



Report 2026

# LCA of Oatly Baristamatic and comparison with cow's milk

Addendum to the report “LCA of Oatly  
Barista and comparison with cow's milk”,  
published on 7 December 2022

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# Executive summary

## Introduction

A Life Cycle Assessment (LCA) has been performed to compare the environmental performance of Oatly Baristamatic to cow's milk in multiple key sales markets: Austria, Germany, Ireland, Switzerland, the United Kingdom, and Sweden.

This study is an addendum to the main report "LCA of Oatly Barista and comparison with cow's milk", which was published by Blonk Consultants on December 7<sup>th</sup>, 2022 (Blonk Consultants, 2022). This addendum should be read in conjunction with the main report. The methodology, data choices, and assumptions made are described in detail in the main report and have remained mostly unchanged for this report. The changes that apply to the products in scope for this addendum concern an update of primary data: energy and water use in the Oatly factories, the product formulation, packaging type and distribution scenarios of the Oatly product, an update of secondary data (updated background databases to Ecoinvent 3.11 and Agri-Footprint 7.0), and an update of the cow's milk emissions modelling.

The functional unit considered for this study is 1 liter of Oatly Baristamatic/cow's milk at point of sale, including packaging manufacturing and packaging end of life. For cow's milk, a country-specific average market mix of skimmed, semi-skimmed, and whole milk was considered, as well as the most common heat treatment type (HTST or UHT), and packaging format (plastic, beverage carton, aseptic/chilled) in each country. The foreground data for Oatly Baristamatic is based on company-specific data from Oatly; it refers to production from Oatly's hybrid factory in Vlissingen, the Netherlands<sup>1</sup>. For the cow's milk, data and statistics at a national level were used.

Like the main report, this study has been performed and critically reviewed according to ISO 14040/14044/14071 standards for comparative assertions to be disclosed to the public and is in line with LCA guidelines including the European Product Environmental Footprint Category Rules (PEFCR). The analysis was done for key impact categories from the ReCiPe 2016 impact assessment method (including an uncharacterised land occupation indicator). The study was conducted between February 2026 and April 2026.

## Results

As can be seen in TABLE 1 below, Oatly Baristamatic 1.5L has a lower impact than cow's milk for climate change (40% to 67% lower), fine particulate matter formation (41% to 95% lower), terrestrial acidification (52% to 91% lower), marine eutrophication (45% to 71% lower), land use (27% to 55% lower), land occupation (35% to 66% lower) and water consumption (37% to 89% lower). The conclusions for the remaining impact categories (freshwater eutrophication, mineral resource scarcity, and fossil resource scarcity) varied depending on the case, being either higher, similar, or lower compared to cow's milk. For freshwater eutrophication, Oatly Baristamatic has a lower impact than cow's milk in Germany, Switzerland, Austria, Ireland, and Sweden, and a higher impact in the UK, mainly due to the update of the ReCiPe method<sup>2</sup> leading to updates in phosphorus and phosphate emissions to

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<sup>1</sup> A Hybrid factory is an Oatly oatbase factory that pumps the oatbase through a pipe to a contract manufacturer next door. The contract manufacturer-neighbour fills and packs the products for Oatly.

<sup>2</sup> Characterization factors for phosphorus emissions to water have been regionalized in a 2024 update of the ReCiPe method (v.1.09). The characterization factors for Chemical Oxygen Demand (COD) have also been updated. As a result, relative emissions have changed. More specifically, they have been geographically spatialised with the phosphorous emission to water evolving from 1 kg Peq/kg P emitted (non-spatialised characterization factor in the 2022 report) to about 0.096 for the UK (feed for cow's milk) and 1.448 for SE (oats cultivation). It should be noted that the model assumes 80% of oats are sourced from Sweden, which remains representative for all countries except the UK. Indeed, since September 2025, UK products have switched to 100% segregated UK oats (see [article](#)); however, this UK-specific change has not yet been incorporated into the model. For unspecified COD emission to water, it went from 0.022 kg Peq/kg P emitted to 0.007 kg Peq/kg P emitted (manure management and feed for cow's milk).

water resulting from the application of fertilizers and Chemical Oxygen Demand (COD) emissions to water resulting from manure management and feed production processes.

The difference in impact for fossil resource scarcity is in favour of Oatly Baristamatic in Germany, the UK, and Ireland (12% to 26% lower impact), and the results are comparable in Switzerland and Austria. However, the results show a 47% higher impact for Oatly Baristamatic compared to cow's milk in Sweden. This is mainly related to different distribution distances and less use of fossil resources in cow's milk in Sweden relative to other countries<sup>3</sup>.

For mineral resource scarcity, Oatly Baristamatic has a lower impact for Switzerland (61%) due to the relatively higher use of mineral resources associated to electricity and machinery in the production of cow's milk compared to the Oatly product. In Germany, Austria, the UK, and Ireland the impact is comparable. This is attributable to the use of aluminium in ambient packaging for the Oatly product and wind energy used in processing, which together lead to similar results as that of cow's milk. In Sweden the packaging of chilled cow's milk has a lower impact than the one used for Oatly Baristamatic (due to absence of aluminium in chilled variants), leading to a relatively higher impact for Oatly Baristamatic (15%).

**TABLE 1: RELATIVE DIFFERENCES OF OATLY BARISTAMATIC 1.5L COMPARED TO COW'S MILK AT POINT OF SALE INCLUDING END-OF-LIFE (EOL) OF PACKAGING.** FOR EXAMPLE, -57% INDICATES THAT OATLY BARISTAMATIC 1.5L HAS A 57% LOWER IMPACT COMPARED TO COW'S MILK. THE DIFFERENCES HAVE BEEN COLOR-CODED AS FOLLOWS: GREEN – MORE THAN 10% DIFFERENCE FAVORING OATLY BARISTA, YELLOW – THE DIFFERENCE IS 10% OR LOWER INDICATING SIMILAR PERFORMANCE FOR THE COMPARED PRODUCTS, RED – MORE THAN 10% DIFFERENCE FAVORING COW'S MILK. COW'S MILK REPRESENTS AN AVERAGE MILK PRODUCT AT POINT OF SALE FOR EACH COUNTRY. ABBREVIATION USED: NL = THE NETHERLANDS

Country of sale	Impact category	Product	Climate change	Fine particulate matter	Terrestrial acidification	Freshwater eutrophication	Marine eutrophication	Land use	Land occupation	Mineral resource scarcity	Fossil resource scarcity	Water consumption
			kg CO2 eq	kg PM2.5 eq	kg SO2 eq	kg P eq	kg N eq	m2a crop eq	m2a	kg Cu eq	kg oil eq	m3
Germany	Oatly Baristamatic NL factory	-	-67%	-91%	-88%	-34%	-56%	-46%	-53%	-8%	-12%	-60%
Switzerland	Oatly Baristamatic NL factory	-	-60%	-95%	-91%	-59%	-51%	-55%	-66%	-61%	-8%	-89%
Austria	Oatly Baristamatic NL factory	-	-57%	-91%	-90%	-75%	-47%	-50%	-65%	-9%	-1%	-77%
United Kingdom	Oatly Baristamatic NL factory	-	-65%	-85%	-67%	14%	-63%	-38%	-54%	-2%	-24%	-60%
Ireland	Oatly Baristamatic NL factory	-	-64%	-84%	-52%	-42%	-71%	-27%	-47%	-8%	-26%	-57%
Sweden	Oatly Baristamatic NL factory	-	-43%	-41%	-77%	-36%	-43%	-31%	-33%	23%	52%	-37%

<sup>3</sup> It should be noted that, in Sweden and the UK, distribution from distribution centre to point of sale is conducted using HVO100 renewable diesel. This was not reflected in the model due to a lack of robust background data (it has been modelled instead using a proxy, see Appendix II).



### Climate change impact of Oatly Baristamatic and cow's milk at point of sale (incl. packaging EoL)

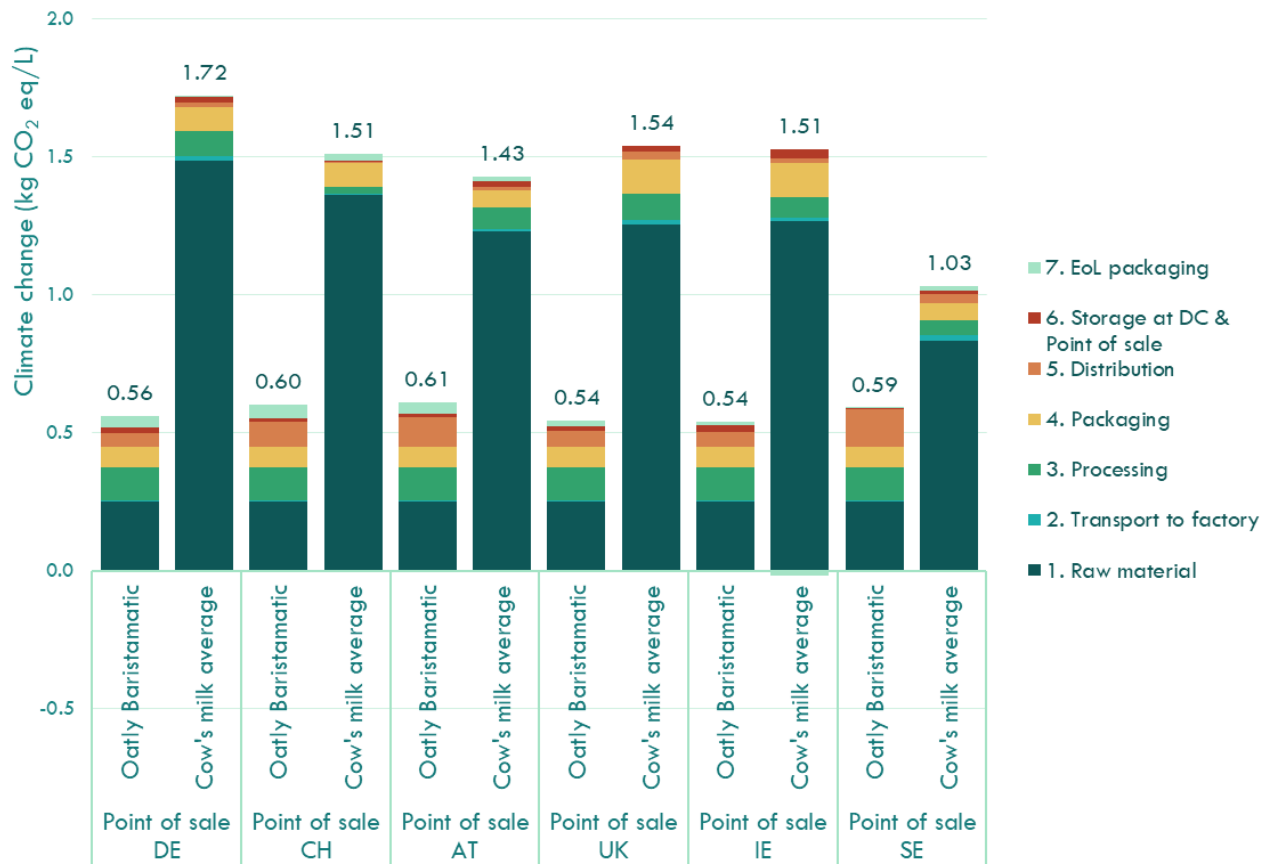
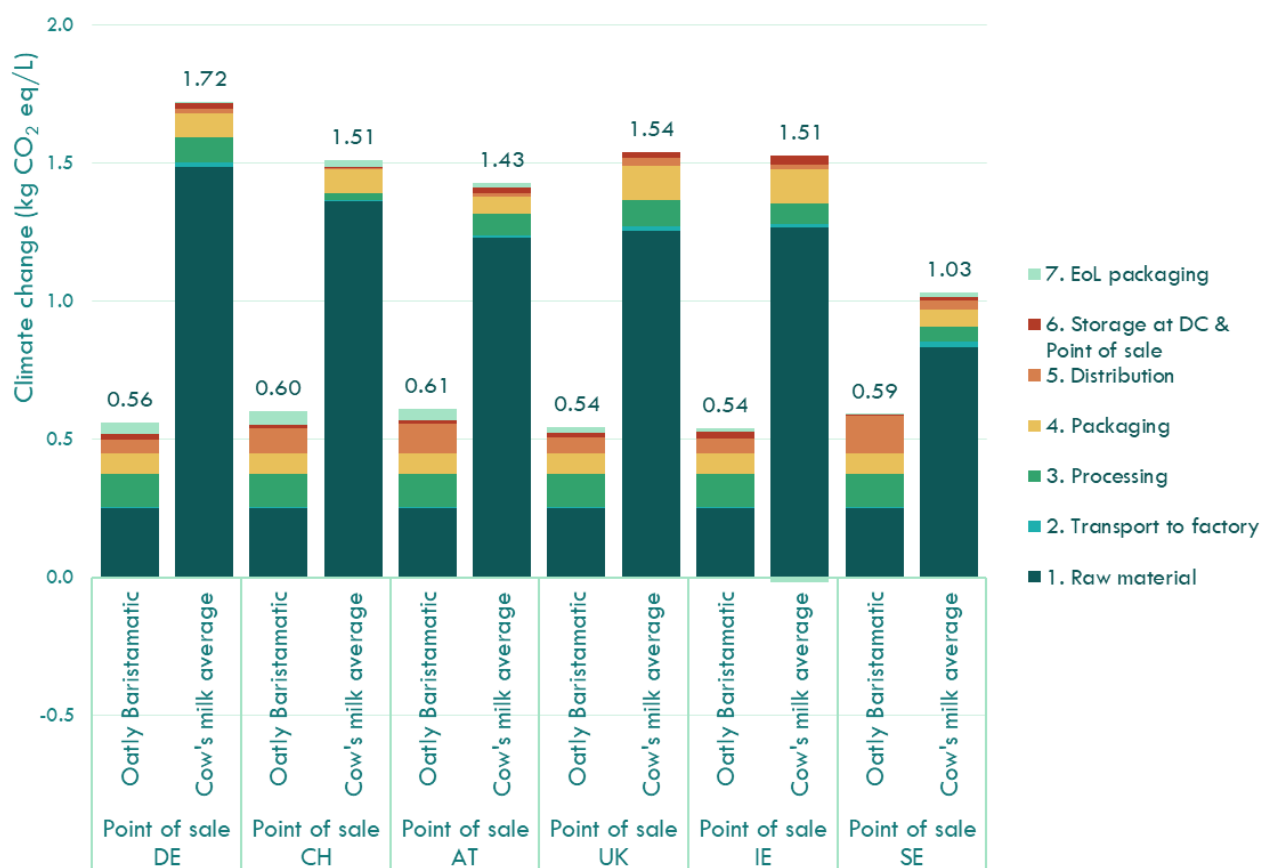


FIGURE 1 shows the contribution of all life cycle stages to the climate change impact of Oatly Baristamatic 1.5 L and cow's milk, showing that raw materials are the main contributor to the climate change impact of all products in scope. For Oatly Baristamatic, the impact of the raw materials is mainly determined by oats and rapeseed oil, whereas for cow's milk, feed and cow's emissions (linked to enteric fermentation and manure management) are the main contributors.

## Climate change impact of Oatly Baristamatic and cow's milk at point of sale (incl. packaging EoL)



**FIGURE 1: CLIMATE CHANGE IMPACT OF OATLY BARISTAMATIC 1.5L AND COW'S MILK AT POINT OF SALE INCLUDING END-OF-LIFE (EOL) OF PACKAGING.** ABBREVIATION USED: DE = GERMANY, CH = SWITZERLAND, AT = AUSTRIA, UK = UNITED KINGDOM, IE = IRELAND, SE = SWEDEN

The significance of the differences between Oatly Baristamatic and cow's milk has been determined by an uncertainty analysis<sup>4</sup>.

The main report included further sensitivity analyses, which also apply to the products evaluated in this addendum, as the products in this addendum are very similar and show a comparable impact to Oatly Barista in the main report. These sensitivity analyses pointed out that using a different impact assessment method (ReCiPe endpoint, EF3.0 single score) confirmed the overall higher environmental footprint of cow's milk compared to Oatly Barista for all countries in scope. It also showed that results in the impact categories land use, mineral resource scarcity and water impact categories are less robust, as they result in different trends when using a different impact assessment method (EF 3.0). Furthermore, the sensitivity analyses in the main report concluded that using different product characteristics (inclusion of use stage, using economic allocation for cow's milk (instead of biophysical recommended by the Dairy PEF CR), or a functional unit based on nutritional characteristics, did not lead to different conclusions on the environmental footprint of Oatly Barista compared to cow's milk.

<sup>4</sup> It should be noted that the use of yellow colours in Table 1 and Table 2, which indicates comparable results, mostly (though not always) corresponds to insignificant differences as pointed out by the uncertainty analysis. The results of the uncertainty analysis can be found in section 5.2.

## Conclusions

Based on the results, the following conclusions can be drawn for Oatly Baristamatic:

- Oatly Baristamatic 1.5L has a lower impact than cow's milk for all countries in scope for the impact categories climate change, fine particulate matter formation, terrestrial acidification, marine eutrophication, land use, land occupation, and water consumption.
- Oatly Baristamatic 1.5L has also a lower impact on freshwater eutrophication except in the UK where it has a higher impact compared to cow's milk.
- For mineral resource scarcity and fossil resource scarcity, the differences between Oatly Baristamatic 1.5L and cow's milk vary between significantly higher, lower, or insignificant.

Overall, the analysis of Oatly Baristamatic and its comparison to cow's milk in the markets assessed led to similar conclusions as in the main report and respective addenda reports, except for freshwater eutrophication in the UK, and shifting trends in mineral resource and/or fossil resource scarcity for Germany, the UK, Ireland and Sweden.

A detailed analysis of the main drivers and opportunities linked to the environmental impact of Oatly products can be found in the main report.

# 1. Goal & Scope

## 1.1 Introduction

This report is an addendum to the report “LCA of Oatly Barista and comparison with cow's milk”, which was published by Blonk Consultants on December 7<sup>th</sup>, 2022 (Blonk Consultants, 2022)<sup>5</sup> and will from now on be referred to in this addendum as the “main report”. This addendum investigates one further product from Oatly: Oatly Baristamatic sold in Germany, Switzerland, Austria, the United Kingdom, Ireland and Sweden. Like some of the Oatly Barista products that were modelled for European countries in the main report, Oatly Baristamatic is produced at the Vlissingen factory (located in the Netherlands). The exact products and markets in scope are listed in TABLE 2 below. Like with Oatly Barista in the main report, these products are compared to cow's milk produced in the country of sale.

The methodology, data choices, and assumptions made, are described in detail in the main report, and have remained unchanged for this report. The following has been updated in this report as further described in Chapter 3 (Life Cycle Inventory):

- The modelling of the raw cow's milk production has been updated for all geographies in scope
- The use of utilities at the Oatly Dutch factory has been updated to 2025 data.
- The new recipe for the Oat Baristamatic product (small differences).
- The 1L packaging size has been updated to 1,5 liter beverage carton for Oatly products.
- Transport means and distances from suppliers have been updated to 2025 data
- Background data has been updated to the following database versions: Agri-footprint 7.0 (Blonk Consultants, 2024), and Ecoinvent 3.11 (Ecoinvent Association, 2024).
- The LCIA ReCiPe 2016 v 1.01 method (Huijbregts et al., 2016) has been updated to ReCiPe 2016 v 1.1.
- Country-specific distribution data from the Dutch factory to markets in Germany, Austria, Switzerland, United Kingdom, Ireland, and Sweden has been updated to 2025 data.

Like the main report, this addendum has been subject to a critical review according to ISO 14040/14044 and ISO/TS 14071:2014 standards (ISO, 2006b, 2006a, 2014), carried out by a review panel consisting of three LCA experts (two of which had already reviewed the main report). The review of the addendum focused particularly on elements that were added or changed compared to the main report and assessed the overall conformance with ISO 14040/14044 standards (ISO, 2006a).

This addendum is not a stand-alone report and should be read in conjunction with the main report. It should be noted that the climate change impact results from this study do not always correspond with those mentioned on Oatly's packaging/web page as the latter are calculated by a different LCA provider that uses different background data and/or different system boundaries.

## 1.2 Goal and scope

### 1.2.1 Goal

The goal of this study is in line with the goal mentioned in section 1.2 of the main report: To assess the environmental impact of Oatly Baristamatic and compare it to cow's milk in the markets in scope. Further details on the intended use of this study can be found in section 1.2 of the main report.

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<sup>5</sup> Link to the publication: [https://website-production-s3bucket-1nevfd7531z8u.s3.eu-west-1.amazonaws.com/public/website/download/fabc1628-d8e1-4cf8-aacc-1a9694908a42/LCA%20Oatly%20and%20comparison%20to%20cow's%20milk%20\(07-12-2022\)%20-%20final.pdf](https://website-production-s3bucket-1nevfd7531z8u.s3.eu-west-1.amazonaws.com/public/website/download/fabc1628-d8e1-4cf8-aacc-1a9694908a42/LCA%20Oatly%20and%20comparison%20to%20cow's%20milk%20(07-12-2022)%20-%20final.pdf)

## 1.2.2 Scope

The function based on which the two systems are compared is defined as follows: the provision of cow's milk or oat-based drinks, to be added to food and beverage items for taste and texture, provided in 1,5L packaging sizes at point of sale.

The functional units associated with both systems are:

- Oat drink: 1 liter of Oatly Baristamatic including packaging, at point of sale.
- Cow's milk: 1 liter of HTST (high temperature short time pasteurization) or UHT (ultra-high temperature pasteurization) whole, and (semi-)skimmed cow's milk (using a country-average mix of these three milk types), including packaging, at point of sale (chilled or ambient storage). As in the main report, the use stage was excluded from the system boundaries. This stage consists of adding milk to prepared coffee and consuming the beverage. The process is assumed to be identical for both cow's milk and Oatly Baristamatic and therefore does not lead to relevant differences between the compared systems. Consequently, it is not expected to influence the comparative results. The potential influence of the use stage was further evaluated through a sensitivity analysis presented in the main report.

Nutritional properties of Oatly Baristamatic and cow's milk can be found in Appendix IV.

TABLE 2 lists the reference flows related to the Oatly products in scope, as well as for their cow's milk equivalents.

The system boundaries considered for this addendum are from cradle-to-point of sale (including packaging end-of-life), in line with the main report. More details on the system boundaries can be found in section 1.3.2 from the main report. As in the main report, the use stage was excluded from the system boundaries. This stage consists of adding milk to prepared coffee and consuming the beverage. The process is assumed to be identical for both cow's milk and Oatly Baristamatic and therefore does not lead to relevant differences between the compared systems. Consequently, it is not expected to influence the comparative results. The potential influence of the use stage was further evaluated through a sensitivity analysis presented in the main report.

Nutritional properties of Oatly Baristamatic and cow's milk can be found in Appendix IV.

TABLE 2 REFERENCE FLOWS, LOCAL NAME, STORAGE CONDITION, PACKAGING TYPE, PRODUCTION LOCATION AND COUNTRY OF SALE OF THE OATLY BARISTAMATIC PRODUCTS AND COW'S MILK

Oatly Baristamatic 1,5L ...					...Compared with cow's milk				
Reference flow	Local name and packaging type	Storage condition	Produced in	Sold in	Reference flow	Cow's milk and packaging type	Storage condition	Produced and sold in	
1 liter	Oatly Haferdrink Baristamatic (1,5 L UHT aseptic beverage carton)	Ambient	Vlissingen, the Netherlands	Germany	1 liter	Mix of UHT-treated whole and (semi-)skimmed milk (1L beverage carton)	Ambient	Germany	
1 liter	Oatly Haferdrink Baristamatic (1,5 L UHT aseptic beverage carton)	Ambient	Vlissingen, the Netherlands	Switzerland	1 liter	Mix of UHT-treated whole and (semi-)skimmed milk (1L beverage carton)	Ambient	Switzerland	
1 liter	Oatly Haferdrink Baristamatic (1,5 L UHT aseptic)	Ambient	Vlissingen, the Netherlands	Austria	1 liter	Mix of HTST-treated whole and (semi-)skimmed milk	Chilled	Austria	

	beverage carton)				(1L beverage carton)				
1 liter	Oatly Oat Drink Baristamatic (1,5 L UHT aseptic beverage carton)	Ambient	Vlissingen, the Netherlands	United Kingdom	1 liter	Mix of HTST-treated whole and (semi-)skimmed milk (1L plastic bottle)	Chilled	United Kingdom	
1 liter	Oatly Oat Drink Baristamatic (1,5 L UHT aseptic beverage carton)	Ambient	Vlissingen, the Netherlands	Ireland	1 liter	Mix of HTST-treated whole and (semi-)skimmed milk (1L plastic bottle)	Chilled	Ireland	
1 liter	Oatly Havredryck Baristamatic (1,5 L UHT aseptic beverage carton)	Ambient	Vlissingen, the Netherlands	Sweden	1 liter	Mix of HTST-treated whole and (semi-)skimmed milk (1L beverage carton)	Chilled	Sweden	

### Oatly Baristamatic

Oatly Baristamatic is an oat-based drink that is fortified with calcium, vitamin D, riboflavin and vitamin B12. Next to that, oil is added as a functional ingredient that provides structure and texture to the drink. "Barista" refers to the oat drink's functionality in coffee, for which Oatly Barista's foamability and stability are leading properties.

The Oatly Baristamatic, is similar in ingredients to the original Oatly Barista with a slight variation in ingredients. The drink is formulated for use in automatic coffee machines to minimize sedimentation and is packaged in 1.5L multilayer beverage carton container.

Oatly Baristamatic is available in 1.5L packaging sizes for European markets and is known under different market names in the countries in scope (as mentioned in TABLE 2). In the remainder of this report, Oatly Oat Drink Baristamatic will be consistently referred to as "Oatly Baristamatic 1.5L" for all countries in scope. The Oatly Baristamatic 1.5L is solely produced in Oatly's hybrid factory<sup>6</sup> located in Vlissingen, the Netherlands, which supplies to all markets in scope.

### Cow's milk

Since the Oatly products in this study can replace both (semi-)skimmed and whole cow's milk, the country-average mix of (semi-)skimmed and whole cow's milk has been selected for the comparison. The most common heat treatment type (HTST or UHT) was considered in each country. Related to this the storage conditions are chilled or ambient respectively. Section 1.3 of the main report describes which data has been used to define this country-average mix of cow's milk.

## 1.2.3 Critical review

A critical review has been carried in accordance with ISO 14040/14044 (ISO, 2006) and ISO/TS 14071:2014 standards (ISO, 2014), to assess whether this study is consistent with LCA principles and meets all criteria related to methodology, data, interpretation and reporting. Because of the comparative nature of this LCA, the review is conducted by a panel.

<sup>6</sup> Hybrid Factory: A Hybrid factory is an Oatly oatbase factory that pumps the oatbase through a pipe to a contract manufacturer next door. The contract manufacturer-neighbour fills and packs the products for Oatly.

A review panel of three independent and qualified reviewers has been compiled, reflecting a balanced combination of qualifications (LCA, dairy, nutrition) and backgrounds (academic, research institute, non-governmental organisation).

- Jasmina Burek (chair): Assistant Professor at University of Massachusetts Lowell (based in the US)
- Joseph Poore: Food Sustainability expert at the University of Oxford (based in the UK), with assistance of Valentina Caldart, Agri-environmental data lead (HESTIA), University of Oxford (based in the UK)
- Hayo van der Werf: LCA expert (based in France)

The full review statement and report can be found in Appendix VI of the main report. This addendum includes a shortened review statement applying specifically to this addendum.

The critical review statement and report can be found in Appendix III.

## 2. Calculation method

This addendum follows the exact same methodological standards and approaches as listed in chapter 2 of the main report. Differences to the main report include the addition of the land occupation indicator as additional impact category (instead of only in the appendix), updates of the ReCiPe methodology<sup>7</sup>, as well as of the Ecoinvent and Agri-Footprint databases and the modelling of the raw milk's production data for all geographies in scope<sup>8</sup>. In the ReCiPe impact assessment method, land use is expressed as intensity of the land use relative to annual crops (see Huijbregts et al., 2016 for more information), and hence the unit used is m<sup>2</sup>a crop-eq. Due to several flaws related to the methodology of this indicator,<sup>9</sup> the land occupation indicator was added, which shows land occupation results without characterization, with the unit m<sup>2</sup>a, and thus reflects the surface area needed to produce the products in scope. Table 3 provides an overview of the impact categories used in this study, including a description of the indicators and characterisation factors belonging to these categories.

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<sup>7</sup> In the main report, the ReCiPe 2016 v 1.01 method (Huijbregts et al., 2016) was used. In this report the method used is ReCiPe 2016 v 1.1. Several updates have taken place in between, such as regionalization of phosphorus emissions to water (affecting freshwater eutrophication results) and update of ammonia and nitrogen oxides emissions (affecting terrestrial acidification results).

<sup>8</sup> For the raw cow's milk, data from literature has been used and modelled using the same methodology as the cow's milk datasets used in the main report. However, in this report a newer version of the Animal Life Cycle Engine has been used for the modelling of the cow's milk (more details can be found in Oatly Barista for Austria and Switzerland addendum (2025) and in appendix III of this report).

<sup>9</sup> The ReCiPe 2016 method for land use considers species richness in different land uses by applying a characterization factor (CF) by land type. Certain land types like forests, grassland and permanent crops get a lower characterisation factor (CF < 1) than annual crops (CF = 1). However, this method is somewhat outdated and only provides one global CF per land use type, without differentiating by location/geography, whereas biodiversity varies substantially by geography. Furthermore, the unit m<sup>2</sup>a crop-eq can be hard to interpret. To also provide an indication of the actual land surface used for each of the products, this addendum adds a land occupation indicator (m<sup>2</sup> of total land occupied per year), which does not characterise land use (CF = 1 for all land use types). Additional land impact assessment methods were evaluated in the sensitivity analysis in the main report, including the EF 3.0 method which uses the LANCA model to quantify land use.

TABLE 3 OVERVIEW OF KEY IMPACT CATEGORIES (CLASSES OF ENVIRONMENTAL IMPACT TO WHICH LIFE CYCLE INVENTORY DATA ARE RELATED) USED FOR THIS STUDY, RESPECTIVE INDICATORS (QUANTIFIABLE REPRESENTATION OF AN IMPACT CATEGORY) AND CHARACTERISATION FACTORS (FACTORS THAT REPRESENT THE IMPACT INTENSITY OF A SUBSTANCE RELATIVE TO THE COMMON UNIT OF THE IMPACT CATEGORY'S INDICATOR)

Impact category	Indicator	Characterisation Factor	Unit	Description
<b>Impact categories belonging to the ReCiPe impact assessment method</b>				
<b>Climate change</b>	Infrared radiative forcing increase	Global warming potential (GWP)	kg CO <sub>2</sub> -eq to air	Increase in global average temperature by the emission of greenhouse gases. The widely used global warming potential (GWP) quantifies the integrated infrared radiative forcing increase of a greenhouse gas (GHG), expressed in kg CO <sub>2</sub> -eq. Emissions related to peat oxidation (abbreviated as peat ox in tables and figures) as well as land use change (abbreviated as LUC in tables and figures) are included, but reported separately as required by LCA guidelines such as the PEFCR
<b>Fine particulate matter formation</b>	PM2.5 population intake increase	Particulate matter formation potential (PMFP)	kg PM2.5-eq to air	Fine Particulate Matter with a diameter of less than 2.5 µm (consisting of organic and inorganic substances) affects the respiratory tract and lungs when inhaled. Particulate matter formation potentials (PMFP) are expressed in kg primary PM2.5-equivalents.
<b>Terrestrial acidification</b>	Proton increase in natural soils	Terrestrial acidification potential (TAP)	kg SO <sub>2</sub> -eq to air	Inorganic acids released into the atmosphere—such as sulphates, nitrates, and phosphates—which cause changes in the acidity of the soil. Acidification potentials considers the fate of a pollutant in the atmosphere and the soil.
<b>Freshwater eutrophication</b>	Phosphorus increase in freshwater	Freshwater eutrophication potential (FEP)	kg P-eq to freshwater	Accumulation of nutrients in water overstimulates plant growth, which reduces the level of oxygen. FEP is based on the fate of phosphorus, which is the limiting nutrient in freshwater.
<b>Marine eutrophication</b>	Dissolved inorganic nitrogen increase in marine water	Marine eutrophication potential (MEP)	kg N-eq to marine water	Accumulation of nutrients in water overstimulates plant growth, which reduces the level of oxygen. MEP is based on the fate of and exposure to nitrogen, which is the limiting nutrient in marine waters.
<b>Land use</b>	Occupation and time-integrated land transformation	Agricultural land occupation potential (LOP)	m <sup>2</sup> × yr annual cropland-eq	The characterisation factor refers to the relative species loss caused by a specific land use type (e.g. annual crops, permanent crops, forestry, urban land, pasture) proportionate to the relative species loss resulting from annual crop production.
<b>Water use</b>	Increase of water consumed	Water consumption potential (WCP)	m <sup>3</sup> water-eq consumed	Quantity of water used, expressed as m <sup>3</sup> of water consumed per m <sup>3</sup> of water extracted
<b>Mineral resource scarcity</b>	Increase of ore extracted	Surplus ore potential (SOP)	kg Cu-eq	The primary extraction of a mineral resource will lead to an overall decrease of the concentration of that resource in ores worldwide. The SOP expresses the average extra amount of ore produced in the future caused by the extraction of a mineral resource considering all future production of that mineral resource.
<b>Fossil resource scarcity</b>	Upper heating value	Fossil fuel potential (FFP)	kg oil-eq	Depletion of resources that contain hydrocarbons, such as coal, oil or natural gas. FFP is defined as the ratio between the higher heating value of a fossil resource and the energy content of crude oil.
<b>Additional impact category</b>				
<b>Land occupation</b>	Land area	N/A	m <sup>2</sup> a	Occupation or use of a certain area of land for a certain period of time. The inventory data is not characterised.

Since the products in scope of this addendum are very similar to the products investigated in the main report, this report contains no sensitivity analyses. Only an uncertainty analysis is included.

The main report can be consulted to obtain more insight into results of the sensitivity analyses with regard to applying different impact assessment methods (EF 3.0, 20-year timeframe for global warming), applying a different scope (cradle-to-grave), applying different allocation methods (economic allocation for cow's milk) and applying a different functional unit (including nutritional characteristics).

In comparison to the main report a new version of Mérieux NutriSciences | Blonk's tool is used: Animal Life Cycle Engine. The parameters necessary to model the dairy systems have not changed, except for milk produced in Sweden for which several parameters were updated. The new tool also makes use of

different background data and an updated emission modelling according to the latest insights from the Intergovernmental Panel on Climate Change (IPCC) (see Appendix III for more details).

## 3. Life Cycle Inventory

This addendum covers Oatly Baristamatic 1.5L produced at the hybrid factory located in Vlissingen, the Netherlands. More details on the factory and the production process can be found in section 3.1.1 of the main report.

The data used for the manufacturing of the Oatly products of this addendum is identical to Oatly Barista as described in section 3.1.2 of the main report, except for the following:

- The sourcing countries for oats and rapeseed oil have been updated.
- The proportions of oat base and rapeseed oil for the Baristamatic are slightly different than those for Oatly Barista, and the oatbase itself is slightly different to support low sedimentation.
- The utilities at the factories (energy and water use) have been updated with 2025 data.
- The packaging has been adjusted to the packaging size in scope (different composition of material and suppliers).
- Distribution distances have been updated with 2025 data based on data provided by Oatly.

For the raw cow's milk, most data from previous Oatly reports<sup>10</sup> have been used, completed with new and updated data for milk produced in Sweden. The difference in data can be found in Appendix III. The following deviations from the main report occurred during the raw materials stage:

- Allocation of the impact between milk and animals: biophysical allocation is used as recommended and prescribed by the International Dairy Federation (IDF, 2022) and in the updated version of the Product Environmental Footprint Category Rules (PEFCR) for dairy products (The European Dairy Association et al., 2025). Before, the biophysical allocation was based on the previous version of the PEFCR for Dairy Products (The European Dairy Association, 2018). The result of this change is that more impact is now allocated to the milk produced. More information and the updated formula can be found in 7.Appendix III.
- Updated fat and protein content of the raw milk due to new data (National Inventory Report, 2025).

For all other life cycle stages, the exact same data has been used as in previous critically reviewed LCA studies performed for Oatly (Blonk Consultants, 2022; 2024;2025) depending on the country. An overview of the data that was used to generate these datasets can be found in the respective reports. Section 3.2 of the main report contains further information on how the subsequent life cycle stages were modelled.

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<sup>10</sup> <https://blonksustainability.nl/news/LCAs-Oatly>

Below reports:

Blonk Consultants, 2022. LCA Oatly Barista and comparison to cow's milk. (US, UK, SE, FI, DE, NL)

Blonk Consultants, 2024. LCA of Oatly Barista for Poland, Ireland and France, and comparison with cow's milk.

Blonk Consultants, 2024. LCA of Oatly Barista for Denmark, Norway, Belgium, Italy and Spain, and comparison with cow's milk.

Blonk Consultants, 2025. LCA of Oatly Barista for Austria and Switzerland, and comparison with cow's milk.

TABLE 4 shows an overview of the changes in allocation used in the previous Oatly reports and this report. All countries show a higher impact of the dairy system allocated to the milk in this report.

TABLE 4: OVERVIEW OF CHANGES IN ALLOCATION USED IN THE MAIN REPORT AND THIS REPORT

	Allocation to milk (%)					
	DE	CH	AT	UK	IE	SE
Main report and addenda (based on PEFCR for Dairy products, 2018)	84.54	79.21	78.53	85.96	84.75	85.52
This report (based on IDF, 2022)	86.69	83.70	83.78	87.93	87.72	89.28

## 4. Life Cycle Impact Assessment (LCIA)

This chapter provides an overview of the key results for all products in scope, whereas the next chapter (Life Cycle Interpretation) provides a more detailed account of the stages and processes contributing most to the impact of the products.

The results for the key impact categories are listed in TABLE 5. The results for all impact categories are included in Appendix V. Table 6 provides an overview of the relative differences of the Oatly products and cow's milk.

These tables indicate that:

- For all countries, Oatly Baristamatic has a lower impact than cow's milk when it comes to the environmental impact categories climate change, fine particulate matter formation, terrestrial acidification, freshwater eutrophication (except for the UK where Oatly Baristamatic has a higher impact than cow's milk), marine eutrophication, land use, land occupation and water consumption.
- For the mineral resource scarcity impact category, the Oatly Baristamatic has a comparable impact to cow's milk for Germany, Austria, the UK and Ireland, a lower impact for Switzerland and a higher impact than cow's milk for Sweden.
- For the fossil resource scarcity impact category, the Oatly Baristamatic has a comparable impact to cow's milk for Switzerland and Austria, a lower impact for Germany, the UK and Ireland and a higher impact than cow's milk for Sweden.

Chapter 5.1 presents a comparison of these results with the results reported in the main report and its addenda.

Note that the differences observed between Oatly Baristamatic and cow's milk are in some cases not significant, as determined by the uncertainty analysis in chapter 5.2. A further explanation of what causes the differences that can be observed between products can be found in the next chapter (Life Cycle Interpretation).

TABLE 5 (5-A to 5-F): RESULTS FOR KEY IMPACT CATEGORIES FOR OATLY BARISTAMATIC 1.5L AND COW'S MILK AT POINT OF SALE INCLUDING END-OF-LIFE (EOL) PACKAGING. OATLY PRODUCTS ARE PRODUCED IN THE HYBRID FACTORY LOCATED IN VLISSINGEN, THE NETHERLANDS. COW'S MILK REPRESENTS AN AVERAGE COW'S MILK PRODUCT AT POINT OF SALE FOR EACH COUNTRY. ABBREVIATIONS: DE = GERMANY, CH = SWITZERLAND, AT = AUSTRIA, UK = UNITED KINGDOM, IE = IRELAND, SE = SWEDEN

TABLE 5A: RESULTS FOR KEY IMPACT CATEGORIES FOR OATLY BARISTAMATIC 1.5 L AND COW'S MILK AT POINT OF SALE INCLUDING END-OF-LIFE (EOL) PACKAGING IN GERMANY

Point of sale Germany				
Impact category	Unit	Oatly Baristamatic 1.5L	Cow's milk DE	Difference compared to cow's milk
Climate change – incl LUC and peat ox	kg CO <sub>2</sub> eq	0.560	1.720	-67%
Climate change – excl LUC and peat ox	kg CO <sub>2</sub> eq	0.463	1.297	-64%
Climate change – only LUC	kg CO <sub>2</sub> eq	0.025	0.049	-49%
Climate change – only peat ox	kg CO <sub>2</sub> eq	0.073	0.374	-81%
Fine particulate matter formation	kg PM <sub>2.5</sub> eq	0.0005	0.0052	-91%
Terrestrial acidification	kg SO <sub>2</sub> eq	0.004	0.038	-88%
Freshwater eutrophication	kg P eq	0.0002	0.0003	-34%
Marine eutrophication	kg N eq	0.0007	0.0016	-56%
Land use	m <sup>2</sup> a crop eq	0.634	1.164	-46%
Land occupation	m <sup>2</sup> a	0.706	1.513	-53%
Mineral resource scarcity	kg Cu eq	0.0012	0.0013	-8%
Fossil resource scarcity	kg oil eq	0.112	0.127	-12%
Water consumption	m <sup>3</sup>	0.004	0.010	-60%

TABLE 5B: RESULTS FOR KEY IMPACT CATEGORIES FOR OATLY BARISTAMATIC 1.5 L AND COW'S MILK AT POINT OF SALE INCLUDING END-OF-LIFE (EOL) PACKAGING IN SWITZERLAND

Point of sale Switzerland				
Impact category	Unit	Oatly Baristamatic 1.5L	Cow's milk CH	Difference compared to cow's milk
Climate change – incl LUC and peat ox	kg CO <sub>2</sub> eq	0.601	1.513	-60%
Climate change – excl LUC and peat ox	kg CO <sub>2</sub> eq	0.504	1.471	-66%
Climate change – only LUC	kg CO <sub>2</sub> eq	0.025	0.034	-27%
Climate change – only peat ox	kg CO <sub>2</sub> eq	0.073	0.008	856%
Fine particulate matter formation	kg PM <sub>2.5</sub> eq	0.0005	0.0098	-95%
Terrestrial acidification	kg SO <sub>2</sub> eq	0.005	0.049	-91%
Freshwater eutrophication	kg P eq	0.0002	0.0005	-59%
Marine eutrophication	kg N eq	0.0007	0.0014	-51%
Land use	m <sup>2</sup> a crop eq	0.634	1.416	-55%
Land occupation	m <sup>2</sup> a	0.704	2.044	-66%
Mineral resource scarcity	kg Cu eq	0.0012	0.0032	-61%
Fossil resource scarcity	kg oil eq	0.126	0.136	-8%
Water consumption	m <sup>3</sup>	0.004	0.036	-89%

TABLE 5C: RESULTS FOR KEY IMPACT CATEGORIES FOR OATLY BARISTAMATIC 1.5 L AND COW'S MILK AT POINT OF SALE INCLUDING END-OF-LIFE (EOL) PACKAGING IN AUSTRIA

Point of sale Austria				
Impact category	Unit	Oatly Baristamatic 1.5L	Cow's milk AT	Difference compared to cow's milk
Climate change – incl LUC and peat ox	kg CO <sub>2</sub> eq	0.609	1.427	-57%
Climate change – excl LUC and peat ox	kg CO <sub>2</sub> eq	0.511	1.390	-63%
Climate change – only LUC	kg CO <sub>2</sub> eq	0.025	0.030	-18%
Climate change – only peat ox	kg CO <sub>2</sub> eq	0.073	0.007	974%
Fine particulate matter formation	kg PM <sub>2.5</sub> eq	0.0006	0.0058	-91%
Terrestrial acidification	kg SO <sub>2</sub> eq	0.005	0.048	-90%
Freshwater eutrophication	kg P eq	0.0002	0.0009	-75%
Marine eutrophication	kg N eq	0.0007	0.0013	-47%
Land use	m <sup>2</sup> a crop eq	0.634	1.265	-50%
Land occupation	m <sup>2</sup> a	0.706	2.023	-65%
Mineral resource scarcity	kg Cu eq	0.0012	0.0014	-9%
Fossil resource scarcity	kg oil eq	0.128	0.130	-1%
Water consumption	m <sup>3</sup>	0.004	0.017	-77%

TABLE 5D: RESULTS FOR KEY IMPACT CATEGORIES FOR OATLY BARISTAMATIC 1.5 L AND COW'S MILK AT POINT OF SALE INCLUDING END-OF-LIFE (EOL) PACKAGING IN THE UNITED KINGDOM

Point of sale United Kingdom				
Impact category	Unit	Oatly Baristamatic 1.5L	Cow's milk UK	Difference compared to cow's milk
Climate change – incl LUC and peat ox	kg CO <sub>2</sub> eq	0.543	1.535	-65%
Climate change – excl LUC and peat ox	kg CO <sub>2</sub> eq	0.445	1.443	-69%
Climate change – only LUC	kg CO <sub>2</sub> eq	0.025	0.035	-29%
Climate change – only peat ox	kg CO <sub>2</sub> eq	0.073	0.057	27%
Fine particulate matter formation	kg PM <sub>2.5</sub> eq	0.0005	0.0035	-85%
Terrestrial acidification	kg SO <sub>2</sub> eq	0.005	0.014	-67%
Freshwater eutrophication	kg P eq	0.0003	0.0002	14%
Marine eutrophication	kg N eq	0.0007	0.0019	-63%
Land use	m <sup>2</sup> a crop eq	0.634	1.026	-38%
Land occupation	m <sup>2</sup> a	0.706	1.536	-54%
Mineral resource scarcity	kg Cu eq	0.0012	0.0013	-2%
Fossil resource scarcity	kg oil eq	0.120	0.157	-24%
Water consumption	m <sup>3</sup>	0.004	0.010	-60%

TABLE 5E: RESULTS FOR KEY IMPACT CATEGORIES FOR OATLY BARISTAMATIC 1.5 L AND COW'S MILK AT POINT OF SALE INCLUDING END-OF-LIFE (EOL) PACKAGING IN IRELAND

Point of sale Ireland				
Impact category	Unit	Oatly Baristamatic 1.5L	Cow's milk IE	Difference compared to cow's milk
Climate change – incl LUC and peat ox	kg CO <sub>2</sub> eq	0.539	1.510	-64%
Climate change – excl LUC and peat ox	kg CO <sub>2</sub> eq	0.442	1.269	-65%
Climate change – only LUC	kg CO <sub>2</sub> eq	0.025	0.013	98%
Climate change – only peat ox	kg CO <sub>2</sub> eq	0.073	0.229	-68%
Fine particulate matter formation	kg PM <sub>2.5</sub> eq	0.0006	0.0039	-84%
Terrestrial acidification	kg SO <sub>2</sub> eq	0.005	0.010	-52%
Freshwater eutrophication	kg P eq	0.0003	0.0005	-42%
Marine eutrophication	kg N eq	0.0007	0.0025	-71%
Land use	m <sup>2</sup> a crop eq	0.633	0.863	-27%
Land occupation	m <sup>2</sup> a	0.704	1.329	-47%
Mineral resource scarcity	kg Cu eq	0.0012	0.0013	-8%
Fossil resource scarcity	kg oil eq	0.120	0.162	-26%
Water consumption	m <sup>3</sup>	0.004	0.009	-57%

TABLE 5F: RESULTS FOR KEY IMPACT CATEGORIES FOR OATLY BARISTAMATIC 1.5 L AND COW'S MILK AT POINT OF SALE INCLUDING END-OF-LIFE (EOL) PACKAGING IN SWEDEN

Point of sale Sweden				
Impact category	Unit	Oatly Baristamatic 1.5L	Cow's milk SE	Difference compared to cow's milk
Climate change – incl LUC and peat ox	kg CO <sub>2</sub> eq	0.592	1.033	-43%
Climate change – excl LUC and peat ox	kg CO <sub>2</sub> eq	0.494	0.835	-41%
Climate change – only LUC	kg CO <sub>2</sub> eq	0.025	0.045	-44%
Climate change – only peat ox	kg CO <sub>2</sub> eq	0.073	0.153	-52%
Fine particulate matter formation	kg PM <sub>2.5</sub> eq	0.0006	0.0010	-41%
Terrestrial acidification	kg SO <sub>2</sub> eq	0.005	0.020	-77%
Freshwater eutrophication	kg P eq	0.00020	0.00031	-36%
Marine eutrophication	kg N eq	0.001	0.001	-43%
Land use	m <sup>2</sup> a crop eq	0.645	0.928	-31%
Land occupation	m <sup>2</sup> a	0.739	1.112	-33%
Mineral resource scarcity	kg Cu eq	0.0013	0.0010	23%
Fossil resource scarcity	kg oil eq	0.143	0.094	52%
Water consumption	m <sup>3</sup>	0.004	0.006	-37%

Table 6: RELATIVE DIFFERENCES OF OATLY BARISTAMATIC 1.5L COMPARED TO COW'S MILK AT POINT OF SALE INCLUDING END-OF-LIFE (EOL) OF PACKAGING. FOR EXAMPLE, -57% INDICATES THAT OATLY BARISTAMATIC 1.5L HAS A 57% LOWER IMPACT COMPARED TO COW'S MILK. THE DIFFERENCES HAVE BEEN COLOR-CODED AS FOLLOWS: GREEN – MORE THAN 10% DIFFERENCE FAVORING OATLY BARISTA, YELLOW – THE DIFFERENCE IS 10% OR LOWER INDICATING SIMILAR PERFORMANCE FOR THE COMPARED PRODUCTS, RED – MORE THAN 10% DIFFERENCE FAVORING COW'S MILK. ABBREVIATIONS USED: NL = THE NETHERLANDS.

Country of sale	Impact category	Product	Climate change	Fine particulate matter	Terrestrial acidification	Freshwater eutrophication	Marine eutrophication	Land use	Land occupation	Mineral resource scarcity	Fossil resource scarcity	Water consumption
			kg CO2 eq	kg PM2.5 eq	kg SO2 eq	kg P eq	kg N eq	m2a crop eq	m2a	kg Cu eq	kg oil eq	m3
Germany	Oatly Baristamatic NL factory	-	-67%	-91%	-88%	-34%	-56%	-46%	-53%	-8%	-12%	-60%
Switzerland	Oatly Baristamatic NL factory	-	-60%	-95%	-91%	-59%	-51%	-55%	-66%	-61%	-8%	-89%
Austria	Oatly Baristamatic NL factory	-	-57%	-91%	-90%	-75%	-47%	-50%	-65%	-9%	-1%	-77%
United Kingdom	Oatly Baristamatic NL factory	-	-65%	-85%	-67%	14%	-63%	-38%	-54%	-2%	-24%	-60%
Ireland	Oatly Baristamatic NL factory	-	-64%	-84%	-52%	-42%	-71%	-27%	-47%	-8%	-26%	-57%
Sweden	Oatly Baristamatic NL factory	-	-43%	-41%	-77%	-36%	-43%	-31%	-33%	23%	52%	-37%

## 5. Life Cycle Interpretation

### 5.1 Contribution analysis

A contribution analysis shows the contribution of individual life cycle stages to the overall impact results. Contribution analyses are provided for all products in scope and for all key impact categories. Section 5.1.1 of the main report explains in detail which processes contribute to the different impact categories and can be consulted to better understand what is behind the results and the differences that can be observed between the Oatly products and cow's milk. Notable differences from the main report are included below.

Most of the results are consistent with those reported in the main report on Oatly Barista (Pas & Westbroek, 2022) and the respective addenda for Switzerland, Austria, and Ireland on Oatly Barista.

The deviations outlined below concern impact categories where the relative differences between the Oatly products and cow's milk differ from the previously reported results:

- For Germany: in the main report, Oatly Barista had a comparable impact to cow's milk for both the mineral and fossil resource scarcity impact categories. In the current results, only the mineral resource scarcity impact category remains comparable. Changes in fossil resource scarcity results are primarily driven by higher impacts associated with raw milk production, reflecting updates in the background database (e.g. increased impact from the diesel background dataset, a key contributor to milk production in this impact category). All other impact categories are lower for Oatly Baristamatic
- For Switzerland and Austria: the results are in line with those presented in the respective addendum report.
- For United Kingdom: In the main report, Oatly Barista had a higher impact than cow's milk for the mineral resource scarcity impact category; this impact is now comparable for Oatly Baristamatic. Oatly Barista had a comparable impact for the fossil resource scarcity impact category; this impact is now lower for Oatly Baristamatic. Changes in both fossil and mineral resource scarcity results are primarily driven by the higher impacts associated with raw milk

production. Oatly Barista had a lower impact for the freshwater eutrophication impact category; this impact is now higher for Oatly Baristamatic primarily due to the update of the ReCiPe methodology<sup>11</sup>. For all other impact categories, Oatly Baristamatic continues to have a lower impact compared to cow's milk.

- For Ireland: In the addendum report, Oatly Barista had a comparable impact to cow's milk for both land use and fossil resource scarcity impact categories; these impacts are now lower for Oatly Baristamatic. Oatly Barista had a higher impact than cow's milk for the mineral resource scarcity impact category; this impact is now comparable for Oatly Baristamatic. Changes in the mineral resource scarcity results are primarily driven by the higher impacts associated with raw milk production. For all other impact categories, Oatly Baristamatic continues to have a lower impact compared to cow's milk. The lower impact on land use is primarily attributable to the adjusted oat origin mix for Baristamatic in 2025.
- For Sweden: In the main report, Oatly Barista had a comparable impact to cow's milk for the mineral resource scarcity; it is now higher for Oatly Baristamatic. Oatly Barista had a higher impact for the fossil resource scarcity impact category; it remains higher for Oatly Baristamatic. These updated results arise from updates to the input data for Swedish milk, as well as updated background databases. For all other impact categories, the Oatly product continues to have a lower impact compared to cow's milk.

As the updates to the ecoinvent and Agri-footprint databases as well as the cow's milk emission methodology update were implemented all simultaneously, the individual contribution of each change to the observed differences cannot be isolated.

### 5.1.1 Comparison of Oatly Baristamatic 1.5L and cow's milk

The contribution analysis for the climate change impact category is shown in

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<sup>11</sup> Characterization factors for phosphorus emissions to water have been regionalized in a 2024 update of the ReCiPe method (v.1.09). The characterization factors for Chemical Oxygen Demand (COD) have also been updated. As a result, relative emissions have changed. More specifically, they have been geographically spatialised with the phosphorous emission to water evolving from 1 kg Peq/kg P emitted (non-spatialised characterization factor in the 2022 report) to about 0.096 for the UK (feed for cow's milk) and 1.448 for SE (oats cultivation). It should be noted that the model assumes 80% of oats are sourced from Sweden, which remains representative for all countries except the UK. Indeed, since September 2025, UK products have switched to 100% segregated UK oats (see [article](#)); however, this UK-specific change has not yet been incorporated into the model. For unspecified COD emission to water, it went from 0.022 kg Peq/kg P emitted to 0.007 kg Peq/kg P emitted (manure management and feed for cow's milk).

### Climate change impact of Oatly Baristamatic and cow's milk at point of sale (incl. packaging EoL)

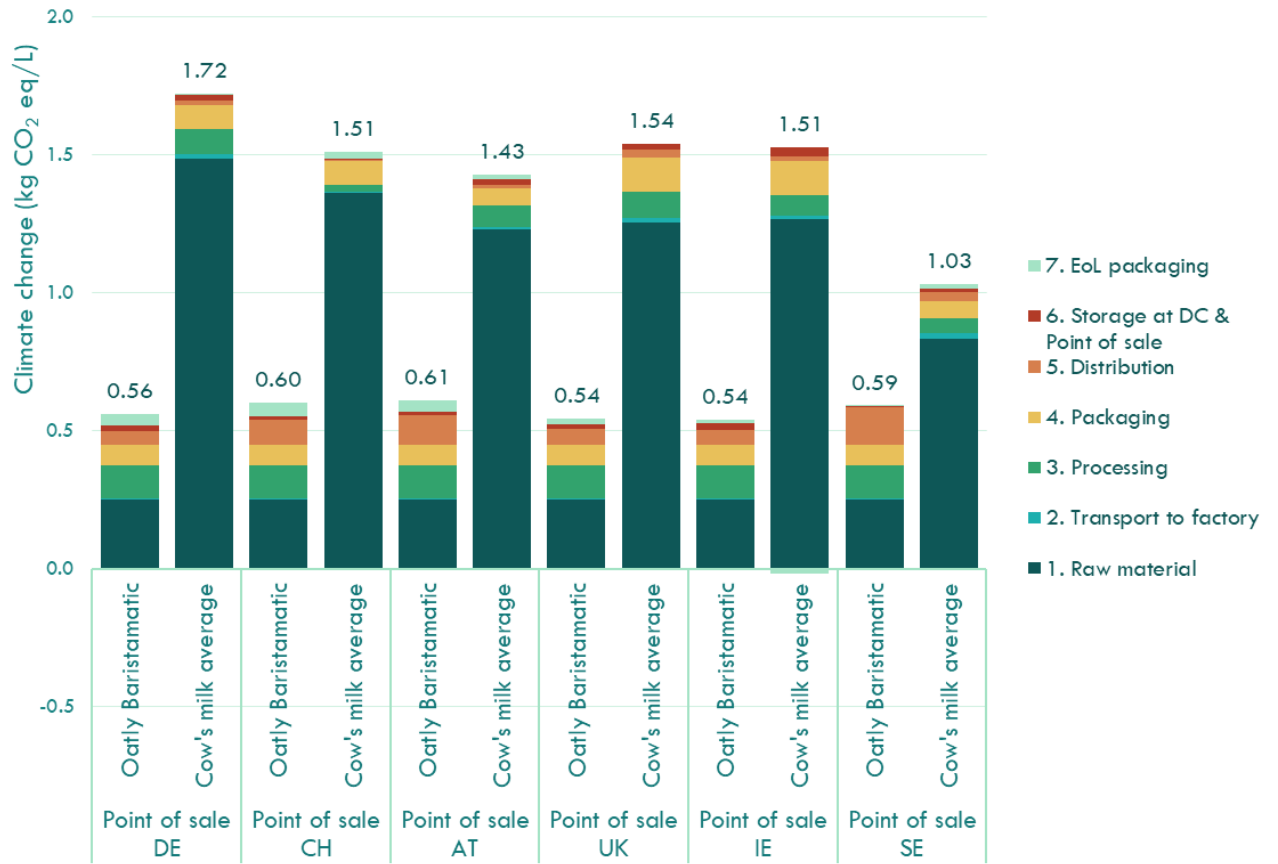


FIGURE 2. FIGURE 5 shows the contribution analysis for the other impact categories.

## Climate change impact of Oatly Baristamatic and cow's milk at point of sale (incl. packaging EoL)

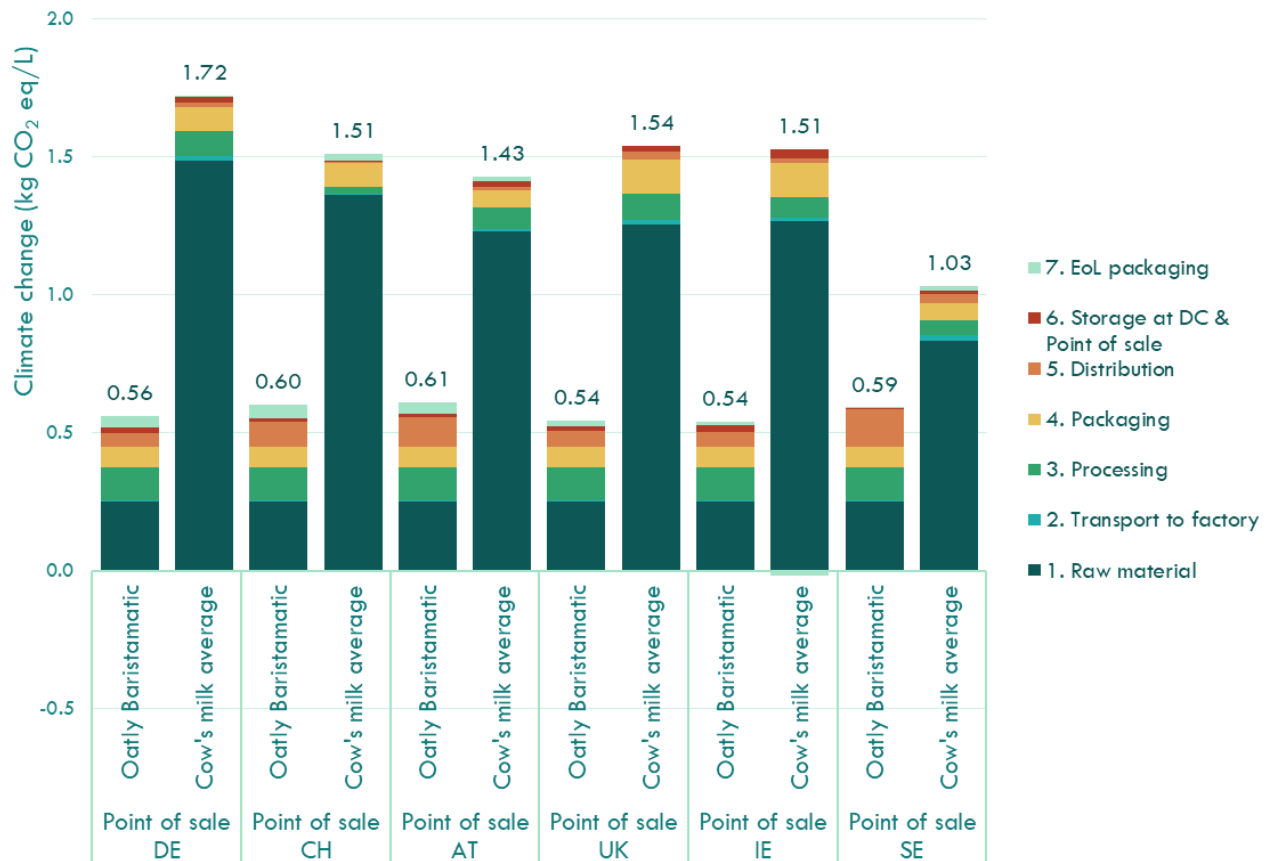


FIGURE 2: CONTRIBUTION ANALYSIS FOR THE CLIMATE CHANGE IMPACT OF BARISTAMATIC 1.5L AND COW'S MILK AT POINT OF SALE INCLUDING END-OF-LIFE (EOL) OF PACKAGING. ALL OATLY BARISTAMATIC 1.5L IS PRODUCED IN THE HYBRID FACTORY IN VLISSINGEN, THE NETHERLANDS. ABBREVIATIONS USED: DE = GERMANY, CH = SWITZERLAND, AT = AUSTRIA, UK = UNITED KINGDOM, IE = IRELAND, SE = SWEDEN.

The results show that, similar to the results in the main report, the raw material stage is for the Oatly products the largest contributor to the climate change impact category in the markets in scope, as well as to most other impact categories. In line with the main report Oatly Baristamatic products have a consistently lower impact on almost all impact categories. Also in line with the main report, some products have a comparable or higher mineral resource scarcity impact due to the use of aluminum in Oatly ambient (UHT) packaging, and a comparable or higher fossil resource scarcity impact, which is either linked to distribution (with Oatly products having longer distribution distances than the locally produced cow's milk), or the use of natural gas for processing at the factory. In contrast to the main report, Oatly products sold in the UK have a higher freshwater eutrophication impact, mainly due to the regionalization of characterization factors for phosphorus emissions to water in the ReCiPe methodology.



FIGURE 3: CONTRIBUTION ANALYSIS FOR KEY IMPACT CATEGORIES OF OATLY BARISTAMATIC 1.5L AND COW'S MILK AT POINT OF SALE INCLUDING END-OF-LIFE (EOL) OF PACKAGING. f (LAND OCCUPATION) CONCERNS AN ADDITIONAL IMPACT CATEGORY AS EXPLAINED IN CHAPTER 2. ABBREVIATIONS USED: DE = GERMANY, CH = SWITZERLAND, AT = AUSTRIA, UK = UNITED KINGDOM, IE = IRELAND, SE = SWEDEN.



FIGURE 4 (continued): CONTRIBUTION ANALYSIS FOR KEY IMPACT CATEGORIES OF OATLY BARISTAMATIC 1.5L AND COW'S MILK AT POINT OF SALE INCLUDING END-OF-LIFE (EOL) OF PACKAGING. f (LAND OCCUPATION) CONCERNS AN ADDITIONAL IMPACT CATEGORY AS EXPLAINED IN CHAPTER 2. ABBREVIATIONS USED: DE = GERMANY, CH = SWITZERLAND, AT = AUSTRIA, UK = UNITED KINGDOM, IE = IRELAND, SE = SWEDEN.

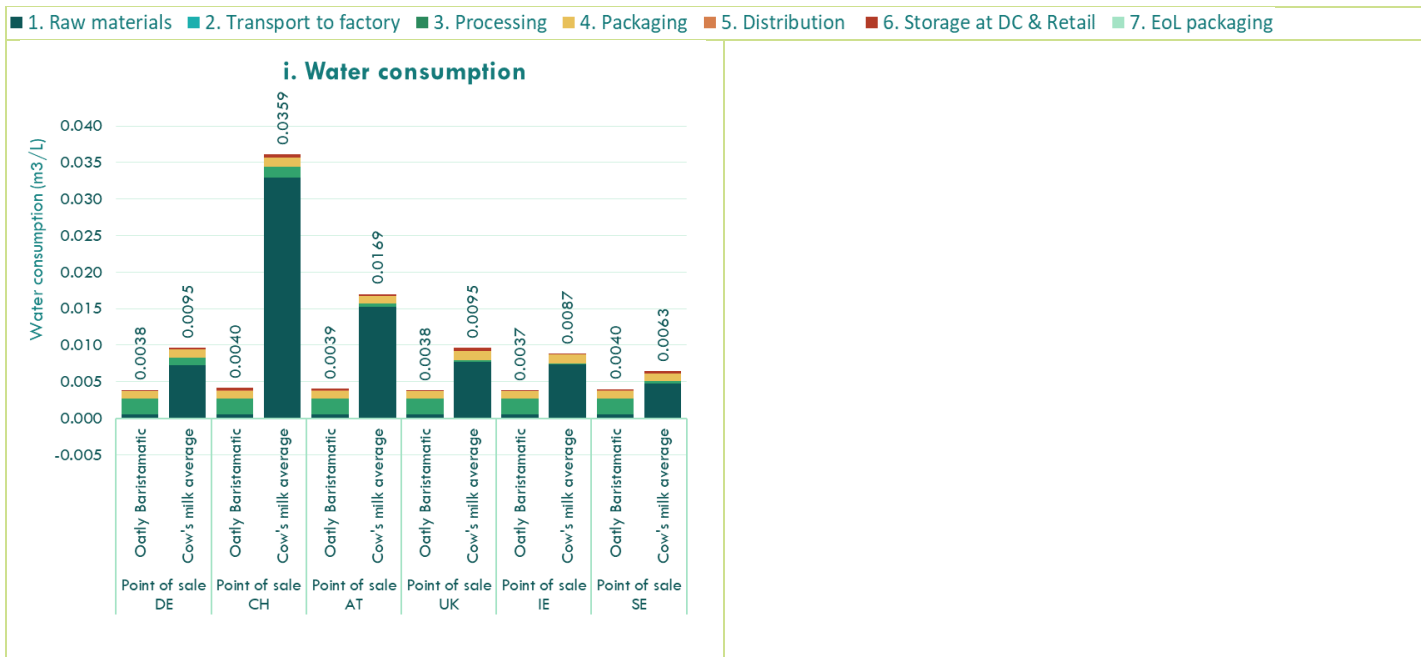


FIGURE 5 (continued): CONTRIBUTION ANALYSIS FOR KEY IMPACT CATEGORIES OF OATLY BARISTAMATIC 1.5L AND COW'S MILK AT POINT OF SALE INCLUDING END-OF-LIFE (EOL) OF PACKAGING. f (LAND OCCUPATION) CONCERNS AN ADDITIONAL IMPACT CATEGORY AS EXPLAINED IN CHAPTER 2. ABBREVIATIONS USED: DE = GERMANY, CH = SWITZERLAND, AT = AUSTRIA, UK = UNITED KINGDOM, IE = IRELAND, SE = SWEDEN.

In addition, table 7 shows that, compared to the main report and respective Barista addenda, Oatly Baristamatic's climate change impacts is lower than the ordinary Barista Edition product for Germany, the UK, Ireland and Sweden, and higher for Switzerland and Austria, although it should be noted that Oatly Baristamatic and Oatly Barista are also different products modelled with data collected in different years. Meanwhile most cow's milk impacts increased, the main driver for this being the change in the biophysical allocation, where more impact is now allocated to the milk produced. However, the impact for Swedish cow's milk decreased. The decrease in the impact of cow's milk from Sweden, is due to an update of input data and is mainly driven by two aspects. The first is the increase in milk yield. Compared to the main report the milk yield is increased by 7%. Next to that, there is a change in manure management systems. In the main report, 100% of the manure management systems for heifers and calves was a liquid system. This is updated for this report and the share of liquid systems decreased to 27% and 48% respectively. The shift to a higher share of solid storage, deep bedding and anaerobic digestion results in a decrease in methane emissions.

Because the ReCiPe method, the background databases and the animal system modelling method were updated simultaneously, the individual contribution of each change to the observed differences cannot be isolated. However, the overall conclusions of the main report remain consistent with the updated results.

TABLE 7: RESULTS FOR THE CLIMATE CHANGE IMPACT CATEGORY FOR OATLY PRODUCTS AND COW'S MILK AT POINT OF SALE INCLUDING END-OF-LIFE (EOL) PACKAGING. \*CONCERNS VALUES RETRIEVED FROM ADDENDA TO THE MAIN REPORT. ABBREVIATIONS USED: DE = GERMANY, CH = SWITZERLAND, AT = AUSTRIA, UK = UNITED KINGDOM, IE = IRELAND, SE = SWEDEN, NL = THE NETHERLANDS

Product	Country of sale	Climate change impacts (data from 2025) (kgCO <sub>2</sub> eq/L)	Climate change impacts in main report (data from 2021) or addenda (data from 2023 and 2024) (kgCO <sub>2</sub> eq/L)	Difference compared to the main report and addenda
Oatly product, NL factory	DE	0.560	0.577	-3%
Oatly product, NL factory	CH	0.601	0.576	+4%
Oatly product, NL factory	AT	0.609	0.575	+6%
Oatly product, NL factory	UK	0.543	0.584	-7%
Oatly product, NL factory	IE	0.539	0.625	-14%
Oatly product, NL factory	SE	0.592	0.628	-6%
Cow's milk	DE	1.720	1.652	+4%
Cow's milk	CH	1.513	1.427	+6%
Cow's milk	AT	1.427	1.342	+6%
Cow's milk	UK	1.535	1.374	+12%
Cow's milk	IE	1.510	1.337	+13%
Cow's milk	SE	1.033	1.124	-8%

## 5.1.2 Oatly Baristamatic 1.5L

FIGURE 6 shows a detailed contribution analysis for the climate change impact category for Oatly Baristamatic 1.5L. Top contributors for these products in all markets are oat cultivation, processing of the Baristamatic product, packaging, and distribution (especially high for Switzerland, Austria and Sweden).

Climate change impact of Oatly Baristamatic 1.5L at point of sale (incl EoL packaging)

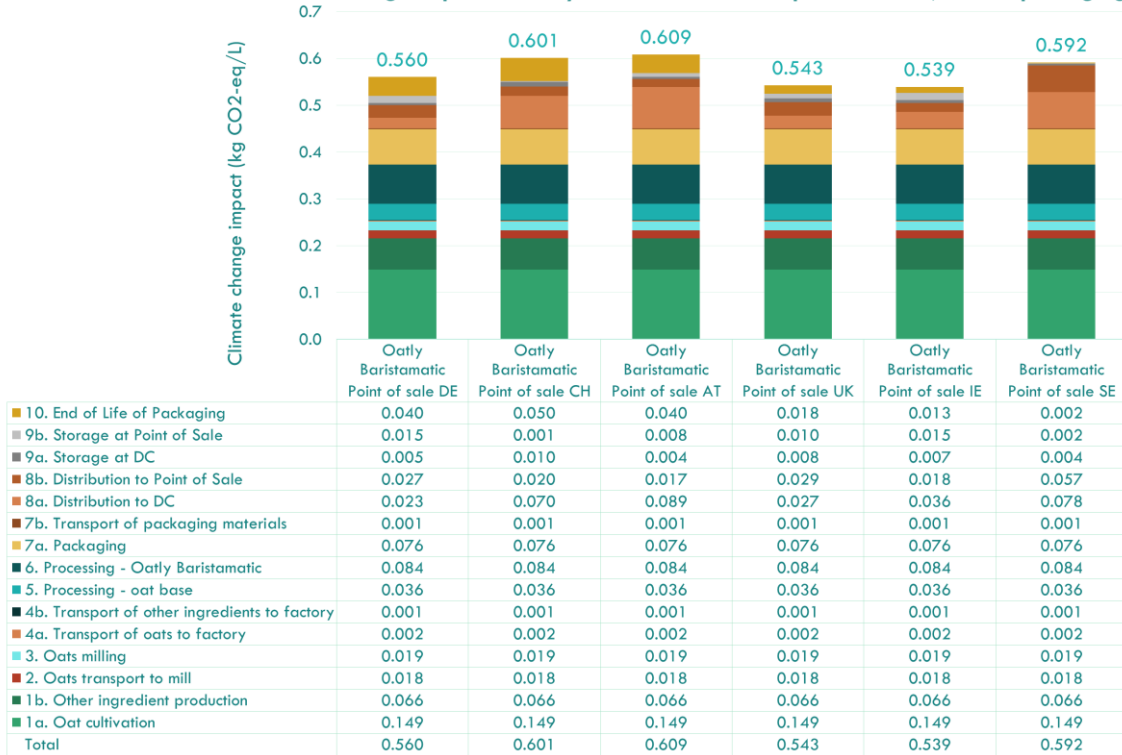


FIGURE 6: CONTRIBUTION ANALYSIS FOR THE CLIMATE CHANGE IMPACT OF OATLY BARISTAMATIC 1.5L AT POINT OF SALE INCLUDING END-OF-LIFE (EOL) OF PACKAGING. ABBREVIATIONS USED: DE = GERMANY, CH = SWITZERLAND, AT = AUSTRIA, UK = UNITED KINGDOM, IE = IRELAND, SE = SWEDEN.

### 5.1.3 Cow's milk

FIGURE 7 shows the contribution analysis for climate change impact of raw cow's milk. As in the main report, most of the climate change impact still comes from the biogenic methane emissions (30 to 59% of impacts) originating primarily from enteric fermentation and manure management.

Feed emissions remain typically the second largest contributor to climate change impacts (27% to 47% of impacts) and contribute through several pathways:

- Feed production (16% to 31% of impacts) including crop production, application of fertilizers and energy use.
- Peat oxidation (0% to 16% of impacts) relevant where feed crops are grown on drained peat soils especially in Germany, Ireland and Sweden.
- Land use change (LUC) (1% to 5% of impacts), due to emissions from land conversion happening more often in Sweden and Germany than other countries in scope.

### Climate change impact of raw cow's milk

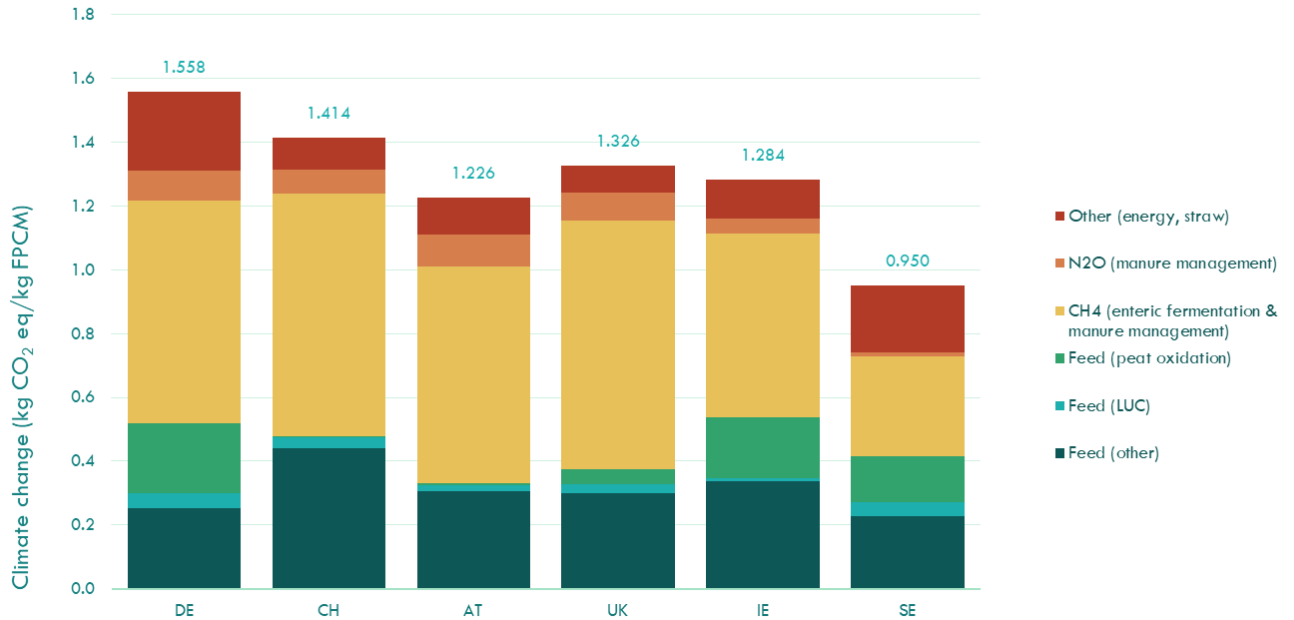


FIGURE 7: CONTRIBUTION ANALYSIS FOR THE CLIMATE CHANGE IMPACT OF RAW COW'S MILK IN AUSTRIA, SWITZERLAND, GERMANY, IRELAND, UNITED KINGDOM AND SWEDEN. ABBREVIATIONS USED: DE = GERMANY, CH = SWITZERLAND, AT = AUSTRIA, UK = UNITED KINGDOM, IE = IRELAND, SE = SWEDEN.

The overall lower climate change impact of Swedish milk compared to the other countries in scope is mainly explained by a higher milk productivity.

Table 7 in section 5.1.1 shows how the climate change impacts have changed relative to the main report and the respective addenda following updates to the milk emission modelling for all countries, as well as updated data for Sweden and background database updates.

## 5.2 Sensitivity and uncertainty analyses

Sensitivity analyses serve to evaluate the robustness of the results by assessing the influence of several assumptions and modelling choices that have been made. In the main report, sensitivity analyses were performed to evaluate the choice of impact assessment method, the choice of functional unit, the choice of allocation, as well as several choices with regard to characteristics of the systems under study (e.g. inclusion of use stage, comparison to ambient version of cow's milk). Next to that, an uncertainty analysis has been performed to determine the range in outcomes when considering uncertainties with regard to data quality.

These sensitivity analyses in the main report demonstrated that using a different impact assessment method (ReCiPe endpoint, EF3.0 single score) confirmed the overall higher environmental footprint of cow's milk compared to Oatly Barista for all countries in scope. It also showed that results in the impact categories land use, mineral resource scarcity and water impact categories are less robust, as they result in different trends when using a different impact assessment method (EF 3.0) because of their different underlying metrics. Furthermore, the sensitivity analyses in the main report concluded that using different product characteristics (inclusion of use stage) and methodological choices (using economic allocation for cow's milk), did not lead to different conclusions on the environmental footprint of Oatly Barista compared to cow's milk.

Considering how similar the Oatly Baristamatic products considered in this study are to the Oatly Barista investigated in the main report (and having a similar or relatively lower impact for most impact categories<sup>12</sup>), it was not deemed necessary to repeat all sensitivity analyses. The conclusions that were drawn based on the sensitivity analyses in the main report also apply to the Baristamatic products in this addendum. This chapter therefore just includes an uncertainty analysis.

Uncertainty in inventory data has been determined using the pedigree matrix<sup>13</sup>, as described in section 2.4.1 of the main report. With this data, a Monte Carlo analysis was run in SimaPro to assess the uncertainty range for each product.

FIGURE 8 shows the climate change impact results including uncertainty ranges for the 95% confidence interval; meaning that of the 1000 times that the analysis has been repeated, 95% of the intervals that were generated include the true mean value.

The graph shows a higher uncertainty range for cow’s milk, which is caused by the higher uncertainty factors attributed to emissions from manure management and enteric fermentation and to feed intake (see section 2.7.1 of the main report). Oatly Baristamatic has lower uncertainty ranges due to the use of primary (foreground) data.

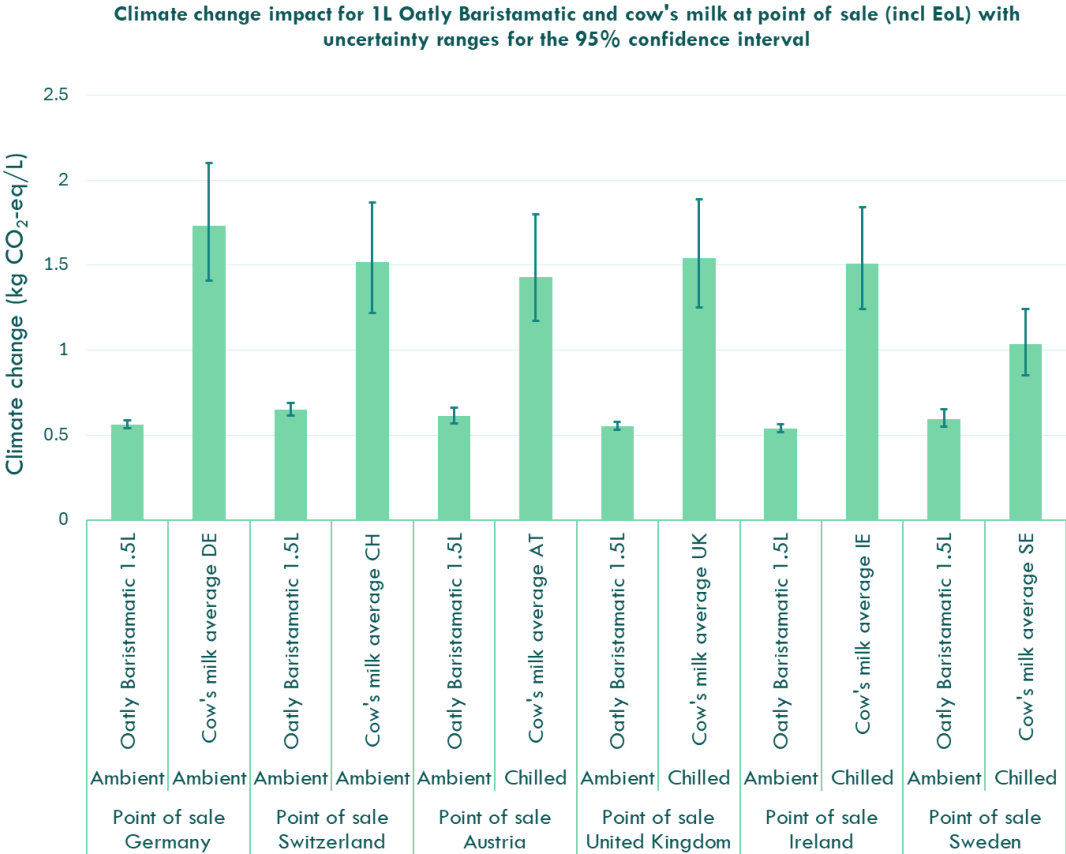


FIGURE 8: CLIMATE CHANGE IMPACT FOR OATLY BARISTAMATIC PACKED IN 1.5L AND COW'S MILK AT POINT OF SALE INCLUDING END-OF-LIFE (EOL) PACKAGING, WITH UNCERTAINTY RANGES FOR THE 95% CONFIDENCE INTERVAL. ABBREVIATIONS USED: DE = GERMANY, CH = SWITZERLAND, AT = AUSTRIA, UK = UNITED KINGDOM, IE = IRELAND, SE = SWEDEN.

<sup>12</sup> When comparing the average relative difference between Oatly Barista and cow’s milk for the impact categories in scope, the Oatly Baristamatic in this report have on average a similar or relative lower impact than the Oatly products in the main report and respective addenda for all impact categories except an increase in freshwater and marine eutrophication.

<sup>13</sup> The assumption is made that the uncertainty factors would not change for the newer version of the Ecoinvent database, so the pedigree matrix is not updated in this study



The graph gives an impression of how Oatly Baristamatic compares to cow's milk when taking these uncertainties into consideration. If the error bars of the 95% uncertainty interval do not overlap, one can assume differences between products are statistically significant (Payton et al., 2003).

A more accurate way to compare two products is a paired Monte Carlo analysis, which considers the uncertainty of the difference between two products (thus accounting for correlation in data). The number of runs (from the total of 1000 runs) is counted in which product A has a higher impact than product B. In general, it can be assumed that if >90% of the Monte Carlo runs are favourable for one product, the difference can be considered significant (Goedkoop et al., 2013).

FIGURE 10 below shows the outcome of this paired Monte Carlo analysis for all products in scope, and for all impact categories. It shows that for climate change, fine particulate matter formation, terrestrial acidification, freshwater eutrophication (except for Baristamatic in the United Kingdom), marine eutrophication, land use, land occupation, and water consumption, the impact of Oatly Baristamatic is consistently and significantly lower than the impact of cow's milk.

For mineral resource scarcity, the differences between Oatly Baristamatic and cow's milk vary between significantly higher (for Sweden), lower (for Germany, Austria, Switzerland and Ireland) or insignificant (for the UK). As for fossil resource scarcity, the impact of Oatly Baristamatic sold in Sweden is consistently and significantly higher than the impact of cow's milk, and is consistently and significantly lower for Germany, the UK, and Ireland. The differences are insignificant for Austria and Switzerland.

It should be noted that the results shown here concern just an approximation rather than an accurate reflection of uncertainty ranges, as uncertainty was estimated for the data in absence of information on variability of the data.

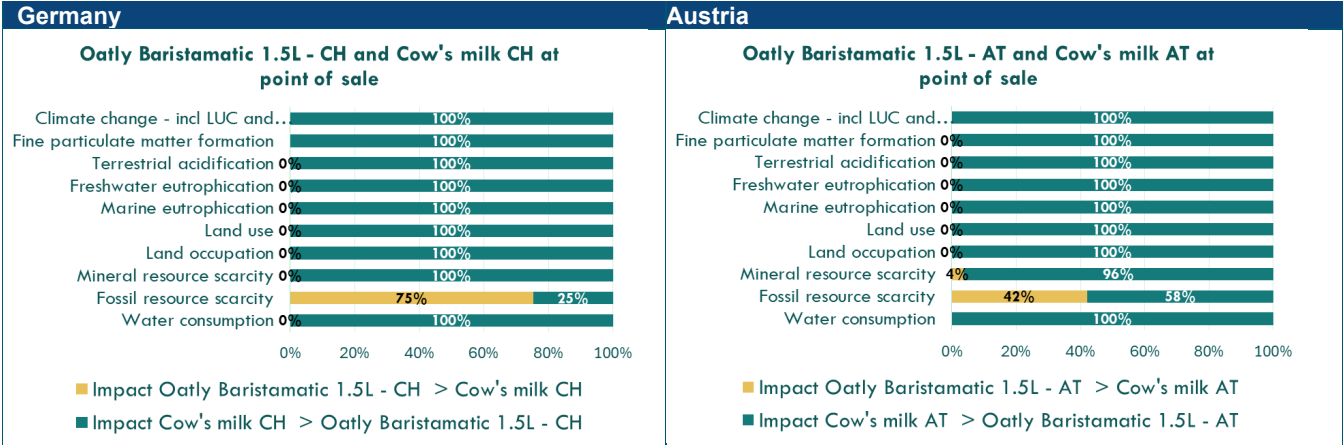


FIGURE 9: PAIRED MONTE CARLO ANALYSIS OF OATLY BARISTAMATIC 1.5L AND COW'S MILK AT POINT OF SALE INCLUDING END-OF-LIFE (EOL) PACKAGING, SHOWING THE PERCENTAGE OF MONTE CARLO RUNS IN WHICH ONE PRODUCT HAS A HIGHER IMPACT THAN THE OTHER. FOR EXAMPLE, FOR CLIMATE CHANGE, OATLY BARISTAMATIC 1.5L AT POINT OF SALE IN GERMANY HAS A LOWER IMPACT THAN COW'S MILK FOR 100% OF THE 1000 MONTE CARLO SIMULATIONS PERFORMED. ABBREVIATIONS USED: DE = GERMANY, CH = SWITZERLAND, AT = AUSTRIA, UK = UNITED KINGDOM, IE = IRELAND, SE = SWEDEN.



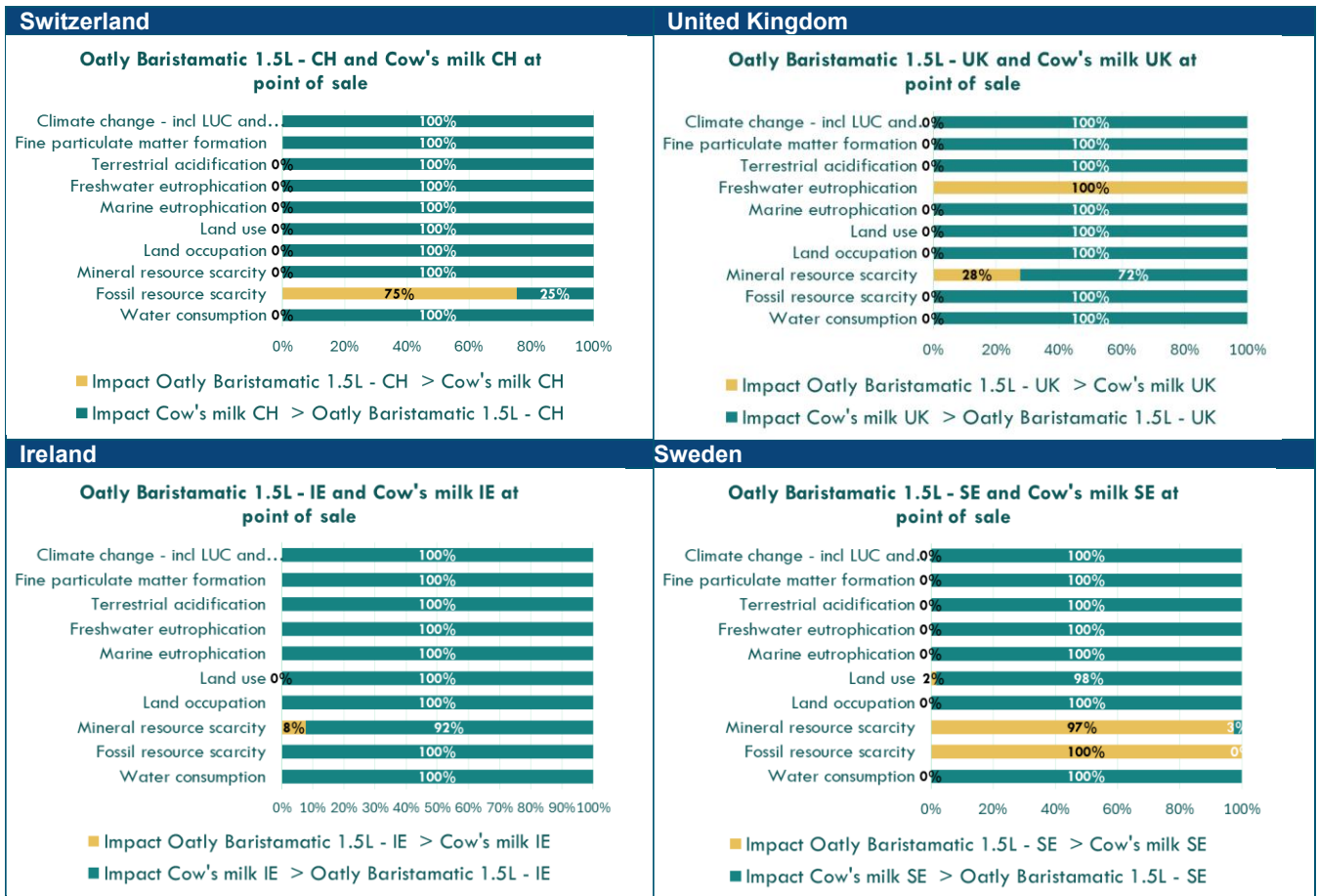


FIGURE 10 (continued): PAIRED MONTE CARLO ANALYSIS OF OATLY BARISTAMATIC 1.5L AND COW'S MILK AT POINT OF SALE INCLUDING END-OF-LIFE (EOL) PACKAGING, SHOWING THE PERCENTAGE OF MONTE CARLO RUNS IN WHICH ONE PRODUCT HAS A HIGHER IMPACT THAN THE OTHER. FOR EXAMPLE, FOR CLIMATE CHANGE, OATLY BARISTAMATIC 1.5L AT POINT OF SALE IN GERMANY HAS A LOWER IMPACT THAN COW'S MILK FOR 100% OF THE 1000 MONTE CARLO SIMULATIONS PERFORMED. ABBREVIATIONS USED: DE = GERMANY, CH = SWITZERLAND, AT = AUSTRIA, UK = UNITED KINGDOM, IE = IRELAND, SE = SWEDEN.

## 6. Conclusion

A Life Cycle Assessment (LCA) has been performed to compare the environmental performance of Oatly Baristamatic 1.5L to cow's milk in multiple sales markets in Europe. The functional unit considered for this study is 1 liter of Oatly Baristamatic/cow's milk at the point of sale, including packaging manufacturing and packaging end of life. The study has been performed and critically reviewed according to ISO 14040/14044/14071 standards for comparative assertions to be disclosed to the public.

The results show that Oatly Baristamatic 1.5L in most markets has a lower impact than cow's milk for the impact categories climate change, fine particulate matter formation, terrestrial acidification, marine eutrophication, land use, land occupation, and water consumption. Oatly Baristamatic 1.5L has also a lower impact on freshwater eutrophication except in the UK where it has a higher impact mainly due to the regionalization of characterization factors for phosphorus emissions to water in the ReCiPe methodology. For mineral resource scarcity and fossil resource scarcity, the differences between Oatly Baristamatic 1.5L and cow's milk vary between significantly higher, lower, or insignificant. A higher impact on mineral resource scarcity than cow's milk can be mainly attributed to the combination of the use of aluminum in ambient beverage cartons and wind electricity used in the factory.

Overall, the results are largely consistent with those presented in the main report and the respective addenda for Switzerland, Austria, and Ireland. Some deviations are observed for specific impact categories in certain countries; however, these changes are limited in scope and do not alter the overall conclusions of the study. In most cases, Oatly Baristamatic shows lower impacts than cow's milk across



most impact categories. The observed differences relative to the results presented in the main report and the respective addenda for Switzerland, Austria, and Ireland mainly concern mineral and fossil resource scarcity, and freshwater eutrophication in selected markets. Changes in both fossil and mineral resource scarcity results are primarily driven by the higher impacts associated with raw milk production. Oatly Barista had a lower impact for the freshwater eutrophication impact category; this impact is now higher for Oatly Baristamatic primarily due to the update of the ReCiPe methodology. As the database updates and the revision of the cow's milk's emission methodology were implemented simultaneously, the individual contribution of each change to the observed differences cannot be isolated.

The significance of the differences between the Oatly product and cow's milk has been determined by an uncertainty analysis. In the main report additional sensitivity analyses were carried out (see section 5.2 of the main report), the conclusions of which also apply to the current products, as they are of similar impact to the Oatly Barista in the main report and the respective addenda. The main report concluded that using a different impact assessment method (ReCiPe endpoint, EF3.0 single score) confirmed the overall higher environmental footprint of cow's milk compared to Oatly products for all countries in scope. It also showed that results in the impact categories land use, mineral resource scarcity and water consumption impact categories are less robust, as they result in different trends when using a different impact assessment method (EF 3.0). Furthermore, the sensitivity analyses in the main report concluded that using different product characteristics and methodological choices (inclusion of use stage, using economic allocation for cow's milk, functional unit based on nutritional characteristics), did not lead to different conclusions on the environmental footprint of Oatly products compared to cow's milk.

A detailed analysis of the main drivers and opportunities linked to the environmental impact of Oatly products can be found in the main report. It is worth mentioning, that even if the scope of this report is not to compare results with the main report, Oatly's processing stage in the Vlissingen factory has seen a slight reduction in impact for climate change, mineral resource scarcity and water consumption. This is due to a switch in their electricity source, from hydropower to wind power, since the main report was published.

The conclusions and recommendations presented here are subject to the assumptions and limitations addressed in this report and the main report. Any comparative assessment intended to be disclosed to the public, should transparently refer to the conclusions of these studies, and be accompanied by the critical review statement.

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# Appendix I Oatly production modelling (confidential data)

This appendix is not available in this version of the report due to confidential data.



# Appendix II Oatly production modelling (Non-confidential)

The data quality assessment below has been partially updated, as the sources of the secondary data changed compared to the main report. The sources of primary data, however, did not change.

Life cycle stage	Description of data	Data quality
<b>1a. Oat cultivation</b>	<p>Modelled using oat cultivation datasets from Agri-Footprint 7. Agri-footprint datasets consider cultivation-related inputs and resources (yield, water consumption, land occupation/ transformation, input of manure, fertilizers, lime, pesticides, start material, energy and transport of inputs), as well as emissions related to the use of these inputs and resources (nitrous oxide, ammonia, nitrate, nitric oxide, carbon dioxide, phosphorus, pesticide, heavy metals). Emissions from land use change and peat oxidation are included as well. The sourcing countries for the factories are listed below, including the yields for oat cultivation as used in Agri-footprint (these are based on FAO statistics; more information on data used can be found in the publicly available Agri-footprint 7 Methodology Report, Part 2 – Data).</p> <ul style="list-style-type: none"> <li>• Vlissingen factory NL: oats from Sweden (yield of 4054 kg/ha), Finland (yield of 3386 kg/ha) and the UK (yield of 5653 kg/ha)</li> </ul>	Good
<b>1b. Other ingredient production</b>	<p>The quantity of other ingredients used during processing or added to the final product are provided by Oatly. These include enzymes, calcium carbonate, vitamins, salt, and rapeseed oil. Rapeseed oil and a proxy for vitamins was derived from the Agri-footprint database, whereas the other ingredients were modelled using datasets from ecoinvent 3.11.</p>	Good
<b>2. Oats transport to mill</b>	<p>To account for transport from oat cultivation to mills, estimates are provided by Oatly (as location of farmers is not available).</p> <ul style="list-style-type: none"> <li>• Oats destined for Vlissingen factory (NL): An estimate of 300km is assumed for the transportation between the oat fields and the ports. We assume diesel trucks from the oat fields to the port, and a consecutive transportation from the port to the mill in Belgium by sea and diesel trucks.</li> </ul> <p>All trucks are modelled with a capacity &gt;20t, a load factor of 80% and an empty return.</p>	Fair
<b>3. Oats milling</b>	<p>Primary data was provided by Oatly on energy use (electricity and heat), and water consumption for the mill in Belgium.</p> <p>The oat hulls are going to either animal feed or biogas production.</p>	Good
<b>4a. Transport of oats to factory</b>	<p>Distance based on locations of the mill and the Oatly factory. Transport was modelled using diesel trucks.</p>	Very good
<b>5. Processing – oat base</b>	<p>The input use (energy, heat, water) to generate oat base and finished product was provided by Oatly based on data from the production facilities in scope. Water use includes both water in the recipe (final product), and water used for processing (mainly cleaning). The quantity of water going to wastewater treatment is also recorded.</p>	Very good

<b>6. processing – Oatly Baristamatic</b>	<p>The input use (energy, heat, water) to generate oat base and finished product was provided by Oatly based on data from the production facilities in scope. Water use includes both water in the recipe (final product), and water used for processing (mainly cleaning). The quantity of water going to wastewater treatment is also recorded.</p> <p>To account for losses during processing, an estimation was provided by Oatly of 5% losses during the production. This concerns a maximum and is based on an interview with Oatly’s factory controller (Veljanovski, 2022).</p>	<i>Very good</i>
<b>7a. packaging</b>	<p>Primary data on packaging composition is supplied by the packaging manufacturer. Next to the materials used (such as LDPE, aluminum, paperboard), energy was accounted for processing these materials based on ecoinvent datasets (sheet rolling for aluminum, injection moulding for the HDPE cap etc).</p> <p>BioPE is used in all beverage cartons used by Oatly. It is generated with sugarcane cultivated in Brazil. A BioPE dataset has been calculated by Quantis (Quantis, 2022) and its climate change impact is slightly higher than regular PE (excl LUC). Land use change was added from Blonk’s LUC database to account for the risk of deforestation attributed to sugar cane cultivation in Brazil.</p> <p>Secondary packaging (corrugated board) is also included.</p>	<i>Very good</i>
<b>7b. Transport of packaging material</b>	<p>Upstream data for packaging (e.g. of raw materials) is already included in the ecoinvent datasets used. Transport (assuming diesel trucks) was added from the packaging manufacturing facilities to Oatly’s corresponding factories based on their locations.</p>	<i>Very good</i>
<b>8a. Distribution to DC</b>	<p>The transport from the factory to the distribution center is provided by Oatly. Oatly uses trucks with a capacity of 21.5-36 tonnes (Månsson, 2022) (modelled as &gt;20ton trucks with a load factor of 80%).</p>	<i>Good</i>
<b>8b. Distribution to Retail</b>	<p>Transport data is provided by Oatly. An additional 50 km of last mile distribution was added.</p> <p>In Sweden and the UK, distribution from distribution center to point of sale is conducted using HVO100 renewable diesel. This was not reflected in the model due to a lack of robust background data (modelled as diesel trucks as proxy)</p>	<i>Fair</i>
<b>9. Storage at DC and retail</b>	<p>For European countries, this is based on defaults for ambient storage provided by the PEF CR, with storage duration provided by the Dairy PEF CR (section 6.4):</p> <ul style="list-style-type: none"> <li>• 1 week of storage at DC (assuming 3x storage volume)</li> <li>• 3 days chilled storage at retail (HTST)</li> <li>• 14 days ambient storage at retail (UHT)</li> </ul> <p>Loss rates at retail were provided by Oatly.</p>	<i>Fair-Poor</i>
<b>10. End of Life of Packaging</b>	<p>The EoL of the packaging material is calculated using the Circular Footprint Formula (CFF) from the PEF CR. The CFF is only applied for primary packaging materials, using country-specific parameters as provided in Annex C of the PEF CR.</p> <p>The CFF annex provides recycling rates for liquid packaging board as a whole. It is assumed that only the paper part of the beverage</p>	<i>Fair</i>

carton can be recycled (into pulp). All of the plastic and aluminum is assumed to be incinerated and/or landfilled (Kremser et al., 2022; Velzen and Smeding, 2022), using country-specific incineration/landfill rates.

For secondary packaging material (corrugated board) no CFF was applied, and dataset was selected that already includes recycled material.

# Appendix III Dairy production modelling

The tables below highlight the data used as well as calculations and assumptions made to model dairy systems in the countries in scope.

In comparison to the main report a new version of the Animal Life Cycle Engine is used. The parameters necessary to model the dairy systems have not changed, except for Sweden. However, the new tool makes use of different background data. Table 8 shows the difference between the tool used in the main report and this addendum.

TABLE 8 DIFFERENCES BETWEEN APS-FOOTPRINT MAIN REPORT AND ADDENDUM

<i>APS-footprint Main Report</i>	<i>Animal Life Cycle Engine Baristamatic Addendum</i>
IPCC 2006	IPCC 2019
Agri-footprint 5	Agri-footprint 7.0
Biophysical allocation based on PEFCR for Dairy Products (2018)	Biophysical allocation based on IDF 2022

## Allocation at farm

Allocation is used to distribute the overall environmental impacts to the different outputs: milk and animal liveweight (aggregate of replaced dairy cows and sold calves). The dairy module of the new version of the Animal Life Cycle Engine uses biophysical allocation to calculate the environmental impact of the two co-products according to the latest biophysical allocation developed by the International Dairy Association (IDF, 2022) and was suggested by the dairy PEFCR (European Dairy Association, 2025). The formula is as below:

$$AF_{milk} = \frac{NE_L * M_{milk}}{NE_L * M_{milk} + NE_G * M_{meat}}$$

Where:

- $AF_{milk}$  is the dairy farm milk allocation factor, the fraction of total farm emissions assigned to milk.
- $NE_L$  is the net energy required for lactation (milk production) per unit of milk output (MJ/kg FPCM). This accounts for the energy cows expend to produce one kilogram of fat- and protein-corrected milk (FPCM).
- $M_{milk}$  is the total mass of milk produced per year, expressed in kilograms of FPCM.
- $NE_G$  is the net energy required for growth (meat production) per unit of live weight gain (MJ/kg live weight). This reflects the energy needed to produce one kilogram of meat (including cull cows and surplus calves).
- $M_{meat}$  is the total mass (kg) of live weight of animals sold, per year.

This way of allocating has higher accuracy as it considers the energy needed for milk production, energy needed for growth, mass of milk produced and mass of liveweight. Where, in the biophysical allocation used in the main report only the milk/meat ratio was considered. The biophysical allocation according to the International Dairy Association (IDF, 2022) [results in a higher impact allocated to the milk produced.](#)

## Austria and Switzerland

As reported in Appendix III of the 2025 addendum *LCA of Oatly Barista for Austria and Switzerland and comparison with cow's milk*, no specific data was available for Austria and Switzerland on ration, housing

system, bedding and manure management to make a distinction between heifers, calves 1-2 years and calves <1 year, as was done in the main report. We therefore aggregated these three groups as 'replacement animals'. Assumptions were made on the number of animals by the livestock unit (LU) stated in the papers used to model the country specific dairy systems.

## Sweden

The data for Sweden is updated based on the data derived from the National Inventory Report (NIR) of Sweden and Managos 2026. The data on feed composition did not change compared to the main report. The main changes in data are the milk yield per cow, which increased by 7% compared to the main report, and a shift from manure management systems (liquid systems) with a higher methane conversion to manure management systems with a lower methane conversion (solid storage and deep bedding).

More details on the exact data sources used and assumptions made can be found in the table below.

Data point	Value (per year) - used in the main report from 2022	Value (per year) – updated in this report	Explanation/source for this report
<b>General details</b>			
Geography	Sweden	Sweden	
Climate type		Cool temperate moist	IPCC Climate Zones
Average annual temperature	2.1		
<b>OUTPUTS</b>			
Milk (total weight as is) (kg)	3,690,820,180	2,981,052,052	Milk yield (10071, from NIR 2025) multiplied by number of dairy cows (see below)
Protein content (%)	3.38	3.53	NIR 2025
Fat content (%)	4.25	4.26	NIR 2025
<b>RESOURCE USE</b>			
Electricity use	1,840,494,240 (MJ) (= 511,248,400 kWh)	384,800,000 (kWh)	Cederberg, 2009 (1300 kWh per dairy cow /year), modelled using Swedish electricity mix
Diesel use (MJ)	390,480,000	357,725,246	Cederberg, 2009
Water consumption (m3)	18,081,075.080	11,398,753.51	From SIK, 2013
<b>HOUSING SYSTEMS</b>			
Housing - Heifers	149000	30391	Average # animals present in stage. Based on input/output stage and mortality.
Housing - Calves 1-2 year	87000	102532	Average # animals present in stage. Based on input/output stage and mortality.
Housing - Calves <1 year	194000	104585	Average # animals present in stage. Based on input/output stage and mortality.
Housing - Dairy cows	393268	296000	NIR 2025
<b>Housing system dairy cows</b>			
<b>RATION</b>			
			Feed rations are based on a combination of data from Cederberg (2009) and Hendriksson (2013). Ingredients are modelled to represent Swedish cultivation conditions, thus using Swedish cultivation data from AFP as well as Swedish market mixes in case of feed from outside the farm. Transport from cultivation country to Sweden, as well as within Sweden, is added.
Concentrate feed (kg as is)	1994	1994	Based on Cederberg. 10 main ingredients were included: rapeseed meal, beet pulp, soymeal, palmkernel exp, grain bran, distiller's dried gr, molasses, fatty acids, grain middlings, peas
Minerals (kg as is)	86	86	
Grass silage, grown on farm, SE (kg as is)	5350	5350	Adapted N fertilizer input grass based on Cederberg, 2009
Maize silage, grown on farm, SE (kg as is)	294	294	

Grass for grazing, permanent pasture, SE (kg as is)	1927	1927	Adapted N fertilizer input grass based on Cederberg, 2009
Wheat, via feed (kg as is)	133	133	Swedish cultivation
Triticale, via feed (kg as is)	114	114	Swedish cultivation
Barley, via feed (kg as is)	170	170	Swedish cultivation
Oats, via feed (kg as is)	57	57	Swedish cultivation
Barley (grain), grown on farm (kg as is)	652	652	
Oats (grain), grown on farm (kg as is)	639	639	
Super pressed pulp (kg as is)	172	172	sugar beet
Barley straw (kg as is)	66	66	
<b>Total feed intake (kg/animal)</b>	<b>11654</b>	<b>11654</b>	<b>Total of the above</b>
Gross energy intake (MJ/animal)	112959	112959	Calculated with values from feedipedia
Digestibility (% of GE)	70.2%	70.2%	Calculated with values from feedipedia
Crude protein in diet (% of DM)	17.9%	17.9%	Calculated with values from feedipedia
Percentage of silage (% of GE)	41.1%	41.1%	GE provided by silage/total GE
<b>HOUSING</b>			
Straw for bedding (kg/animal)	44	44	Based on Danish dairy system, as no Swedish data was available
Saw dust (kg/animal)	6.25	6.25	Based on Danish dairy system, as no Swedish data was available
Type (e.g. housed/ free ranging)	Housed	Housed	
<b>MANURE MANAGEMENT</b>			
Manure management system (select type, e.g. dry lot)	11% solid storage, 79% Liquid/slurry with natural crust cover	84.8% liquid system, 6.22% solid storage, 1.19% deep bedding, 7.78% digestion	NIR 2025
<b>TIME SPENT DISTRIBUTION</b>			
Time spent grazing (%)	21%	40%	NIR 2025
Time spent in buildings (%)	79%	60%	NIR 2025
<b>Housing system Heifers and Calves 1-2 years</b>			
<b>RATION</b>			
			Feed rations are based on a combination of data from Cederberg (2009) and Hendriksson (2013). Ingredients are modelled to represent Swedish conditions, thus using Swedish cultivation data from AFP as well as Swedish market mixes in case of feed from outside the farm. Transport from cultivation country to Sweden, as well as within Sweden, is added.
Concentrate feed (kg as is)	366	366	
Minerals (kg as is)	16	16	
Grass silage, grown on farm, SE (kg as is)	2592	2592	
Grass for grazing, permanent pasture, SE (kg as is)	934	934	
Wheat, via feed (kg as is)	27	27	Swedish cultivation
Triticale, via feed (kg as is)	23	23	Swedish cultivation
Barley, via feed (kg as is)	34	34	Swedish cultivation
Oats, via feed (kg as is)	11	11	Swedish cultivation
Barley (grain), grown on farm (kg as is)	130	130	
Oats (grain), grown on farm (kg as is)	128	128	
Wheat straw (kg as is)	57	57	Swedish cultivation
<b>Total feed intake (kg/animal)</b>	<b>4317</b>	<b>4317</b>	<b>Total of the above</b>
Gross energy intake (MJ/animal)	36738	36738	Calculated with values from feedipedia
Digestibility (% of GE)	69.4%	69.4%	Calculated with values from feedipedia
Crude protein in diet (% of DM)	16.2%	16.2%	Calculated with values from feedipedia
Percentage of silage (% of GE)	59.0%	59.0%	GE provided by silage/total GE
<b>HOUSING</b>			
Straw for bedding (kg/animal)	44	44	Based on Danish dairy system, as no Swedish data was available

Saw dust (kg/animal)	6.25	6.25	Based on Danish dairy system, as no Swedish data was available
Type (e.g. housed/ free ranging)	Housed	Housed	
<b>MANURE MANAGEMENT</b>			
Manure management system (select type, e.g. dry lot)	liquid/slurry with natural crust cover	27.47% liquid system, 16.08% solid storage, 52.35% deep bedding, 4.10% digestion	NIR 2025
<b>TIME SPENT DISTRIBUTION</b>			
Time spent grazing (%)	46%	51.67%	NIR 2025
Time spent in buildings (%)	54%	48.33%	NIR 2025
<b>Housing system calves &lt;1 year</b>			
<b>RATION</b>			
			The quantity of feed consumed is based on data from Denmark, as Swedish data was not available. This was deemed appropriate as calves don't have a big contribution compared to dairy cows and heifers. Swedish data was used to model the feed ingredients.
Concentrate feed (kg as is)	78	78	
Grass silage, grown on farm, SE (kg as is)	4281	4281	
Grass for grazing, permanent pasture, SE (kg as is)	40	40	Grass dataset modelled based on yield and inputs from (Krizsan, Chagas, Pang, & Cabezas-Garcia, 2021) and Cederberg, 2009
Wheat straw (kg as is)	154	154	Swedish cultivation
Total feed intake (kg/animal)	4553	4553	Total of the above
Gross energy intake (MJ/animal)	41 348	41 348	Calculated with values from feedipedia
Digestibility (% of GE)	80.0%	80.0%	Calculated with values from feedipedia
Crude protein in diet (% of DM)	18.3%	18.3%	Calculated with values from feedipedia
Percentage of silage (% of GE)	90.5%	90.5%	GE provided by silage/total GE
<b>HOUSING</b>			
Straw for bedding (kg/animal)	0	0	
Saw dust (kg/animal)	0	0	
Type (e.g. housed/ free ranging)	housed	housed	
<b>MANURE MANAGEMENT</b>			
Manure management system	liquid/slurry with natural crust cover	48.23% liquid system, 16.01% solid storage, 30.56% deep bedding, 5.20% digestion	NIR 2025
<b>TIME SPENT DISTRIBUTION</b>			
Time spent grazing (%)	33%	34.17%	NIR 2025
Time spent in buildings (%)	68%	65.83%	NIR 2025

## Appendix IV Nutritional composition of Oatly Baristamatic and cow's milk

Nutritional data is provided based on minimum and maximum values for skimmed and whole milk for the countries in scope. All values are provided per 100 ml. The data gaps regarding nutritional information are stated as 'not reported' in the table below.

	Unit	Oatly Baristamatic	Cow's milk	
		EU	Minimum value	Maximum value
<b>Energy</b>	kJ	264	142.0	273.0
	kcal	63.0	34.0	65.0
<b>Fat</b>	g	3.2	0.1	3.7
<b>of which saturated</b>	g	0.3	0.0	2.4
<b>essential fatty acids</b>	g	Not reported	0.0	0.2
<b>Carbohydrates</b>	g	7.0	4.5	5.2
<b>of which sugars</b>	g	2.7	4.5	5.0
<b>Fiber</b>	g	0.8	0.0	0.0
<b>Protein</b>	g	1.1	3.0	3.7
<b>Sodium</b>	mg	0.1	0.0	0.1
<b>Vitamin D</b>	µg	0.5	0.0	1.1
<b>Riboflavin</b>	mg	0.21	0.1	0.2
<b>Vitamin B12</b>	µg	0.24	0.4	0.9
<b>Calcium</b>	mg	120.0	120.0	130.0
<b>Iodine</b>	µg	0	7.5	37.9
<b>Iron</b>	mg	not reported	0.0	0.1
<b>Potassium</b>	mg	not reported	150.0	169.0
<b>Vitamin A</b>	µg	not reported	1.0	58.0
<b>Phosphorus</b>	mg	not reported	90.0	106.0

Source Oatly: <https://www.oatly.com/en-gb/products/oat-drink/oat-drink-baristamatic-1-5l>

# Appendix V Full LCIA Results

Oatly Baristamatic 1.5L

All impact categories (FU : 1 l, at point of sale)

Impact category	Unit	Oatly Baristamatic 1.5L DE	Oatly Baristamatic 1.5L CH	Oatly Baristamatic 1.5L AT	Oatly Baristamatic 1.5L UK	Oatly Baristamatic 1.5L IE	Oatly Baristamatic 1.5L SE
Climate change - incl LUC and peat ox	kg CO2 eq	5.60E-01	6.01E-01	6.09E-01	5.43E-01	5.39E-01	5.92E-01
Climate change - excl LUC and peat ox	kg CO2 eq	4.63E-01	5.04E-01	5.11E-01	4.45E-01	4.42E-01	4.94E-01
Climate change - only LUC	kg CO2 eq	2.49E-02	2.49E-02	2.49E-02	2.49E-02	2.49E-02	2.50E-02
Climate change - only peat ox	kg CO2 eq	7.28E-02	7.28E-02	7.28E-02	7.28E-02	7.28E-02	7.28E-02
Stratospheric ozone depletion	kg CFC11 eq	3.10E-06	3.12E-06	3.13E-06	3.10E-06	3.09E-06	3.12E-06
Ionizing radiation	kBq Co-60 eq	3.69E-02	3.81E-02	3.58E-02	4.01E-02	3.47E-02	4.37E-02
Ozone formation, Human health	kg NOx eq	1.34E-03	1.59E-03	1.70E-03	1.49E-03	1.76E-03	1.90E-03
Fine particulate matter formation	kg PM2.5 eq	4.96E-04	5.35E-04	5.51E-04	5.32E-04	6.24E-04	5.90E-04
Ozone formation, Terrestrial ecosystems	kg NOx eq	1.72E-03	1.98E-03	2.09E-03	1.87E-03	2.15E-03	2.29E-03
Terrestrial acidification	kg SO2 eq	4.46E-03	4.58E-03	4.63E-03	4.57E-03	4.88E-03	4.74E-03
Freshwater eutrophication	kg P eq	2.26E-04	1.99E-04	2.13E-04	2.77E-04	2.91E-04	1.97E-04
Marine eutrophication	kg N eq	6.94E-04	6.88E-04	6.93E-04	7.18E-04	7.23E-04	6.88E-04
Terrestrial ecotoxicity	kg 1,4-DCB	1.61E+00	1.68E+00	1.73E+00	1.60E+00	1.56E+00	1.73E+00
Freshwater ecotoxicity	kg 1,4-DCB	2.04E-02	1.98E-02	1.99E-02	2.09E-02	2.10E-02	1.70E-02
Marine ecotoxicity	kg 1,4-DCB	2.63E-02	2.56E-02	2.58E-02	2.69E-02	2.72E-02	2.18E-02
Human carcinogenic toxicity	kg 1,4-DCB	4.94E-02	4.91E-02	4.87E-02	4.91E-02	4.94E-02	4.97E-02
Human non-carcinogenic toxicity	kg 1,4-DCB	7.57E-01	7.35E-01	7.44E-01	7.84E-01	7.94E-01	6.93E-01
Land use (Total)	m2a crop eq	6.34E-01	6.34E-01	6.34E-01	6.34E-01	6.33E-01	6.45E-01
Land use (Transformation)	m2a crop eq	6.23E-03	6.90E-03	6.91E-03	6.35E-03	6.31E-03	7.37E-03
Mineral resource scarcity	kg Cu eq	1.22E-03	1.24E-03	1.23E-03	1.24E-03	1.23E-03	1.26E-03
Fossil resource scarcity	kg oil eq	1.12E-01	1.26E-01	1.28E-01	1.20E-01	1.20E-01	1.43E-01
Water consumption	m3	3.78E-03	4.00E-03	3.92E-03	3.77E-03	3.72E-03	3.99E-03
Land occupation	m2a	7.06E-01	7.04E-01	7.06E-01	7.06E-01	7.04E-01	7.39E-01



# Appendix VI Critical Review Statement and Report

## Critical Review Statement

The life cycle assessment (LCA) study *LCA of Oatly Baristamatic and comparison with cow's milk* was commissioned by Oatly (commissioner of the study) and carried out by Merieux NutriSciences | Blonk (practitioner of the LCA study). Merieux NutriSciences | Blonk commissioned a panel of external experts to review the study *LCA of Oatly Baristamatic and comparison with cow's milk*. The study was critically reviewed by an international panel of experts comprising:

- Jasmina Burek (chair): Assistant Professor at University of Massachusetts Lowell (based in the US)
- Joseph Poore: Food Sustainability expert at the University of Oxford (based in the UK), with assistance of Valentina Caldart, Agri-environmental data lead (HESTIA), University of Oxford (based in the UK)
- Hayo van der Werf: LCA expert (based in France)

All members of the review panel were independent of any party with a commercial interest in the study. The following is a final statement by the external review panel based on the review of the revised report, a version of the document submitted on April 8, 2026.

## Critical Review Process

The critical review was performed based on ISO 14044:2006 standard, by a panel of interested parties (ISO 14044, 2006). The critical review panel followed the ISO/TS critical review process guidelines (ISO/TS, 2024). The critical review was performed concurrently with the finalization of the LCA study. The panel reviewed the full draft report and the revised report version. The review excluded an assessment of the LCI models developed by Merieux NutriSciences | Blonk for this project and hence all the findings of the critical review are based solely on the LCA report that was made available to the panel during the critical review. However, the LCI was made available to the reviewers as an annex to the report, but it is excluded from the published report due to confidentiality.

The critical review panel found the LCA study to be in conformance with ISO 14040 and ISO 14044 standards (ISO 14040, 2006; ISO 14044, 2006) including:

- the methods used to carry out the LCA were consistent with the applicable international standards
- the methods used to carry out the LCA were scientifically and technically valid
- the data used were appropriate and reasonable in relation to the goal of the study
- the interpretations reflected the limitations identified and the goal of the study, and
- the study report was transparent and consistent.

The critical review did not verify nor validate the goals that are chosen for an LCA by the commissioner of the LCA study, nor the ways in which the LCA results are used (ISO/TS, 2024). Finally, following the ISO/TS standard (ISO/TS, 2024) this critical review in no way implies an endorsement of any comparative assertion that is based on an LCA study. The panel

asserts conformity with the ISO standards followed (ISO 14040, 2006; ISO 14044, 2006; ISO/TS, 2024) and a scientifically and technically valid methodological approach and results interpretation.

The critical-review process involved the following:

- receipt of the finalized draft report from the practitioner (March 19, 2026)
- a review of the full report according to the above criteria and recommendations for improvements to the study and the report (March 28, 2026)
- a review of the revised version of the report, in which the authors of the study addressed the review points, followed by submission of the signed review statement and report (April 8, 2026)

Because the LCA of Oatly Baristamatic and comparison with cow's milk builds on the foundations of the previous LCA study for Oatly, i.e., LCA of Oatly Barista and comparison with cow's milk, all reviewers' comments were provided via email, including:

- March 28, 2026, reviewers provided comments on the full draft report via email.
- April 8, 2026, reviewers validated changes from the previous review on the revised LCA report via email.
- After each review, the LCA practitioner responded and documented the adopted changes and implementation in the next version of the draft report. The Critical Review Report (Appendix VI) includes panel review comments and recommendations, along with the corresponding responses from the LCA study practitioner.

The review panel concludes based on the goals set forth to review this study, that the study generally conforms to the applicable ISO standards as a comprehensive study that may be disclosed to the public.

The reviewers recognize the tremendous work of the LCA practitioners and stakeholders in completing this study.

April 8, 2026

Dr. Jasmina Burek



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Panel Chair

Dr. Joseph Poore



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Panel Member

Dr. Hayo van der Werf



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Panel Member

*LCA of Oatly Baristamatic and comparison with cow's milk*  
*Critical Review Report*

*LCA of Oatly Baristamatic and comparison with cow's milk*  
*Version of the document submitted on April 8, 2026*

## **Critical Review Report**

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**Dr. Joseph Poore & MSc. Valentina Caldart** (ISO  
Review panelist)  
Agri-Food Sustainability experts  
University of Oxford (based in the UK)

**Dr. Hayo van der Werf** (ISO Review panelist)  
LCA expert  
France

## **1. Introduction**

The Critical Review Report is a summary documenting the critical review process in accordance with the ISO/TS 14071:2024 Standard, Environmental management - Life cycle assessment - Critical review processes and reviewer competencies: Additional requirements and guidelines to ISO 14044:2006. The Critical Review Report provides details of the complete review process (ISO/TS, 2024) and includes all review comment iterations of the study “*LCA of Oatly Baristamatic and comparison with cow's milk*”. The study “*LCA of Oatly Baristamatic and comparison with cow's milk*” was commissioned by Oatly and life cycle assessment (LCA) was performed by Merieux NutriSciences | Blonk. The critical review was commissioned by the practitioners of the LCA study. A critical review was carried out by a panel of reviewers, as defined in ISO 14044:2006 (ISO 14044, 2006). The Critical Review Report was prepared by the critical review panel. The Critical Review Report applies to the revised version of “*LCA of Oatly Baristamatic and comparison with cow's milk*” submitted on April 8, 2026.

## **2. Critical Review Process**

The critical review panel followed the ISO/TS critical review process guidelines (ISO/TS, 2024). Because this LCA study includes results which are intended to be used to support a comparative assertion intended to be disclosed to the public, per critical review process guidelines (ISO/TS, 2024), the critical review was conducted by a panel.

The critical review was performed concurrently with the LCA study and thus a first set of comments by the critical review panel was shared with the practitioners of the LCA study after the full draft of the LCA report was provided to the independent panelists. A second review was performed after the revised report was shared with the critical review panel. The critical review report includes panel review comments and recommendations, and the corresponding responses given by the practitioner of the LCA study.

Per critical review process guidelines (ISO/TS, 2024), the goal of this critical review was to verify that:

- the methods used to carry out the LCA study are consistent with the 14040/14044 International Standards (ISO 14040, 2006; ISO 14044, 2006),
- the methods used to carry out the LCA are scientifically and technically valid,
- the data used are appropriate and reasonable in relation to the goal of the study,
- the interpretations reflect the limitations identified and the goal of the study,
- the study report is transparent and consistent.

However, critical review can neither verify nor validate the goals that are chosen for an LCA by the commissioner of the LCA study, nor the ways in which the LCA results are used (ISO/TS, 2024). Finally, following the ISO 14040 standard this critical review in no way implies an endorsement of any comparative assertion that is based on an LCA study (ISO 14040, 2006).

The review was performed by an independent expert panel composed of three members. The critical-review process involved the following:

- receipt of the finalized draft report from the practitioner (March 19, 2026)
- a review of the full draft report according to the above criteria and recommendations for improvements to the study and the report (March 28, 2026)

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- a review of the revised version of the report, in which the authors of the study addressed the review points, followed by submission of the signed review statement and report (April 8, 2026)

### **3. Critical Review Results**

This section includes a summary of the critical review. A complete list of comments addressing specific statements on the draft LCA report provided by the critical review panelists and subsequent revisions is provided in Appendix VI.

The reviewers recognize the remarkable effort by the LCA practitioners (Merieux NutriSciences | Blonk) in conducting the comparative LCA study as well as the stakeholder (Oatly) that provided primary data as well as critical comments. The critical review panel pointed out both the strengths as well as key areas of improvement necessary to conform to the 14040/14044 International Standards (ISO 14040, 2006; ISO 14044, 2006).

#### **3.1. Consistency with 14040/14044 International Standards**

The final LCA report is consistent with the 14040 and 14044 International Standards (ISO 14040, 2006; ISO 14044, 2006) and the European Product Environmental Footprint Category Rules (PEFCR). The authors appropriately defined the goal of the study and functional unit for comparison of one liter of Oatly Baristamatic and cow's milk products at the point of sale, including packaging. The study is comprehensive in scope and contains a wealth of information and data related to the Oatly Baristamatic supply chain and the corresponding cow's milk systems in Germany, Switzerland, Austria, the United Kingdom, Ireland, and Sweden. The authors provided information on why the critical review is being undertaken, what data were collected, to what level of detail, and how comparisons with country-specific cow's milk were conducted, in addition to an uncertainty analysis.

#### **3.2. Life Cycle Assessment Approach and Life Cycle Impact Assessment Method**

The authors computed results following the attributional LCA approach. In the baseline scenario, Oatly Baristamatic was compared to 1 liter of cow's milk at the point of sale. The life cycle impact assessment was performed using the key midpoint environmental impact categories from the ReCiPe 2016 impact assessment method, along with the additional land-occupation indicator included in the report.

Sensitivity and scenario analyses performed for the earlier LCA study of Oatly Barista were not repeated in this addendum because the authors explained that the conclusions from those analyses remain applicable to Oatly Barista. In this study, an uncertainty analysis was performed to determine the range of outcomes when considering uncertainties in the input data, including a pairwise Monte Carlo comparison of Oatly Baristamatic and cow's milk. Overall, the methodology and the selection of an uncertainty analysis to evaluate the impact assessment results and support the conclusion are considered appropriate for the goal and scope of the study.

#### **3.3. Data Used for Life Cycle Inventory in Relation to the Goal of the Study**

Overall, the data used is considered appropriate and reasonable for the goal and scope of the study. In parallel to proprietary stakeholder life cycle inventory (LCI) data necessary to perform

## *LCA of Oatly Baristamatic and comparison with cow's milk Critical Review Report*

the LCA of Oatly Baristamatic, the study included country-specific cow's milk supply chain LCI data from recent literature, national statistics, and LCI databases. The authors of the final report clearly described LCIs and data sources. The authors also provided information on the robustness and limitations of the data used for the Oatly Baristamatic and cow's milk product systems, as well as the assumptions underlying the uncertainty analysis.

### 3.4. Interpretation and Limitations within the Goal of the Study

The authors present a large variety of results addressing various aspects of the study. The selected results help to understand the study's conclusions and adequately support the derived interpretation. The uncertainty analysis further provides insight into methodological and data choices, their influence on results, the robustness of the conclusions, and the limitations of the results. Overall, the interpretation of results and limitations of the study discussed in the report are considered appropriate for the goal of the study.

### 3.5. Transparency and Consistency of the Final Report

The authors provided an extensive report in accordance with the 14040/14044 International Standards (ISO 14040, 2006; ISO 14044, 2006) and supplemental information on the data and methodology used. The main report describes the LCA framework, including goal and scope, LCI, LCIA, results and interpretation, uncertainty analysis, and conclusion. The key aspects of the data used are described in the LCI section and accompanied by supplemental information, which provides more details on the data sources. Overall, the information provided in the documentation is considered sufficient to understand the methodology and data basis for most topics.

## **Literature**

- ISO 14040, 2006. ISO 14040:2006 - Environmental management - life cycle assessment - principles and framework [WWW Document]. ISO. URL <https://www.iso.org/standard/37456.html> (accessed 2.21.17).
- ISO 14044, 2006. Environmental management - Life cycle assessment — Requirements and guidelines (International Organization for Standardization).
- ISO/TS, 2024. ISO/TS 14071:2024 - Environmental management -- Life cycle assessment -- Critical review processes and reviewer competencies: Additional requirements and guidelines to ISO 14044:2006 [WWW Document]. URL <https://www.iso.org/standard/61103.html> (accessed 6.20.19).

## **4. List of Specific Reviewer Comments Recommendations and Corresponding Responses**

Critical Review Panel provided comments on goal and scope document and 2 iterations of the draft report. These comments were addressed and/or incorporated in the final version of the report by the LCA partitioners. The review statement and review panel report including comments of the experts and any responses to recommendations made by the reviewers or by the panel have been included in the final LCA report.

Date:	Document: <b>LCA of Oatly Baristamatic and comparison with cow's milk</b>	Project:
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Reviewer <sup>1</sup>	Line number	Clause/ Subclause	Paragraph/ Figure/ Table/	Type of comment <sup>2</sup>	Comments	Proposed change	Response of the commissioner& practitioner
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HW	4			Ed.	It would be good to describe the specific characteristics of Oatly Baristamatic in a few words.	Can you adjust?	Specific information on Baristamatic can be found in chapter 1.2.2 (lines 168-179). More info can be found here: <a href="https://www.oatly.com/en-gb/products/oat-drink/oat-drink-baristamatic-1-5l">https://www.oatly.com/en-gb/products/oat-drink/oat-drink-baristamatic-1-5l</a>
HW	14			Ed.	Change "product" to "Baristamatic"	Can you adjust?	Adjusted.
HW	118			Ed.	Change "milk's" to "milk".	Can you adjust?	Adjusted.
HW	152			Ed.	Change "list" to "lists".	Can you adjust?	Adjusted.
HW	161			Te.	It suggest to add here (just before Table 2) the sentence "Nutritional properties of Oatly Baristamatic and cow's milk can be found in Appendix ... And then add a table showing the nutritional properties of the two products as an appendix, as in previous Addendum reports..	Can you adjust?	Adjusted, now Appendix IV
HW	238			Ed.	Not clear. Did you mean: "and the oatbase itself is slightly different"?	Can you check?	Adjusted.
HW	246-248			Te.	"biophysical allocation is used as recommended and prescribed in the International Dairy Federation (IDF, 2022). Before, the biophysical allocation was based on the PEFCR for Dairy Products (2018)." This seems in contradiction with what is said lines 21-23:"this study has been performed and critically reviewed according to ISO 14040/14044/14071 standards for comparative assertions to be disclosed to the public and is in line with LCA guidelines	Can you adjust?	Adjusted.

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					including the European Product Environmental Footprint Category Rules (PEFCR)." To clarify this you should cite here: European Dairy Association (EDA) et al. (2025). Product Environmental Footprint Category Rules (PEFCR) for dairy products: Updated version (Feb. 2025).		
HW	329			Ed.	Change "the Oatly product" to "Oatly Baristamatic"	Can you adjust?	Adjusted. Now line 345
HW	342			Ed.	Change "the Oatly product" to "Oatly Baristamatic"	Can you adjust?	Adjusted. Now line 355
HW	350			Ed.	Change "the Oatly product" to "Oatly Baristamatic"	Can you adjust?	Adjusted. Now line 362
HW	352			Ed.	Change "higher" to "higher for Oatly Baristamatic".	Can you adjust?	Adjusted. Now line 366
HW	372			Ed.	Change "Oatly products" to "Oatly Baristamatic products".	Can you adjust?	Adjusted. Now line 385
HW	387			Ed.	Change "product's" to "Baristamatic's".	Can you adjust?	Adjusted. Now line 401
HW	389-390			Te.	"Meanwhile most cow's milk impacts increased, with the exception of cow's milk produced in Sweden."	Can you comment on the causes of these increases, in particular for the UK and Ireland they are important (12 and 13%)?	Added
HW	390			Ed.	Change "decrease in cow's milk" to "decrease in the impact of cow's milk".	Can you adjust?	Adjusted. Now line 406
HW			Table 6	Ed.	This table needs some changes. The heading of the third column should be: "Climate change impact (data from 2025) (kgCO2eq/L)" instead of "Climate change	Can you adjust?	Adjusted.

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					impacts of Baristamatic 1.5L (data from 2025) (kgCO <sub>2</sub> eq/L)" The heading of the fourth column should be: "Climate change impact in main report (data from 2021) or addenda (data from 2023 and 2024) (kgCO <sub>2</sub> eq/L)" instead of "Climate change impacts of Barista 1L ambient in main report (data from 2021) or addenda (data from 2023 and 2024) (kgCO <sub>2</sub> eq/L)"		
HW			Fig. 4	Te.	It is surprising to see large differences in climate change impact for storage at distribution centre (e.g. 0.005 for DE and 0.010 for Switzerland), given that storage is at ambient temperature for all points of sale.	Can you have a look at this?	The product is distributed through one distribution center in DE, AT, and SE, while in CH, UK, and IE it passes through two distribution centers before reaching the point of sale.
HW			Fig. 5	Ed.	Countries are not in the same order as in other figures and tables.	Can you present the results in the "usual" order, i.e.: DE, CH, AT, UK, IE, SE?	Adjusted.
HW	448			Ed.	Change "Baristamatic" to "Barista".	Can you adjust?	Adjusted. Now line 467
HW	455			Ed.	Change "Oatly products" to "Oatly Baristamatic products".	Can you adjust?	Adjusted. Now line 474
HW	458			Ed.	Change "products" to "Baristamatic products".	Can you adjust?	Adjusted. Now line 477
HW	487			Ed.	Change "eutrophication," to "eutrophication, land use, land occupation,"	Can you adjust?	Adjusted. Now line 505
HW	507			Ed.	Change "product" to "Baristamatic"	Can you adjust?	Adjusted. Now line 533
HW	510			Ed.	Change "have" to "has".	Can you adjust?	Adjusted. Now line 536
HW	513			Ed.	Change "Oatly" to "it".	Can you adjust?	Adjusted. Now line 539

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HW	522			Ed.	Change "continues to show" to "shows".	Can you adjust?	Adjusted. Now line 548
HW	523			Ed.	Change "differences" to "differences relative to the results presented in the main report and the respective addenda for Switzerland, Austria, and Ireland".	Can you adjust?	Adjusted. Now line 549
HW	529			Ed.	Change "of which the conclusions" to "the conclusions of which".	Can you adjust?	Adjusted. Now line 559
HW	533-534			Ed.	Change "water impact categories" to "water consumption".	Can you adjust?	Adjusted. Now line 564
HW	618			Te.	Sea transport is missing for trip from Vlissingen to UK.	Can you adjust?	The UK and IE distances and transportation modes were updated in the table. Results remained unchanged because the model was already using the correct data.
HW	620			Te.	Distance from DC to point of sale of 669 km seems very high for Switzerland.	Can you check?	Corrected, it is 82km. Results remained unchanged because the model was already using the correct data.
VC/J P	83			Ed	Missing "or"	concluded that using different product characteristics.... OR a functional unit based on nutritional characteristics	Adjusted.
VC/J P	108			Ed	Remove comma before reference	...on December 7 <sup>th</sup> , 2022 (Blonk Consultants, 2022) <sup>14</sup> and	Adjusted.

<sup>14</sup> Link to the publication: [https://website-production-s3bucket-1nevfd7531z8u.s3.eu-west-1.amazonaws.com/public/website/download/fabc1628-d8e1-4cf8-aacc-1a9694908a42/LCA%20Oatly%20and%20comparison%20to%20cow's%20milk%20\(07-12-2022\)%20-%20final.pdf](https://website-production-s3bucket-1nevfd7531z8u.s3.eu-west-1.amazonaws.com/public/website/download/fabc1628-d8e1-4cf8-aacc-1a9694908a42/LCA%20Oatly%20and%20comparison%20to%20cow's%20milk%20(07-12-2022)%20-%20final.pdf)

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Reviewer <sup>1</sup>	Line number	Clause/ Subclause	Paragraph/ Figure/ Table/	Type of comment <sup>2</sup>	Comments	Proposed change	Response of the commissioner & practitioner
VC/J P	112			Ed	Use singular rather than plural	Instead of they are produced → it is produced / Oatly Baristamatic is produced	Adjusted.
VC/J P	116			Ed	As further described	Instead of “as to be further described”	Adjusted.
VC/J P	118			Ed	Can you mention here the update to ReCiPe v1.1? It's quite important		Added, line 124
VC/J P	151			Ed	Missing dot at the end of the sentence	.. at point of sale (chilled or ambient storage).	Adjusted. Now line 152
VC/J P	162		Table 2	Ed	I think you missed the word “packaging”	.. STORAGE CONDITION, PACKGING TYPE	Adjusted.
VC/J P			Table 2	Ed	Can you clarify in the table that also the cow milk is 1.5L?	.. (1.5 L beverage carton)..	The volume is now specified in the table. Cow's milk is 1L packaging, like in the main report
VC/J P			Table 2	Ed	In this table you use “1.5” rather than “1,5” as in main text	Improve consistency	Adjusted.
VC/J P	178			Te	Worth adding a sentence to explain how ambient vs chiled cow milk was chosen		Added
VC/J P	206			Ed	Shorten the reference to just Huijbregts, 2016		Adjusted. Now line 209
VC/J P	214		Table 3	Ed	Delete “it also includes”	....Used in this study, respective indicators	Adjusted. Now line 217
VC/J P			Table 3	Ed	In “freshwater eutrophication” description, overstimulates instead of overstimulate		Adjusted.
VC/J P	225			Ed	“:” instead of “;”	“:”	Adjusted. Now line 228

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VC/J P	236			Ed	Add dot at the end of each bullet point		Adjusted.
VC/J P	237			Ed	This sentence is not super clear: “the proportions of oat base and rapeseed oil for the Baristamatic, are slightly different than those for Oatly Barista and the oatbase itself so it supports low sedimentation”	Delete the comma after Baristamatic; and the oatbase itself is different to support low sedimentation	Adjusted. Now line 241
VC/J P	247			Ed	Prescribed by the IDF		Adjusted. Now line 250
VC/J P	250			Te	Can the fact fat and protein changed affect the sensitivity related to the nutritional FU? Might be worth briefly discussing this.		The fat and protein content of raw milk in SE has been updated, while keeping the composition of whole, semi-skimmed, and skimmed milk unchanged. As a result, the composition of the processed milk products did not change. Adjusted line 256 to specify.
VC/J P	271			Ed	“and” before Ireland		Adjusted. Now line 282
VC/J P	328			Ed	All other categories “are” comparable, rather than “remain” as fossil resource scarcity changed		“remain lower” was changed to “are lower”. Now line 344
VC/J P	330			Te	I would just focus on the fossil resource scarcity when explaining the difference as the mineral scarcity remained comparable		Adjusted. Now line 341
VC/J P	342		footnote	ed	I would copy note 2 from page one, which explains in detail what changed in the CFs for Recipe 1.1		Adjusted.

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Reviewer <sup>1</sup>	Line number	Clause/ Subclause	Paragraph/ Figure/ Table/	Type of comment <sup>2</sup>	Comments	Proposed change	Response of the commissioner& practitioner
VC/J P	348			Ed	Focus on mineral resource scarcity, which is the one which changed		Adjusted. Now line 360
VC/J P	350			Te	Can you discuss why land use is now lower rather than comparable?		Oatly now also sources part of its oats from the UK (for the products made in Vlissingen), which has a lower land-use impact compared to oats sourced from Sweden or Finland. In the main report, oats were sourced from Finland, Sweden, and Estonia. Added line 363.
VC/J P	353			Te	Do we know if the lower water consumption for Oatly (was comparable before) is due to increased water use in the Swedish animal systems in your new model?		An error in the unit of water used in the animal system for Sweden was identified and corrected. The results were updated accordingly.
VC/J P	375			Ed	Could you specify that the Oatly Baristamatic is UHT in Table 2 at page 6? It's not clear before getting to this point.		Adjusted.
VC/J P				Figure 3 caption	e* should be replaced by "f" as this is the letter associated with land occupation in the figures.		Adjusted.
VC/J P	422			Ed	Add dots at the end of each bullet point.		Adjusted.
VC/J P	456		Footnote	Ed	Can you put footnote 11 all in the same page?		Adjusted.
VC/J P	471		Fig 6	ed	Is the "ambient" label correct? In table 2, you said you used "chilled" for some countries.		Adjusted.

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VC/J P	492			Ed	Replace dot with comma		Adjusted. Now line 510
VC/J P	510			Ed	Has a lower impact instead of have		Adjusted. Now line 536
VC/J P	541			Te	From this sentence, it looks like switching to wind electricity led to reduced mineral resource scarcity impact, but this is in contrast with line 518		Reduced mineral resource scarcity impact compared to Oatly Barista from the main report Adjusted sentences to clarify, lines 570-574
VC/J P	590			Ed	Finnish instead of Finish		Adjusted. Now line 619
VC/J P	606		Table	Te	Is the salt uniodised? How is the product fortified with iodine? Has it been included in the vitamin mix?		Oatly confirmed that BaristaMatic is not iodized. It is fortified with Riboflavin (vit B2), vit B12, vit D, and calcium. Corrected in the text line 169.
VC/J P	634		Table	Te	So, you did not use Agrifootprint 7 for the oat cultivation?		Yes, we did, the table has been corrected accordingly.
VC/J P	634		Table		Update "Barista" to "Baristamatic" (e.g, point 6)		Adjusted.
VC/J P	642			Ed	Parameters are changed for Sweden right?		Added
VC/J P	665			Te	Might be worth showing/discussing how different the results of the two formulas are?		Added a clarification on the difference between the formulas

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Reviewer <sup>1</sup>	Line number	Clause/ Subclause	Paragraph/ Figure/ Table/	Type of comment <sup>2</sup>	Comments	Proposed change	Response of the commissioner& practitioner
VC/J P	677			Ed	Can you highlight the main changes from the previous model you used for Sweden? E.g., the management of manure was 100% before..		Added
VC/J P	677		Table	Ed	Some of the data for milk refer to years like 2005 (e.g., the Cederberg et al 2009 data).	I think this needs referencing in the text and the reference data of 2025 in the table needs changing.	Adjusted
VC/J P	677		Table	Ed	The source of “market mix” for feed needs a bit more detail.	Specify the actual source of these data more clearly. How does the source “market mix” relate to the comment in the cell above describing the overall data sources?	Adjusted
VC/J P	677		Table	Ed	The units of the data are not clear enough – e.g., Concentrate feed – is this kg fresh matter or kg DM?	Specify units more clearly.	It was mentioned in the heading above all feed ingredients. It has now been removed there and added to each line.
JB			Table 1	Ed	Abbreviations (DE, CH, AT, UK, IE, SE) are defined in the caption, but not actually used in the table. Country names are written in full.	Remove from the top of the Table 1	Adjusted
JB			Table 1	Ed	The abbreviation “NL” (used in “NL factory”) is not defined	Add once at top of Table 1	Adjusted
JB			Tables 4A–4F	Ed	Country abbreviations (DE, CH, AT, UK, IE, SE) are used in column headers (e.g., “Cow’s milk CH”) but are not defined anywhere in the table set or caption.	Add once at top of Table 4:  Abbreviations: DE = Germany, CH = Switzerland, AT = Austria, UK = United Kingdom, IE = Ireland, SE = Sweden	Adjusted
JB	246			Te	A change in allocation method (from PEFCR-based biophysical allocation to IDF 2022-based biophysical allocation) is mentioned but not	ISO 14044 requires that all methodological choices, especially those affecting results, are clearly described and justified in the main report. Allocation is a critical	Table 4 is added on the allocation used in previous report and new report.

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					described in the main body, with details deferred to Appendix III.	methodological element and must be transparent, reproducible, and accessible without reliance on appendices.	
JB	246			Te	No sensitivity analysis is provided comparing old (PEFCR) vs new (IDF 2022) allocation	Include a sensitivity analysis comparing both allocation approaches or justify why differences are negligible	Table 4 is added on the allocation used in previous report and new report
JB	250			Te	The statement “Updated fat and protein content of the milk due to new data” is not supported by a source or description of the data used. Changes to key parameters must be transparent and reproducible.	Add source and/or description	Source added
JB			Table 5	Ed	Abbreviations (DE, CH, AT, UK, IE, SE) are defined in the caption, but not actually used in the table. Country names are written in full.	Remove from the top of the Table 1	Adjusted
JB			TABLE 6:	Ed	Abbreviations not provided	Check all figures and tables if the abbreviations have been consistently defined or excluded in their captions	Adjusted
JB			Chapter 3	Ge/Te	Changes to 2022 need to be documented and explained how they influence the results. Right now, we can't see whether the values changed significantly, whether they are consistent with 2022 ranges, whether they affect allocation or results	Minimum ISO-compliant version would be something like: Data were updated based on source, year, dataset... Previous values were X% and Y% updated values are X'% and Y'%. This update reflects: provide reason, e.g., more recent national statistics The effect on results is negligible / X% change	Added table 4 with differences in allocation and added a column in Appendix III for comparison of data between old and new report

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JB		Allocation		Te	ISO 14044 requires that all methodological choices, especially those that affect results, be clearly described and justified in the main report. Allocation is a methodological element and must be transparent, reproducible, and accessible without reliance on appendices.	Include more details in the main report	Table 4 is added on the allocation used in previous report and new report.
JB	523			Ed	Differences vs previous reports not clearly contextualized.	Strengthen the interpretation of results and differences	Adjusted. Now lines 551-554
JB	541			Te	Contradictory statements regarding mineral resource impacts.	Resolve inconsistency and align with results.	Adjusted. Now lines 570-574

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5. Self-declaration of independence

I, the signatory, hereby declare that:

- I am not a full-time or part-time employee of the commissioner or practitioner of the LCA study
- I have not been involved in defining the scope or carrying out any of the work to conduct the LCA study at hand, i.e. I have not been part of the commissioner's or practitioner's project team(s)
- I do not have vested financial, political, or other interests in the outcome of the study

I declare that the above statements are truthful and complete.

Date: April 8, 2026

Name: Jasmina Burek

Signature:



Name: Hayo van der Werf

Signature:



Name: Joseph Poore

Signature:





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