

## INTRODUCTION



Annual food waste of 88 million tonnes in the European Union (EU) is connected with costs of 143 billion euros [1]. While these discards influence the environment, its revalorisation represents a significant volume of raw substance ready for new production flows and implies decrease of environmental footprint. The objective of this review is to give an overview of published environmental assessments concerning revalorisation of food waste using life-cycle assessment (LCA) approach.

**Table 1. Summary of studies linking environmental impacts of the food waste revalorisation through different treatments**

AUTHORS	COUNTRY	TECHNOLOGY	ENVIRONMENTAL IMPACT
Mu et al. (2017)	United States	L/C	GWP, AP, EP, OLD, POF, FFU, ETP, HH, HTP
Saer et al. (2013)	United States	C	GWP, AP, EP, OLD, POF, FFU, ETP, HH, HTP
Fruergaard and Astrup (2011)	Denmark	I/AD	GWP, AP, EP, POF, ETP, HTP
Khoo et al. (2010)	Singapore	I/AD/C	GWP, AP, EP, POF, EU
Kim and Kim (2010)	South Korea	I/C	GWP
Martínez-Blanco et al. (2010)	Spain	C	GWP, AP, EP, POF, ADP, ODP, EU
Boldrin et al. (2009)	Denmark	C	GWP
Møller et al. (2009)	Denmark	AD	GWP
Cabaraban et al. (2008)	United States	L/C	GWP, AP, EP, POF, HH, EU
Börjesson and Berglund (2007)	Sweden	I/AD/C	GWP, AP, EP, POF
Lee et al. (2007)	South Korea	I/L/C	GWP, AP, EP, HTP

L: Landfill; C: Compost; I: Incineration; AD: Anaerobic digestion; GWP: Global warming potential; AP: Acidification potential; EP: Eutrophication potential; OLD: Ozone layer depletion; POF: Photochemical ozone formation; FFU: Fossil fuel use; ETP: Ecotoxicity potential; HH: Human health; HTP: Human toxicity potential; ODP: Ozone layer depletion; EU: Energy use, ADP: Abiotic depletion potential.

## DISCUSSION



LCA is a tool used for identifying hot spots in the production chain which may give opportunities for lowering environmental impacts while improving efficiency and profitability [2]. Environmental indicators and performance measurements are crucial for preventing the outcomes of unsustainable usage of limited natural resources and LCA is one of the most often used approaches in environmental performance analysis [3]. All studies included in Table 1. have been published in the last ten years and include global warming potential (GWP) as one of evaluated impact categories.

## CONCLUSION



This review revealed environmental potentials used as indicators for estimating environmental performance of the food waste revalorisation process. According to ISO 14040 life-cycle assessment represents the compilation and evaluation of the inputs, outputs and potential environmental impacts of a product system throughout its life cycle and it is a tool for the analysis of the environmental burden of products at all stages in their life cycle [4]. In the future research reviewed studies will be used for comparison with LCA analysis of the food waste revalorisation process associated to the GreenProtein project. LCA methodology that will be used in the GreenProtein project will be based on the standard published by the International Organization for Standardization and it will include: mapping the process (setting the goal), setting scope and boundaries, collecting data, calculations and evaluating the results [4].

## REFERENCES



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