gfli

Global Metrics for Sustainable Feed

External Review guidance document

Version 1.0, 16 December 2022

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1 Introduction

The Global Feed LCA Institute (GFLI) is an independent animal nutrition and food industry institute with the purpose of developing a publicly available Feed Ingredients Life Cycle Analysis (LCA) database to support meaningful environmental assessment of animal nutrition products and stimulate continuous improvement of the environmental performance in the animal nutrition, animal production and food industry. GFLI will maintain and expand its regional and sectoral Animal Nutrition LCA database, ensuring the integrity and quality of the LCA ingredient dataset in accordance with the Food and Agriculture Organization of the United Nations Livestock Environmental Assessment and Performance Partnership (FAO/LEAP) guidelines for animal nutrition and food chain systems. The Institute facilitates access to the GFLI database, as the recognized global reference for feed ingredients LCA data by the public and private sector (LCA researchers, industry, academia and government bodies). The Institute also facilitates GFLI database access for stakeholders in the field of animal nutrition, animal production and food industry, for use in conducting environmental footprint calculations of their products and meaningful comparisons based on a harmonized methodology.

1.1 GFLI database

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 database contains various types of products, each with a product-specific system boundary:

- Products “at farm”: the environmental impact of cultivated feed products until farm gate. Environmental impacts include inputs for cultivation (energy, fertilizer, lime, pesticides, etc.) and emissions on the farm (fertilizer use, pesticides, etc.).
- Products ‘’at storage’’: the environmental impact of cultivated feed products, dried, until storage gate. Environmental impacts include inputs for cultivation, drying technologies, and emissions.
- Marine products "at vessel": the environmental impact of captured marine products until landing (energy, gear, refrigerants) and emissions at sea (e.g., guts).
- Products “at plant”: 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.

The database has three allocation options: Economic (preferred method in Feed PEFCR), mass, and energy allocation. The full life cycle impact assessment (LCIA) is the final product in its aggregated form of the activity data and background data through two methods of assessment (ReCiPe Midpoint Hierarchy and Environmental Footprint (EF)).

A data quality rating (DQR) is included, which is a semi-quantitative assessment based on the representativeness of the data in technological, geographical, and time-related aspects. The scoring of the DQR is determined based on a rating system derived from the DQR system applied in the EU Product Environmental Footprint Category Rules (PEFCR) Method. The score is adjusted annually to reflect the time-related aspect.

1.2 Data-in project

The GFLI database relies on data-in projects facilitated by stakeholders in the sector and/or the GFLI itself (when budget allows) to increase the available datasets and improve the quality of existing datasets. Data-in projects can be coordinated by individual companies, associations, NGOs, as well as by collaborations (without a legal entity). A data-in project usually includes a LCA expert and/or consultant to advise the involved parties on which data needs to be acquired and deal with methodological issues that might occur. A data-in project can be conducted for sectoral products, regional crops or products, and branded products (company specific ‘branded’ products).

Three types of “data-in” projects can be distinguished:

1. Regional: covering feed ingredients within a geographical area
2. Sectoral: covering a specific type of feed ingredients (e.g. wheat and its by-products)

3. Branded: providing data for a specific company's animal nutrition product[1]

Table 1 portrays a simplified process of a data-in project. A data-in project consists of two reviews to validate the data before it can be integrated into the database. After the data is gathered and modelled with the background data, the datasets and the supporting documents go through an internal review through data manager Blonk Sustainability or the GFLI LCA expert (to be hired start of 2023). Upon approval of the internal reviewer, data providers contact an external reviewer (ideally, shortlisted on the GFLI website and communicated by the GFLI Secretariat). The external reviewer provides a critical review of the data collection process, the methodological choices made, and the documentation provided by the data provider to verify the quality of the data is as suggested in the documents and the end result (the life cycle impact assessment and inventory that will be published in the GFLI database).

1.3 GFLI – reviewer partiality commission

To ensure consistency between reviewers, as well as open dialogue by reviewers regarding key topics within LCA review, the GFLI will create a partiality commission which all reviewers who review for GFLI will have to participate in. This commission will come together 1-2 times a year, with the possibility of ad hoc meetings when an urgent matter needs to be discussed. The partiality commission is estimated to be created in the first quarter of 2023.

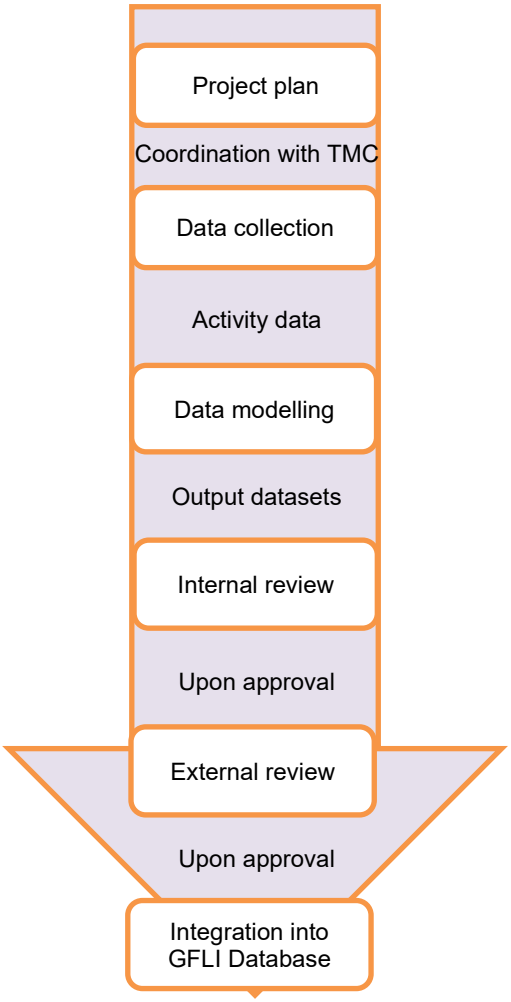

Table 1. A simplified process of a data-in project

1.4 Verification of the guidance document

This guidance document for the external review has been developed to highlight the important factors when reviewing the data, provide more insight on the review process which can be used to communicate the process to potential data providers, and create uniformity among reviewers to ensure the quality of the data and allow for fair reviewing of all data.

The current guidance document is a working document and may change upon gaining new insights. If you see any mistakes in this document or see items that could be defined better, please reach out to Laura Nobel for the feedback through nobel@globalfeedlca.org. Many thanks!

[1] Procedures for branded data are currently under development through a branded data pilot phase that will finalize in 2023.

2 Reviewing 'groundrules'

This chapter details some of the starting blocks, including the qualifications of the reviewer and which documents are to be reviewed for a complete review.

2.1 Qualifications to review

To qualify for review, the following requirements should be met:

- performed at least 3 reviews of LCA/LCI datasets in the past 5 years;
- have at least 5 years of experience with LCA methodology and practice;
- have at least 3 years of experience in the private or public sector related to the feed ingredients or technologies.

The last two requirements may be met within an organisation by one or more persons.

To qualify for review of a specific data project, the reviewer should be independent from the data provider and have no conflict of interest with any parties involved. Double functioning persons (i.e., LCA experts providing consultancy and offering reviewing services) shall not review data they have provided consultancy and/or data collection for. A statement of no conflict of interest must always be included in the review statement.

2.2 What documents to review

The external review tests the compliancy of the datasets created through the data project with the GFLI methodology. The GFLI methodology is freely accessible on the GFLI website (LINK). The data provider includes which version of the methodology has been used, which should be the newest available at the time of review. Differentiation of the three different types of projects (regional, sectoral, branded) should be considered when reading the methodology.

A data provider shall provide all documents necessary for the external reviewer with a level of detail that allows the reviewer to understand from where the data was sourced and how it can be calculated until the impact assessment. A selection of these documents may be:

- Data collection document: all activity data collected from the data provider(s) and clarification of approaches; as well as the goal and scope of the data-in project. This can be in the form of a data-in collection template as provided by Blonk Consultants and any other document detailing all requirements regarding data collection.
- A LCA report: detailing the data calculated in an LCA and data sources, can also be shown in the LCA models used through software tools. Data points may be substantiated by physical proof, such as invoices or meter readings for energy use.
- The inventory and system processes: accessible through LCA software (Simapro, OpenLCA).
- Final output: the datasets in GFLI format (LCIA Excel format or LCI Simapro format) of how it will be implemented in the complete GFLI database upon approval. This should also include the data quality rating (DQR).
- Internal review report: the report including the verdict of the internal reviewer and any relevant suggestions (e.g., data changes, peculiarities, alternative approaches or data sourcing).
- Any other documents deemed relevant by the reviewer, LCA consultant and/or data provider.

2.3 Reviewing role and sample testing

Table 2 portrays the role of each part of the data-in process. The internal review is essentially a submission check to confirm that the GFLI methodology is upheld for the data collection and modelling, whereas the external review verifies either all data points (branded data) or a sample of data points (regional and sectoral datasets). For calculations, which are based on data points, assumptions, and calculation rules, this may be presented in a sample check on whether the assumptions and expert judgements made are plausible and substantiated.

Due to the sensitivity around branded data, a heightened alertness for the review is desired. Data points which pertain a relevant impact on the end product's impact assessment should be verified. For calculations with relevant impact, the plausibility of the calculation should be reviewed.

	Data-in provider + LCA consultant	GFLI internal review	External review
Data point	**Check on plausibility** of values, for **all data points**: for instance: is it plausible that electricity use doubles in two years? **Verify values with the source** (invoice, meter readings) for branded data. **Sample verify values with the source** (invoice, meter readings) for sectoral/regional data.	**Check compliance with GFLI methodology** based on values. **Sensitivity analysis:** is the outcome comparable with similar processes, and crosscheck outliers.	**Verify values** with the source (invoice, meter readings) for branded data. **Sample verify values with the source** (invoice, meter readings) for sectoral/regional data.
Calculation	**Check on plausibility** of **all** assumptions, calculation rules; expert judgement with a logical substantiation. Check if **all** calculations are accurate and correct.	**Check compliance with GFLI methodology** based on values. **Sensitivity analysis:** is the outcome comparable with similar processes, and crosscheck outliers. Check if **some** calculations are accurate and correct.	**Sample check on plausibility** of assumptions, calculation rules; expert judgement with a logical substantiation.

Data point = unique value derived from invoice, measurement. Not edited primary data.
Calculation = combination of data point, assumptions, calculation rules to derive a value which is input for further LCA calculations.

Table 2. Role of the expert behind the steps of a data-in project.

For large scale regional or sectoral data-in projects, in which the data-in provider concludes its project with a large amount of new or updated datasets, the external reviewer may decide upon sample testing the datasets in favour of reducing the workload. The reviewer may use their expert judgement on which datasets would be subject to sampling, but should contain a variety of aspects on which the sampling is decided upon (such as sources, methodological (semi-)specific or baseline approaches, allocation, etc.). The data collection report may help with such decisions.

3 Data review

Data review is distinguished in the three categories of data-in projects the GFLI accepts (i.e., regional, sectoral, and branded data). Data review should be aligned with ISO/TS 14071:2014 and its original specifications of ISO 14040:2006 and ISO 14044:2006 in compliance with the EU PEFCR 'verification' (chapter 12 of the EU PEFCR Feed for food producing animals).The GFLI methodology document describes the minimal requirements for an LCA in a GFLI-compliant approach. However, some leniency may occur when an alternative approach reaches higher granularity and is of higher quality than previously documented in the methodology. This would be discussed and approved by the GFLI Technical Management Committee (TMC) before the execution of the external review, thus this would be communicated as well.

The first chapter includes reviewing categories applicable for all data-in projects (sectoral, regional, branded). The later chapters include the reviewing categories for each specific kind of data-in project.

3.1 General information

The following chapter includes some baseline information that should be reviewed for all data reviews.

Topic	Criteria	Reference
Goal and Scope	Do the data comply with the Goal and Scope defined in the project proposal?	Procedures document: project plan
Scope	Does the scope include all relevant information to determine the completeness of the scope and datasets resulting from it?	Procedures document
Reference unit	The reference unit of feed ingredients is 1000 kg of product as is. All data in the GFLI database are related to this reference unit. Has the correct reference unit been used?	Methodology document chapter 3.2
System boundaries	The LCA datasets collected and implemented in the GFLI database are data that refer to the operational primary production, processing, and transport processes of producing feed ingredients. Have the system boundaries been modelled correctly?	Methodology document chapter 3.3, 3.10.2, 3.11.1, 3.11.2, 3.12.1
Represent-ativeness	Do the datasets represent a likely environmental footprint? Is it measurable against other datasets in the same category of ingredients? If there are large deviations, do the documents provide enough evidence and reason to support the data?	
Allocation	Are allocation factors provided for multifunctional processes for three allocation methods (economic, mass dry matter, energy content)? Or for the allocation method as prescribed in specific chapters of the methodology document?	Methodology document chapter 3.10.5.5, 3.11.1.2 and 3.12.1.2
Method	Have both the EF3.0 and the ReCiPe Midpoint Hierarchy method been used to calculate the impact assessment?	
Background data	The background data for products and processes used at primary production, processing and transport originate either from the Agri-footprint database (Van Paassen, Braconi, Kuling, Durlinger, & Gual, 2019b, 2019a) or from data collected during GFLI projects. Have the correct data been used for background processes?	Methodology document chapter 3.6.10, 3.10, 3.11 and 3.12

Data quality rating	Has the data quality been rated according to the data quality matrix, developed in the EC feed database project?	Methodology document chapter 3.9 and Annex 3
Meta data	Meta data describe the data and the process of data generation. Meta data include reference year(s), technology description, deviations from GFLI methodology (if applicable), allocation method, data sources used, sample size / % production covered, use advice for dataset. Have the meta data been collected appropriately?	Methodology document chapter 3.10.5 and Annex 4
Process description	Do the datasets include a process description, detailing included activity data (e.g., water use, fertilizer use) and what is not included?	

3.2 Regional data review

Regional datasets may be collected entirely from secondary data sources (databases), but may include primary data if it is representative for the sector using a sound method of data sampling such as stratified data sampling. The following review points should be included when reviewing regional datasets.

Topic	Criteria	Reference
Steady state	Have the requirements for modelling cultivation in a steady state been met?	Methodology document chapter 3.10.3 - table 6
Crop rotation, co-production and allocation	Has the assignment of inputs (organic fertilizer, energy from co-products, straw from cereals) at cultivation to co-products been done according to the requirements (according to table 7)?	Methodology document chapter 3.10.4 - table 7
Activity data	Have all necessary activity data for crop cultivation, animal co-products, and processing been included?	Methodology document chapter 3.12.2. Table 17 3.10.2 - table 5
Data quality – secondary improved data	Does the data at least include the minimal required secondary improved data on: Cultivated crop/fisheries: cultivation activity data '1 step processed' Product: market mix & logistics for transport, farm activity data, animal farm production mix & logistics, farm production mix & logistics for transport, processing activity data 'multiple step processed' product: Production mix & logistics for transport, secondary processing activity (this includes the most contributing activity data points: yields of main and co-products, prices, organic/artificial fertilizer, energy, and irrigation water use)	Methodology document chapter 3.7, table 2
Sample size - primary data	For the primary data collected, is the data sample size used following a stratified data sampling? If yes, is it representative for the sector? If no, is the sampling method sound, and is it representative for the sector?	Methodology document chapter 3.8
Peat oxidation	(to be added when methodology is updated)	

3.3 Sectoral data review

Sectoral data should be representative for the sector (i.e., specified to a specific region or technology). It shall include primary data from a representative sample of companies of that sector using a sound method of data sampling such as stratified data sampling.

Topic	Criteria	Reference
Data collection	Is the dataset complete and including data on all necessary steps in the LCA?	Ch3.7, table 2
Data quality – primary data	Does the data at least include the minimal required primary data for: Crop/fisheries: cultivation activity data '1 step processed' Product: processing activity data 'multiple step processed' product: processing activity data of primary and secondary processing	Ch3.7, table 2
Data quality – secondary improved data	Does the data at least include the minimal required secondary improved data on: '1 step processed' Product: market mix & logistics for transport, farm activity data, farm production mix & logistics 'multiple step processed' product: farm production mix & logistics, product mix & logistics for transport	Ch3.7, table 2
Sample size - primary data	If primary data is used, is the data sample size used following a stratified data sampling? If yes, is it representative for the sector? If no, is the sampling method sounds, and is it representative for the sector?	Ch 3.8
Allocation (co-products)	If cultivated co-products are calculated, is it compliant with the baseline GFLI approach? If an alternative option is used for manure application, is it sufficiently substantiated to use said alternative option?	Methodology document chapter 3.10.4, table 7 Methodology document chapter 3.10.5.8
Product properties	Are the mandatory product properties for each ingredient collected (yield in weight, dry matter content, price, N & P content) in line with the approach (specific and semi-specific)?	
Peat oxidation	(to be added when methodology is updated)	

3.4 Branded data review

Branded data is considered to become a more relevant venture in the coming years as feed companies and producers look for ways to commercialize their products based on their environmental footprint, as well as the demand for processors, livestock farms, and feed companies to document their footprint calculations. In contrast to sectoral/regional data projects, branded data requires a higher percentage of primary data (higher data quality rating) and the sample sizes uphold a different kind of representativeness factor. The branded data methodology is currently under development, which means the follow criteria may be altered after the evaluation of the pilot (projected to be finalized March 2023).

(UNDER DEVELOPMENT)

Topic	Criteria	Reference
Data sampling	Does the data sampling include the square root of the number of operations in the sub-population? And is it a representative sample size for the product?	GFLI draft branded data methodology
Data quality rating	Has the data quality been rated according to the data quality matrix, developed in the EC feed database project; and does it meet the ≤ 2 threshold?	GFLI draft branded data methodology
Activity data	Have all necessary activity data for the type of product been collected (e.g., crop cultivation, animal co-products, processing)?	Methodology document chapter 3.12.2. Table 17, 3.10.2 - table 5

Primary data requirements	Does the data meet the minimal requirements of primary data in the criteria of feed ingredient type? - If secondary improved data is not available for certain materials, processing aids, or carriers, it is acceptable to use secondary data. However, in this case, the impact of a single material, processing aid, or carrier should not be more than 5 % of the total impact of the feed ingredient. - If secondary data are used for multiple materials, processing aids, or carriers, the total impact of these materials, processing aids or carriers, shall not exceed 30% of the total impact of the feed ingredient. - An exception is made for cultivated feed ingredients. Secondary data is allowed for any chemical input, however, it should not exceed 30% of the total impact of the cultivated feed ingredient. Is there a sufficient amount of primary data sourced?	220127 Primary data criteria per feed ingredient type
Steady state	In the case of cultivated products, have the requirements for modelling cultivation in a steady state (3-year average) been met?	Methodology document chapter 3.10.3 – table 6
Crop rotation, co-production and allocation	In the case of cultivated products, has the assignment of inputs (organic fertilizer, energy from co-products, straw from cereals) at cultivation to co-products been done according to the requirements?	Methodology document chapter 3.10.4 - table 7

3.5 Review statement template

The review statement may be described as the reviewer sees fit, but should include a description of the project and its background, as well as the following details:

- Period of data collection:
- Date of finalizing the data-in project:
- Date of the external review:
- Who is the data-in provider:
- Who is the LCA expert:
- Who is the external reviewer:
- Description of the feed ingredient(s):
- (If relevant, selection of technologies):
- What kind of data-in project is it (regional/sectoral/branded data):
- Specify above type:
- Which documents have been reviewed:
- Statement of no conflict of interest

A template for review is available from the GFLI Secretariat and contains the previous chapters' review points. Additional review points may be added if relevant. Questions, comments, and advise may be added in the review statement or as an attachment.

Review statement:

"The compiling of the [number] datasets meets the criteria of relevant documents and procedures: GFLI methodology Version (…) and GFLI procedures Version (…). These datasets therefore qualify for inclusion into the GFLI database.".

3.6 Recommendations

The GFLI methodology aims to be as complete as possible, but innovative practices and new technologies may result in modifications and/or additions that should be considered to improve. Recommendations may be given on the methodological approaches taken in the particular data-in

project, e.g., recommending improved secondary databases, an adjusted economic allocation. Recommendations to GFLI regarding the procedure and/or methodology are welcome and can be shared with the GFLI Secretariat at info@globalfeedlca.org.

4 Annexes

Annex 1 Shortlist of reviewers

This list contains the shortlist of external reviewers GFLI data providers may reach out to.

Name	Contact details	Function and organization	Country	Expertise
Martijn van Hovell	martijn.vanhovell@sgs.com +31 88 214 6600	SGS	The Netherlands	Cultivated products (Europe and Global) and other feed ingredients
Hugues Imbeault-Tétreault	hugues.i-tetreault@groupeageco.ca	Scientific Affairs Advisor, Corporation responsibility service at Groupe AGÉCO	Canada	Agri-food LCA (especially hay and livestock) Other expertise in construction materials and packaging.
Rafael Batista Zortea	rafaelzortea@ifsul.edu.br +55 51 98110 1113	Professor and Researcher - IFSul	Brazil	Biofuels

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