AGRIBALYSE: Assessment and lessons for the future

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Final report

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Abstract

The AGRIBALYSE® program was set up to provide data for environmental labeling of food products and to organize and share information for environmental assessment of French agricultural production systems to improve practices (ecodesign). This report describes the various stages involved in building the database for the Life Cycle Inventory (LCI) data sets, the deliverables and the lessons that the partners learned from the program.

The two main deliverables of the AGRIBALYSE® program were the database containing 116 LCI data sets, covering the main French agricultural production systems, and the report on the methodology to ensure transparency and reproducibility.

The partners learned a great deal from the program and acquired considerable experience in building and interpreting LCI data sets. The partners realized that the requirements and additional tools needed for building a database are far more complex than those for building individual LCI data sets (consistency and coherence of allocation procedures, automatic calculation systems etc.). The key aspects of this project were the definition of representative production systems and the selection of appropriate direct emission calculation models. Quality control and, to a lesser extent, sensitivity analyses played a significant contribution to the quality of the findings. However, further development is needed to improve the results, in particular to take account of uncertainties and improve methodologies (eg: storage of biogenic carbon). The partners consider that, given the expectations and high profile of the program, the results obtained meet a major need for harmonized data. They consider that LCA is an effective tool for encouraging discussion within agricultural sectors, for prioritizing actions and raising awareness among consumers. LCA is complementary to other environmental assessment methods (assessment of farms, local scale, impact studies, etc.) to help to improve agricultural practices.

To distribute and make it easier to use AGRIBALYSE® data sets, these must be linked to larger databases covering a range of sectors such as the ADEME IMPACTS® environmental labeling database and the Carbone database.

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1. Contents

This report describes how the AGRIBALYSE® program was carried out, its results and the lessons to be learned.

The report:

- sets out the products inventoried in AGRIBALYSE® and describes the access to the results
- describes the stages, constraints and solutions used to build the LCI database for AGRIBALYSE® given the size of the program
- provides the information required for an objective interpretation of the results (quality control, sensitivity analysis)
- describes the reasons behind building LCI databases, the requirements and the usefulness of this data.

This report is intended for those producing or using agricultural LCI data sets (research, advisory services, consultancies, etc) and for those setting up or funding projects who wish to find out more about the justification for undertaking similar programs and the constraints involved.

2. The AGRIBALYSE® program

1. Background to the project

Environmental assessment methods applied to agricultural products, including Life Cycle Assessment (LCA) were mainly developed during the period 2000-2010. However, several studies showed that it was not possible to compare the data produced and that there was a lack of standards for French agricultural production (ADEME, 2008).

Furthermore, in 2007, the Grenelle de l'Environnement called for the promotion of sustainable agriculture and environmental labeling of food products. Labeling should include greenhouse gas emissions (GGE) and other pertinent criteria depending on the product family. The LCA method was selected for developing environmental labeling.

The ADEME realized the need for a **coherent, transparent database** for agricultural products and launched the AGRIBALYSE® program in 2009.

Although labeling has not yet been made compulsory (labeling is still in the experimental phase in France and Europe), there is still a need for pertinent agricultural data.

2. Aims

The program was set up to build an **open, consistent** LCI database[1] for French agricultural products using **appropriate methods** the sector. This database is intended to be **coherent**, **harmonized** and **widely accepted** for all production systems.

The AGRIBALYSE® program had two aims:

- **1. Help to provide the information necessary for environmental labeling** of food products. The AGRIBALYSE® LCI data sets will be available for incorporation into the IMPACTS® public database. The final selection and the principles for the labeling methodologies are the responsibility of ADEME.
- **2. Provide standards for the agroindustry to help environmental assessments and actions to reduce environmental impacts.** The methodologies selected will provide a starting point and set standards for subsequent LCAs and will provide support for projects seeking to improve agricultural practices (ecodesign).

This database should improve the international visibility of French research.

3. Partners and program organization

Building a database for agricultural LCI data sets draws on a wide range of expertise: LCI methodology experts, agronomy and animal husbandry experts for the various production systems studied and organizations with access to raw data (descriptions of agricultural production systems). To meet this requirement, ADEME set up a multi-partner project between research institutes and technical institutes. The AGRIBALYSE® brought together partners representing 11 of the main agricultural sectors to give a high level of expertise for each type of production system.

[1]Life Cycle Inventory (LCI) data set: List of emissions and consumption of non-renewable resources associated with a product's life (in this case, agricultural). Details of the stages are given in §.3 of this report, see also Jolliet et al, 2010.

The following table shows how the tasks were allocated.

Task	Organization responsible
Strategic coordination	ADEME
Operational management (joint)	Agroscope ART and INRA
LCI data set calculations, drawing up and implementing methodologies	INRA: livestock production (44 LCI data sets) Agroscope ART: arable and horticultural production (66 LCI data sets) CIRAD: imported products (3 LCI data sets)
Data collection, contributions to methodologies and quality control of the LCI data sets.	ACTA + 10 Technical Institutes: ARVALIS-Institut du Végétal, CETIOM, UNIP, IFV, CTIFL, ITB, Terres d'Innovation, Institut de l'Elevage, ITAVI and IFIP

The program set up three committees. A strategic committee[2] which defined the guidelines, a steering committee[3] which approved the technical and methodological decisions and a consultation committee[4] which provided a forum for discussion between all parties interested in the success of the program.

The quality of the input data (production systems) was checked by experts external to the AGRIBALYSE® program (chambers of agriculture, cooperatives, academics, research scientists, etc) and the quality of the results of the LCI and Life Cycle Impact Assessment (LCIA) was checked by the technical institutes. This contributed to the quality of the results and provided a guarantee of transparency and independence to data users.

3. Project stages: data collection, LCI, LCIA

The LCA methodology was used. The agricultural products studied were non-processed products. The boundaries of the study were from the cradle to the "farm gate" (leaving the field for arable and outdoor horticultural data sets, leaving the greenhouse for indoor horticultural data sets and leaving the farm buildings for livestock data sets). The reference period was for 2005-2009.

[2] ADEME (President), ACTA, Agroscope ART, CIRAD and INRA

[3] Agroscope ART and INRA (co-president) and all the partners in the program

[4] Involving government ministries, chambers of agriculture, professionals in the food industry chain, scientists and non-governmental organizations, etc.

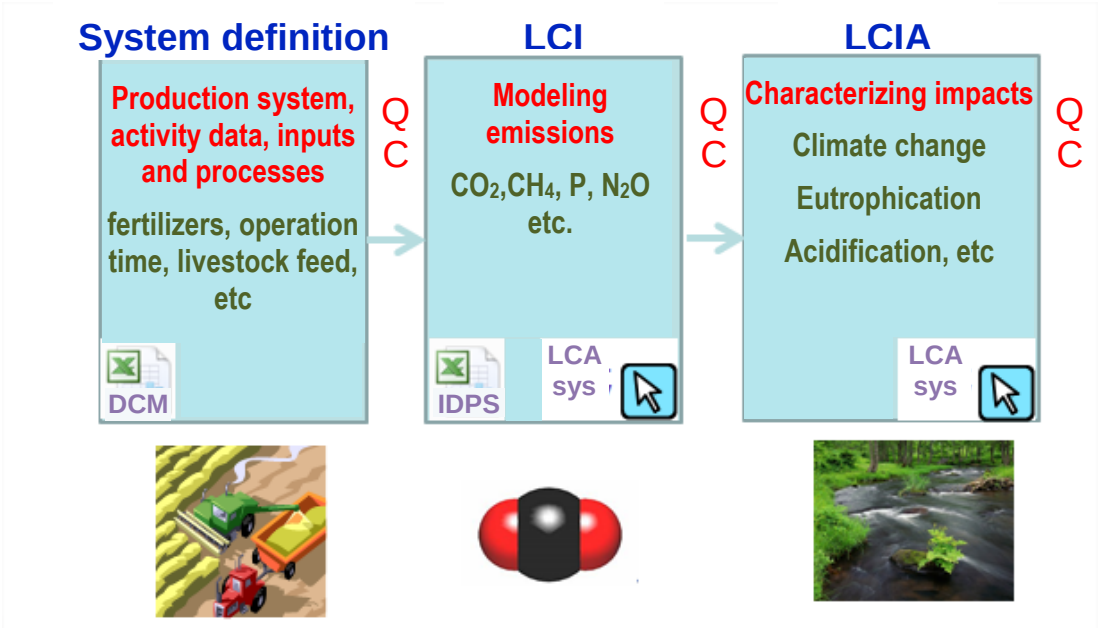
In general, the methodology and deliverables are consistent with:

- the French methodologies of the ADEME-AFNOR platform on environmental labeling for fast-moving consumer goods (AFNOR 2011).
- international methodologies
  - ISO 14040 and 14044 relating to LCA methodology
  - the ILCD good practices handbook.

All the methodologies are described in the AGRIBALYSE® methodology report (Koch and Salou, 2013).

The LCIA for agricultural products is carried out in three main stages (Figure 1):

- Defining the production systems studied: this entails defining production systems that are representative of French production systems and collecting the data required to calculate the LCI data sets.
- Calculating the LCI data sets: the production systems are converted into a list of pollutant emissions and consumption of resources. This was done using the Inventory data processing system (IDPS), a computerized system used to couple the description of the production systems with the emission calculation models.
- Calculating the LCIA: The Life Cycle Impact Assessment was calculated by converting the pollutant emissions and the consumption of resources into potential impacts on the environment. For example, all greenhouse gas emissions are grouped into a climate change indicator, all the substances contributing to eutrophication are grouped into a eutrophication indicator, etc. The LCIA was produced using characterization methods (eg: CML, ReCiPe, Usetox, etc.). The LCIA provides an indicator only whereas a complete LCA must also provide an analysis and an interpretation of the findings.



Legend: QC: Quality control. DCM: Data Collection Module; IDPS: Inventory Data Processing System; LCA sys: LCA system (eg: SimaPro®, GaBi® etc)

Figure 1: The three stages of building agricultural LCAs in AGRIBALYSE®

1- Defining production systems and collecting data

The first aim of AGRIBALYSE® to provide references at national scale implied defining production systems that were representative for France.

In certain cases, it was possible to define a "French production system" and data was collected directly. More often, given the variations in systems and practices, it was impossible to define a system directly representative at national level and variants had to be defined. These variants were weighted according to their contribution to national production to create an average French LCI data set (eg: tomatoes France = tomatoes in cold frame + tomatoes in heated greenhouses). Sometimes it was impossible to create an average product considered to be representative of France (eg: wine grapes). In these cases, the LCI data sets were then only representative of the systems defined.

The description of the production systems for each product should provide all information required for the parameters required to calculate the emissions: type of soil, inputs, yield etc. Different sources were used, in order of preference: official statistics, the literature and expert opinion.

The systems were defined using the Data Collection Module (DCM), an Excel® spreadsheet to ensure standardized data entry. The systems were defined by agronomic or biological parameters using commonly used units. When necessary, these parameters were converted to parameters or units specific to the emission calculation models in a second step. It is important to start by defining the emissions to be calculated and the models that will be used to ensure that the right data is collected.

A considerable amount of time and resources were involved in defining the production systems and collecting data. However, the quality of the final LCI data sets depended to a great extent on the quality of the system definitions. Defining variants for each product called for a compromise between the precision required, the data available, the time and the level of representativeness. This work was carried out mainly by the Technical Institutes.

2-Calculating the LCI data sets

The calculation of the emissions and consumption of resources can be separated into direct (foreground processes according to LCA vocabulary) and indirect flows (background processes). Direct emissions from the field or farm were calculated using emission calculation models (agro-environmental models). Selecting models that had been validated and were recognized at national or international level and that were suitable for the scope of the program was a particularly important task which drew on the expertise of all those involved. The models selected should be reviewed as more information becomes available. The DCM was coupled to the various models using the Inventory Data Processing System (IDPS), an Excel system produced by Agroscope ART which was modified to meet the requirements of the project. The IDPS produced files that could be exported to SimaPro® (Ecospold format), containing lists of all the direct emissions and all the inputs used.

The indirect emissions (background processes) (production of inputs: fertilizers, machines, feed, buildings etc.) were then incorporated into SimaPro®. The emissions were calculated from the lists of inputs used, based on existing LCI databases, mainly ecoinvent®. Specific processes were constructed within AGRIBALYSE® for certain important inputs, such as fertilizers or certain agricultural equipment. Adding direct and indirect emissions within SimaPro® created complete LCI data sets for agricultural products (Figure 2).

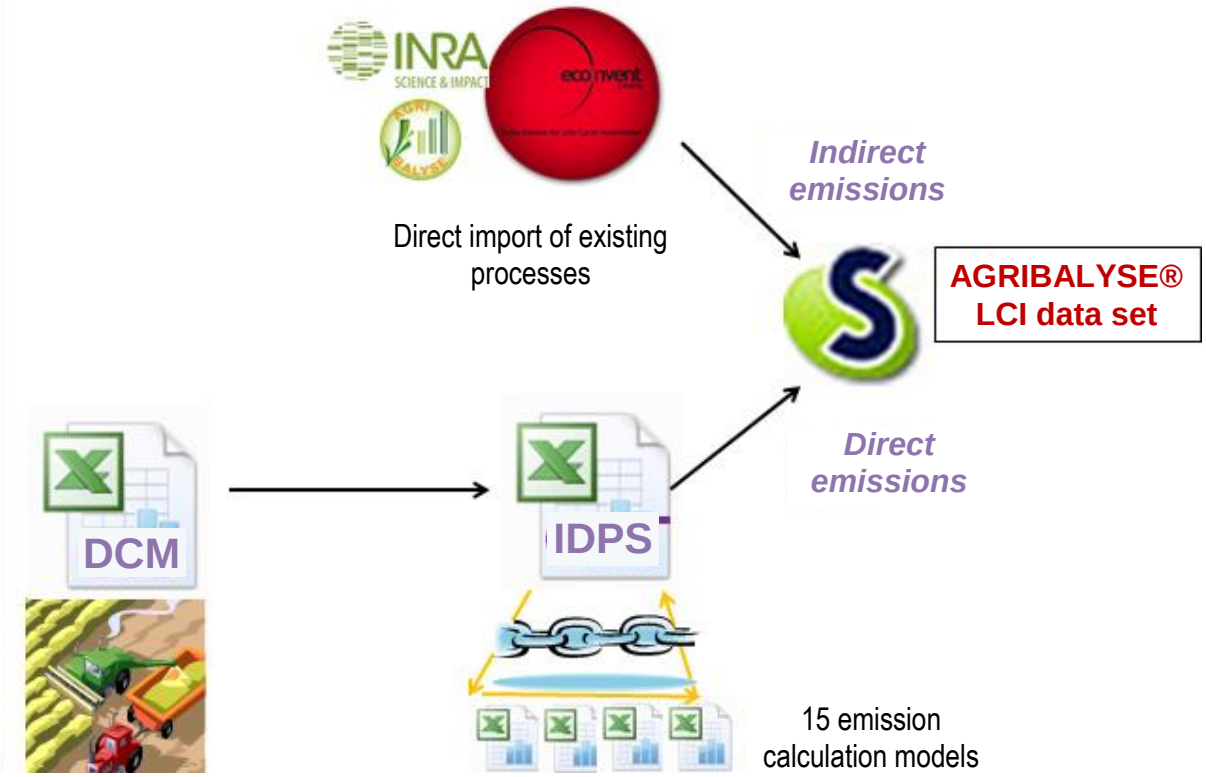


Figure 2: Calculating LCI data sets, coupling the DCM, the IDPS and SimaPro®

3-Calculating the LCIAs

The final stage was to calculate the LCIAs using SimaPro® (any other LCA system could have been used). AGRIBALYSE® did not carry out any specific work on this stage, apart from selecting the current characterization methods, in particular those recommended by the ILCD. Users must be familiar with these methods to interpret these indicators correctly. Although some indicators are generally accepted and considered to be robust (eg: climate change), there is less consensus on others which have far greater uncertainties and must be interpreted with care (eg: toxicity indicators). Incorrect interpretation of the LCIA results by those who are not very familiar with the method is a cause of concern when setting up databases that do not have interpretation of the results. Particular care was, therefore, given to the way in which the findings of AGRIBALYSE® were published.

4. The results of the program and access to these results

The program created 116 LCI data sets for arable, horticultural and livestock products.

The following table lists the products studied in AGRIBALYSE®. The complete list of LCI products with variants can be found in the methodology report (Koch and Salou, 2013).

Including variants (specific production systems), the database contains a total of 116 LCI data sets: 44 for livestock production and 69 for arable and horticultural production (Appendix A).

Products inventoried in AGRIBALYSE®	
Annual crops	*Durum wheat, soft wheat, sugar beet, carrot, rapeseed, faba beans, grain maize, barley, pea, potato, sunflower, triticale*
Forage/grassland	*Grass, alfalfa, silage maize*
Fruits and vineyard	*Peache, apple, cider apple, wine grape*
Special crops	*Rose, tomato, ornamental shrub*
Tropical special crops	*Coffee, clementine, jasmine rice, mango, cocoa, oil palm fruit*
Arable and horticultural total: 28 product groups	
Cattle	*Cow's milk, beef cattle*
Sheep	*Sheep's milk, lamb*
Goats	*Goat's milk*
Poultry	*Egg, broiler, turkey, duck for roasting, duck for foie gras*
Rabbits	*Rabbit*
Aquaculture	*Trout, sea bass/sea bream*
Pigs	*Pig*
Livestock total: 14 product groups	

These LCI data sets were grouped within the AGRIBALYSE® database and were accompanied by several documents. The deliverables of the AGRIBALYSE® program are set out below.

- The AGRIBALYSE® database

The database is available[5] in various formats with various levels of detail depending on the user's requirements:

  - **Two summary Excel files (one for animal, one for vegetal productions)** : Providing the most common LCI and LCIA indicators, recommended by ILCD mainly. The files enable to access to the main data and metadata without any specific LCA software.
  - **The AGRIBALYSE_vIMPACTS** database (system processes, Ecospold_V1 format): containing aggregated LCI data sets considered by the AGRIBALYSE® consortium to be sufficiently reliable to be used for a product environmental labeling approach (robustness, representativeness, etc). These LCI data sets are available for incorporation into the ADEME IMPACTS® database, the official environmental labeling database. An LCA program is required to analyze this data.
  - **The AGRIBALYSE_vcomplete** database (unit processes, Ecospold_V1 format). This is intended primarily for ecodesign projects and provides the results in disaggregated format. An LCA program is required to analyze this data.

Ecospold format is suitable for LCA specialists as the data can be used in current LCA software. A good knowledge of the LCA methodology is required for using and interpreting the LCA data. The databases can be obtained from ADEME after agreeing to license conditions[6]. The intention is that the AGRIBALYSE® results will be integrated into the ADEME IMPACTS® and Carbone® databases. The AGRIBALYSE® results are also complementary to the ACYVIA program which was set up to provide LCI data sets for food industry processing processes.

- The documents related to the databases are:
  - The Methodology report, which presents all the decisions made and ensures that the procedures used are transparent.
  - This Assessment report, which presents the project organization, the main lessons learned and feedback on the results.
  - A short note "Comment utiliser les résultats d'AGRIBALYSE®" (Using the AGRIBALYSE® results) which draws attention to key aspects.

[5] www.ademe.fr/agribalyse

[6] www.ademe.fr/agribalyse

- Information processing systems
  Various information processing systems were developed within the AGRIBALYSE® program.

    - The Data Collection Module (DCM) can be downloaded. This module is essential for using the Inventory Data Processing System (IDPS) to calculate LCI data sets. The DCM ensures that the data required for the models used by AGRIBALYSE is consistent and complete. It is supplied with a user manual and data collection guide.

    - The Inventory Data Processing System (IDPS) is not supplied as it stands as it is complex and specific to the project. The IDPS is intended mainly for setting up a large number of LCI data sets (eg: constructing and updating databases) by automating the calculations. All calculation stages can be carried out independently (without using the models coupled to the IDPS) for users who wish to build LCI data sets similar to those used for AGRIBALYSE®.

Deliverables and availability

Format	Deliverable	Availability
Database	Two Excel summary files	Can be downloaded from the website
Database	AGRIBALYSE_vIMPACTS database (ecospold v1)	Available on request from ADEME
Database	AGRIBALYSE _vcomplète database (ecospoldv1)	Available on request from ADEME
Documents	Methodology report	Can be downloaded from the website
Documents	Assessment report	Can be downloaded from the website
Excel spreadsheet	DCM + data collection guide	Can be downloaded from the website

*In blue, the two main deliverables of the ABRIBALYSE® program.

5. Quality control

The quality of the data was checked at 2 levels. The data defining the systems generated by the Technical Institutes were checked by experts external to the program. The LCI data sets calculated by Agroscope ART and INRA were checked by the Technical Institutes.

The quality control of the system definitions checked the plausibility of the production systems defined. More than 160 definitions were checked with unqualified acceptance in 30% of cases, minor revisions in 50% of cases and major revisions in 20% of cases. More than 500 suggestions for improvement or comments on technical data and sources were taken into account to meet the requirements of the experts.

The quality control of the LCI results corrected calculation errors, detected anomalies, ensured coherence and improved the credibility of the results. This quality control was carried out in four steps. The first step checked that the data in the DCM was transferred correctly to the IDPS. The units and current values (fuel consumption, fertilizer applied per hectare, etc) were checked. The second step was to check the validity of external data, in particular the correspondence between the inputs into the DCM and the LCI data sets of inputs from ecoinvent® (non agricultural processes, fertilizer, seed, etc). The third step was to check the internal coherence of the AGRIBALYSE® results by comparing the various inventory data sets obtained (eg: wheat/barley, types of pig depending on the type of feed, etc). When possible, the fourth step was to compare the results obtained with the results of previous studies. The quality control of the LCI results gave rise to considerable discussion between the partners.

The combination of checking the system description data with the LCI data set results significantly improved the quality of the AGRIBALYSE® database.

6. Sensitivity analysis

A sensitivity analysis of sugar beet and pigs was undertaken at the end of 2013. The results will be published on the AGRIBALYSE website when they are available.

7. Assessment of the organization and results of AGRIBALYSE®

The AGRIBALYSE® program lasted three and a half years. An internal assessment was carried out to make best use of the significant contributions of all the partners and the innovations in this program. This assessment was undertaken by ADEME, during the final months of the program, by questionnaire. The main lessons learned from this project are described below.

- AGRIBALYSE® in context

Given considerable promotion both nationally and internationally by all partners, the AGRIBALYSE® program had a high profile in the environmental assessment field even before the results were published. This indicated that the agricultural world and associated sectors had great expectations for the outcome. The partners recognized the LCA approach as being an effective means of encouraging discussion within the agricultural community, of prioritizing actions and raising awareness among consumers, businesses and policy makers.

- Results

The program achieved significant results. There are currently few LCI databases of agricultural products of the size and quality of that produced by AGRIBALYSE®. The report on the methodology produced by all partners ensures that the work is fully transparent and is a major result of the program. It should enable anyone who so wishes to produce LCAs comparable to those produced by AGRIBALYSE®. Despite all the care taken in selecting methods, several aspects of the methodology remain to be improved (see paragraph “Challenges for the future”).

The environmental labeling project was a major driver for the program. It also gave the project a political dimension, which sometimes made decisions more complex. In 2013, pending guidelines for the proposed environmental labeling, it is difficult to assess the extent to which the data produced will be able to play a role. However, the availability of consistent, comparable data for French agricultural production systems is without doubt to be considered as a major step forward.

The partners were in agreement on the aim for ecodesign and improving agricultural systems as well as on the limitations of LCA. The approach was considered satisfactory for work on reducing energy consumption and greenhouse gas emissions and for setting up vertical cooperation (upstream-downstream) within the sectors. Standardization and an approach which considered multiple impacts to avoid targeting a single pollutant, possibly increasing other emissions, were considered strengths of the method. However, the way in which account was taken of certain flows (dynamics of C stocks in the soil) and certain impacts (water consumption, biodiversity, etc) needs to be improved. The geographical scale of the project (not taking significant account of local impacts) and the complexity of LCA (which requires large quantities of data) are also constraints on its application to agronomy. The conceptual framework based on the assessment of a single product (results expressed in terms of functional units for a typical product) could produce results that conflict with agronomic analyses based on the assessment of systems at farm scale (rotation, combined cereals and meat production, etc.) or when the impacts are expressed as a function of the area used. All partners were in agreement on the need to take account of uncertainties in the analysis of results and to continue to

develop LCA methodologies appropriate for the agricultural sector. Overall, the LCA framework implemented was considered to be appropriate for the purpose and should be used together with other environmental assessment methods (assessment of farms, landscape scale assessment, impact studies, etc) to help to improve practices (cf. PLAGE platform)[7].

- Project management and partners

Although at first sight LCA may appear to be fairly intuitive, carrying out an LCA requires a conceptual framework and a comprehensive, precise terminology. Building a broad, multi-product, consistent database is more complicated than producing individual LCI data sets. All partners were able to learn from the program and gained a better understanding of the challenges in terms of data collection, selection of methodologies, database construction and feedback from the results.

The representation of all sectors and cooperation between Research and the Technical Institutes played a significant role in achieving the initial objectives. Bringing together all these various organizations was an ambitious approach: they were able to make significant contributions, which were complementary, but their knowledge of LCA varied considerably and they sometimes had diverging priorities. The role of the strategic committee proved decisive in achieving consensus and imposing decisions when necessary for building the LCI database.

AGRIBALYSE® demonstrated the importance of defining, right from the start, the type of results expected, the level of detail supplied and the intended communication method (including associated results such as computer programs and databases).

The project provided the results expected and met the initial commitments (transparency, ILCD compatibility).

- Communication

Given the purpose and the importance of the program, particular attention was paid to how the LCI results would be published. Correct interpretation of LCA results requires a good knowledge of this method and so the results need to be explained. To help potential users (agricultural sectors, consultancies, industry, etc), several support documents are available, in addition to the methodological report, and the database can be accessed with various levels of complexity. All the results were published together at the end of the program, following the conference held on October 1st, 2013[8]..

The AGRIBALYSE® program was set up to produce a LCI database. Consideration of the means used to publicise the results and the impact indicators to be used for labeling was not part of the AGRIBALYSE® program. The program, therefore, followed the recommendations of other organizations for characterizing the impact of emissions and publishing the LCIA results for environmental labeling.
So far, the partners do not provide simplified information suited for the “general public” (journalist, NGOs etc.) without any LCA knowledge. It requires a deep and specific

[7] http://www.plage-evaluation.fr/

[8] www.ademe.fr/agribalyse

work on the choice of indicators, the communication vehicles etc, which could be done in the future.

- Conclusion

The AGRIBALYSE® program produced a significant knowledge base (database + methodology report), which can be used as a reference for drawing up other LCIs. This project was based on established methodologies and was part of a major international research effort. In addition to these results, the program enabled those involved to extend their knowledge on LCA methods and provided feedback on the results that can be used for environmental communication and ecodesign.

8. Development and challenges for the future

The program set up an agricultural LCI database and provided answers to many methodological questions (Koch and Salou 2013). A major step was the construction of reliable references that will be used to support environmental information and improve agricultural practices and sectors.

At the end of the program, it is useful to assess the outlook for continuing the AGRIBALYSE® program, still with the aim of meeting the same two objectives. Consideration is being given both to the application of the methodology and to operational requirements in the future. These requirements must be prioritized to meet the expectations of the partners and the resources available. These suggestions for development are not part of a commitment on the part of partners in the AGRIBALYSE® program but are guidelines for consideration by all the organizations involved in the development and use of LCAs.

Maintaining the database: Updating data and methods

- **Updating LCI data set data.** Agronomy practices change (fertilization practices, pesticides available and used, etc) as does the production of the inputs (eg: national energy mix). Allowance should, therefore, be made for updates.

- **Updating methodologies.** The methods and models for calculating emissions (nitrates, phosphorus, trace metals, etc) may change to take better account of the specific characteristics of crops, agricultural practices and soil-climate characteristics. It must, therefore, be possible to update the database to use the best models available.

Extending models (calculation of direct emissions, emissions taken into account and impacts)

AGRIBALYSE® was not set up to develop models but was based on existing models. There is room for improvement: in some cases the models existed but could not be implemented in the program (eg: water consumption) or there was no consensus on a model (eg: impact on biodiversity).

The main challenges determined were:

- **Soil and biomass carbon stocks**. Changes in land use and certain agricultural practices cause changes in the soil and biomass carbon stocks causing positive or negative CO_2 flows which have an impact on climate change. It was not possible to take account of these flows as there was no consensus on the models to be used. However, these flows can have a significant effect on the carbon balance in certain systems (eg: grassland) and they will need to be incorporated into the database in the future.
- **Biodiversity**. Agriculture has major effects on biodiversity, in particular by the area of land it covers. Furthermore, much is expected from an indicator for the impact on biodiversity. At the moment there is no model that takes account satisfactorily of the effect that agricultural practices have on biodiversity using LCA. Research needs to be carried out on this subject.
- **Water resources.** The most widely recognized LCA for taking account of the impact of water consumption on water resources appears to be that developed by Pfister et al. (2009). However, it was not possible to implement this for AGRIBALYSE, mainly because the data required was not available. This is a major challenge for the future.
- **Collection and availability of data for extending the database.** The characteristics of the systems studied and the emission calculation models selected determine the type of data to be collected to build the LCI data sets. It was clear that the availability of data for defining systems varied considerably depending on the sector and the production methods (eg: there was no representative data for organic agriculture). It is necessary to assess whether, the data required for extending the database to other products or other production systems will be available. If it is not, it will be necessary to decide whether a particular data collection strategy is required or whether the emission calculation models should be changed. The availability of representative data for the various types of production systems is a major challenge that goes beyond the strict boundaries of the LCA.
- **Definition of systems and sources of data**. The product groups and their variants (production system) were mainly defined on the basis of expert opinion. This method could be more consistent. The rules defined in the data collection guide for defining production systems gave an initial level of uniformity by defining several possible data collection strategies (statistical data, expert opinion, etc.). For continuing the program, an assessment could be undertaken to determine whether greater consistency is possible (eg: yield always based on statistics).
- **Uncertainty**. An initial approach, based on the ecoinvent® pedigree matrix and the criteria in the ILDC Handbook, was set up in AGRIBALYSE® to assess the uncertainty associated with the LCI results (Koch and Salou, 2013). However, quantifying the uncertainty is still an approximate procedure and is mainly based on expert opinion. To assess the results and improve the comparability of the LCI data sets, it would be useful to have a more precise description of the uncertainties associated with the results. Various analysis methods are available (sensitivity analysis, Monte Carlo analysis, etc.). Exploratory research began at the end of 2013 with a sensitivity analysis on the results for

sugar beet and pigs. In the future it would be interesting to define and apply a standard procedure for calculating the uncertainties for each LCI data set.

Extending the database

- **Incorporate other French products.** There are still many French agricultural products not included in the database: many fruit and vegetables, fish caught at sea, shellfish, aromatic plants, etc. Consideration could also be given to the possibility of extending the database to non-food agricultural products (fibers, domestic animals, etc.) and forestry.
- **Take better account of the diversity of production methods and practices.** It would be useful to refine the granularity of the database, by including other types of production: AOC and PGI labels, more organic products, new systems (eg: horticultural greenhouses with solar panels) and regional variations. The analysis of various typical cases and production methods will show up the possible environmental benefits and guidelines for improvement. For this, the availability of representative data is a major challenge.
- **Include imported products.** Extending the database to incorporate the wide range of food products consumed in France, including imported products, is a major challenge. Taking account of widely different production conditions (eg: tropical production systems) and the availability of data requires changes to be made to the methodologies (data, emission calculation models) and will require considerable work.
- **Method for extending the database**. The database can be extended by building new LCI data sets in a new program similar to AGRIBALYSE and/or by incorporating LCI data sets produced by third parties. Incorporating LCI data sets produced externally appears to be essential but requires setting up a procedure for checking and validating the LCI data sets before incorporation.

Assistance for those wishing to create LCI data sets comparable to AGRIBALYSE®

As a follow-up to AGRIBALYSE, it might be useful to provide assistance for those wishing to create LCI data sets comparable to those in the database and possible extend the database. To do so it is necessary to:

- **Make the results available.** Create a website to ensure that they are available and visible.
- **Advise on implementing the method**. The report on the methodology could be converted into a methodological guide, a specific guide could be produced for products outside mainland France, training could be provided on the AGRIBALYSE® method.
- **Supply IT tools**. A more user-friendly working application could be developed including a data collection system (equivalent to the DCM) and a system for interfacing to emission calculation models (equivalent to the IDPS). It would in fact be advisable to improve the current DCM for use in other LCI projects as was shown in the data collection and quality control phases. It would in particular be necessary to help to understand the whole production system to

make it easier to check coherence. The current DCM can nevertheless be used to build LCI data sets for agricultural products as it makes it easier to collect comprehensive data.

Ensure the visibility of the database and the link with other data sources, in particular internationally

- **Distribute the data.** It is important to ensure the visibility of the database which could contribute to other larger databases similar to ecoinvent® or be incorporated into current LCA software.
- **Describe the methodologies selected.** At the time of its publication, the report on the AGRIBALYSE® methodology is probably the most detailed report for agricultural products. The modeling approach retained could be used for other international programs which aim to develop methodological standards for future LCI data sets. Exploiting the research includes the translation of the methodological report into English (now available), the presentation of AGRIBALYSE® at scientific conferences and for LCI database projects, etc.
- **Ensuring compatibility with standards that are being developed**. The AGRIBALYSE® database will be all the more useful if it remains compatible with the main international standards (FAO, European Union, PAS2050, etc.). It is, therefore, important to promote the methodologies selected for AGRIBALYSE® (and in particular the methodological report) to support international projects to produce new databases and new LCI standards for agricultural products.

9. Conclusion

The main outcomes of the AGRIBALYSE® program are the database with 116 agricultural LCI data sets and the associated methodological report. These results meet a major need for consistent, high quality LCI data to help to improve practices and to provide environmental labeling. The partners learned a great deal from the program in particular about producing and interpreting LCI data sets. However, several aspects need further development, in particular taking account of biogenic carbon in the LCI data sets as well as the impact of agricultural practices on biodiversity. The database must also be updated and extended to satisfy the needs of environmental labeling and ecodesign. Many international projects are being undertaken into the construction of databases and methodological standards and it is important that the progress made by AGRIBALYSE® is made known.

10. Glossary

ACYVIA: LCI database for food industry processes (in course of construction)

Carbone database: Database developed by ADEME complementary to the IMPACTS® database. It contains only information on greenhouse gas emissions.

DCM: Data Collection Module used for collecting and entering data.

IDPS: Inventory data processing system used to calculate direct emissions

ILCD: International Reference Life Cycle Data System. European good LCA practices guide.

IMPACTS® database. Public LCI database developed by ADEME in system process format for implementing environmental labeling of major consumer products. This database contains generic data.

IT : Information Technology

AOC. “Appelation d’origine controlee”

PGI : Protected Geographical Indication

LCA: Life Cycle Assessment

LCI: Life Cycle Inventory.

LCIA: Life Cycle Impact Assessment

SimaPro®: LCA system

11. Bibliography

ADEME 2008. Revue bibliographique des études « Analyse du cycle de vie des produits agricoles ». Synthesis. Study carried out by ECOINTESYS on behalf of ADEME.

AFNOR, 2011. BPX 30-323-0 : Affichage environnemental des produits de grande consommation – Principes généraux et cadre méthodologique. Ed AFNOR, La Plaine Saint-Denis, France.

Jolliet O., Saadé M., Crettaz P., Shaked S., 2010. Analyse du cycle de vie: comprendre et réaliser un écobilan. Vol. 23. Presses polytechniques et universitaires romandes, Lausanne, Suisse.

Koch P. and Salou T., 2013. AGRIBALYSE® : Rapport Méthodologique – Version 1. Ed. ADEME, Angers, France.

Pfister S., Koehler A. and Hellweg S., 2009. Assessing the environmental impacts of freshwater consumption in LCA. Environmental Science & Technology, 43 (11), 4098-4104.

12. Appendices

AGRIBALYSE

August 2011

Quality control of French production systems

Specification

For organizations selected to undertake quality control

Authors
Peter Koch
Thibault Saou

AGRIBALYSE program

Specification: Quality control for French production systems

Table of contents

Introduction - Purpose of the specifications

These specifications provide answers to questions on methodologies and practices that might be raised by the experts selected to undertake the quality control of the data collected for the production systems describing the agricultural production processes of the AGRIBALYSE program. It set out i) to help experts in checking the quality of the data and ii) ensure that experts have a consistent approach.

This specification, therefore, defines:

- The scope of the data subject to quality control
- The assessment method

Partners of the program

Part A – Presentation of the quality control procedure for the AGRIBALYSE program

The credibility of the database built for the AGRIBALYSE program depends on scrupulous quality control. This quality control will be undertaken in three phases:

1. Verification, by the project leaders, of the data and information entered by the Technical Institutes
2. Quality control of the data describing the production systems of the French production processes, carried out by independent organizations
3. Quality control of the results of the LCI and LCIA, carried out by the Technical Institutes who are partners of the program

A working seminar will be organized at the end of the second and third phases.

This document concerns the second quality control phase. This phase is divided into two stages. The first stage is quality control by the experts and the second stage is the assessment of their comments on checking the data at seminar N°3 (February 2012). This seminar will decide what action, if any, should be taken on the comments from the experts. The experts are invited to attend the seminar but this is not compulsory.

Part B – Quality control framework

For the AGRIBALYSE program, each expert should review a group of similar agricultural production processes (eg all oleaginous plants), depending on his field of competence.

B.1 Scope of quality control

Comment:

The AGRIBALYSE program was set up to build a database of LCI datasets for French agricultural production. The data was, therefore, collected for "French average" production, in most cases. One of the aims of the program is to ensure that the various products were handled uniformly.

These two requirements require a strict definition of the methodology to be used (system boundaries, functional units, allocation, etc.)

The quality control required here does not cover the methodological choices. Experts are required to check:

a) Compliance with the main recommendations defined in the Data Collection Guide for the AGRIBALYSE program

b) Data for French production systems

As most of the data is for “French average” production systems, experts are not required to give their opinion on the precision of the data entered for particular situations. They are asked to give their opinion on the **plausibility** of the data entered.
They are asked to fill in the “Evaluation” column on the forms with the following scores:

- X ***Good (Plausible data):*** the data entered conforms, in the AGRIBALYSE context, to current French agricultural production practices
- X ***Acceptable (With reservations):*** the values entered are borderline for what is usually found but remain plausible. If possible, they should be verified to check that there are no errors. This score should be supported by a comment
- X ***Unacceptable (To be corrected):*** the values are unrealistic or suspect and need to be corrected. This score should be supported by a comment.
- X ***No opinion:*** if the expert was not qualified to evaluate the data quality

Experts are also asked to comment on any omissions or incoherences in the data checked.

Note : Depending on his conclusion (“major modifications required, to be reviewed after modifications”), the expert may be asked to carry out a second review to verify the quality of the data that has been modified.

B.1.1 General section

The first part covers general points common to the livestock and plant production processes. The following points are evaluated.

(A) Correspondence between the name of the process and its content

- X Does the name of the process correspond to the content?
- X Is the name sufficiently explicit?

(B) Implementation of the principles in the Data Collection Guide

- X Are the main recommendations set out in the Data Collection Guide correctly applied?

(C) Data quality: - Representativeness

- X Technological
- X Geographical
- X Time-related: is the data representative of the reference period (2005-2009)?

- Documentation

- X Are the data and calculations adequately documented?
- X Are the documents cited available to the public?

B.1.2 Livestock production

The data to be checked is divided into various groups (see livestock production form). Different information is evaluated for each group.

Activity data

- X Yields: weight of animals on output, quantities produced (eggs/milk)
- X Time spent on the farm
- X Specific technical data (eg: lean meat percentage for pigs)

Feed

This section has two parts, one for the formulation of feed mixes and one defining the composition of rations. The following data should to be checked:

- X Formulation of the feed mixes: list of raw materials and proportions
- X Composition of the rations
- X Distribution of rations for a given class of animals

Excretions

- X Management in buildings, quantities, dry matter content, storage duration
- X Management during storage: storage structure, duration, quantities managed

Dates

- X Distribution of feed rations
- X Turning ruminants out to grass

Buildings

- X Type, area
- X Time spent by animals in buildings

Power consumption

- X Fossil fuel (natural gas, propane/butane, oil, electricity)
- X Lubricants

B.1.3 Arable / horticultural production

The data to be checked is divided into various groups (see plant production form). Different information is evaluated for each group.

1. Yield and co-products

- X Yield: suitability of the functional unit definition (in particular details of the product quality), quantities produced and variations.
- X Permanent crops: duration of the process
- X Co-products: quantities produced
- X Plausibility of the yield of the main product

2. Management of intercrops

- X Previous crop: date of harvest, distribution and quantity of crop residues
- X Plausibility of the intercrop management (no intermediate crop, intermediate crop not sold, with intermediate crop sold)

3. Tilling and drilling (quantities and mechanization

- X Suitability of the production system for tilling
- X Quantities of seed sown and proportion of farm seed

4. Fertilization (quantities and mechanization)

- X Plausibility of fertilizers used
- X Application methods (mechanization) and frequency (number of passes)
- X Plausibility of quantities applied (and variation)

5. Pesticides (quantities and mechanization)

- X Plausibility of active substances used
- X Application methods (mechanization) and frequency (number of passes)
- X Plausibility of quantities applied (and variation)

6. Sundry

- X Irrigation (if appropriate): volume of water used for watering, amount of power used and type of power
- X Suitability of the various inputs entered
- X Travel of seasonal labor: distances and number of seasonal workers per data collection unit

7. Plausibility of the dates

- X Dates for harvesting previous crops
- X Dates for tilling
- X Date for sowing main crop
- X Dates of fertilization (if given)
- X Dates for applying pesticides (if given)
- X Date for harvesting main crop

B.2 Estimated time taken for each process

Estimated workload for each process

1.	Evaluation of the specific criteria:	2 to 5 minutes for each section =	10 – 35 minutes
2.	Filling in the review form:		30 – 45 minutes
For each process			**40 – 80 minutes**

It is likely that the speed of evaluation will improve. The upper limit applies, therefore, to the first processes checked.

B.3 Reporting

The review forms should be returned to the project leaders. One review form should be returned for each production system reviewed.

Part C – Documents provided

Various documents are provided for the experts to make it easier to check the quality of the production system data.

C.1 Specification

This document. It provides the information required on the quality control aims and methods. It defines the quality control procedures: what data should be checked and how this should be done.
The specification also includes important information on the schedule, confidentiality, etc.

C.2 Production system data

When the expert has signed a confidentiality agreement, production system data will be sent in the form of EXCEL spreadsheets. These were prepared by the project leaders and extracted from the data collection module. They contain all the data to be checked.

C.3 Review forms

The review forms are designed i) to provide a checklist for the data to make it easier to check the data ii) to ensure that the data review is consistent. These review forms should be sent back to the project leaders.
One form should be filled in for each process checked.

The review forms have a formal part setting out the criteria to be evaluated. This part is the core element of the review process and should to be filled in. The second part allows experts greater freedom to give a more general assessment of the quality of the data checked.

C.4 Main Recommendations in the Data Collection Guide

An overview of the main recommendations in the Data Collection Guide for the AGRIBALYSE program is provided for the experts to make it easier for them to check that the data entered complies with these recommendations.

C.5 Confidentiality agreement

The confidentiality agreement ensures that the data sent for quality control will be kept confidential. This agreement must be signed before the start of the quality control procedure.

Part D – Schedule

The quality control procedure is scheduled to take place during fall 2011 and the phase for checking French production system data is scheduled to end with a working seminar in February 2012. To make preparations for this phase, experts are asked to send their reports to the appropriate project leaders **within at least four weeks after receiving the data to be checked**.

Part E – Confidentiality

Experts are reminded that the data sent is confidential and must be treated as such. It may not be used outside the scope of the AGRIBALYSE program.

Part F – Main recommendations in the Data Collection Guide

The following table lists the main recommendations to ensure that the data collected for the AGRIBALYSE program is consistent.

Main recommendations in the AGRIBALYSE Data Collection Guide

Recommendation N°		*Recommendation*
R1		**Functional unit** The functional unit must be a unit of mass or volume at the farm gate with a description. Reasons must be given for any exceptions.
R2	**Arable/ horticultural**	**Time-related representativeness** The reference period is from 2005 to 2009. Exception: the period may be extended to 2000-2009 … … if insufficient data is available for the period 2005-2009 … for products with fluctuating yields.
	Livestock	**Time-related representativeness** The reference period is from 2005 to 2009. Exception: the period may be extended to 2000-2009 … … if insufficient data is available for the period 2005-2009.
R3		**System boundaries** The general boundary is cradle to gate. Post harvest processes (drying, etc) should be modeled in separate LCI data sets.
R4	**Arable/ horticultural**	**Details of the system boundaries** Processes that are within the boundary: ✓ production of seed and plants ✓ production and application of active substances in pesticides (herbicides, fungicides, insecticides, etc). ✓ production and application of mineral fertilizers ✓ application of organic fertilizers. If processing is required, this is taken into account (eg: composting, feather meal, bone meal, etc) ✓ equipment, materials and buildings used for arable / horticultural products (management of intercrops, tilling, drilling, application of pesticides and fertilizers, harvesting, transport, etc.), including the production of the machines and buildings, maintenance and the space for storing the equipment (shed/barn/garage) ✓ for tropical products, animal traction is taken into account and feed for the animals used for traction is considered as an input ✓ work by third parties ✓ irrigation
	Livestock	**Details of the system boundaries** Process that is within the boundary: ✓ fabrication of feed (production of raw materials and processing) and bedding, as well as transporting them to the livestock building, whether they are produced on the farm or not ✓ drinking water for the animals ✓ breeding of genitors and production of animals for input and feed ✓ work by third parties ✓ machinery and livestock buildings (milking parlor, stabling,

Recommendation N°		*Recommendation*
		handling equipment, buildings, etc.), including the production of the machines and buildings, maintenance and the space for storing the equipment (shed/barn/garage) ✓ water for cleaning the equipment and buildings and cooling systems ✓ activity of animals (rumination) and excretions (grazing, buildings, storage).
R5	**Arable/ horticultural**	**Details of the assessment period for determining the start and end of the crop for cropping sequences** The assessment period for a crop goes from the harvest of the previous crop to the harvest of the crop considered in the data set.
	Livestock	**Assessment period for livestock production** January 1st to December 31st.
R6		**Inputs not considered / cut-off rule** In theory there is no cut-off rule. It is stated explicitly whether an input is excluded from the system.
R7		**Data quality** The data quality is evaluated using the name of the data source.

Part G – Contacts

Further information may be obtained from the project leaders of the AGRIBALYSE program.

Arable / horticultural products:

Peter KOCH (ART - Switzerland):
Telephone: 00-41-44- 377-75-74
e-mail: peter.koch@art.admin.ch

Livestock production:

Thibault SALOU (INRA - Rennes) :
Telephone: 02-23-48-70-40
e-mail: Thibault.Salou@rennes.inra.fr

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MINISTÈRE DE L'ENSEIGNEMENT SUPÉRIEUR ET DE LA RECHERCHE

AGRIBALYSE

August 2011

Quality control of French production systems

Brief

For ADEME and organizations selected to undertake quality control

Authors:

Peter Koch

Thibault Salou

AGRIBALYSE program
Brief: Quality control of French production systems

Table of contents

Introduction - Purpose of this brief

This brief provides answers to questions on methodologies and practices that might be raised by the experts selected to undertake the quality control of the data collected for the production systems describing the agricultural production processes of the AGRIBALYSE program. It sets out to: i) explain the aims of the quality control phase, ii) define the means used to achieve these aims and iii) ensure that experts have a consistent approach.

This note, therefore, defines:

- The scope of the data subject to quality control
- The criteria and procedures for selecting the experts
- The assessment method

Partners of the program

Part A – Goals of the quality control

Presentation of the quality control procedure for the AGRIBALYSE program

The credibility of the database built for the AGRIBALYSE program depends on scrupulous quality control. This quality control will be undertaken in three phases:

1. Verification, by the project leaders, of the data and information entered by the Technical Institutes
2. Quality control of the data describing the production systems of the French production processes, carried out by independent organizations
3. Quality control of the results of the LCI and LCIA, carried out by the Technical Institutes who are partners of the program

A working seminar will be organized at the end of the second and third phases.

This document concerns the second quality control phase. This phase is divided into two stages. The first stage is quality control by the experts and the second stage is the assessment of their comments on checking the data at seminar N°3 (February 2012). This seminar will decide what action, if any, should be taken on the comments from the experts. The experts are invited to attend the seminar but this is not compulsory.

Part B – Means

B.1 Experts

The AGRIBALYSE Strategic Committee will appoint an independent expert for each review of a group of similar agricultural production processes (eg: all oleaginous plants).

B.1.1 Eligible experts

The experts selected must belong to an organization external to the AGRIBALYSE program whose competence is established beyond doubt.
The experts selected must be independent and have the necessary qualifications and experience. This quality control phase requires technical qualifications and experience and a knowledge of French agricultural production systems.

Procedure for selecting the experts:

1. Selection of organizations for quality control
2. Proposal of experts by the Technical Institutes
3. Proposal of experts by the organizations selected for quality control
4. Selection of the experts by the Strategic Committee from the proposals made by the organizations and Technical Institutes, on the basis of the following criteria (§B.1.2)

B.1.2 Expert selection criteria for

Basic criteria taken into account for selecting experts

1. Knowledge of the systems studied at regional level but above all at national level
2. Independent with respect to AGRIBALYSE
3. Accepted without veto by one of the members of the Strategic Committee
4. Availability

B.1.3 Anonymity

AGRIBALYSE undertakes to ensure that experts involved in checking the French production system data remain anonymous.
However, the identity of experts who wish to take part in seminar N°3 will be recorded.

B.2 Documentation

B.2.1 Specification for experts

This specification has been drawn up to simplify the quality control work of the experts by explaining the data to be assessed and how this should be done.
It defines the scope of quality control required.
It also defines that, when modifications are required, the quality of the modifications will be subject to a second review.
It also states that experts who take part in the quality control procedure are urged to be present at seminar N°3.

B.2.2 Review forms

Review forms are being sent to the experts to provide uniform results. These forms are specific to each livestock or arable / horticultural production system and are attached at Appendices 1 and 2. One form should be filled in for each process checked.
These forms have:

1. a pre-printed section: to ensure that the experts check critical points
2. a blank section: for comments by the expert on the general quality of the process

Several forms may be completed for a review if this review covers several processes.

B.2.3 Confidentiality agreement

The confidentiality agreement, sent to the experts and the organization to which they belong, ensures that the data transmitted will be handled confidentially. It should be signed and returned by the expert before they receive the data.

Part C – Quality control

C.1 Scope

The experts are not asked to assess the methodological decisions made for the project (system boundaries, functional units, allocation, etc). They are responsible for checking the quality of the production system data. Details of the data to be reviewed are defined in the specification (Appendix 5).
The experts are also asked to comment on any omissions or incoherence in the descriptions of the production systems.

C.2 Procedure

Production systems are grouped into similar types of production (eg: one expert will check data for all oleaginous plants). One review covers the whole group of similar production systems.
Quality control procedure:

1. Preparatory phase: selection of organizations and experts
2. Data and documents sent to experts for quality control. The production system data will be sent as Excel files, prepared by the project leaders, containing extracts from the data collection module
3. Return of review forms
4. If required, quality control of modified data
5. Seminar N°3

C.3 Reporting

C.3.1 Schedule for returning the review forms

The quality control phase is scheduled for October 2011 to January 2012. The review forms should be returned to project leaders as soon as possible. The experts are asked to return the review forms within four weeks after the data has been sent.
This also applies if the production system data has to be reviewed a second time.

C.3.2 Expected results

Experts are expected to fill in and return the review forms (Appendices 1 and 2). One review contains one review form for each production system checked.

Part D – Confidentiality

D.1 Confidentiality of data checked

The production system data sent to experts is confidential and may not be used outside the AGRIBALYSE program.
A confidentiality agreement (Appendix 3) should be signed by the expert before the data is sent for checking.

D.2 Publication

Experts will not be named in the various reports published and will only be known to the AGRIBALYSE Strategic Committee. For publication, the organizations to which the experts belong will be named, unless the expert explicitly requests that it remains anonymous.

Part E – Estimated time taken for each process

Estimated workload for each process

1.	Evaluation of the specific criteria:	2 to 5 minutes for each section =	10 – 35 minutes
2.	Filling in the review form:		30 – 45 minutes
For each process			**40 – 80 minutes**

It is likely that the speed of evaluation will improve. The upper limit applies, therefore, to the first processes checked.

Part F – Bibliography

ILCD 2010 **ILCD JRC and EIS, 2010.** ILCD Handbook : Reviewer qualification for Life Cycle Inventory data set

Part G – Appendices

G.1 Appendix 1: Arable / horticultural review form

Process reviewed *(name and number)*		
Evaluation		
General analysis	**Evaluation**	**Comments**
(A) Correspondence between the process name and its content		
(B) Implementation of the Data Collection Guide principles		
(C) Data quality: *- Technological representativeness*	☐ *Good* ☐ *Acceptable* ☐ *Unsatisfactory* ☐ *No opinion*[1]	
- Geographical representativeness	☐ *Good* ☐ *Acceptable* ☐ *Unsatisfactory* ☐ *No opinion*[1]	
- Time-related representativeness - Current	☐ *Good* ☐ *Acceptable* ☐ *Unsatisfactory* ☐ *No opinion*[1]	
- Documentation	☐ *Good* ☐ *Acceptable* ☐ *Unsatisfactory* ☐ *No opinion*[1]	
Quality control criteria	**Evaluation**	**Comments**
1. Yield and co-products		

[1] *No opinion*: This box should only be checked if it is not possible to assess the criterion to be evaluated.

2. Intercrop management		
3. Tilling and drilling (quantities and mechanization)		
4. Fertilization (quantities and mechanization)		
5. Pesticides (quantities and mechanization)		
6. Sundry		
7. Plausibility of dates		

General evaluation and comments

Decision
☐ *Accepted*
☐ *Accepted with minor modifications*
☐ *Major modifications required (to be reviewed after modifications)*

Date checked	
Name and signature	

G.2 Appendix 2: Livestock production review form

Process reviewed *(name and number)*		
Evaluation		
General analysis	**Evaluation**	**Comments**
(A) Correspondence between the process name and its content		
(B) Implementation of the Data Collection Guide principles		
(C) Data quality: *- Technological representativeness*	☐ *Good* ☐ *Acceptable* ☐ *Unsatisfactory* ☐ *No opinion*[2]	
- Geographical representativeness	☐ *Good* ☐ *Acceptable* ☐ *Unsatisfactory* ☐ *No opinion*[2]	
- Time-related representativeness	☐ *Good* ☐ *Acceptable* ☐ *Unsatisfactory* ☐ *No opinion*[2]	
- Documentation	☐ *Good* ☐ *Acceptable* ☐ *Unsatisfactory* ☐ *No opinion*[2]	
Quality control criteria	**Evaluation**	**Comments**
1. Activity data		
2. Feed: formulation of feed mixes and composition of rations		

[2] *No opinion*: This box should only be checked if it is not possible to assess the criterion to be evaluated.

4. Excretions: management in building, management during storage and treatment		
5. Dates		
6. Buildings		
6. Power consumption		

General evaluation and comments

Decision
☐ *Accepted*
☐ *Accepted with minor modifications*
☐ *Major modifications required (to be reviewed after modifications)*

Date checked	
Name and signature	

G.3 Appendix 3: Confidentiality agreement

Undertaking to treat the documents as confidential

The data contained in the following files is confidential and may not be used outside the AGRIBALYSE program.

(1)
(2)
(3)

are transmitted to the signatory organization named below,

Organization: _____

on condition

a) that the signatory declares that it agrees (by signing at the bottom of the page) to treat the information as confidential and not to pass it to third parties
b) that the signatory uses the information only for the purpose of "Quality Control of production system data for the AGRIBALYSE program"

For AGRIBALYSE:

Mr _____, Head of production system project _____.

Signatory organization: _____
Represented by: _____

☐ The signatory undertakes to notify the directors of his organization of the content of this agreement

_____ _____
Place and date Signature of the expert