

Cool Farm Tool User Guide

Livestock – Beef & Dairy



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Introduction


2 Welcome to the Cool Farm Tool (CFT) User Guide for **Beef & Dairy Livestock**. This document is designed to help you identify and record the data you will need to complete a Cool Farm Tool assessment and provides you with additional guidance on specific measurement options. The user guide is directed at producers, agronomists and technicians who work with farmers, interested in measuring their greenhouse gas (GHG) emissions.

4 Scope

4 The CFT is a global tool designed to be easily completed and to calculate GHG emissions based on information a farmer has available. Both the beef & dairy modules are divided into seven input sections: **General, Production/Milk, Herd, Grazing, Feed, Manure, Energy & Transport**. Each section asks questions about the animals as well as the farm practices on the farm you are assessing and will require you to have data at hand to answer. In the beef & dairy modules, GHG emissions are calculated for

17  For a full herd considering the average number of animals on farm.

 A functional unit; for beef this is 'live weight added', for dairy this is kg of milk produced.

 A default reference period of one year (calendar or fiscal year); if animals are not year-round on the farm as at intermediate/finishing beef farms, you can calculate one cycle.

The result is a summary of emissions sources and uncovers what decisions and management practices a farmer could implement to create a positive impact on total net greenhouse gas emissions.

When deciding on the scope of your assessment, you should keep the following in mind:

- If you produce your own feed, you can assess the emissions of feed crops prior to the livestock assessment to make your footprint more accurate. This also allows to include carbon sequestration from crop production.
- The Cool Farm Tool does not consider rotational grazing and in general, no soil carbon build-up is simulated yet for grasslands.
- Make sure to correctly allocate your data that is applicable to the herd and reference period you are assessing.
- Clearly define the **boundaries of your analysis** before you start collecting data. E.g. if you are only interested in on-farm impacts up to 'farm gate', exclude processing & transport after the product leaves the farm. Decide whether to register detailed feed DMI values that allows to monitor emission changes through feed efficiency, or only average amounts.

Source of Data

Much of the data will just require your general knowledge of your herd, field and farming practices. Other data will require more specific information; likely sources for these are annual sales statements, (national) inventory lists, purchase/sales documentation from livestock traders/slaughterhouse, farm perimeters, nutrient analysis, feed use records, energy/fuel use records and fertiliser records.

Answer types

There are several answer types in the tool: open text box, drop-down menu, or a combination of them, where you might enter a number and choose the unit of measurement from a drop-down menu. In this guide, you can find the options of drop-down answers either in grey colour directly in the table, or in the appendix (use the [links](#) under answer type). Some fields are filled automatically with default values based on the data indicated. You can adjust them if you have more accurate data at hand.

The beef & dairy modules are to a large part identical. Where they differ, this guide will indicate the questions and answer types in 2 options as a) for beef and b) for dairy for you to collect the correct information for the relevant module. Comments for clarification can be saved in an extra 'notes' text box in each input section.

Units of measurement

The CFT covers all common international units of measurements for different data (e.g. yield, inputs, irrigation, etc.) in the drop-down menus of a module. This user guide will provide suggested units where applicable. If the measurement units you use are not included in the table below, you may need to convert your data before entering.

Helpful information

While filling out the CFT, you'll find an icon that looks like this next to most questions: ⓘ . Hover over this button to find helpful contextual information about the question you are answering. This information is also listed in the "context" box of each question in this user guide.

Farm Assessment

General – Before you start your livestock assessment

In the beef & dairy module, there are different options to register feed items. On-farm pasture used for grazing is included in these modules. Other on-farm feed crops such as corn, small grains or soy need to be assessed separately in the crop module before you start your livestock pathway, which is also advisable for hay and hay silage. The crop user guide explains how to make a crop assessment and how to save it as a feed item (see appendix of crop user guide). Where this separate assessment is not possible (e.g. when pasture is used for both grazing and hay production), forage crops can be covered in the livestock modules.

Section 1a. Beef Production

✓	Question	Answer type	Your answers/notes	Context
	Production System	Drop-down	[breeding farm] [intermediate/finishing farm]	
	Organic or conventional farm	Drop-down	[conventional] [organic]	
	Start of reference period	Drop-down	[start] or [middle] or [end] + [month] + [year]	Choose a relevant start date for your reference period (the end date will be set automatically). To calculate a complete beef footprint, you will need data on your herd management for the entire reference period.
	End of reference period	Drop-down	Filled automatically	Automatically set to 12 months after start of reference period. This can be adapted to the duration of the cycle (if animals are not year-round on the farm).
	Assessment name	Text box		Could include farm name, breed, year, country etc. to identify your assessment.

Section 1b. Milk Production

✓ Question	Answer type	Your answers/notes	Context
Main breed	Drop-down: <u>main breeds</u>		If you have more than one breed you will need to select the most representative breed and adjust the default live weights to reflect your herd averages.
Start of reference year	Drop-down	[start] or [middle] or [end] + [month] + [year]	Choose a relevant start date for your 12-month reference period (the end date will be set automatically). To calculate a complete dairy footprint, you will need data on your herd management for the entire reference period.
End of reference year	Drop-down	Filled automatically	12 months after start of reference period.
Assessment name	Text box		Could include farm name, breed, year, country etc. to identify your assessment.
Total milk production	Number + <u>weight unit</u>		
Fat Content	Text box: percentage	Filled automatically	Default for selected breed; can be adjusted.
True / Crude Protein Content	Text box: percentage	Filled automatically	Default for selected breed; can be adjusted. The percentage can be either true or crude protein content.

Section 2. Your Herd

In this section you need to indicate for each category the average number of animals on-farm for the reference period, and the actual number of animals sold, and the number purchased. Dead animals are NOT included under sold animals, as the GHG footprint per milk/meat would be underestimated. You will also need to indicate the average live weight, which can be indicated in kilograms or pounds (for dairy this is auto populated but can be adjusted to the average weights if you know them). There are two approaches to estimate the average number of animals on-farm during your reference period:

- Snapshot (only dairy):** Estimate the number of each animal category at a point in time, usually in the middle of the reference period.
- Average:** See two examples how to calculate averages: **a)** Take the average of your opening and closing stock numbers, by category, for the whole reference period. For example, if you started the year/cycle with 12 milk cows and closed with 8, then assume your average is 10 (evt. 'round up' numbers); **b)** Estimate the average number of animals present at the end of each month and then average these numbers for the whole reference period. E.g. if in one year you had a monthly average of 100 veal calves that stay on-farm for 6 months, assume your annual average is 50.

2a. Beef

Dropdown (select): weight in kilograms/pounds

✓ Category	Answer type	On-farm animals (average)		Sold animals		Purchased animals	
		Number	Live Weight	Number	Live Weight	Number	Live Weight
(1) Veal calves up to 8 months	Text box: number						
(2) Beef calves younger than 1 year	"						
(3) Younger beef heifer 1 year to 18 months	"						
(4) Younger beef steer 1 year to 18 months	"						

General	Production Milk	Herd	Grazing	Feed	Manure	Energy	Transport
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Results

14%
Complete

(5) Older beef heifer older than 18 months	"						
(6) Older beef steer older than 18 months	"						

2.1a. Beef Herd Characteristics

For the beef module, you can optionally note down the following 'herd characteristics' as KPIs that won't affect the calculation, but will be shown later in the 'Performance' tab:

✓	Answer type	Age first calving	Calving Interval	Calving rate	Replacement rate	Time to slaughter
	Text box: number	months	months			months

2b. Dairy

Dropdown (select): weight in kilograms/pounds

✓ Category	Answer type	On-farm animals (average)		Sold animals		Purchased animals	
		Number	Live Weight	Number	Live Weight	Number	Live Weight
(1) Dairy calves 0-1 year, for replacement of dairy cows	Text box: number						
(2) Meat calves 0-1 year for beef production	"						
(3) Heifers 1 year until first calving	"						
(4) Milk cows lactating dairy cows	"						
(5) Dry cows non-lactating dairy cows	"						
(6) Nursing / suckling cows	"						

Section 3 – Grazing

Please provide information on

- **the grazing time** for each animal category of your herd calculated based on the whole reference period, in **total days and average hours per day** (exclude e.g. the hours cows are in for milking). The CFT will then automatically estimate the grass consumed and the manure distributed on the field during grazing. ATTENTION: If assessing one year, you need to consider that the maximum grazing time per animal category is 365 days. Then look at the average proportion of that total an animal category normally spends on pasture. E.g. even if cows are only dry for 60 days - if during the reference period your dry cows graze half of the time, indicate 183 days of grazing (= 365/2, rounded up).
- **the grazing type** which is needed for the energy requirement calculation. Confined pasture refers to confined areas where animals graze with sufficient forage, requiring modest energy expense to obtain feed. Rangeland / rough grazing refers to animals grazing in open range land or hilly terrain expending more energy to obtain feed;
- **the grazing quality** which is required for the digestibility of grass. High quality refers to grass from good pastures (generally fertilised), low quality refers to grass from rangelands (mostly unfertilised, not sown, not managed).

✓	Herd category	Answer type	Days (between 0 and 365)	Hours / day (average)	Answer type	Grazing type	Grazing quality
	(1)	Text box: number			Drop-down	[Confined pasture] [Rangeland/rough]	[High] [Low]
	(2)	"			"	[Confined pasture] [Rangeland/rough]	[High] [Low]
	(3)	"			"	[Confined pasture] [Rangeland/rough]	[High] [Low]
	(4)	"			"	[Confined pasture] [Rangeland/rough]	[High] [Low]
	(5)	"			"	[Confined pasture] [Rangeland/rough]	[High] [Low]
	(6)	"			"	[Confined pasture] [Rangeland/rough]	[High] [Low]

Section 3.1 Grassland Fertilisation

Indicate only the area used for grazing for the assessed herd (and evt. forage production area also used for grazing). Indicate fertilisers you apply to this area (one/multiple applications; include imported or your own produced manure). Only indicate fertilisers applied to the area during the reference period, NOT manure distributed by the herd during grazing. Also, do NOT include fertilisers applied to crops you assess in a separate crop assessment.

Grazing Area

✓	Question	Answer type	Your answer/notes	Question	Answer type	Your answer/notes
	Type (dairy only)	Drop-down	[Grazing area only] [Grazing, grass silage and hay area combined]	Grassland area	Number + unit	[ha] [acres] [m2]

Fertiliser application

✓	Question	Answer type	Your answers/notes	Context
	Fertiliser type	Drop-down: Fertilisers		See appendix for list of fertilisers; if your fertiliser is not in the list, choose the one closest to it. You can also define your custom NPK blend by indicating the percentage for each element. Also, specify the percentage of N applied as ammonium, nitrate, or urea (e.g. if 30% N comes equally from ammonium & urea, it's 15/0/15%).
	Rate measure	Drop-down	[Product] [Unit of active element]	Specify if the amount applied refers to the applied fertiliser product, or only to the weight of an active element (e.g. units of P205, K20, N...). For example: 100 kg/ha of Urea (46% N) product could also be entered as 46 kg/ha of N.
	Amount applied	Number + weight/area		Enter the amount and weight per area. If you fertilise with your own manure, only add the amount of manure applied to the area, not all you produced. NEW FIELDS – OPTIONAL: Indicate application date or the use of an inhibitor.
	Source region	Drop-down: Source region	Filled automatically	The available options for source region vary between fertiliser type (cross-check in the CFT). If you do not know the source region of your fertiliser, you can leave the default answer suggested by the CFT.

Section 4. Feed

There are two feed approaches in the Cool Farm Tool that calculate the digestive efficiency of your herd: The first approach allows you to specify the dry matter intake for each feed item and each animal category. This is the most accurate, preferable way to account for feed emissions. The second approach only requests the percentage of fresh matter intake for different feed items for the entire herd but can under- or overestimate emissions.

If you produce your own feed, you can make your livestock footprint more accurate by making a separate crop assessment for your feed. Once completed, save it as feed item (see the crop user guide appendix for guidance) so you can select it as option from the top of the feed component list in the livestock pathway. For such feed items, note down the assessment name under “feed component” and indicate the additional required information.

Feed approach 1: Dry matter intake per animal

Please provide all feed items for each animal category indicated in “your herd”. Register **dry matter intake (DMI) per animal per daily average** throughout the reference period for each feed. Note: For grass consumed during grazing time, the CFT will estimate the DMI per animal category and automatically list it as a component in the feed section. You can overwrite this if you have your own DMI data for forage at hand – add that data as an item in the list below.

✓	<u>Herd category</u>	Answer type	Feed Component	Region (of feed production)	Answer type	Average DM/animal/day
	(1)	Drop-down: <u>Feed</u>		Default = World, available regions vary per item	Number + unit	[kilograms] [pounds]
	(2)	“		“	“	[kilograms] [pounds]
	(3)	“		“	“	[kilograms] [pounds]
	(4)	“		“	“	[kilograms] [pounds]

General	Production Milk	Herd	Grazing	Feed	Manure	Energy	Transport
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Results

43%
Complete

(5)	"		"	"	[kilograms] [pounds]
(6)	"		"	"	[kilograms] [pounds]

For feed items containing soy: you can discount the land-use change carbon impact from the production emissions of feed items that are sourced from non-deforestation areas (from a certified-sustainable source) = responsibility of user to use this deduction. Tickbox will show:

Deforestation-free (no land-use change for 20 years)

Dairy: Some examples of average total DMI per animal per day are (can vary between countries and production systems):

Calves 0-1 year: 5.5kg DMI/day	Milk cows (lactating) with yield of +/- 5000l/year: 20-21kg DMI/day
Heifers 1-2 years: 11kg DMI/day	Milk cows (lactating) with yield of +/- 6000l/year: 22kg DMI/day
Dry cows: 12 kg DMI/day	Milk cows (lactating) with yield of +/- 8000l: 24kg DMI/day
Milk cows (lactating) with yield of +/- 4000l/year: 19kg DMI/day	Milk cows (lactating) with yield of +/- 10000l/year: 25kg DMI/day

Feed approach 2: Average feed use for entire herd

Enter the feed mix used for the entire herd over the reference period by indicating the proportion of each feed component in percentage by weight. The percentages should add up to 100%. Note: The impact of fresh grass, hay and haylage grown on-farm will be automatically estimated based on the data entered under the "**Grazing**" section. Do not enter these feed components again.

✓	Question	Answer type	Your answers/notes	Context
	Feed component	Drop-down: Feed		You can add multiple feed components.
	Percentage	Percentage		All components should add up to 100%.

Section 5. Manure

This section refers to the handling of manure that is produced **during housing or on hard standings**. Choose one/multiple manure management type(s), **excluding grazing**, for each animal category in your herd. A certain amount of manure can only be assigned to one management type and is indicated as percentage. The percentages of all management types should add up to 100%. For the time the animals are grazing, the tool already automatically calculates the manure left at pasture, so this shouldn't be added. If no manure management is selected for an animal category, grazing will be assumed.

✓	<u>Herd category</u>	Answer type	Management Type	Answer type	Percentage of total
	(1)	Drop-down: <u>Manure</u>		Percentage	
	(2)	"		"	
	(3)	"		"	
	(4)	"		"	
	(5)	"		"	
	(6)	"		"	

5.1. Bedding

Choose one or multiple bedding types used for your entire herd and indicate the quantity bedded for each type.

✓	Question	Answer type	Your answer/notes	Question	Answer type	Your answer/notes
	Bedding Type	Drop-down	[straw] [sand] [newspaper] [sawdust]	Bedding quantity	Number + unit	[kg] [tonnes] [tons (US short)] [pounds]

Section 6. Energy

Be sure the energy use corresponds to the (usually one year) reference period you have indicated in the [Production/Milk](#) section. Include the different sources and amounts used in your beef/milk production (e.g. energy for housing, milking, diesel for wheel loader, feed mixer). Also, the consumption of your own renewable energy produced on-site must be included. Excluded is energy used for transport off-farm which is entered in the "Transport" section.

Energy used for the on-farm production of crops should be assessed in a separate crop assessment in the CFT and thus should NOT be included here. For diesel, you could e.g. take your weekly consumption (e.g. 2 full tanks) as reference to calculate the amount for the whole year.

✓	Question	Answer type	Your answers/notes	Context
	Energy source	Drop-down: energy		E.g. diesel, electricity, biodiesel, propane, CHP; if you use energy from your own solar cells, select "energy (photovoltaic)". See Appendix for full list.
	Usage	Number + energy unit		
	Label (optional)	Textbox		Specify your energy usage; use this later in the cost tab (results) to link expenses to it.

Section 7. Transport

Inbound transportation of inputs to your farm should be included. Examples of inbound transport include cattle, manure or fertiliser moved from the point of purchase (e.g. neighbour, merchant) to your farm (for feed transport, see our [FAQ](#)). Include transport even if you do not own or operate the vehicles.

It is good practice to also include outbound transportation of finished products (milk, beef cattle) from your farm to the processing site, the slaughterhouse or to the 'point of sale'. You should decide up to which point you include outbound transportation. If your assessment is to 'farm gate' only, then outbound transportation of goods can be excluded.

Beware double counting: If you have added fuel data for goods transportation on the 'Fuel & Energy' tab, do not enter transport data here.

Transport data can be entered for every journey, or multiple journeys can be combined if the vehicle and distance are the same. For example, if 2 tonnes of fertiliser are transported 20km by heavy goods vehicle five times, you can enter: HGV, 10 tonnes, 20km.

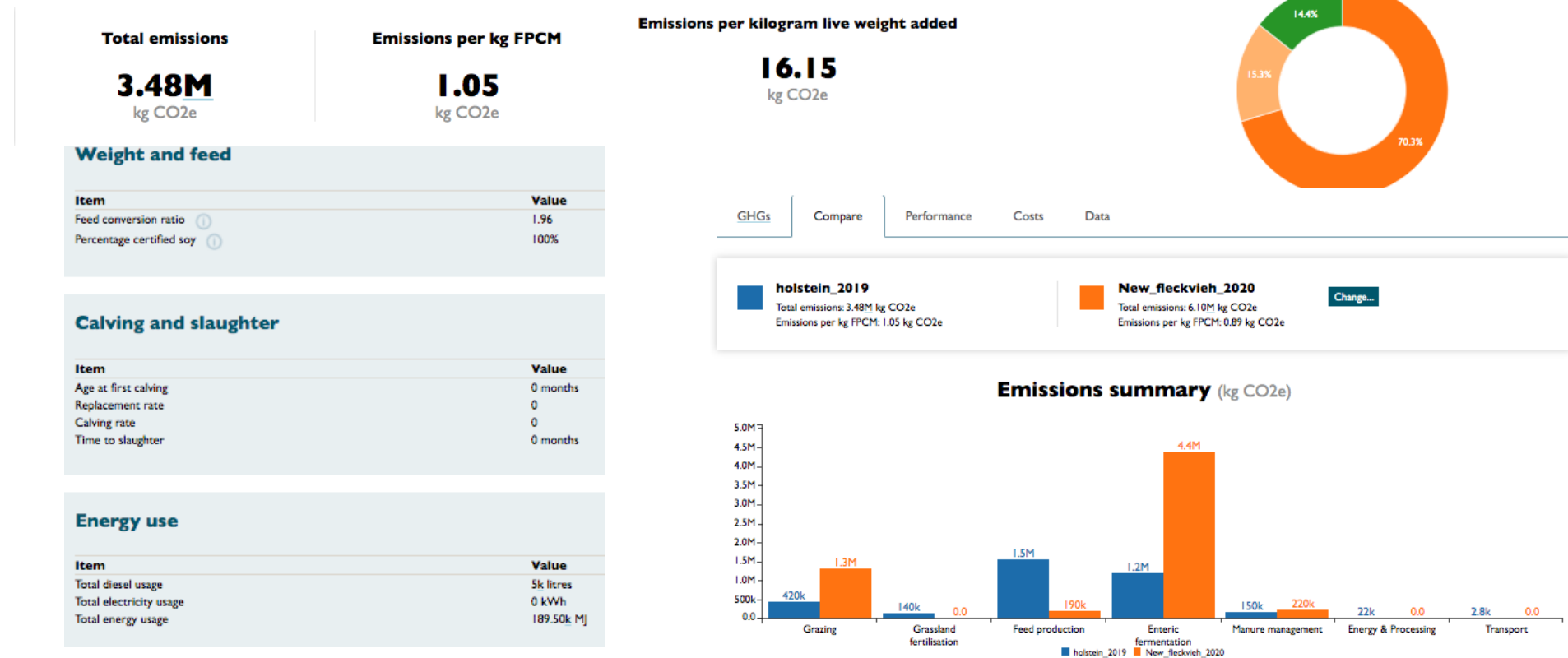
✓	Question	Answer type	Your answers/notes	Context
	Mode	Drop-down: transportation		Road, rail, air, ship; see Appendix for full list.
	Weight	Number + unit	[kilograms] [tonnes] [tons (US short)] [pounds]	Enter the weight of your input / product transported. Do <u>not</u> include the weight of the vehicle.
	Distance	Number + unit	[kilometres] [miles]	Enter the distance from point A to point B for the entire load. Do not add up km from multiple trips. For example, for 100 tonnes of wheat moved 7km from the field to storage, even if multiple journeys are required only enter "7km" for distance. One-way trip only (do not include the round-trip amount).
	Label (optional)	Free text		If you would like to see a breakdown of transport emissions by activity, you can label your transport events using the label.

Congratulations!

You have finished your assessment.

You can now review your results, duplicate it and create 'what-if' scenarios by changing individual values to see how changes in practices affect your GHG footprint, compare it with other assessments, or enter the costs related to the produced crops to get a breakdown of your expenditures.

Have a look at our [quick start guide](#) that shows what else you can do in the Cool Farm Tool.



Appendix

Drop-down menu answer options

Go back to [Milk Production](#) // [Manure](#)

Main breeds	Weight units	Manure management types
<ul style="list-style-type: none"> ✓ ----- Ayrshire Brown Swiss Fleckvieh Friesian Girolando Guernsey Holstein Illawarra Jersey Meuse Rhine Issel / Rotbunt Montbéliarde Normande Norwegian Red Randall 	<ul style="list-style-type: none"> ✓ ----- kilograms tonnes litres tons (US short) gallon (imperial) pounds gallons (US) 	<ul style="list-style-type: none"> Aerobic treatment - natural aeration Anaerobic Digester, High leakage, low quality technology, high quality gastight storage technology Anaerobic Digester, High leakage, low quality technology, low quality gastight storage technology Anaerobic Digester, High leakage, low quality technology, open storage Anaerobic Digester, Low leakage, High quality gastight storage, best complete industrial technology Anaerobic Digester, Low leakage, High quality industrial technology, low quality gastight storage technology Anaerobic Digester, Low leakage, High quality industrial technology, open storage Composting - In vessel (forced aeration) Composting - Intensive windrow Composting - Passive windrow (infrequent turning) Composting - Static pile (Forced aeration) Daily spread Deep bedding - active mixing (< 1 month) Deep bedding - active mixing (> 1 month) Deep bedding - no mixing (< 1 month) Deep bedding - no mixing (> 1 month) Dry lot Exporting manure off-farm - zero on farm emissions Liquid slurry with cover Liquid slurry with natural crust cover Liquid slurry without natural crust cover Pit storage below animal confinements (1 month) Pit storage below animal confinements (12 months) Pit storage below animal confinements (3 months) Pit storage below animal confinements (4 months) Pit storage below animal confinements (6 months) Solid storage Solid storage - Additives Solid storage - Bulking agent addition Solid storage - Covered/compacted Uncovered anaerobic lagoon

Feed components

Roughages	Cereals	Compound feed	Cakes/meal
Grass fresh managed - on farm	Wheat	Compound dairy feed: default (15% soy)	Soybean cake/meal
Grass fresh managed - off farm	Barley	Compound dairy feed: high (46%) soy, high protein	Rapeseed cake/meal
Grass fresh (extensive)	Maize / corn grain	Compound dairy feed: low (8%) soy, high protein	Sunflower cake/meal
Grass hay - on farm	Oats	Compound dairy feed: Mexico big farm (milking) (21% soy)	Cottonseed cake/meal
Grass hay - off farm	Rice	Compound dairy feed: Mexico big farm (dry) (0% soy)	Palm kernel cake/meal
Grass silage - on farm	Rye	Compound dairy feed: Mexico big farm (milking) (40% soy)	Other oil cake/meal
Grass silage - off farm	Sorghum	Compound dairy feed: Mexico big farm (dry) (20% DDG, 0% soy)	
Maize silage	Other cereals	Compound dairy feed: Mexico small farm (milking) (8% soy)	Pulses
Lucerne / Alfalfa silage		Compound dairy feed: Mexico small farm (dry) (4.5% soy)	Soybean
Other fodder		Compound dairy feed: Brazil (30% soy)	Peas
Straw		Compound dairy feed: Poland (20% soy)	Beans
Other crop residues		Compound dairy feed: Poland (10% soy)	Other pulses
Grass hay		Compound dairy feed: Argentina (20% soy)	Root crops
Lucerne/Alfalfa hay		Compound dairy feed: South Africa (6% soy)	Cassava / tapioca
Clover hay		Compound dairy feed: Spain (20% soy)	Sweet potato
Oat hay		Compound dairy feed: Spain (42% soy)	Fodder beet
Sorghum silage		Compound dairy feed: Spain (0% soy)	Other root crops
		Compound dairy feed: Germany (4% sugar molasses, 0% DDG, 0% soy)	Other
Processing by-products		Compound dairy feed: Germany (3% sugar molasses, 0% DDG, 0% soy)	Other feed
Brans		Compound dairy feed: Germany (3% sugar molasses, 10% DDG, 0% soy)	Vegetables residues
Maize / Corn gluten feed (a by-product of processing)		Compound dairy feed: Belgium (10% soy)	Milk powder (dry matter)
Dried distillers grains (DDGS) / Draff		Compound dairy feed: Belgium (65% soy)	Organic household waste
Brewer's grain		Compound dairy feed: Belgium (16% soy)	Sugar beet pulp
Potato starch		Compound dairy feed: Russia East (0% soy)	Citrus pulp
Sugarbeet / sugarcane molasses		Compound dairy feed: Russia South (0% soy)	Mineral mix
Soy hull		Compound dairy feed: Russia West (5% soy)	
Bypass fat		Compound dairy feed: Algeria (28% soy)	
Molasses			
Whey powder			

Fertiliser type	Fertiliser source region	
<p>✓ (select type)</p> <ul style="list-style-type: none"> Compose your own NPK Ammonium nitrate - 33.5% N (granulated) Ammonium nitrate - 33.5% N (prilled) Ammonium sulphate - 21% N Ammonium sulphate nitrate - 26%N Anhydrous ammonia - 82% N Calcium ammonium nitrate - 27% N Calcium nitrate - 15.5% N Compound NPK - 15% N / 15% K₂O / 15% P₂O₅ (mixed-acid process) Compound NPK - 15% N / 15% K₂O / 15% P₂O₅ (nitrophosphate process) Diammonium phosphate - 18% N / 46% P₂O₅ Monoammonium phosphate - 11% N / 52% P₂O₅ Muriate of potash / Potassium chloride - 60% K₂O Phosphate/Rock Phosphate - 32% P₂O₅ Polyhalite - 48% SO₃ / 14% K₂O / 6% MgO / 17% CaO Potassium sulphate - 50% K₂O / 45% SO₃ Super phosphate - 21% P₂O₅ Triple super phosphate - 48% P₂O₅ Urea - 46% N Urea ammonium nitrate solution - 32% N 	<ul style="list-style-type: none"> Cattle digestate - 0.26% N Cattle digestate - 0.6% N Compost (fully aerated production) - 1% N Compost (non-fully aerated production) - 1% N Compost (zero emissions) - 1% N Horse digestate - 0.7% N Pig digestate - 0.36% N Pig digestate - 0.7% N Poultry layer digestate - 1.9% N Sheep digestate - 0.7% N Broiler/Turkey litter - 3% N Cattle manure - 0.6% N Cattle slurry - 0.26% N Horse manure - 0.7% N Pig manure - 0.7% N Pig slurry - 0.36% N Poultry layer manure - 1.9% N Separated pig slurry (liquid part) 0.36% N Separated pig slurry (solid part) - 0.5% N Sheep manure - 0.7% N Limestone - 55% CaCO₃ / 29%CaO 	<p>✓ -----</p> <ul style="list-style-type: none"> World Europe China North Africa USA Russia Europe 2014 N America 2014 S America 2014 Africa 2014 Middle East 2014 Russia (CIS countries) 2014 SE Asia 2014 S Asia 2014 Oceania 2014 China 2014 World 2014 Europe (2006) World (2002) World (1998) World 2019
<p>Weight per area</p>		
<p>✓ -----</p> <ul style="list-style-type: none"> kg / acre tonnes / ha kg / ha tonnes / acre lbs / acre 		

Energy source	Energy units	Transportation mode
<ul style="list-style-type: none"> diesel (average biofuel blend) diesel (100% mineral diesel) petrol (average biofuel blend) petrol (100% mineral petrol) bioethanol biodiesel ME electricity (grid) electricity (hydroelectric) electricity (wind) electricity (photo-voltaic) wood pellets fuel wood coal (by weight) gas (by weight) oil (by volume) gas (by volume) coal (by energy) gas (by energy) oil (by energy) biodiesel HVO propane CHP onsite (natural gas) CHP onsite (biogas) CHP export - electricity (natural gas) CHP export - heat (natural gas) CHP export - (biogas) CHP import - electricity (natural gas) CHP import - heat (natural gas) CHP import (biogas) 	<ul style="list-style-type: none"> ✓ ----- kilograms tonnes litres tons (US short) gallon (imperial) pounds cubic metres MJ kWh therm btu gallons (US) acre inches cubic centimetres 	<ul style="list-style-type: none"> ✓ ----- road HGV (average heavy goods vehicle) road LGV diesel (light goods vehicle <3.5t) road LGV petrol (light goods vehicle <3.5t) road LGV CNG/LPG (<3.5t) rail air very short haul (<800km) air short haul (800 - 3700km) air long haul (>3700km) ship small tanker (~1000t) ship large tanker (~20 000t) ship very large tanker (>60 000t) ship small bulk carrier (~2000t) ship large bulk carrier (~15 000t) ship very large bulk carrier (~70 000t) ship small container vessel (0-1999 TEU) ship large container vessel (2,000+ TEU) car diesel car petrol motorbike