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Título artículo: An environmental assessment of *Agaricus bisporus* ((J.E.Lange) Imbach) mushroom production systems across Europe.

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RESUMEN: Mushrooms have become a relevant part of our diet globally, as non-animal sources of proteins; but data on their value chain and environmental impact are still scarce. Therefore, a good understanding of the environmental impacts of mushroom production, the environmental hotspots throughout the value chain, comparisons between production systems and regions, and an assessment of the improvement potential of mushroom production is required. This paper carried out a life cycle assessment (LCA) to estimate the environmental impacts of three Agaricus bisporus mushroom production systems in three different European countries: Spain, Poland and Serbia. We found that there is a large variability in the composition of the substrates, which is in all cases a combination of compost (mainly straw and animal manure) topped by casing materials (mainly peat), and a large variability in energy use, substrate use and yields. Especially the Serbian organic dried mushroom case distinguishes from the other conventional fresh mushroom cases. This is also reflected in the life cycle impact assessment results. The composting processes resulted in the largest contribution to environmental impact (about 49.6% on average ranging between 16.4% and 84.4% across all impacts assessed), followed by the electricity production and the casing (respectively 20.3% and 10.3% on average across all systems and impact categories analysed). Thus, optimizing composting and casing production together with switching to renewable energy sources appeared to be the most effective to reduce the overall environmental impacts of mushroom production. This paper provided a comprehensive assessment across Europe which could be further expanded to have a broader and more representative overview of the impact of mushroom production at European level.

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