



2018 Life Cycle Assessment Report

In 2018 Moving Mountains Foods® commissioned Eaternity, a sustainability analytics organisation, to review the environmental impact of the Moving Mountains® Burger in direct comparison with it's beef counterpart.

The Moving Mountains® Burger is 100% plant-based, contains zero cholesterol and is free-from hormones and antibiotics. It is designed to emulate the taste, texture and satisfaction of a beef burger, while using less land, less water and producing less greenhouse emissions than animal meat.

We decided to work with Eaternity in 2018 due to their reputation in the development of accurate food based Life Cycle Assessments. First developed in 2008, Eaternity's comprehensive LCA database for CO₂eq for food uses state-of-the-art technology to improve the efficiency, scope and accuracy of data collection and calculations. Moving Mountains Foods® received an accurate assessment of The Moving Mountains® Burger's ecological footprint with verified results.

The EDB (Eaternity Database) contains CO₂eq values and unit processes for all the popular food items based on seasonality, farming procedure, transportation, conservation, and processing models.

Eaternity have equally developed a greenhouse model that determines the CO₂eq emissions related to the heating of greenhouses in both, organic and traditional farming. The individual food CO₂eq values are the result of collaborations with scientists from ZHAW – Zurich University of Applied Sciences and Quantis – World Food Database, University of Zürich (UZH), Swiss Federal Institute of Technology in Zurich (ETHZ), Research Institute of Organic Agriculture (FiBL), ecoinvent v3.6, Agribalyse, Agri-footprint, peer-reviewed literature, reports (grey literature), extrapolated; or they are based on research subsequently adjusted to assure comparability.

The EDB is currently the largest and most comprehensive database to carry out CO₂eq calculations for food produce worldwide. The EDB also contains the Eaternity Health and Organic performance. It comprises of nutritional values, water scarcity footprint, and a Health Score for the assessment of the health risk factors of food consumption.

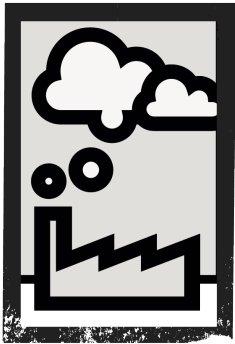
Our 2018 Eaternity Score

The Eaternity Score is the first carbon footprint award for a climate-friendly food future worldwide, and is designed to help consumers make educated decisions about individual diet choices towards their ideal carbon footprint, and their contribution towards freshwater availability, animal welfare, and rainforest protection.

Eaternity calculate and rate products on a 3-star rating system

3 = very good, 2 = good, 1 = critical

The average is based on over 100,000 calculated products, depending on the portion size they are compared fairly.



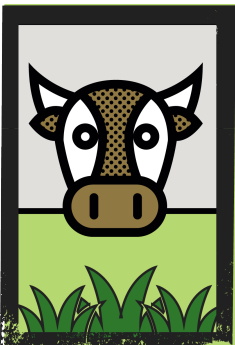
For the **Climate Score** the CO₂ equivalents are given for the whole product with packaging and transport.

Score Rating		Explanation
3-stars:	50% less emissions than average	Is within the limits of a climate-friendly diet.
2-stars:	less than average	Improves our carbon budget.
1-star:	more than average	Worsens our carbon budget.



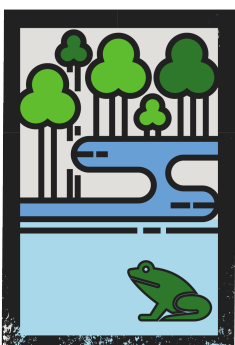
For the **Water Footprint** the scarce water is given in litres for the whole product with packaging and transport.

Score Rating		Explanation
3-stars:	less than average	Very low consumption of scarce water.
2-stars:	reduces our consumption by 50% on average	Is within the limits of a water-saving diet.
1-star:	30% worse than average	Consumes more scarce water than good.



The **Animal Treatment Score** looks at the measures taken to increase animal welfare.

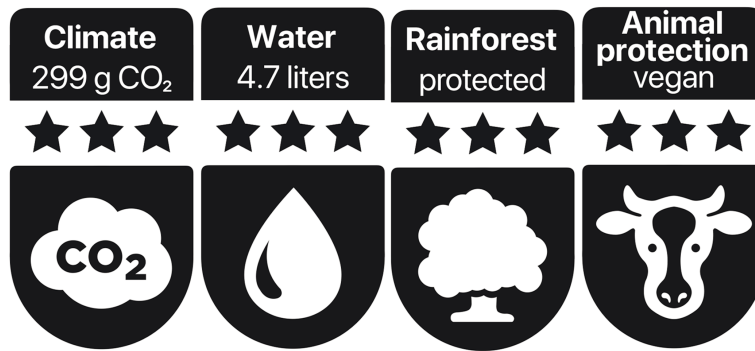
Score Rating	Explanation
3-stars:	No animal based products, or only certified.
2-stars:	Contains certified and non-certified animal based products.
1-star:	Contains animal based products and has no animal welfare certification.



The **Rainforest Score** looks at palm oil and soybean production, including animal feed.

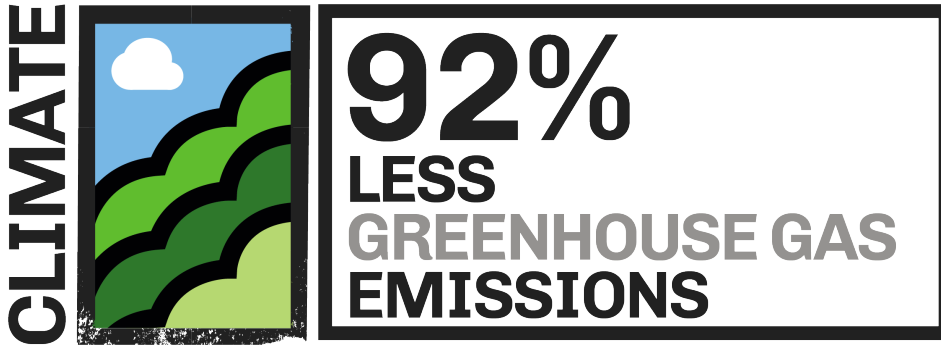
Score Rating	Explanation
3-stars:	No critical products. Only uncritical (from non-rainforest land) or certified.
2-stars:	Contains certified and critical products. Or only certified which do not explicitly protect from deforestation.
1-star:	Contains critical products which destroy the rainforest.

2018 Analysis Results



In 2018 the Moving Mountains® Burger achieved the best rating in all categories that were evaluated. That is 3 stars for climate, water, animal treatment and rainforest protection.

CO₂eq Footprint



The evaluation includes agricultural production, primary processing and production of all raw materials, transport, manufacturing of the burger, storage, distribution and packaging disposal.

The main impact comes from the raw materials. The relative contributions of the different steps are as follows:

- 47.5% raw material production (agriculture and processed ingredients)
- 24.7% burger production
- 20% transport
- 7% packaging
- 0.8% storage

From the raw materials coconut oil and soy protein contribute 37% and 23%, respectively, with mushrooms contributing 19% of the footprint of the raw materials. Overall the raw materials used to produce the Moving Mountains® Burger cause 63% less emissions than what is consumed on average and therefore is within the goal of a climate friendly food future.

The main impact from the Moving Mountains® Burger manufacturing is electricity consumption and gas used for heating (55.8% and 28.7%).

Transport emissions are dominated by refrigerated transport from the factory to the frozen storage site and from the distribution centre into the UK (almost 75%). Average distribution in the UK was calculated at 300 miles.

The comparison was calculated with the following UK beef production mix as "beef meat general":

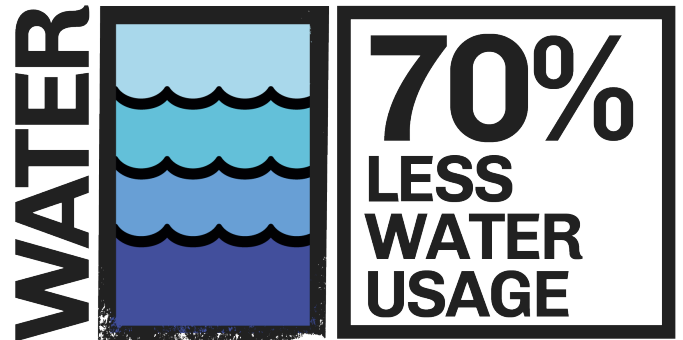
- 50% of beef meat comes from the dairy herd (Agricultural and horticultural development board, 2017)
- 3.3% of cattle is organic (Defra, 2018)

In direct comparison the Moving Mountains® Burger has a 92% lower CO₂ footprint than an average piece of beef meat.

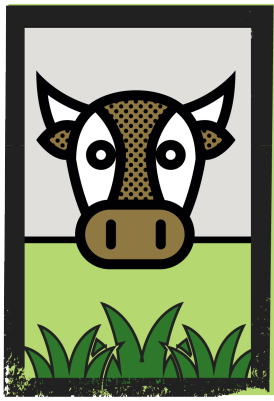
Furthermore, less scarce water is used to produce the Moving Mountains® Burger. The scarce water footprint is 70% lower when compared to an average piece of beef meat.

Waterfootprint

In total, the raw materials of the Moving Mountain Burger use 69% less scarce water compared to average consumption. This is positive and within the goal of reducing our scarce water footprint by half.



Animal Treatment

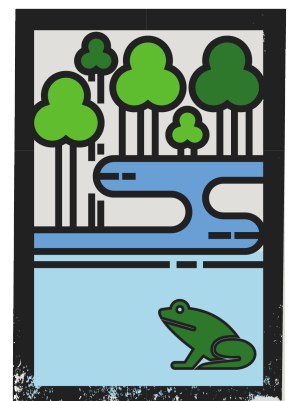


HIGH ANIMAL WELFARE

Since no animal products were used the Moving Mountains® Burger has achieved a 3 star rating.

Rainforest

No critical raw materials were used. Coconut trees grow mainly on sandy and poor soils and are not linked to heavy deforestation in most locations. Therefore, the product achieved a 3-star rating.



LESS RAINFOREST DESTRUCTION

Moving Mountains® Burger – Eaternity Score

Product	CO ₂ eq (g)	Climate Rating	Scarce Water (L)	Water Rating	Animal Treatment	Animal Treatment Rating	Rainforest	Rainforest Rating
Moving Mountains® Burger – 1 piece (113g)	299	3 stars	4.7	3 stars	Vegan	3 stars	No critical ingredients	3 stars
Moving Mountains® Burger – 20 pieces	5988	3 stars	94	3 stars	Vegan	3 stars	No critical ingredients	3 stars

Comparison Moving Mountains® Burger vs Beef

Product	CO ₂ eq (g)	Climate Rating	Scarce Water (L)	Water Rating	Animal Treatment	Animal Treatment Rating	Rainforest	Rainforest Rating
Moving Mountains® Burger – 1 piece (113g)	299	3 stars	4.7	3 stars	Vegan	3 stars	Protected	3 stars
Beef meat general (113g) UK representative production mix	3842	1 star	16	1 star	Uncertified	1 star	Uncertified soy may be used	1 star

Direct Comparison with Beef meat general

Product	CO ₂ eq Less (g)	CO ₂ eq Better (%)	Scarce Water Less (L)	Better Waterfootprint (%)
Moving Mountains® Burger – 1 piece (113g)	-3543	92	11	70

Comparison with average food consumption (based on ingredients only)

Product	% CO ₂	% Water
Moving Mountains® Burger – 1 piece (113g)	63% less emissions	69% less scarce water
Beef meat general (113g) UK representative production mix	601% more emissions	17% more scarce water

Comparison Moving Mountains® Burger with Beef patty UK

Inputs	Amount	Reference
% organic cattle	3.3%	Defra, 2018 for UK
% conventional cattle	97%	Calculated
% beef from dairy cows	50%	Agricultural and horticultural development board 2017 (England)
% beef from suckler cows	50%	Calculated
Product	Amount	Unit
Meat from dairy herd	27.56	Kg CO ₂ eq
Meat from dairy herd, organic	24.5	Kg CO ₂ eq
Meat from suckler cow herd	39.51	Kg CO ₂ eq
Meat from suckler cow herd, organic	70.84	Kg CO ₂ eq
		Kg CO ₂ eq
Average beef meat production UK	34.001455	Kg CO ₂ eq
Average beef meat production UK if organic is only suckler cow	34.766065	Kg CO ₂ eq
Product	Amount	Unit
Live weight dairy herd	12.37	Kg CO ₂ eq
Live weight dairy herd, organic	10.9	Kg CO ₂ eq
Live weight suckler cow herd	18.27	Kg CO ₂ eq
Live weight suckler cow herd, organic	29.53	Kg CO ₂ eq
		Kg CO ₂ eq
Average live weight cattle UK	15.48	Kg CO ₂ eq
Allocation minced meat UK	18.92	Kg CO ₂ eq
Product per 113g	CO ₂ (g)	% worse than average
Beef meat ZHAW	1925.00	301%
Beef meat UK Quantis	3842.16	601%

Scarce water

	m3/Kg	L/Kg	Region
Beef without bones	0.14	140.00	GB

**** Disclaimer-** Moving Mountains Foods LTD conducted this LCA with Eaternity in 2018. We are no longer affiliated with Eaternity and therefore Eaternity cannot be held accountable for the accuracy of these results, since the official LCA in 2018. Ingredients and processes used in the manufacture of Moving Mountains Burgers may have changed during this time. However, Moving Mountains Foods LTD remains firmly committed to reducing its environmental impact.**