FeedPrint

**Category**
Outcome-based

**Objective**
To gain an understanding of GHG emissions generated by animal feed supply chains over their complete life cycle as well as from feed utilization
To use results to assist in strategic management (sourcing feed materials, change compound feed composition, affect upstream production) to reduce GHG emissions
To help organizations report on corporate responsibility

**Commodities covered**
- Live cattle (exc. Purebred), pork, prepared animal feeds and chicken

**Geographical applicability**
Europe

**BMPs covered**
- Reduced tillage practices*
- Fertilizer application - source
- Application rate based on testing and book values
- Application method - all types of land tillage
- Fertilizer application - rate
- Fertilizer application - placement

**Target audience**
Farmers, food supply chain managers and feed industry and suppliers

**Developers**
Wageningen University and Blonk Milieu Advies (Netherlands)

**Cost (tool and data)**
Free

**Data inputs**

<table>
<thead>
<tr>
<th>Environmental conditions</th>
<th>Primary data required</th>
<th>Default values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm type: farm category (dairy, pigs, poultry or veal calves) and animal category</td>
<td>n/a</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Crop management</th>
<th>Feeding livestock: soil type of grassland, nitrogen on grassland</th>
<th>n/a</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Source of feed (country)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Feed: dry matter, energy value, crude protein, phosphorus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Feed management: pesticides applied, manure applied, fertilizers applied, machinery use, energy for storage, yield at harvest, weight losses</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Carbon sequestration/storage | No | No |

*modelled partially (i.e. only to calculate the emissions from machinery use)
Livestock

- Farm feeds: byproducts and roughage (select the feed only)
- Feeding livestock:
  - for all livestock: ration of feed
  - for dairy only: amount of concentrate in feed, amount of feed besides grass
  - for fattening pigs: type of fattening pigs, bodyweight at slaughtering, strategy of feeding, water/feed ratio
  - for breeding sows: farrowing per sow per year, age of weaning piglets, age of selling piglets, littersize (piglets born alive), water/feed ratio
  - for broilers: type of broilers, type of growth curve, bodyweight at slaughtering
  - for laying hens: type of laying hens, number of laying days

Energy use

- No
- No

Primary processing

- No
- No

Water

- No
- No

Transport

- No
- No

Others

- No
- No

Scope

- Farm level
- Supply chain

Ease of use for the data collector

Relatively easy, but may require specific documentation, quick to fill - Qualitative data entries can be easily completed by the user. However, unless the producer has done a soil assessment, data on soil organic matter (nitrogen) can be hardly found but there are default values for guidance. Any data entries related to livestock are easy for producer to fill.

Modelling methods

- Consistent - calculation of entire life cycle impacts of feed supply (including utilization) which helps identify the hotspots and test alternative scenarios

Consistency of the model with the goal and scope of the tool

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Transparency and quality of documentation

Guidance document: Yes - A manual is imbedded in the tool

Methodology document: Yes - http://edepot.wur.nl/254098

Conformity of the methodology with the current state-of-the-art agronomic and environment sciences

Consistent - aligned with GHG calculation and LCA standards (ISO 14040/14044/14067, PAS2050, IPCC Guidelines for National Inventory Reports, IDP Guide to standard LCA)

Methodology

- LCA standards such as ISO 14040 and 14044 and PAS 2050 are the basis of the methodology
- For GHG emissions calculations at the national level, the LCA methods were consistent with IPCC requirements
- For methane emissions from enteric fermentation: Tier 3 method used in the Dutch National Inventory Report
- Cradle-to farm gate with functional unit for meat of 1 kg of live weight of a specific animal, for eggs of 1 kg of fresh eggs, and for milk 1 kg of FPCM leaving the farm-gate
- Allocation methodology: based on ISO 14044 rules and Dutch horticulture protocol

Dataset sources used for modelling

- Collected data publicly available: FAOstats, Eurostat, public research results from Blonk Consultants and WUR
- Reviewed the draft reports with industry experts: stakeholders of CFPAN working group
- Feed: average nutritional quality of feed materials from Dutch feed list of the "Centraal Veevoeder Bureau" (CVB-list)

Outputs / Results

- Detailed summary of results in tables
- Detailed summary of results in graphs
- Summary of main hotspots
- Comparison with alternative scenarios

Limits of the tool/model

As the tool is focused on GHG emissions related to feed, options to modify farm conditions are limited