GENERAL PRINCIPLES FOR AN ENVIRONMENTAL COMMUNICATION ON MASS MARKET PRODUCTS

METHODOLOGY FOR THE ENVIRONMENTAL IMPACTS ASSESSMENT OF FOOD PRODUCTS

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ADEME
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READING GUIDE

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INTRODUCTION

Background

General background on environmental labelling

Article 54 of law No. 2009-967 passed on 3 August 2009 states that consumers shall be given objective environmental information on product characteristics (environmental impacts of the product/packaging pair).
Environmental labelling applies to all consumer products targeted at the end-consumer. Since spring 2008, AFNOR has been conducting work headed by ADEME to develop the methodologies assessing environmental impacts with the involvement of all stakeholders: professionals, but also based on input from civil society. **The AFNOR repository of best practices BP X30-323 is the framework document that sets out the general principles** so that companies who wish to initiate environmental labelling can do so on the basis of a common methodology. The repository has established that the indicators should allow products belonging to the same category to be compared. It is therefore necessary for the indicators to be calculated in the same manner. For this reason, and as an extension of this repository, work groups have met to specify calculation methods.
Sector-specific work groups bring together professionals and other stakeholders concerned by a product family to discuss and propose calculation methodologies specific to a given product.

Specific background of the reading guide: work on food products

This repository aims at providing a methodological framework for the environmental impact assessment of food products, intended for human consumption or animal feed.

Environmental labelling principles

In order to provide consumers with information that is representative of the main environmental impacts of products, the environmental labelling system is based on a key method for all work in the area: **life-cycle analysis** (LCA). This assessment makes it possible to identify and evaluate all the potential environmental impacts of a product at each stage of its life cycle: raw materials production or extraction, product manufacture, distribution, product use and the impacts associated with its end-of-life processing or disposal.

ISO 14040 and ISO 14044 [1] provide an international framework for this type of assessment. The standards have, however, left various methodological options open. The purpose of the cross-sector methodology annex and the sector-specific methodology annexes is to further specify these methodologies in order to ensure that **all calculations follow the same method and that the results included in the environmental labelling system are therefore comparable.**

Objective of the reading guide

The aim of this reading guide is to explain some of the concepts and requirements included in the repository on food products and make them accessible to a wider audience so that everyone can understand the choices made in the repository.
There is also a reading guide for the cross-sector methodology annex that is applicable to all products.

[1] www.iso.org

PRESENTATION OF THE PRODUCT COVERED BY THE REPOSITORY

Introduction

The Working Group "Food products", jointly led by the ANIA (French national association of food industries) and ADEME, met on a regular basis from 2009.
The works were based on the findings of a pilot project led by the ANIA, the FCD (Federation of Trade and Retail Companies) and ADEME in 2009 and 2010 as well as works led by a limited group on upstream agricultural activities.

Their work culminated in a framework repository for processed and unprocessed food products intended for human consumption or animal feed.

Given the wide variety found in food products, this general repository may be adapted by food industry sectors to constitute subsector-specific repositories (i.e: milk products, edible vegetable oils, meat and sausage products, wines and spirits…)

Functional unit

Determining the functional unit and the reference flow

Functional unit

The functional unit is the unit of measurement used to evaluate the service provided by the product, which is therefore a result. The functional unit adopted for food products can be one or the other of the following units:

- 100 g / 100 ml;
- or the portion, when this information is available and defined by the profession or a European regulation.

In any case, these units shall be considered while taking into account the quantity «as consumed», i.e. the foodstuff once it is prepared, provided the means of preparation is described (ready-to-eat product; e.g. reconstituted product).

Reference flow

The reference flow designates the quantity of product necessary to satisfy the needs defined by the functional unit. For this study, the reference flow selected is:

- The quantity retained of the product
- The packaging system:
    - Sales packaging
    - Groupage packaging
    - Transport packaging

Food products cycle and study scope

All the stages of the life cycle are taken into account excepted that are **excluded by the** methodological repository **BP X30-323-0** (consumer transport to the point of sale is not directly included in the assessment).

If certain stages have a **negligible influence on the environmental balance of the product**, subsector-specific repositories could propose to exclude it.

Food waste

Avoidable materials (wastage) and unavoidable materials can be generated over all the stages of the product life circle.

The unavoidable losses are taken into account over all the stages of the life cycle through the processes that constitute them.

However, the currently available data does not enable the assessment to take into account avoidable losses. It is, however, interesting to conduct work on this subject so as to eventually be able to incorporate them in a future review of the repository.

Food products life circle

Raw materials and ingredients

Raw materials and ingredients transports

Packaging system

Manufacturing process (preparation or processing)

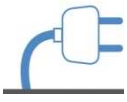
Sales/Distribution

- Warehouses and distribution platform
- Points-of-sale
- Mode of storage
- Transport and refrigeration

Distribution

Modes of transport, distribution and storage are taken into account (ambient temperature, cold, frozen).

Use by the consumer
Preservation, preparation, consumtion



Use by the consumer

Modes of preservation (i.e.: ambient temperature, cold, frozen) as well as modes of preparation (i.e.: cooking time, cooking method, etc.) are taken into account.

End of life :
Product and packaging

EXPLANATION OF METHODOLOGICAL CHOICES

Environmental issues and impacts

Environmental impact assessment:

Some criteria have been identified as significant for the overall environmental balance of a food product:

Climate change:

The agricultural production, transport activities, manufacturing and consumption that occur throughout the life cycle of food products result in greenhouse gas emissions that drive climate change. **The Grenelle 2 laws and the requirements of BP X30-323 have made it mandatory to consider this issue.**

Water consomption:

The agricultural production and ulterior phases of food manufacturing, preservation and preparation, require water consumption and represent an important environmental impact. **It would no doubt be possible to distinguish a certain number of products from the others once a calculation method for water consumption was scientifically validated.**

Marine water eutrophication:

Marine water eutrophication is the modification and deterioration of an aquatic environment by inputs of nitrogen nutrients. It can generate an excessive and rapid development of micro-algae and could lead to a lack of oxygen in the deep waters. **This indicator was retained on the one hand because agricultural production, food manufacturing and consumption contribute to these nutrient inputs and on the other hand because the** levels of accuracy make it possible to distribute the products over several thresholds **that are deemed to present significant differences.**

Aquatic ecotoxicity:

This criterion represents the effect of pollutants on aquatic ecosystems once they enter the water evacuation and treatment system. Agricultural phases can reject products that can be toxic for the aquatic systems. It generates an important impact that is, a priori, discriminating among the method used.

Biodiversity

Human activities, by their nature, their intensity or their space use, can lead to a decrease of abundance and richness species. This is the case of agriculture, farming and fishing, which are in high interaction with ecosystems.

The choice of environmental indicators for the environmental labeling was made on several criteria:

- indicator relevance: importance of the impact and differentiation for a majority of market products (comparability)
- indicator ease of implementation: feasibility for the database and accessibility of the data for the firm
- indicator consistency: coverage of the whole life cycle scope and product packaging scope, consistency with other posted indicators
- indicator robustness and reliability: methodological recognition and robustness, reliable data.

Indicators retained for food products environmental labelling communication:

- **Climate change**, expressed in g CO_2 equivalent
- **Water consumption**, expressed in Litre
- **Marine water eutrophication,** expressed in g N eq.
- **Aquatic ecotoxicity**, expressed in CTUe (Comparative Toxic Unit for ecosystems)
- **Biodiversity,** to be defined

(see the Unit glossary)

Two database projects for food products: AgriBalyse and Acyvia

There are no sufficient scientific data on ingredients and transformation processes in the agri-food sector. AgriBalyse and Acyvia are two projects ongoing for:

- ***Provide a public-access database of inventory data on agricultural products and transformation processes***
- ***Provide a methodological repository for production of inventory data for agricultural products and transformation processes***

Agribalyse includes inventory data on agricultural products and will be available in October 2013.
Acyvia includes inventory data onf transformation processes and it is expected at the end of 2015.
These two projects are led in collaboration by ADEME, INRA (AgriBalyse), Quantis (Acyvia), Agroscope and agricultural technical institutes for AgriBalyse and agri-food technical institutes, ITERG in particular, for Acyvia.

Data underlying impacts and articulation of specific and generic data

Type of data used for labeling

The work group shall specify which parts of the quantified data shall necessarily be specific data and which can or shall be generic data.

The data qualification depends on:

- the relative importance of this data for the overall balance,
- the availability of the data,
- the cost involved in obtaining the data

Data used to calculate impacts:

<u>Activity data</u>: data relating to the activity

- **Specific data**: data measured or calculated by the company. Example: nature and quantity of the packaging material.
- **Generic data**: averaged data used by all companies of a specific sector. Example: loss rate of a specific process.
- **Semi-specific data**: data that is proposed by default and that the company can replace with primary data.

<u>Inventory generic data sets</u>: data available in the ADEME database.
Example: impact factors of a material

Subsector-specific work groups will specify semi-specific data, in particular transport and use phase data. This work at subsector scale will allow taking into account the logistics schemes and the use modes specific to the product family.

An operator can propose, for the ingredients that he uses, impact factors as a substitute for the impact factor in the ADEME public-access database (see note page 10). The specified inventory data shall be produced in a manner that is consistent with the methodological guide on setting up the public-access database for agricultural products.

The following table summarizes the choices made for food product modelling:

Phase	Activity data			Inventory generic data sets
	Specific data	Semi-specific data	Generic data	
Product manufacture	- Ingredients : quantity and origin - Identification of manufacturing processes	- Mode of agricultural production of ingredients (conventional, bio..) - Processes characteristics (water, energy, waste…)		- Factor impacts of ingredients production[2] - Factor Impacts of processes characteristics
Package manufacture	- Packaging : materials and manufacturing processes			- Factor impacts of manufacturing processes
Transport	- Ingredients/final product : distance, mode of transport and kind of transport (ambient, refrigerated, frozen)	- Ingredients/final product: rate of loading rate and empty backhaul rate - Between the platform and the retailors: characteristics		- Factor impacts from transport modes
Storage	- Mode of storage			- Factor impacts of each mode of transport according to the type of transport (ambient, refrigerated, frozen)
Consumer Use	- Mode of conservation - Mode of preparation	- Default values of consumer use scenario (specified in the sector-specific repositories)		- Impact Factors of mode of conservation and mode of preparation
End-of-life				- Impact factors of raw materials and of end-of life of packaging and ingredients

[2] Ingredients strongly contribute to the environmental impacts of products but data are difficult to obtain so they cannot be specific. Neither is it possible to propose semi-specific data that would overestimate impacts because the impacts of most products would then be overestimated.
Because of this specific situation, an operator will be authorized to propose primary data to replace the secondary data in the public-access database. For the calculation of specific data, operators shall follow the methodological guide of the public-access database on agricultural products (agribalyse).

Other methodological choices

Allocation rules for products and co-products

In general, agricultural phase and ulterior phases of processing led to the production of several “co-products”. For example:

- Dairy/sheep farming: milk, meat, wool, fat, leather…
- Dairy processing: milk, butter…

Allocation rules have to be defined to allocate environmental impacts of agricultural production or processing between different co-products. Given the wide variety and specificities in agricultural and processing fields, the allocation rule is defined by sectors.

Some fields have already established such rules to apply:

- Dairy processing : mass allocation on the basis of the dry matter
- Fruit juice and nectar processing : mass allocation
- Wines processing : mass allocation on the basis of the raw material ;
- Spirits processing: mass allocation on the basis of the dry matter

For other fields, allocation rules will be specified in subsector-specific.

Integrating carbon emission time lag

Unless there is an exception, which shall then be explained as part of a sector-specific repository, integrating time lag for greenhouse gas emissions is not relevant for food products because they have a short lifespan and greenhouse gas emissions in the end-of-life phase are low. Carbon emissions are therefore taken into account according to the «by default» approach stipulated in Annex A of the BP X 30-323-0 repository.

Modeling of the end-of-life

- **Primary packaging waste:** the end-of-life of the primary packaging has to respect the end-of-life scenario of French household packaging based on the materials.
- **Secondary and tertiary packaging waste:** the end-of-life scenario is the same as the French trade packaging end-of-life scenario.
- **Non consumed product: the end-of-life of** unsold and waste due to wastage is currently not taken into account due to a lack of data. The objective is to incorporate them in a future review of the repository.

Subsector-specific repositories: expected arbitrage

Subsector-specific repositories have to adopt positions on the following aspects:

- Choice of one of the two functional units;
- Allocation criteria between co-products
- Translation of the cut-off rules for the product category and explanation of eventual exclusions
- Means of simplifying and modelling certain phases (transport phase, use phase)
- Mode of calculation for the biodiversity indicator

Data validity period and frequency of updates

If one of the indicators used is modified by more than 20%, calculations must be updated.
In all cases, all data shall be recalculated after 3 years and the information is valid for a minimum of one year.

How data is validated

The company shall keep the information used in the calculations available for any subsequent inspection.

UNIT GLOSSARY

Indicator	Unit	Illustration
Greenhouse effect	g CO2 eq.	A vehicle emits 130g of CO2 per kilometer covered
Water use	litre	A consumer uses 50 L of water on average for one shower.
Marine water eutrophication	g P eq.	900 people reject 1 tone eq. N per year in marine water, after treatment plant.
Aquatic ecotoxicity	CTUe	1 kg of toluene discharged to water is equivalent to 56 CTUe
Biodiversity	To be defined	To be defined

ABOUT ADEME

The French Environment and Energy Management Agency (ADEME) is a public agency under the joint authority of the Ministry of Ecology, Sustainable Development and Energy, and the Ministry for Higher Education and Research. The agency is active in the implementation of public policy in the areas of the environment, energy and sustainable development.

ADEME provides expertise and advisory services to businesses, local authorities and communities, government bodies and the public at large, to enable them to establish and consolidate their environmental action. As part of this work the agency helps finance projects, from research to implementation, in the areas of waste management, soil conservation, energy efficiency and renewable energy, air quality and noise abatement.

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