FLORA NORMAALISUOLAINEN LIFE CYCLE ASSESSMENT RESULTS FOR FINLAND

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 Upfield, the parent company of the brand above, by Quantis is set out in the Annex below.

PRODUCT SPECIFICATIONS

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

Specification	Description
Product type:	Plant-based spread
Product brand and variant	Flora Normaalisuolainen
Market:	Finland
Product format (grams):	400
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 16 indicators were assessed: 14 environmental impact indicators from the European Commission Environmental Footprint (EF) 3.0 method and two additional indicators: land occupation (m2.y) and water consumption (m3). In order to make comparative assertions, and specific claims on climate, land or water, the overall environmental performance of the Upfield product must be favourable compared to its dairy counterpart, based on all indicators assessed.

ON-PACK CARBON LABEL

0,3 kg CO2-eq per 100 g

COMPARATIVE CLAIMS

What dairy counterpart is Flora Normaalisuolainen being compared to? Dairy butter in Finland

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

Life cycle stage	Flora Normaalisuolainen	Dairy butter
Ingredients & product manufacturing	1,58	13,0
Packaging production & end-of-life	0,27	0,05
Distribution	1,00	0,32
Use stage	0,05	0,05
TOTAL	**2,9**	**13,4**

SUMMARY OF COMPARATIVE RESULTS FOR 1 KG OF FRESH PRODUCT

Indicator	Upfield product	Dairy equivalent	Absolute savings	% savings
Climate impacts [kg CO_2-eq/kg product]	2,9	13,4	10,5	78
Land occupation [m^2a/kg product]	3,6	13,2	9,6	73
Water consumption [l/kg product]	No claim possible	No claim possible	No claim possible	No claim possible

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 Finland, Flora Normaalisuolainen has 78% less climate impact than dairy butter.

In Finland, Flora Normaalisuolainen has at least 50% less climate impact than dairy butter

SPECIFIC STATEMENT FOR LAND OCCUPATION

In Finland, Flora Normaalisuolainen occupies 73% less land than dairy butter.

SPECIFIC STATEMENT FOR WATER CONSUMPTION

No comparative claim possible for this indicator

EQUIVALENCIES PER KG OF PRODUCT

CLIMATE EQUIVALENCIES

In Finland, switching from one kg of Dairy butter to Flora Normaalisuolainen could save at least 10,5 kg CO2-eq, equivalent to:

- Driving a car 52 km. — *Assumptions: Based on a medium-size petrol car (EURO5), considering tailpipe emissions only.*
- Charging a smartphone overnight for 47 months (1437 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 3065 hours (128 days). — *Assumptions:Based on a 9-Watt LED lightbulb, assuming the regional electricity mix (EU)*

LAND OCCUPATION EQUIVALENCIES

In Finland, switching from one kg of Dairy butter to Flora Normaalisuolainen could save at least 9,6 square meter, equivalent to:

- 2,5 table tennis / ping pong tables. — *Assumptions: Based on the area of a standard table tennis / ping pong table (4.18 m2).*

- 154 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

No comparative claim possible for this metric

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

CLIMATE EQUIVALENCIES

In Finland, if an average household of 4 people switched from dairy butter to Flora Normaalisuolainen for a year, it could save at least 181 kg CO2-eq, equivalent to:

- Driving a car 902 km.	*Assumptions: Based on a medium-size petrol car (EURO5), considering tailpipe emissions only (201 g CO2eq/km).*
- Traveling 498 km by plane.	*Assumptions: Based on a short-haul economy flight (364 g CO2eq/km), based on My climate tool*
- The electricity consumption of 741 washing machine cycles.	*Assumptions: Based on a short-haul economy flight (364 g CO2eq/km), based on My climate tool*
- The electricity consumption of putting on an electric kettle 3795 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 Finland, if an average household of 4 people switched from dairy butter to Flora Normaalisuolainen for a year, it could save at least 165 square meters, equivalent to:

- 9 parking spots.	*Assumptions: Based on a 17.7 square meter parking spot.*
- 0,6 tennis courts.	*Assumptions: Based on a standard size tennis court of 260 square meters.*

WATER CONSUMPTION EQUIVALENCIES

No comparative claim possible for this metric

ANNEX 1 - LCA TECHNICAL SUMMARY

UPFIELD PRODUCTS VS DAIRY EQUIVALENT

Upfield is a world leading food company which owns a wide range of well-known plant-based and vegan brands (including Country Crock, Flora, Becel, Rama, Tulipan, 'I Can't Believe It's Not Butter', Violife and many, many more). Upfield, 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 alternatives to equivalent dairy products.

In 2022, Upfield commissioned Quantis to develop a Life Cycle Assessment (LCA) Tool (the "Tool") to enable Upfield to assess the environmental impacts of its products sold in Europe, the USA and Canada ("Upfield Product") and compare these to the dairy equivalent products sold in the same regions.

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 Upfield to support claims made on its branded products.

The Product LCA Results above are generated by Upfield and include the results of defined products assessed, including the specifications of the assessment for each Upfield 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 Upfield 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 latest international standards for dairy products, published by the International Dairy Federation (IDF, 2015) and the European Dairy Association (EDA, 2016).

CRITICAL REVIEW

The Tool and the methodology used to perform the LCAs are aligned with PEF methodology and ISO 14040 and 14044 standards for public disclosure of results. The Tool has been peer reviewed by a panel of three independent experts on topics such as LCA, agronomy and dairy production.

The product LCA results generated by the Tool based on assessments performed by Upfield 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 Upfield Products.

FUNCTIONAL UNIT

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

ENVIRONMENTAL IMPACT INDICATORS CONSIDERED

The Tool assesses a total of 16 indicators: 14 environmental impact indicators from the European Commission Environmental Footprint (EF) 3.0 method and two 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), and water consumption (m3), the total amount of fresh water consumed (ISO 14046), which includes, for example, evapotranspiration of irrigation water.

FROM CRADLE TO GRAVE

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

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

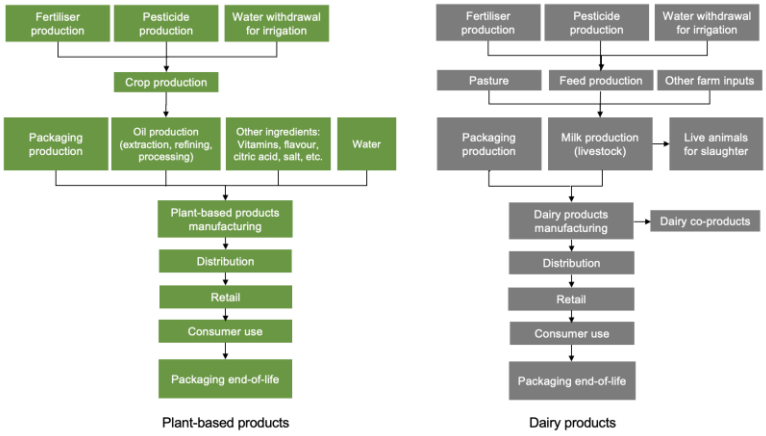

Figure 1. Schematic of the systems evaluated

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

- Upfield Products: primary data for the recipes and ingredient sourcing were provided by Upfield based on its supply chain and manufacturing operations
- Dairy products for European countries: Default dairy data 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)
- 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.
- Dairy products for US and Canada markets: Default data representative of US and Canada averages and published by the USDA were used. Canadian milk modelling was updated with the latest available data from Dairy Farmers of Canada (DFC, 2018).

NOTE 1: *EDA (2018) Product Environmental Footprint Category Rules for Dairy Products. Version 1.0 (April 2018. The European Dairy Association. Brussels, Belgium*
NOTE 2: *Raw milk datasets are based on the World Food Life Cycle Assessment Database (WFLDB), Nemecek et al. 2015*

EXTERNAL COMMUNICATIONS

In order to make comparative assertions, and specific claims (e.g., climate impact comparisons), the overall environmental performance of the Upfield Product must be favourable, overall, compared to its dairy counterpart in each country, based on the 16 indicators assessed. Climate change, land occupation, and water consumption have a high relevance for Upfield 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.

For communication purposes Upfield uses "climate impacts" to communicate the impacts of their products 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 ESGinquiries@upfield.com

ABOUT QUANTIS

Quantis guides top organizations to define, shape and implement intelligent environmental sustainability solutions. In a nutshell, our creative geeks take the latest science and make it actionable. They deliver resilient strategies, robust metrics, useful tools, and credible communications.

With offices in the US, France, Switzerland, Germany, Italy and Colombia and clients around the world, Quantis is a key partner in inspiring sustainable change on a global scale.

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REFERENCES

Boulay A-M et al (2018) The WULCA consensus characterization model for water scarcity footprints: assessing impacts of water consumption based on available water remaining (AWARE). Int J Life Cycle Assess 23:368–378

EDA (2016) Product Environmental Footprint Category Rules for Dairy Products. Draft report (28 July 2016). The European Dairy Association. Brussels, Belgium

Eurostat database. URL: https://ec.europa.eu/eurostat/data/database Access June 2016

FAO and WHO. 2011. Codex Alimentarius – Milk and Milk Products. Second edition. The Food and Agriculture Organization of the United Nations and the World Health Organisation. Rome, Italy

FAO, IDF, IFCN 2014. World mapping of animal feeding systems in the dairy sector. Food and Agriculture Organisation of the United Nations, the International Dairy Federation, the IFCN Dairy Research Network. Rome, Italy

IDF (2015) A common carbon footprint approach for Dairy. The IDF guide to standard life cycle assessment methodology for the dairy sector. International Dairy Federation. Brussels, Belgium

ISO (2006) Environmental management – life cycle assessment – requirements and guidelines, ISO 14044:2006(E). International Organization for Standardization, Geneva

IPCC, 2013: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1535 pp.

JRC-IES (2011). International Reference Life Cycle Data System (ILCD) Handbook- Recommendations for Life Cycle Impact Assessment in the European context. First edition November 2011. European Commission-Joint Research Centre - Institute for Environment and Sustainability. Publications Office of the European Union, Luxemburg

JRC-IES (2017) Product Environmental Footprint Category Rules Guidance. Version 6.2, June 2017. European Commission-Joint Research Centre - Institute for Environment and Sustainability.

Fazio, S. Castellani, V. Sala, S., Schau, EM. Secchi, M. Zampori, L., Supporting information to the characterisation factors of recommended EF Life Cycle Impact Assessment methods, EUR 28888 EN, European Commission, Ispra, 2018, ISBN 978-92-79-76742-5, doi:10.2760/671368, JRC109369

Liao, X., Gerichhausen, M.J.W., Bengoa, X. et al. Large-scale regionalised LCA shows that plant-based fat spreads have a lower climate, land occupation and water scarcity impact than dairy butter. Int J Life Cycle Assess (2020). https://doi.org/10.1007/s11367-019-01703-w

Nemecek T., Bengoa X., Lansche J., Mouron P., Riedener E., Rossi V. & Humbert S. (2015) Methodological Guidelines for the Life Cycle Inventory of Agricultural Products. Version 3.0, July 2015. World Food LCA Database (WFLDB)

Poore J., Nemecek T. (2019) Reducing food's environmental impacts through producers and consumers". February 22, 2019.

Thoma G, Popp J, Nutter D, et al (2013) Greenhouse gas emissions from milk production and consumption in the United States: A cradle-to-grave life cycle assessment circa 2008. Int Dairy J 31:S3–S14. doi: 10.1016/j.idairyj.2012.08.013