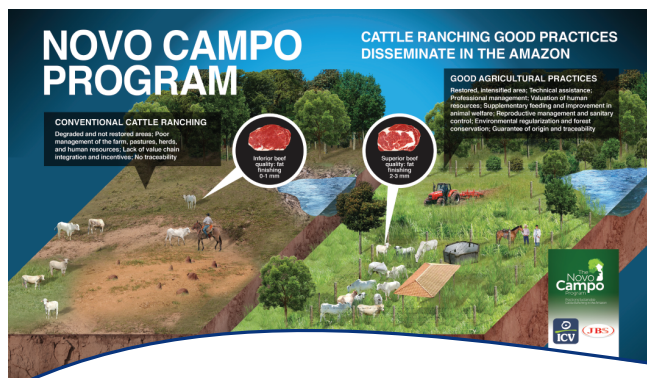
JBS and the Getulio Vargas Foundation's Sustainability Studies Center (GVces) took two of its main products in the Brazilian market and calculated their carbon footprint: the chilled cap of rump ("picanha") and whole frozen chicken (without giblets).

The production processes used to make both products adopt sustainability guidelines. For the cap of rump ("picanha") study, we used a sustainable livestock farming model at farms located at the Brazilian Amazon biome region; the differential was the investment in pasture recovery for cattle production growth. In the whole chicken study, we used an animal-welfare certified production, which uses only vegetable-based feed and does not use antibiotics.



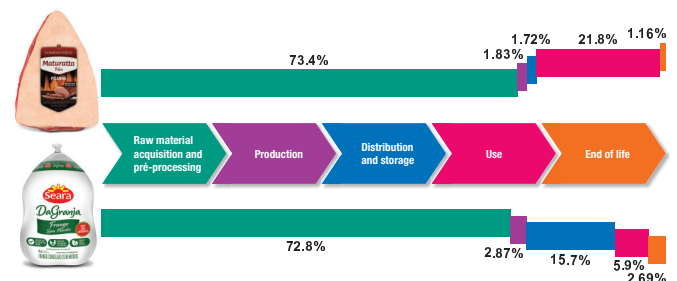
Using the cradle to grave lifecycle approach – presented in ISO 14040 and 14044 (ABNT, 2009a; ABNT, 2009b) and based on ISO 14067 (ISO, 2013), a 1kg cap of rump ("picanha") prepared in a grill and a 2.5kg whole chicken prepared in a gas oven were used as reference flows.

Carbon sinks were not considered in any stage of the process in this study.



## RESULTS AND DISCUSSIONS

The results indicate that the most significant life cycle emission from both products occurs during the 'Acquisition of raw material and pre-processing' phase, with high ratings in the animal and grain production chains. In the **cap of rump ("picanha")** study, 73% of emissions occur during the animal's life (which includes feed production and cattle handling) and 21% during charcoal production, which is used to prepare the food (barbecue). As for the **whole chicken**, 72% of emissions are produced during the grain production stage, used to make feed, with the remainder coming from the industrial, distribution, and preparation and consumption stages.



## CONCLUSION

Emissions measurement and reduction projects carried out by companies without taking into account their own chain's emission can significantly restrict their efforts to achieve a less carbon-intensive economy. A broader emissions picture, based on the life-cycle analysis methodology, makes emission diagnostics more realistic, helping more stakeholders in their search for lower emission products.

Promoting sustainable practices in food supply chains is a key factor in reducing products' carbon footprint. Through these practices, we can achieve a significant reduction in greenhouse gas emissions and reduce the food production chain's environmental impact. Another important step is supply chain engagement, promoting joint actions that stem from hot-spots identified during the LCA study.

The processing industry can be a major agent of change in this process, focusing on product improvement as a whole and benefiting the various stakeholder involved.