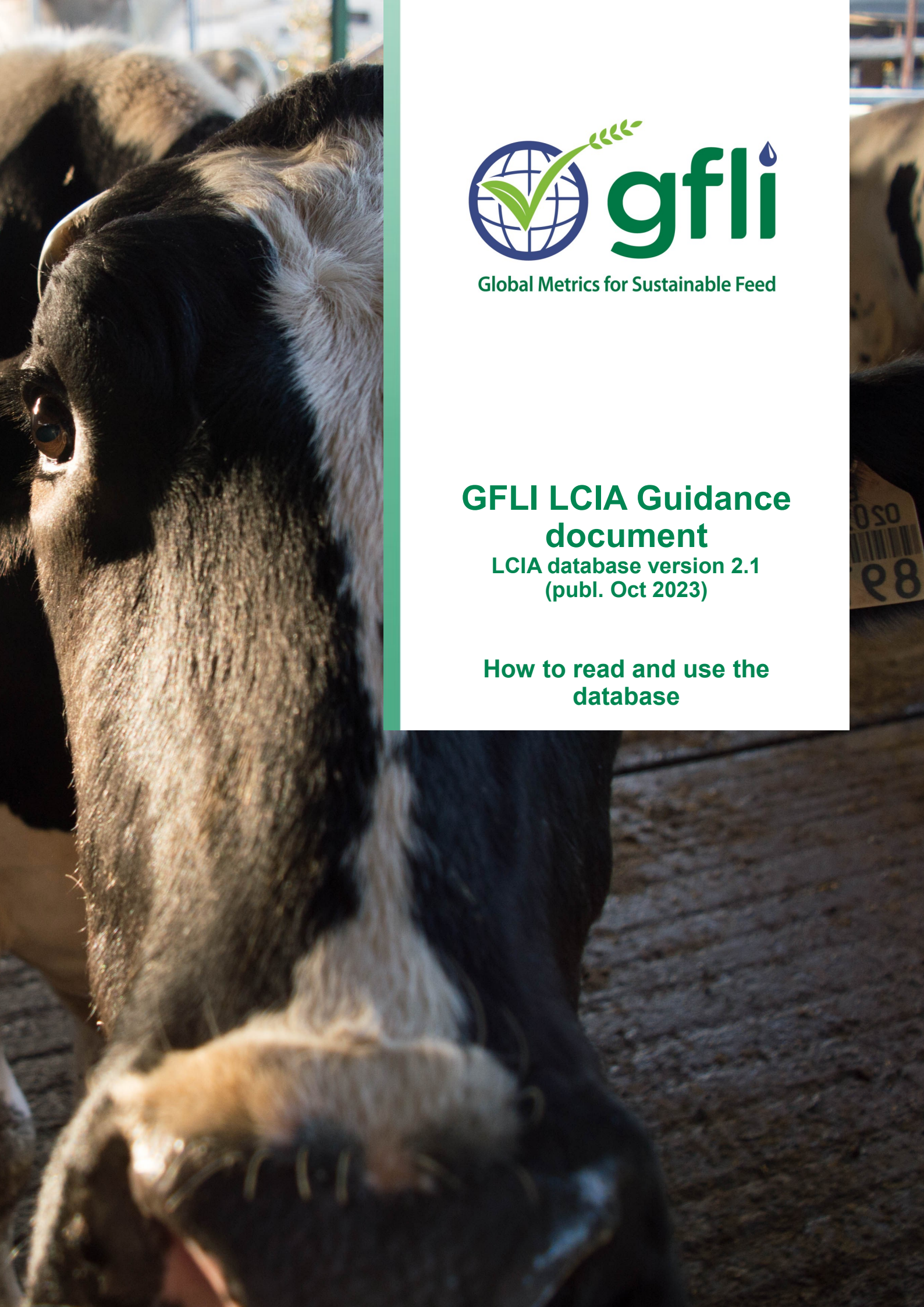


Global Metrics for Sustainable Feed

GFLI LCIA Guidance document

LCIA database version 2.1 (publ. Oct 2023)

How to read and use the database

Index

Global Metrics for Sustainable Feed

1. Introduction

The following guidance document is created for the understanding of the Lifecycle Impact Assessment in excel format, which was updated September, 2023. The GFLI database was officially launched on November 12th 2020, starting a new phase for the Institute focused on maintaining and expanding the database while adhering to international LCA methodologies and principles. This phase welcomes corporations, associations and other entities with an interest in environmental footprints to join as a member or strategic partner, and to collaborate via data provision and/or database use. Over the coming years GFLI aims to expand the global coverage of the database as a means to becoming the global standard for feed LCA data as it has envisioned.

The publicly available GFLI database is a collection of feed ingredient datasets collected using Life Cycle Assessment (LCA) methodology. LCA is a method to evaluate the use of resources and emission of pollutants during the life cycle of a feed ingredient. The GFLI database aims at software neutrality/interoperability to facilitate uptake of the GFLI data by practitioners working on environmental assessment of animal products.

The following guidance document has been set up to aid data users to provide clarification on the usage of the GFLI data(base). Please realize that Lifecycle Assessment is a discipline and requires a specific know-how to use it correctly. As the world of LCA is maturing and gaining more regulation for rightful use of the data (in particular with the communication of one's calculated LCA footprint), it is essential to remain up to date with progressions in the market and what is relevant for the purpose you're using LCA.

DISCLAIMER: GFLI and its data providers cannot be held accountable for any liabilities and/or damages (actual and consequential) that result from the use of the GFLI data, this document, and resulting environmental footprints.

1.1 Products available

The GFLI database consists of three formats,

- Life cycle impact assessment
- Aggregated system processes (inventory data)
- Disaggregated unit process level data

Life cycle impact assessment (LCIA)
The Lifecycle impact assessment is the measurement of emissions through a specific impact assessment method. This allows for the output of different ingredients calculated through that method in order for compare various ingredients, and use the output as the basis for measuring an average carbon footprint for compound feed or other mixed ingredients.

The GFLI database currently includes two methods, the ReCiPe Midpoint (H) (2016) and the Environmental Footprint 3.1 (EF3.1).

Aggregated system processes (LCI)
The system processes is the aggregated inventory of inputs and outputs of each dataset, and allows for flows to be manipulated to perform contribution or sensitivity analysis. Due to the aggregation, only the resources (input), output (ingredient and emissions related to its production) are shown. The interconnectivity within the system boundary are not visible, and would require the disaggregated unit process level data for full transparancy. With the environmental impacts, own processes can be added to connect the data and create 'building blocks' to see the changes to the end-product's environmental footprint.

Disaggregated unit process level data
Unit process level is the disaggregated inventory of inputs and outputs to the level used for modelling: all details of how each dataset has been established and its linked processes are included. It allows for flows to be manipulated to perform contribution or sensitivity analysis. The disaggregated LCI is available under a license in Simapro.

1.2 Accessing the LCIA

The three different levels of the GFLI database (impact assessment, lifecycle inventory, and unit process level) are available for purchase. The shift from free access towards a paid model is due to the new legal obligations the GFLI has for using improved background data, necessitating the GFLI to account for the number of database users. As our new database access structure will require a new and improved (and more secure) IT platform than we currently have available via the GFLI website, we will make our database temporarily available via the tools portal of our database manager, Blonk Consultants, during a transition period while we develop and implement our own in-house IT solution.

Purchase here!

Are you a member? GFLI members receive free access to the database for 1 user. Additionally, any GFLI member beyond the one user access receives discounts to all database formats.

If you'd like to purchase the newest GFLI database at the member pricing, please follow these steps:

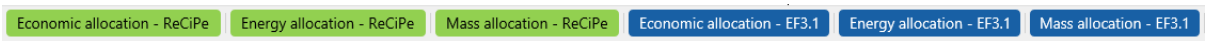
1. Register for the Blonk Tools Portal here (if you do not already have a log in)
2. Once registered, email tools@blonksustainability.nl and info@globalfeedlca.org the following message: "I am a member of GFLI and I would like to purchase the newest database. I have just registered on the Tools Portal with the email address _____. "
3. Blonk Sales team will confirm your member status and send you a payment link (with member prices) via Mollie (the payments provider).
4. Once payment link has been paid, Blonk sales team will grant your Blonk Tools portal account access to the new GFLI database module for download, and email you back letting you know this is completed.
5. You will then be able to download the new GFLI database and EULA.

2. Understanding the GFLI database (LCIA document)

The following chapter displays the different tabs and columns within the impact assessment with the goal to inform how the life cycle impact assessment excel format can be read.

2.1 Allocation

Allocation is relevant for multifunctional processes, when the product has significant inputs from other product systems or significant outputs to other product systems. The environmental burdens of a multifunctional process need to be shared (source). Allocation is the method of allocating emissions to a specific category, for example gross energy within the product or its economic value. The database is separated in three different allocations within the two methods used (ReCiPe and EF).



Economic allocation: economic allocation measures the economic value of the main product produced and the by-products that are less economically valuable, for example soy is used to produce soy oil (main economic activity) with its byproduct being soybean hulls and soybean meal.

Mass allocation: mass allocation quantifies masses entering and leaving a chemical or physical process. In this case, it is based on the total dry matter sum of the outputs.

Energy allocation: the energy content-based allocation is based on a caloric value in MJ per kg.

The GFLI allocation methods are according to PEF guidelines (i.e. based on ISO standards but with additional guidance on specific cases and PEFCRs). Which allocation to use is dependent on the user. The European Union's PEF guidelines prescribes economic allocation as preferred allocation, but there are also possibilities to use other allocation methods which could be useful for doing a sensitivity analysis.

2.2 Product name

The product name describes what product it contains, from what process it is derived and the specification (if relevant), the system boundary, country of cultivation or processing, and the allocation method.

Products are indicated as one of the following system boundaries (read next subchapter):

- At farm, for cultivated ingredients
- At storage, for dried cultivated ingredients
- At processing, for ingredients processed in the indicated country

Product name
Sunflower seed meal (solvent), at processing/DE Economic S
Fish oil, at processing/DE Economic S
Sunflower seed meal (solvent), at processing/DE Economic S

Figure 1. An example of the product name and its description

For countries this is indicated in their official country abbreviation; for some data from Canada and the US, the provinces and states are also included. There are some products that are indicated with:

- RER Region of Europe (European Union + EFTA countries - Iceland, Liechtenstein, Norway and Switzerland)
- RNA Region of North America
- GLO Global figure (of available data points/ relevant countries)

2.3 System boundary

The system boundary of the GFLI database is

- Products “at farm”: the environmental impact of cultivated feed products until farm gate. Environmental impacts include inputs for cultivation (e.g., energy, fertilizer, lime, pesticides, etc.) and emissions on the farm (e.g., fertilizer use, pesticides, etc.).
- Products ‘’at storage’’: the environmental impact of cultivated feed products, dried, until storage gate. Environmental impacts include inputs for cultivation, and possibly drying technologies and emissions.
- Marine products “at vessel”: the environmental impact of captured marine products until landing (e.g., energy, gear, refrigerants) and emissions at sea (e.g., guts).
- Products “at processing”: the environmental impact of processed feed materials until processing gate. Environmental impact of processed products includes the impact of cultivation of raw materials, sourcing from different countries, energy and auxiliary material use at processing and waste.
- Products ‘’production mix’’: a production mix is used when there is limited availability of where the ingredient is produced or processed, usually indicating it is an average for a region (usually region of Europe or Global). These datasets **exclude** transportation as they do not include a defined farm of processing facility boundary.

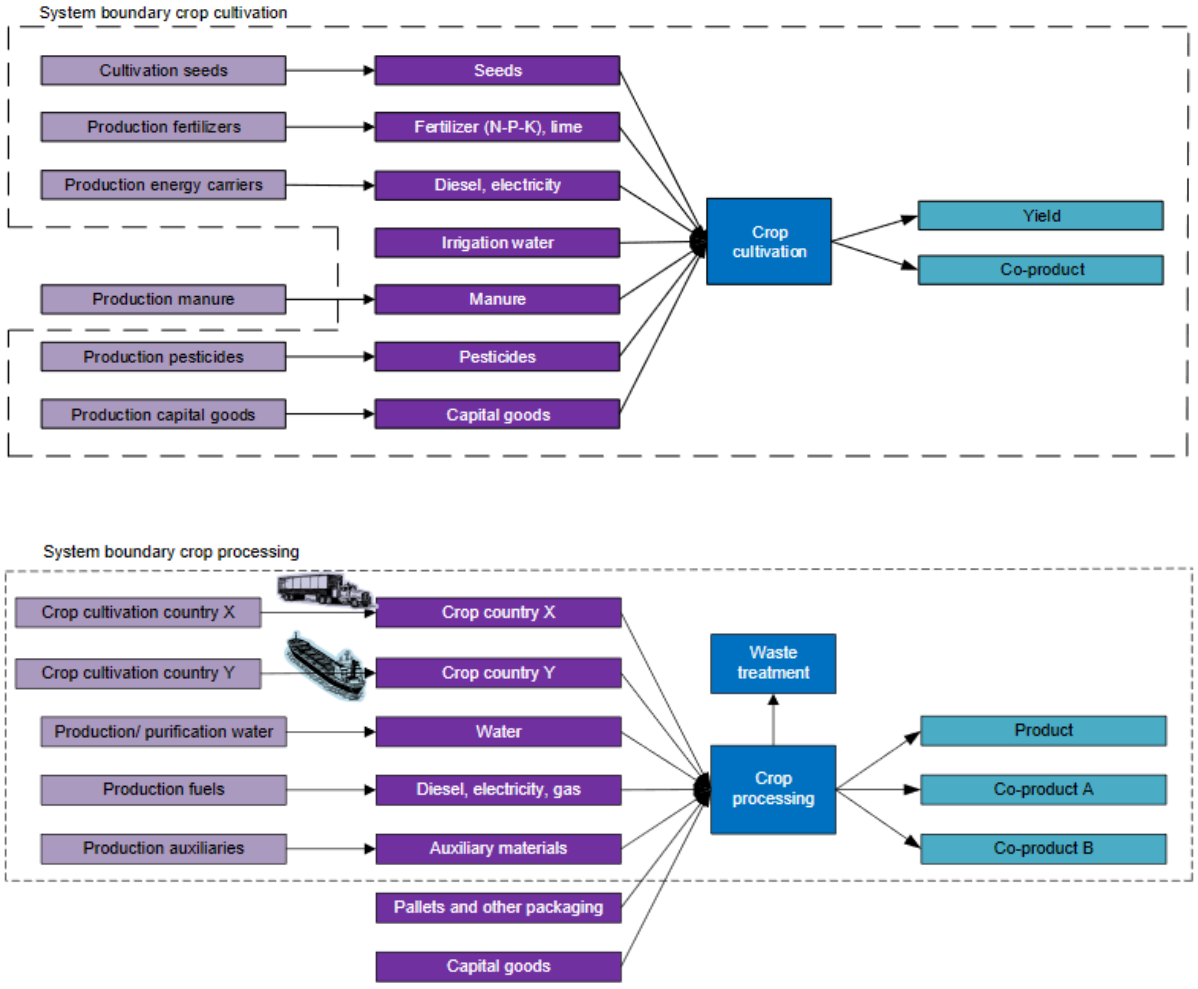


Figure 2. System boundaries of crop cultivation & processing in the GFLI database

The majority of cultivated ingredients are only available in dried (‘’at storage’’) conditions, as opposed to fresh (‘’at farm’’), with the assumption that most ingredients are subject to storage and drying for transport to the designated facility/farm.

2.4 Sources

The source describes the name of the project the data was collected. These are simplified names to identify the project of the data generation. As a data-in project is done in a specific time, this source information can be relevant to identify the project.

Table 2. GFLI sources and projects

Source	Information about the project	Reference year
AFP 6.3	Datasets created through the GFLI default method of statistical and open source data, by Blonk Consultants.	2022
AFP additional	Datasets created through the GFLI default method of statistical and open source data that are currently not available in AFP, by Blonk Consultants.	2022
AFP – Nevedi	Datasets created conform the GFLI default method of statistical and open source data, by Blonk Consultants, funded by the Dutch Feed Association Nevedi.	2022
EAPA	Datasets created through industry data sourced from the European Animal Protein Association (EAPA) members.	2018
EFPRA	Datasets created through industry data sourced from the European Fat Processors and Renderers Association (EFPRA) members	2021
GFLI BFAN	Datasets created through industry data sourced from the German Federal Association for By-Products as Animal Feed (BFaN) members	2019
GFLI Brazil	Datasets created through higher tier modelling sourced from the Brazilian Agricultural Research Corporation (Embrapa).	2021
GFLI Canada	Created through industry data on cultivated ingredients and complemented by statistics from Statistics Canada for missing data, by ANAC	2019
GFLI group totals	Datasets created through averaging available data for the European region, sourced from the PEF screening study for feed (2018)	2018
UKFFPA	Datasets created through industry data sourced from the Former Foodstuffs Association of the United Kingdom (UKFFPA) members.	2019
USDA	Created through statistical data from the USDA.	2017
VIDO	Datasets created through industry data sourced from the Dutch Former Foodstuffs Association (VIDO) members.	2019

2.5 Meta-data

In the update of October, 2022, columns for meta-data of dry matter content (DM), energy content, and N- and P-content. These data points are required for data-in providers to deliver in order to calculate specific impact categories. Such meta-data may consolidate the ingredient's composition. There is no intention to include nutritional datasets to the database.

Table 3. Meta-data in the GFLI database

Products GFLI 2.0 database - economic allocation	Source	Year of publi-cation	DM content (g/kg)	Energy content (MJ/kg)	N-content (g/kg)	P-content (g/kg)
Barley grain, dried, at farm/CA-WE	GFLI Canada	2019	890	16,39	18	4,6
Barley grain, production mix, at farm/CA	GFLI Canada	2019	890	16,39	18	4,6
Maize, dried, at farm/CA-AT	GFLI Canada	2019	860	16,68	12	3,2

2.6 Market mix commodity

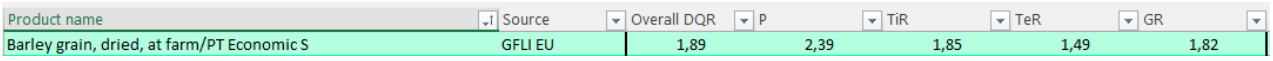
The market mix raw commodity indicates whether the dataset includes a market mix or is not applicable, some examples in table 4.. If its not applicable, it means the ingredient is a raw commodity. If it's a market mix, please read chapter 2.10 Market Mix to understand the tab sheet 'market mix'.

Table 4. market mix raw commodity

Market mix raw commodity
Not applicable
Linseed - AR
Maize - BE
Rapeseed or colza seed - BE
Soybeans - NL
Sugar beet - RER

2.7 Data Quality Rating (DQR)

The Data Quality Rating provides an indication of the total (overall) quality of a dataset and includes four quality criteria of a dataset. An overall score of 1 or close to 1 means the data is of good quality, recent sources, and representative for the ingredient and its production process, whereas a DQR of 3 or close to 3 indicates a lower representativeness, lower quality data, or older sources. Below shows how the DQR is presented in the GFLI database.



Product name	Source	Overall DQR	P	TiR	TeR	GR
Barley grain, dried, at farm/PT Economic S	GFLI EU	1,89	2,39	1,85	1,49	1,82

The Data Quality Rating system originates from the European Union's Product Environmental Footprint Category Rules (PEFCR). It's a semi-quantitative assessment of four quality criteria of a dataset (see table 5). The system allows for a form of assessment of the quality of the data.

Table 5. Data quality rating abbreviations according to the PEFCR Feed

Abbr.	Full name	Meaning
TeR	Technological-Representativeness	how representative is the technology of the source data compared to what is described in the title and meta data
GR	Geographical Representativeness	How representative are the datasets for the geography used in the datasets compared to what is stated in the ''location''
TiR	Time-Representativeness	How old is the collected data to be representative of a product
P	Precision/ uncertainty	How precise is the data derived and what level of uncertainty is included with this derivation.

More information on Data Quality Rating can be found in the EU PEFCR feed.

2.6 Impact categories

The GFLI database has impact categories to calculate an environmental footprint, which includes more than just carbon emissions relevant for a carbon footprint. The following impact categories are currently included from the methods ReCiPe and EF3.1. For alternative impact assessment methods, licensing the system processes (LCI) or unit process level will allow the execution of an impact assessment.

2.6.1 Global Warming Potential/ Climate Change

Global warming potential, or climate change, is expressed in kilograms CO_2 equivalences per ton of product; and is the most commonly used category to express emissions values (called carbon footprint).

The EF3.1 and the ReCiPe method use different forms to separate factors weighing heavily on this category, for example use of fossil CO_2-eq and land use change.

The global warming potential is divided into a total number (global warming – including LUC & Peat), and separated into the three components of the global warming (excluding LUC & Peat, LUC only, and Peat only).

Table 6. Global Warming Potential (GWP) expressed in the ReCiPe format

Product name	Global warming - Including LUC & Peat (kg CO2 eq / ton product)	Global warming - Excluding LUC & peat(kg CO2 eq / ton product)	Global warming - LUC only (kg CO2 eq / ton product)	Global warming - Peat only (kg CO2 eq / ton product)

The global warming potential calculated according to the EF3.1 uses the wording 'Climate change', and like the ReCiPe also separates the components of the figure. Additionally, the EF3.1 also separates the biogenic and fossil climate change (the former includes methane production from ruminants for animal-sourced ingredients and from rice production).

Table 7. Climate Change in EF3.1

Product name	Climate change (kg CO2 eq / ton product)	Climate change - Biogenic (kg CO2 eq / ton product)	Climate change - Fossil (incl peat ox) (kg CO2 eq / ton product)	Climate change - Land use and LU change (kg CO2 eq / ton product)	Climate change - excl LUC / peat ox (kg CO2 eq / ton product)	Climate change - Fossil (only peat) (kg CO2 eq / ton product)

2.6.2 Climate change – land use and land transformation (EF3.1 method)

This impact category accounts for carbon uptakes and emissions originating from carbon stock changes caused by land use change and land use. This includes biogenic carbon exchanges from deforestation, road construction or other soil activities. The emissions are modelled following the modelling guidelines of PAS 2050:2011 (BSI 2011) and the supplementary document PAS2050-1:2012 (BSI 2012), following the PEFCR Feed and the FAO LEAP guidelines.

2.6.3 Other Impact Categories

The EF 3.1 Impact categories and its indicators are listed below in table 7. More information on these impact categories is available in the PEFCR Feed, table 7.5-1.

Table 8. Impact categories EF 3.1

EF Impact category	Indicator
Climate change (total)	Radiative forcing as Global Warming Potential (GWP100)
- Climate change biogenic (methane)	
- Climate change – land use and land	
Ozone depletion	Ozone Depletion Potential (ODP)
Human toxicity, cancer	Comparative Toxic Unit for humans

Human toxicity, non-cancer	Comparative Toxic Unit for humans
Particulate matter	Impact on human health
Ionising radiation, human health	Human exposure efficiency relative to U^{235}
Photochemical ozone formation, human health	Tropospheric ozone concentration increase
Acidification	Accumulated Exceedance (AE)
Eutrophication, terrestrial	Accumulated Exceedance (AE)
Eutrophication, freshwater	Fraction of nutrients reaching freshwater end compartment (P)
Eutrophication, marine	Fraction of nutrients reaching marine end compartment (N)
Ecotoxicity, freshwater	Comparative Toxic Unit for ecosystems (CTU_e)
Land use	- Soil quality index - Biotic production - Erosion resistance - Mechanical filtration - Groundwater replenishment
Water use	User deprivation potential (deprivation weighted water consumption)
Resource use, minerals and metals	Abiotic resource depletion (ADP ultimate reserves)
Resource use, fossils	Abiotic resource depletion – fossil fuels (ADP-fossil)
Peat oxidation	Emissions from oxidation on peat lands

The ReCiPe impact categories and its indicators are listed below in table 9. More information on these impact categories is available in the ReCiPe 2016 report, table 1.4.

Table 9. Impact categories ReCiPe

ReCiPe Impact category	Indicator
Climate change (Global Warming Potential)	Infra-red radiative forcing increase
Ozone depletion	Stratospheric ozone decreased
Ionizing radiation	Absorbed dose increase
Fine particulate matter formation	PM2.5 population intake increase
Photochemical oxidant formation: ecosystem quality	Tropospheric ozone increase (AOT40)
Photochemical oxidant formation human health	Tropospheric ozone population intake increase (M6M)
Terrestrial acidification	Proton increase in natural soils
Freshwater eutrophication	Phosphorus increase in fresh water
Human toxicity: cancer	Risk increase of cancer disease incidence
Human toxicity: non-cancer	Risk increase of non-cancer disease incidence
Terrestrial ecotoxicity	Hazard weighted increase fresh waters
Marine ecotoxicity	Hazard weighted increase in marine water
Land use	Occupation and time integrated transformation
Water use	increase of water consumed
Mineral resource	Ore grade decrease
Fossil resource scarcity	Upper heating value
Peat oxidation	Emissions from oxidation on peat lands

2.8 Process description

The process descriptions of each ingredient is located next to the allocation tabs.

The process description describes the details of the data sets and provides insight in sources of background data used for modelling the GFLI datasets. Details include the DQR, the system boundary, which activities and processed are involved (e.g., electricity or heat from natural gas used), when relevant fertilizer use, water use, and references to the literature and/or statistics used to form the data. This information is included due to this not being available in the impact assessment output in this LCIA format. This information is also included in the system processes and unit process level data.

The process descriptions are a work in progress and will be improved in future updates to accommodate the readability and completeness of the data. However, it will never include the level of detail required to make comprehensive assessments between datasets. For such details, the unit process level data should be licensed.

2.9 Mapper

Since the GFLI database publication of November 2020, the database has had two updates. Due to the updates, the names of some datasets have changed to more accurately portray the ingredient. To assure the right datasets are used with the change of an update, a mapper is included to indicate what the former name was.

Table 10. example of the mapper with the first deliverable (GFLI database publ. November 2020, vs GFLI database publ. October 2022)

GFLI Deliverables v1	Source	GFLI Deliverables v2
Alfalfa, dried, at farm/CA-ON Economic	GFLI Canada	Alfalfa, dried, at farm/CA-ON Economic
Alfalfa, dried, at farm/CA-QC Economic	GFLI Canada	Alfalfa, dried, at farm/CA-QC Economic
Alfalfa, dried, at farm/CA-WE Economic	GFLI Canada	Alfalfa, dried, at farm/CA-WE Economic
Alfalfa, production mix, at farm/CA Economic	GFLI Canada	Alfalfa, production mix, at farm/CA Economic
Animal meal, beef, from dry rendering, at plant/RER Economic	GFLI EU	Animal meal, beef, at processing/RER Economic

The GFLI Technical Management Committee are working on an alternative method of the mapper, such as a unique ID code. This may be implemented in the next database update.

2.10 Market Mix

The market mix is located as the last tab in the document.

For processed products in the database, the upstream (cultivated) ingredients used usually come from a variety of originating countries. This is split by trade data (2014-2018) coming from the country where the product is processed.

The market mix table shows the commodity in question and the country it is processed in (market mix for). The total quantity of imported tons and its relatively percentage of each country of origin (100% in total). Relevant emission data is not always present, meaning that data cannot be included (marked as FALSE). To compensate, the coverage of the mix may not reach 100%, and thus the percentage in the mix will be recalculated based on the available coverage data.

With the example of table 11 this will be explained as such: The Netherlands processes groundnuts, shelled, from 7 different countries (based on available trade data). Argentina represents the large majority of that share (66.69%). There is no available data on emissions of groundnut production in Nicaragua and Spain, therefore the coverage of the mix is only 96.2%. The available emission data of processed groundnuts, shelled, in the Netherlands, consists of emission data from the production of groundnuts of 5 countries, with 66.69% coming from Argentina, 18.64% from the US, 7.36% from Brazil, 6.09% from China, and 1.22% from India.

Table 11. Example of the market mix for groundnuts, shelled, processed in the Netherlands

Market mix for	Commodity	Source country	Quantity total, in tons (2014-2018)	Relative (2014-2018)	Included?	Coverage	Percent in mix
NL	Groundnuts, Shelled	Argentina	200235	0,6416	TRUE	96,20%	66,69%
NL	Groundnuts, Shelled	United States of America	55952	0,1793	TRUE	96,20%	18,64%
NL	Groundnuts, Shelled	Brazil	22094	0,0708	TRUE	96,20%	7,36%
NL	Groundnuts, Shelled	China, mainland	18273	0,0586	TRUE	96,20%	6,09%
NL	Groundnuts, Shelled	Nicaragua	10788	0,0346	FALSE	96,20%	
NL	Groundnuts, Shelled	India	3677	0,0117	TRUE	96,20%	1,22%
NL	Groundnuts, Shelled	Spain	1087	0,00348	FALSE	96,20%	

3. Questions and answers

Here are some of the overarching questions the GFLI has received that may be on your mind as well. Please note that the LCIA is the output of the impact assessment method executed on the unit process level data. If you're looking for specific input data used to arrive to this output value, this is only viewable on unit process level data. The only intermediary solution is reading through the process description, which should give some indication of the activities, carriers, and system boundaries included.

Also note that the GFLI does not offer advisory services towards users. Which allocation method or impact assessment method to use should be up to the user, as well as how to deal with data gaps or alternative ingredients use shall be up to the individual user or institutes that form these decisions.

3.1 General questions

Q) What allocation methods is relevant for which use?
The chosen allocation is up to the user and what is most relevant in their case. Allocation distributes the emissions according to the chosen form. Economic allocation distributes it according to economic relevancy (price per kg product), particularly interesting with by-products that typically don't hold a high economic value, which is also the recommended allocation within the EU framework of the PEFCR Feed. Mass is for dry matter per ton of product, and can be relevant for company-specific datasets where change in emissions is measured through dry matter per ton of product. Energy allocation focuses on energy/ calorie content (nutritional value of the feed taken into account).

Q) I cannot find the feed ingredient I need in the GFLI database, what should I use instead? When will the missing data be available?
Feed ingredients that have not been sourced on a national level yet, often have a global average (GLO) or European average (RER) in the database. When the feed ingredient you are looking for is missing completely, you could also use the averages per feed ingredient category (e.g. Total minerals, additives, vitamins, at plant/RER Economic S). The GFLI database is dependent on data-in providers for the increase of datasets in the GFLI database.

Q) How is transport accounted for in the GFLI database?
Inbound transport is included from cradle-to-farm or cradle-to-plant. Cultivated ingredients have transport of land management and possible storage transport included. Processed ingredients have transport from farm to the processing facility included. Any inbound transport beyond this system boundary, as well as the outbound transport (beyond the system boundary to the feed mill, livestock farm, or other regions) should be calculated through own methods.

3.2 Data-specific questions

Q) Why do some ingredients seem to have a higher environmental footprint as by-product than it does as main product? Examples: DDGS vs maize
The GFLI database shares the state of which the ingredient is in, which may make it not directly comparable with another due to some ingredients being dried, while others are fresh.

Q) How come a by-product with low economic value, where the assumption of a cut-off is made (emission from previous processes to be allocated to the main product), how come some still include emissions of peat and land use change?
Most by-products are further processed, where additional carriers or inputs may have been used to stabilize the ingredient's nutritional value and/or preservability. These inputs may be subject to potential land use, and are therefore included. A few ingredients in the GFLI database are currently included as zero-economic-allocation, which are the fresh byproduct's ingredient without any additional processing (sugar beet pulp, wet; cotton seed husks; groundnut shells; safflower seed hulls)

Q) How come the global warming potential (CO_2-equivalent per ton of product) of specific ingredients can differ so much between countries/states/provinces?
Most data currently available in the GFLI database is based on statistical data from renowned sources such as FAOstat, EURstat, or otherwise. Differences may occur due to land management, fertilizer and pesticides use, yields per hectare of ingredients, soil management, or other practices that may reduce productivity or increase amount of inputs for the same amount of yield. Further details of each dataset can be accessed by purchasing access to the system processes and/or unit process level data.

Q) The market mix used in the GFLI database does not reflect the actual origin of imported ingredients my company/processes acquire, what should I do?
There is currently not a method to calculate a market mix specific to each user's import purchases based on the processed ingredients. An alternative option is for the user to base their market mix on cultivated ingredients that are available in the database, and calculate the transport separately to create a specific market mix.

Q) How is transport calculated into the datasets?
Inbound transport is included from cradle-to-farm or cradle-to-plant. Cultivated ingredients have transport of land management and possible storage transport included. Processed ingredients have transport from farm to the processing facility included. Any inbound transport beyond this system boundary, as well as the outbound transport (beyond the system boundary to the feed mill, livestock farm, or other regions) should be calculated through own methods.

Missing answers to the questions you have? Reach out to info@globalfeedlca.org!

gfli

Global Metrics for Sustainable Feed

address Braillelaan 9
2289 CL Rijswijk
The Netherlands
t +31 (0) 85 77 319 73

e info@globalfeedlca.org
w www.globalfeedlca.org