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LCA of a Biologically Detoxified Cottonseed Cake to be Used for Monogastric Nutrition

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Abstract

Cottonseed cake (CSC) has high protein content (above 26%). However, presents restrictions for animals nutrition, due to the presence of toxic compounds, such as gossypol. Detoxification of CSC by biological treatment, using macrofungi, is an innovative process, that makes this biomass suitable for monogastric animal nutrition. Although it provides economic advantages, the process requires water, energy and other inputs. This study aimed to assess potential environmental impacts of a detoxified cottonseed cake (DCSC), seeking for the improvement of the process. The functional unit is 1 kg of DCSC, and the product system includes the transportation of substrates (CSC and sawdust), and all the processes for the detoxification, considered a gate to gate approach. SimaPro 8.5.0.0 was used for the assessment, and LCI based on primary data from a pilot scale, and secondary data from EcoInvent v.3.0. Recipe Midpoint H v.1.01 was applied to assess potential environmental impacts. Higher impacts were observed for the steps of colonization and sterilization of the substrate, for all the considered impact categories considered, due to the use of electric energy. For this study, in order to improve the environmental performance of DCSC, alternative procedures that consume less energy and also water, shall be sought.

Keywords: *LCA, Cottonseed Cake, Monogastric Nutrition*