BECEL GOLD LIFE CYCLE ASSESSMENT RESULTS FOR GERMANY

The Life Cycle Assessment ("LCA") results and claims for the above product are set out below. The LCA methodology and details of the Tool developed for Flora Food Group, the parent company of the brand above, by Quantis is set out in the Annex below.

Tool version: 2026_07_17

Date of assessment: 8/20/2026

PRODUCT SPECIFICATIONS

All data and results in this fact sheet are for the following product.

Specification	Description
Product type:	Fat spread
Product brand and variant	Becel Gold
Product DU code	91312952
Market:	Germany
Product format (grams):	225
Functional unit	1 kg fresh product

The following results are based on a life cycle assessment, from ingredients production through to packaging end-of-life. A total of 19 indicators were assessed: 16 environmental impact indicators from the European Commission Environmental Footprint (EF) 3.1 method and three additional indicators.
The 16 EF 3.1 indicators include: Climate change; Ozone depletion; Ionising radiation; Photochemical ozone formation; Particulate matter; Acidification; Eutrophication, freshwater; Eutrophication, marine; Eutrophication, terrestrial; Freshwater ecotoxicity; Human toxicity, cancer; Human toxicity, non-cancer; Land use; Water use; Resource use, fossils; Resource use, minerals and metals.
The additional inventory indicators are: Land occupation; Water consumption; Water withdrawal. Climate FLAG indicators, Climate Non-FLAG indicators
In order to make comparative assertions, and specific claims on climate, land or water, the overall environmental performance of the Flora Food Group product must be favourable compared to its dairy counterpart, based on all indicators assessed

ON-PACK CARBON LABEL

0.26 kg CO2-eq per 100 g

COMPARATIVE CLAIMS

What dairy counterpart is Becel Gold being compared to? Dairy butter

CLIMATE IMPACTS BY LIFE CYCLE STAGE FOR 1 KG OF FRESH PRODUCT

Life cycle stage	Becel Gold	Dairy butter
Ingredients & product manufacturing	1.97	11.2
Packaging production & end-of-life	0.40	0.04
Distribution	0.16	0.07
Use stage	0.04	0.04
TOTAL	**2.6**	**11.3**

SUMMARY OF COMPARATIVE RESULTS FOR 1 KG OF FRESH PRODUCT

Indicator	Flora Food Group product	Dairy equivalent	Absolute savings	% savings
Climate impacts [kg CO_2-eq/kg product]*	**2.6**	**11.3**	**8.8**	**77**
*Climate impact range***	*(2.2 - 2.9)*	*(7.3 - 13)*	*(4.4 - 10.8)*	*(60 - 83)*
Land occupation [m^2a/kg product]	3.8	11.4	7.5	66%
Water consumption [l/kg product]	10	85	74.5	88%

**Average Climate impact values that are used for on-pack claims.*

***The Climate impact range values are provided for reference and represent the range between the minimum and maximum possible values, taking into account the error margin in the emission factors used in the assessment. The error margins are informed by a literature review of 18 studies on dairy emission factors in different countries and WFLDB verison 3.12, as well as the uncertainty analysis in the original study of Flora FG products published in Liao, et. al. 2020.*

NOTE: For any given indicator, to make public comparative assertions, savings must be considered significantly lower. If no savings are reported in the table above, the savings are not considered significant; in this case, and in order to be conservative claims are not recommended.

SPECIFIC STATEMENT(S) FOR CLIMATE IMPACTS

In Germany, Becel Gold has 77% less climate impact than dairy butter.

SPECIFIC STATEMENT FOR LAND OCCUPATION

In Germany, Becel Gold occupies 66% less land than dairy butter.

SPECIFIC STATEMENT FOR WATER CONSUMPTION

In Germany, Becel Gold uses 88% less water than dairy butter.

EQUIVALENCIES PER KG OF PRODUCT

CLIMATE EQUIVALENCIES

In Germany, switching from one kg of dairy butter to one kg of Becel Gold could save at least 8.8 kg CO2-eq, equivalent to:

- Driving a car 24 km. — *Assumptions: Based on a medium-size petrol car (EURO5), considering tailpipe emissions only.*
- Charging a smartphone overnight for 0 month (1 times). — *Assumptions: Based on the electricity consumption of charging a smartphone overnight (19.2 Wh/day), assuming the regional electricity mix (EU)*
- Leaving a LED light on for 2 hours (0 day). — *Assumptions: Based on a 9-Watt LED lightbulb, assuming the regional electricity mix (EU)*

LAND OCCUPATION EQUIVALENCIES

In Germany, switching from one kg of dairy butter to one kg of Becel Gold could save at least 7.5 square meters of land, equivalent to:

- 2 table tennis / ping pong tables.	*Assumptions: Based on the area of a standard table tennis / ping pong table (4.18 m2).*
- 120 sheets of A4 paper.	*Assumptions: Based on a letter size (A4) piece of paper of 623.7 cm2, excluding the land occupation associated with paper production.*

WATER CONSUMPTION EQUIVALENCIES

In Germany, switching from one kg of dairy butter to one kg of Becel Gold could save at least 74.5 liters of water, equivalent to:

- Leaving the tap running for 6 minutes.	*Assumptions: Based on a tap water flow of 12 litres per minute.*

EQUIVALENCIES PER HOUSEHOLD OVER ONE YEAR

Based on a household of 4 with an average dairy butter consumption of 4.3 kg per person per year

Source: https://www.statista.com/statistics/415230/butter-per-capita-consumption-europe-eu/

CLIMATE EQUIVALENCIES

In Germany, if an average household of 4 people switched from dairy butter to Becel Gold for a year, it could save at least 151 kg CO2-eq, equivalent to:

- Driving a car 413 km.	*Assumptions: Based on a medium-size petrol car (EURO5), considering tailpipe emissions only (201 g CO2eq/km).*
- Traveling 415 km by plane.	*Assumptions: Based on a short-haul economy flight (364 g CO2eq/km), based on My climate tool* Source: https://co2.myclimate.org/en/flight_calculators/new
- The electricity consumption of 0 washing machine cycle.	*Assumptions: Based on a washing machine cycle of 0.64 kWh/cycle (temperature 40°C, 50 litres of water use), assuming the regional electricity mix (EU)* Source: https://green-business.ec.europa.eu/environmental-footprint-methods_en
- The electricity consumption of putting on an electric kettle 2 times.	*Assumptions: Based on a kettle consuming 0.125 kWh to boil 1 litre of water, assuming the regional electricity mix (EU)*

LAND OCCUPATION EQUIVALENCIES

In Germany, if an average household of 4 people switched from dairy butter to Becel Gold for a year, it could save at least 129 square meters of land, equivalent to:

- 7 parking spots.	*Assumptions: Based on a 17.7 square meter parking spot.*
- 0.5 tennis courts.	*Assumptions: Based on a standard size tennis court of 260 square meters.*

WATER CONSUMPTION EQUIVALENCIES

In Germany, if an average household of 4 people switched from dairy butter to Becel Gold for a year, it could save at least 1281 litres of water, equivalent to:

- Leaving the tap running for 107 minutes.	*Assumptions: Based on a tap water flow of 12 litres per minute.*
- Taking 20 showers.	*Assumptions: Based on one shower using 65 litres.*
- 26 washing machine cycles.	*Assumptions: Based on 50 litres of water use per washing machine cycle.*
- Filling up 7 bathtubs.	*Assumptions: Based on bathtub capacity of 180 litres.*

ANNEX 1 - LCA TECHNICAL SUMMARY

FLORA FOOD GROUP PRODUCTS VS DAIRY EQUIVALENT

Flora Food Group is a world leading food company which owns a wide range of well-known brands, often made using plant oils, and sometimes dairy ingredients (including Country Crock, Flora, Becel, Rama, Tulipan, 'I Can't Believe It's Not Butter', Violife and many, many more). Flora Food Group, through the sale of its branded goods, offers a range of versatile food products in the margarine/spreads, cheeses and creams categories which provide functional counterparts to equivalent dairy products.

In 2022, Flora Food Group commissioned Quantis to develop a Life Cycle Assessment (LCA) Tool (the "Tool") to enable Flora Food Group to assess the environmental impacts of its products sold in Europe, the USA and Canada ("Flora Food Group Product") and compare these to the dairy equivalent products sold in the same regions. The tool is continuously updated. In July 2026, the LCA tool was last updated to the latest emission factor databases available: WFLDB v3.13; ecoinvent v3.12.

This Technical Summary presents the Tool methodology including the scope of the analysis, functional unit and system boundaries, method, and data sources which Quantis developed for Flora Food Group to support claims made on its branded products.

The Product LCA Results above are generated by Flora Food Group and include the results of defined products assessed, including the specifications of the assessment for each Flora Food Group Product reviewed and the results used for the relevant comparative claims.

LIFE CYCLE ASSESSMENT

LCA is a metrics-based methodology used to assess environmental impacts resulting from, for example, greenhouse gas emissions, waste production, water, land, and energy use. Environmental impacts are calculated over the life cycle of a product, from extraction of raw materials to the end-of-life.

METHOD

The Tool was developed following regionalized LCA methodology described by Liao et al. (2020) to compare the environmental impacts of Flora Food Group Products to the same amount (1 kg) of the dairy equivalent product sold in the same market. The Tool uses a cradle-to-grave approach requiring data collection of the product recipe, key ingredients sourcing countries, production factory, energy mixes, packaging designs, transportation, and end-of-life scenarios. Spatially differentiated agricultural life cycle inventory data is generated (archetypes), as well as land use change ("LUC") emissions for agricultural ingredients in all markets relevant to each system's supply chain, using an attributional approach as per PAS 2050 (BSI, 2012), aligned with the international standards for dairy products, published by European Dairy Association (EDA, 2018); these values are confirmed as unchanged in the EDA (2025) update.

The Tool follows the ISO 14040 and 14044 standards. The product LCA results generated by the Tool based on assessments performed by Flora Food Group are reviewed by Quantis and respect and conform with ISO 14026 standards (Environmental labels and declarations — principles, requirements, and guidelines for communication of footprint information) for making comparative claims. The results can be found above for the respective Flora Food Group Products.

Note: Flora Food Group has made best efforts to align the tool with the general principles of the PEF method; however, it cannot be considered PEFCR-compliant, as no dedicated PEFCR exists for the company's specific categories.

CRITICAL REVIEW

The Tool and the underlying methodology used to perform the LCAs are consistent with the ISO 14040 and 14044 standards for the calculation of carbon footprints in accordance with recognized guidance. The Tool has been peer reviewed by a panel of three independent experts in LCA, agronomy, and dairy production; however, the results generated by the Tool should not be interpreted as ISO-compliant comparative assertions unless independently reviewed.

FUNCTIONAL UNIT

The functional unit ("FU") is a reference unit for which all results are calculated and presented. In respect of the Flora Food Group Products, the FU is to provide the same function (cooking, baking, frying, roasting etc.) of 1 kg of the equivalent dairy product and Flora Food Group branded counterpart product in a relevant country market, packaged, for the relevant consumer (domestic or professional).

ENVIRONMENTAL IMPACT INDICATORS CONSIDERED

The Tool assesses a total of 19 indicators: 16 environmental impact indicators from the European Commission Environmental Footprint (EF) 3.1 method and three additional indicators: land occupation (m2.y), which reflects the total area of land used over one year (Nemecek et al. 2011, Milà i Canals et al. 2012), water consumption (m3), the total amount of fresh water consumed (ISO 14046), which includes, for example, evapotranspiration of irrigation water, and water withdrawal (m3), the amount of water that enters a system, from any water body.

FROM CRADLE TO GRAVE

The LCAs performed with the Tool consider all identifiable activities across the product life cycle (cradle-to-grave) for Flora Food Group Products in the different markets (see Figure 1).

The assessments include impacts from:
- Farming (crop production or milk production)
- Packaging manufacturing of Flora Food Group Products
- Distribution
- Retail
- Consumer use
- Packaging end-of-life

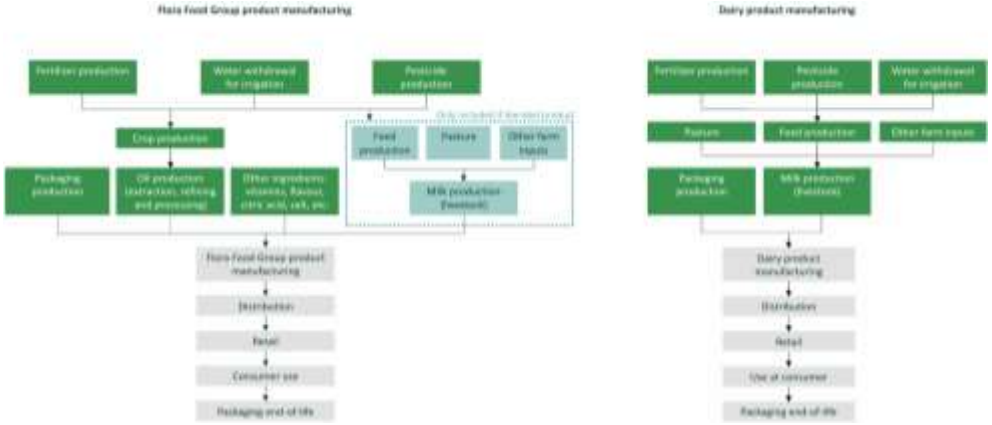

Figure 1. Schematic of the systems evaluated

The studies do not include impacts from:
- Capital goods at the distribution centre and at the point of retail.
- Labour, commuting of workers, administrative work, cattle insemination, and disease control processes.
- Food loss and food waste during distribution, at retail point and at the consumer's home.

DATA COLLECTION AND MODELLING

- Flora Food Group Products: primary data for the recipes and ingredient sourcing were provided by Flora Food Group based on its supply chain and manufacturing operations
- Dairy products for European countries: Default dairy data (WFLDB) used to model dairy production, processing, packaging, and distribution and representative of country averages in Europe is based on guidelines published by the European Dairy Association and the European Commission (see Note 1 and 2 below)
- For those European countries for which no direct national dairy datasets were available, the country with the lowest dairy climate impacts in Europe (in this case, Finland) was chosen for the comparison to ensure a conservative approach.

LCA database of Emission Factors (EFs) used: WFLDB v3.13; ecoinvent v3.12

These database versions were the latest available at the time of the last tool update.

Choice of dataset based on data quality criteria
The data quality of all inputs in the Tool was assessed using the Pedigree Matrix approach in the original study of Flora FG products published in Liao, et. al. 2020, and in line with ISO 14044 and PEF guidance. Each dataset is evaluated according to five criteria, which are scored and used to quantify uncertainty through the Pedigree Matrix:
- Technological representativeness: ensure that the EFs used by Flora Food Group are reflective of the information provided by Flora Food Group and that they are recent.
- Geographical representativeness: align modelling datasets with product sourcing regions specific to Flora Food Group
- Time-related representativeness: ensure data is current and based on the latest database versions available at the time of the update
- Precision: apply the most fitting and relevant dataset to the Flora Food Group products, using proxies when the exact match is not available
- Completeness: include all relative data defined within the system boundaries.

The overall data quality rating determines whether results can be used to make comparative or declarative claims. To ensure robustness and transparency, datasets with high uncertainty must not exceed 3% of total recipe mass; otherwise, comparative environmental claims cannot be substantiated.
This systematic assessment ensures that all modelled data are current, geographically relevant, and representative of Flora Food Group's sourcing and manufacturing practices, consistent with the ISO 14040/14044 framework.

Quantitative parameter uncertainty assessment
The pedigree matrix is used to quantitatively assess the time-related coverage, geographical coverage, technology coverage, completeness, and reliability for foreground processes and data sources by the practitioner. The description of the pedigree matrix can be found in Weidema et al. (2013), with a score of one being most favorable and five being least favorable. The analytical uncertainty assessment is used to propagate the uncertainty to the functional unit, and Monte Carlo simulation is used to quantify the parameter uncertainty related to dairy products in SimaPro. Based on this approach, for Flora Food Group products, the error factor is 14 %, whereas for dairy butter, the error factor related to parameter uncertainty is 15 % based on a 95 % confidence level (Liao et al., 2020).

Meta-anaylsis of dairy emission factor
In addition to the quantitative parameter uncertainty, a meta-analysis was performed. The error factor for dairy products was calculated based on the minimum value reported from 18 studies compared to the baseline value from the WFLDB v3.13 database. In this study, we use 36 % from the USA as the default global error factor to be conservative.

Additional criteria to make general claims based on the uncertainty level of the ingredient datasets
The quality of the data was assessed based on the uncertainty of the dataset selected to match with the Flora Food Group sourced ingredient. The data uncertainty scale goes from 1 to 3, with the score of "1" being a perfect or close-to-perfect match (e.g., refined rapeseed oil is sourced in Canada so it is matched with the WFLDB dataset "rapeseed oil, refined /CA") and "3" attributed to general proxy matching (e.g., all flavorings are matched with the ecoinvent v3.12 dataset "Chemical, organic {GLO}").
To account for this uncertainty in the proxy used, the model requires a maximum of 3 % of the product weight to be of datasets with uncertainty level 3. If this requirement is not fulfilled, general claims that the Flora Group product is better than its dairy equivalent are not possible.

Uncertainty threshold	Definition	Example dataset
1	Exact or Close match of the product	"Rapeseed oil, refined, EU" is matched with "Rapeseed oil, refined /DE U"
2	Proxy is similar to the product but with uncertainty on parameters (p.ex. Concentration)	"FABA BEAN Dextrose Mix" is matched with "Faba bean protein, 60% protein /GLO"
3	Proxy is generic	All flavourings are matched with "Chemical organic {GLO}

The total mass of ingredients with high uncertainty must be less than 3% for the general claims criterion to be satisfied.

NOTE 1: *EDA (2018) (2025) Product Environmental Footprint Category Rules for Dairy Products.. The European Dairy Association. Brussels, Belgium*
NOTE 2: *Raw milk datasets are based on the World Food Life Cycle Assessment Database (WFLDB)*

EXTERNAL COMMUNICATIONS

In order to make comparative assertions, and specific claims (e.g., climate impact comparisons), the overall environmental performance of the Flora Food Group Product must be favourable, overall, compared to its dairy counterpart in each country, based on the 18 indicators assessed. Climate change, land occupation, and water consumption have a high relevance for Flora Food Group product categories and the food industry and therefore are recommended to be used in product footprint environmental communications.

Throughout the development of the Tool, conservative assumptions in favour of dairy have been used for comparisons. For example, the packaging chosen for the dairy comparison is a common format with lowest climate impacts (i.e., for butter, the packaging chosen for retail consumption is 250 g paper parchment wrapper). These conservative approaches ensure further robustness when making comparative claims.

To make comparative claims on climate, land, or water, the overall environmental performance of the Flora Food Group product must be demonstrably better than that of the dairy counterpart across all indicators assessed. No indicator may show a significantly worse result, and the Flora product must perform significantly better for key indicators such as climate change, land use, and water use. To ensure robustness, the total share of ingredients modelled with high-uncertainty datasets must remain below 3 % of the recipe mass; otherwise, comparative environmental claims cannot be substantiated.

For communication purposes Flora Food Group uses "climate impacts" to communicate the products' impacts on climate change. Globally, terms like "climate impacts", "carbon emissions", "carbon footprint" or "greenhouse gas emissions" are used interchangeably for communication purposes when communicating about the impact on climate change of products, although there are some technical nuances and differences.

For any given indicator, in order to make public comparative assertions, savings must be considered significantly lower. For some assessments and for some indicators (e.g., water consumption), results may appear favourable, however, as the Tool considers the level of uncertainty for individual metrics, unless there is a significant difference, a reliable comparative conclusion cannot be drawn to support external communications.

For further information, please contact ESGenquiries@florafg.com

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Quantis, a BCG company, is a leading sustainability consultancy pioneering approaches to solve critical environmental challenges. We partner with leading consumer goods and financial services organizations who are serious about reducing their environmental impacts to future-proof their businesses and prosper in a new planetary economy. Our unique approach combines deep environmental expertise, strategic business knowledge, and enterprise transformation skills to help organizations shape policies, practices and business models that align with the planet's capacity while building resilience, unlocking innovation, and optimizing performance.

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