LIFE CYCLE ASSESSMENT OF BRAZILIAN LIVESTOCK RESIDUES FOR TWO ENERGETIC STRATEGIES: ELECTRICITY AND BIOMETHANE PRODUCTION

Karina Guedes Cubas do Amaral, Camila Ester Hollas*, Marcela Valles Lange, Martha Mayumi Higarashi, Ricardo L. R. Steinmetz, Leidiane Ferronato Mariani, Vanice Nakano, Alessandro Sanches Pereira, Airton Kunz

*Universidade Estadual do Oeste do Paraná - Brazil
Embrapa Suínos e Aves - Brazil
camila.hollas@gmail.com

Abstract: The global changes promoted in various sectors have reflected mainly in consumption patterns, which has fostered discussions about the future viability of human activities. The growing need for energy is one of the current concerns and allied to waste management, has promoted the adoption of circular approaches to meet these requirements. In this sense, anaerobic digestion, has been the technology used to concomitantly enable waste management, value addition, nutrient recovery, and energy recovery, in favor of the sustainability of production chains. Thus, this study evaluates the environmental viability of different agricultural residues through a life cycle assessment, comparing electricity generation and biomethane as critical pathways to promote decarbonization in the agricultural sector. Based on the results, the two strategies prove to be environmentally favorable for mitigating the environmental impacts caused during waste handling. The scenarios with biomethane production (BP) were shown to be more environmentally favorable compared to the scenarios for electricity generation (EG), with pig farming being the activity with the best results for the mitigation of greenhouse gas emissions (107% EG and 121% BP), followed by beef (104% EG and 108% BP), sheep (103% EG and 106% BP) and dairy (74% EG and 77% BP). This demonstrates the great potential that these residues have and how the appropriate management can ensure the environmental viability of agricultural practices.

Keywords: Waste management, circular economy, atmospheric emissions, waste to energy.

Video presentation