

## ENVIRONMENTAL IMPACT OF GREENWAY BURGER

### *compared with a beef burger*

#### COMPANY NAME:

Greenway

#### PRODUCT NAME:

Greenway Burger

#### LCA METHODOLOGY

The cradle-to-gate (of the manufacturer) LCA study compares a plant-based protein burger with a typical beef burger produced in Belgium. The Greenway Burger is a pea-protein based patty designed to look, cook and taste like fresh ground beef.

The functional unit for this study is defined as one uncooked burger patty (0.120kg). Open LCA software has been used for the modelling. Background material and processes in the model are taken from Ecoinvent 3.3 database.

#### LIFE CYCLE INVENTORY

The product composition was given by Greenway, primary data of the ingredients (including transport, production processes, energy use and waste) was provided by the three suppliers and manufacturing details (energy and water use, transport, packaging and waste) were collected from the suppliers.

#### Streams taken into consideration

Ingredients (including transport & processing)

Energy use

Water use

Waste streams

Transport (inbound & outbound)

Packaging (primary & secondary)



## LIFE CYCLE IMPACT CATEGORIES

Environmental impacts listed below were assessed for the product including raw materials extraction, transport and product manufacturing including packaging and waste.

**FUNCTIONAL UNIT:** 1 burger with the weight of 0.120kg

AIR		ENERGY		WATER	LAND OCCUPATION
<b>GLOBAL WARMING (GWP)</b>	<b>HUMAN TOXICITY (HTPINF)</b>	<b>FOSSIL DEPLETION (FDP)</b>	<b>CUMULATIVE ENERGY DEMAND (CED)</b>	<b>WATER DEPLETION (WDP)</b>	<b>AGRICULTURAL &amp; URBAN LAND OCCUPATION</b>
Climate change can be defined as the change in global temperature caused by the greenhouse effect that the release of "greenhouse gases" by human activity creates.	Human toxicity accounts for the environmental persistence (fate) and accumulation in the human food chain (exposure), and toxicity (effect) of a chemical.	The term fossil fuel refers to a group of resources that contain hydrocarbons. The group ranges from volatile materials (like methane), to liquid petrol, to non-volatile materials (like coal).	Results reported are the sum of non-renewable fossil, nuclear and biomass energy as well as <b>renewable energy</b> of biomass, wind, solar, geothermal and water, which accounts for <b>10%</b> in the case of the Greenway Burger	The factor of water depletion takes besides the amount of fresh water consumption, also the water scarcity (ratio of water withdrawn to water available) in a given region into account.	The land use impact category reflects the damage to ecosystems due to the effects of occupation of land for a certain time. Many production processes, for instance growing a crop, need a certain area of land.
<b>0.1407 kg CO2-eqv</b>	<b>0.0493 kg 1.4 DCB-eqv</b>	<b>0.0429 kg oil-eqv</b>	<b>4.3750 MJ</b>	<b>0.0221 m<sup>3</sup></b>	<b>0.0015 m<sup>2</sup>/year</b>
<b>94% less damageable for climate</b>	<b>88% less damageable for human health</b>	<b>77% less fossil fuel energy intensive</b>	<b>90% less energy intensive</b>	<b>54% causing less water scarcity</b>	<b>96% less land occupation</b>

## Beef burger production LCA

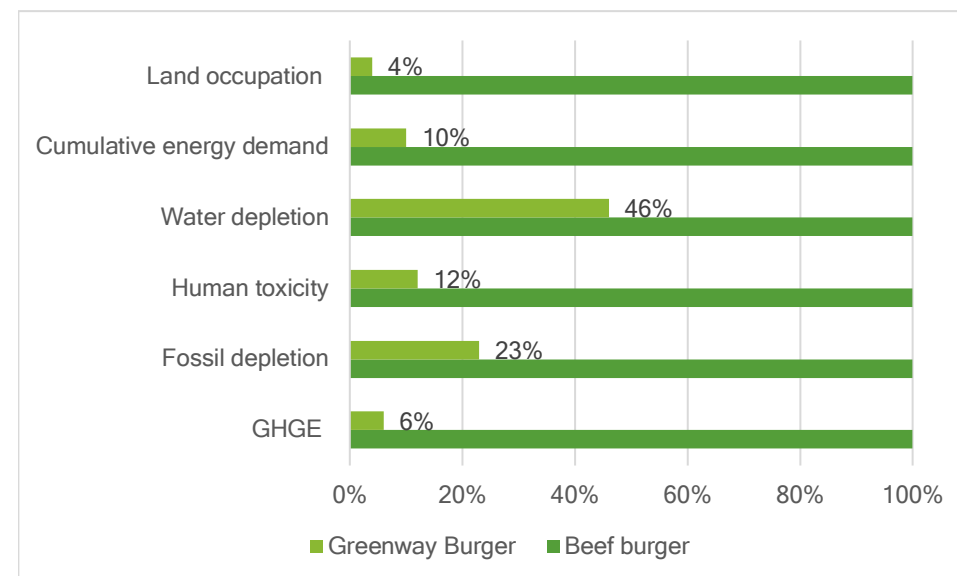
### METHODOLOGY

As for the Greenway burger, this is a cradle-to-gate LCA, which includes the agricultural production, cattle breeding, slaughtering, transport, processing of the meat into burger and the packaging.

In the study the beef originates from dairy operations (co-product of milk industry) which implies a reduced impact than beef from dedicated beef operations because the impacts associated with maintaining and breeding herd are shared between the milk and meat co-products. Typically, the on-farm stages (cattle and feeding) dominate all impact categories. Additional allocation was made in slaughtering, and meat processing between consumable meat and non-consumable parts (bones, fats etc.) from the carcass.

All the data of slaughtering, processing and packaging relies on an existing LCA study of CO2logic, done for a Belgian beef burger producer.

### COMPARISON



## Conclusion

For all impact categories the Greenway Burger has a lower impact than beef burger. Based on the results of the study, the processing of the ingredients, production and packaging of the Greenway burger generates 94% less greenhouse gas emissions, requires 90% less energy, 54% less water and 96% less land use.

If the study would have compared the Greenway Burger with beef from dedicated beef production (meat cows) instead of dairy cows, these differences in environmental impact would be even higher.

The main contributors to the impact of the Greenway Burger are the production and processing of the ingredients with a share of 79-99% of all impacts.

Therefore, Greenway will continue working with their suppliers to continue their efforts to reduce the environmental impact of the Greenway Burger.

## CONTACT INFORMATION



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