TECHNICAL SUMMARY: LIFE CYCLE ASSESSMENT RESULTS FOR UK**
Smug Dairy Blended Oat & Dairy Cheddar Block
Date of assessment: 15/11/2023

Kerry Group partnered with HowGood in 2023 to perform a **cradle-to-manufacturing gate analysis** of our **Smug Dairy** products in the UK. This allowed us to assess the environmental impact of our products and compare them to dairy equivalents sold in the UK.

This is the Technical Summary accompanying the study. It provides details on the methodology, scope of analysis, and data sources used to support the claims made on our packaging.

ABOUT HOW GOOD: (Taken from HowGood published material)

HowGood is an independent research company with the world's largest database on food product sustainability. With data and analysis for more than 33,000 ingredients, chemicals, and materials, HowGood helps leading food brands, retailers and investors improve their environmental and social impact. HowGood data powers strategic decision-making for the sourcing, manufacturing, merchandising, and marketing of sustainable products. Visit howgood.com for more information.

PRODUCT SPECIFICATIONS
This fact sheet contains information and results that are applicable only to the following products:

- Product: Smug Dairy Blended Oat & Dairy Cheddar Block
- Market: United Kingdom
- Product format (grams): 320g

ON-PACK CARBON LABEL

45% less C02e/kg then standard cheddar assessed from farm to pack (cradle to manufacturing gate)
**2023 life cycle assessment; farm to pack comparing Smug Blended Oat & Dairy Cheddar and standard British Cheddar.

COMPARATIVE RESULTS

What is Smug Blended Oat & Dairy Cheddar Block being compared to?
Standard British Cheddar

What unit is it being used for the comparison?
1 kg of Smug Blended Oat & Dairy Cheddar Block

	Smug Dairy Blended Oat & Dairy Cheddar	British Mature Cheddar Cheese	Total savings	% savings
Climate impact [kg CO2-eq/kg product]	4.59	8.52	3.93	46.1%

EQUIVALENCIES CALCULATION

We utilized the KWH-to- CO2 (rensmart.com) to convert total emissions savings into the equivalent amount of carbon dioxide (CO2) emissions from using that amount. It helps us translate abstract measurements into concrete terms that are easy to understand, such as number of smartphones charged

By switching to Smug Blended Oat & Dairy Cheddar Block for 1 year, a regular cheddar buyer could save 32.2 Kg CO2e which is enough to charge an electric car over 4 times. *

* To charge an electric car (100-mile radius), it requires 7kW for 300 minutes. This energy consumption amounts to 34.998 kWh, which in turn equates to 7.247 kg CO2e emissions. In simpler terms, if a person charges their electric car 4.5 times, it will take 32.61 kg CO2e.
*For every 1 kg of Smug Blended Oat & Dairy Cheddar Block used over standard British Cheddar, there's a saving of 3.93 kg of CO2e. For an average buyer purchasing 8.3 kg of Block cheddar annually (Kantar Data from 2023), making the switch to Smug Blended Oat & Dairy Cheddar Block translates to a noteworthy reduction of 32.61 kg of CO2e emissions from farm to pack (cradle to manufacturing gate) in just one year.
*Which equates to enough CO2e to charge an electric car 4.5 times.

LIFE CYCLE ASSESSMENT METHOD & CRITICAL REVIEW

We at Kerry have collaborated with HowGood to complete each life cycle assessment. We have shared our recipes for each Smug Dairy product along with data on each ingredient we use with HowGood. This included us investigating our ingredient sourcing, our supplier crop processing methods, and our own processing methods too.

Want to know about the work HowGood does? Below is information taken from their published materials:

HowGood's methodology for calculating GHG emissions is developed in accordance with the GHG Protocol. Through an ongoing process of exhaustive data collection, analysis of peer-reviewed science, and a progressive heuristic approach to mapping and assessing the data collected, HowGood has developed the world's largest food product and ingredient sustainability database.

1. DATA COLLECTION
HowGood draws on a diverse collection of data sources, including peer reviewed journal articles to calculate the CO2e values for ingredients. For each data source, HowGood performs a data certainty assessment based on the age and comprehensiveness of the findings. This process is completed for every ingredient on which there is accurate and verifiable data. For GHG emissions, HowGood relies on the International Panel on Climate Change (IPCC) 2013 global warming potential 100-year estimates where available and crop-specific LCAs.

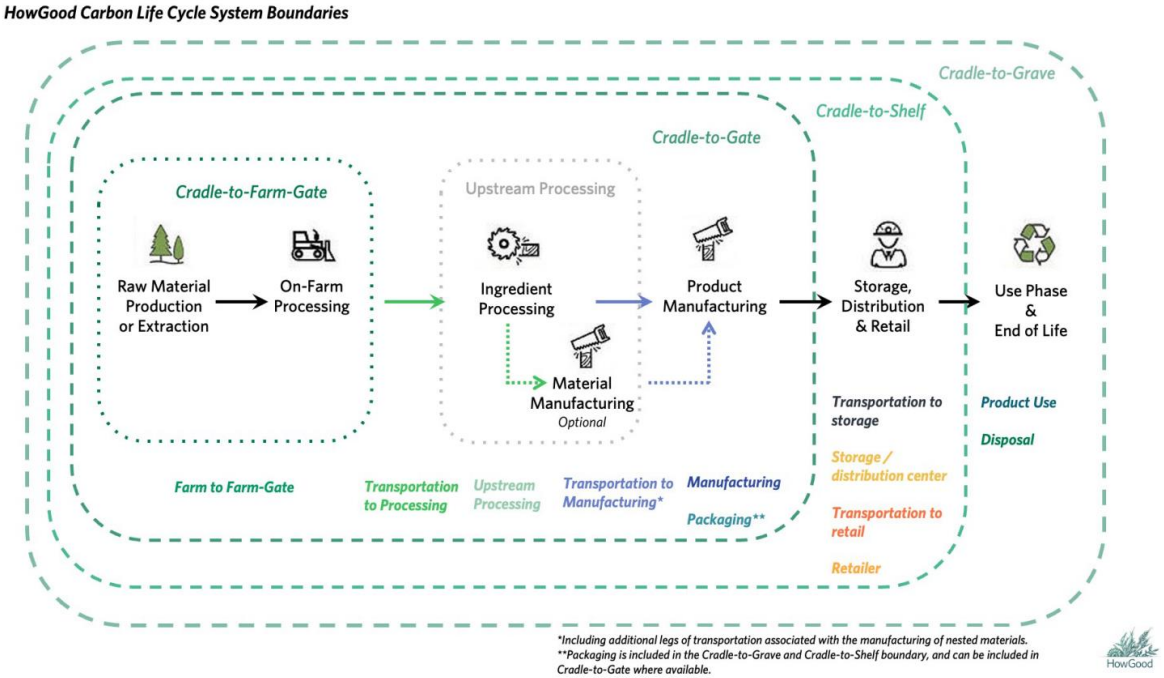
2. INGREDIENT MAPPING
Once the data is collected and analysed, HowGood conducts a proprietary process of mapping each ingredient to its source crop, animal, or material. Using global import/export data and HowGood industry partnerships, HowGood then maps each source crop to its corresponding geographic location to account for the specific on-the-ground practices, impacts, and risks in each locale.

3. DATA AGGREGATION
HowGood, to date, has mapped nearly every ingredient, chemical and material (33,000 in total) in the CPG industry, including where and how it is produced. This mapping is used to aggregate data across geographic regions or ingredient categories and develop industry-average impact profiles for CO2e across every ingredient.

Based on the ingredient mapping process, HowGood assigns a default location and corresponding industry-average profile for every ingredient in a product. If deeper levels of data granularity are available (from a specific supplier, industry partner, or publication), these specifics are applied.

FROM CRADLE TO MANUFACTURING GATE

Our Smug Dairy Comparative claims relate to carbon measured form cradle- to- manufacturing gate. This includes forest, land, and agriculture contribution to emissions, transportation of ingredients to processing, upstream processing, transportation to manufacturing and product manufacturing.



The Life Cycle Analysis conducted on Smug Dairy products are within the cradle to manufacturing gate boundaries (farm to pack).

ENVIRONMENTAL CRITERIA CONSIDERED

The foundation of HowGood's data is a diverse and continuously updated collection of data sources, including peer reviewed journal articles, academic conference proceedings and texts, aggregated commercial databases, targeted industry studies, NGO research, and government publications.
HowGood Example Data Sources:

ANIMAL WELFARE INSTITUTE
AQUACULTURE STEWARDSHIP COUNCIL
BIOVERSITY INTERNATIONAL
EUROPEAN COMMISSION
FAIR FOR LIFE
GLOBAL ANIMAL PARTNERSHIP (GAP)
U.N. FOOD AND AGRICULTURE ORGANIZATION (FAO)

REFERENCES

HowGood has more than 15 years of research on global food supply chains. The team consolidates and analyses findings from over 600 accredited data sources and certifications. These include a range of resources such as international frameworks, NGO guidance and standards reports, peer reviewed life cycle assessment studies, journal articles, academic conference proceedings and texts, aggregated commercial databases, targeted industry studies, NGO research, government publications, and news reports from reputable outlets.

How Good's platform produces data that is aligned with all major sustainability and climate reporting frameworks:

This alignment allows you to confidently navigate the complex landscape of sustainability reporting while demonstrating your commitment to a greener future.