Environmental Product Declaration

This EPD has been prepared in accordance with ISO 14025:2006

Soybean Protein Concentrate

PORTA

EPD®

Argentina EPD®

Programme:	The International EPD® System www.environdec.com
Programm operator:	EPD® International AB
EPD registration number:	EPD-IES-0016461
Publication date:	2024 - 09 - 13
Valid until:	2025 - 09 - 12
CPC code:	23999 Other food products | Protein concentrates and texture protein substance Pre-certified product
Scope:	Global

An EPD should provide current information and may be updated if conditions change.
The stated validity is therefore subject to the continued registration and publication at www.environdec.com

Programme Information

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EPD® Argentina EPD®

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The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but registered in different EPD programmes may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterization factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see ISO 14025.

UN CPC Code:
23999 Other food products: Protein concentrates and texture protein substance.
The CPC is in compliance with the General Programme Instructions for The International EPD System ® AB GPI v4.0

PCR under development
"functional food ingredients"and PCR "food and beverage" PCR is under development GPI 4.0.

Life Cycle Assessment (LCA)
LCA accountability: Leticia Tuninetti; Rodolfo Bongiovanni; María Raquel Cavagnaro.

Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:
☑ EPD verification by individual verifier.
Third-party verifier: Javier Martín Echazarreta Instituto Nacional de Tecnología Industrial
Approved by: The International EPD ® System.

Procedure for follow-up of data during EPD validity involves third-party verifier:
☑ Yes ☐ No

About Porta Hnos. S.A.

Porta Hnos. S.A. is a company with more than 140 years of experience. Our plant is located in Córdoba city, Argentina. We add value to our country´s primary products through innovative and sustainable industrial processes.

We are a leading and pioneer company known for the distillation of high-quality alcohols, production of vegetable protein concentrates, manufacture of different products (Bialcohol, Fernet 1882, Casalta) and development of innovative technologies for the agribusiness sector.

As a certified B Corp, our purpose is to sustain the integral growth of the company, its people and its stakeholders, generating collective value.

Our values:

Passion · Proximity · Respect · Transparency · Courage

Porta in numbers

- Our products are sold in more than 10 countries all over the world
- 6 main business units
- 142 years of industrial experience
- 600 employees
- 140 professionals
- 1,200 tones/month of vegetable protein concentrates
- 175 m^3/day of alcohol

Certifications of our Products

KOSHER

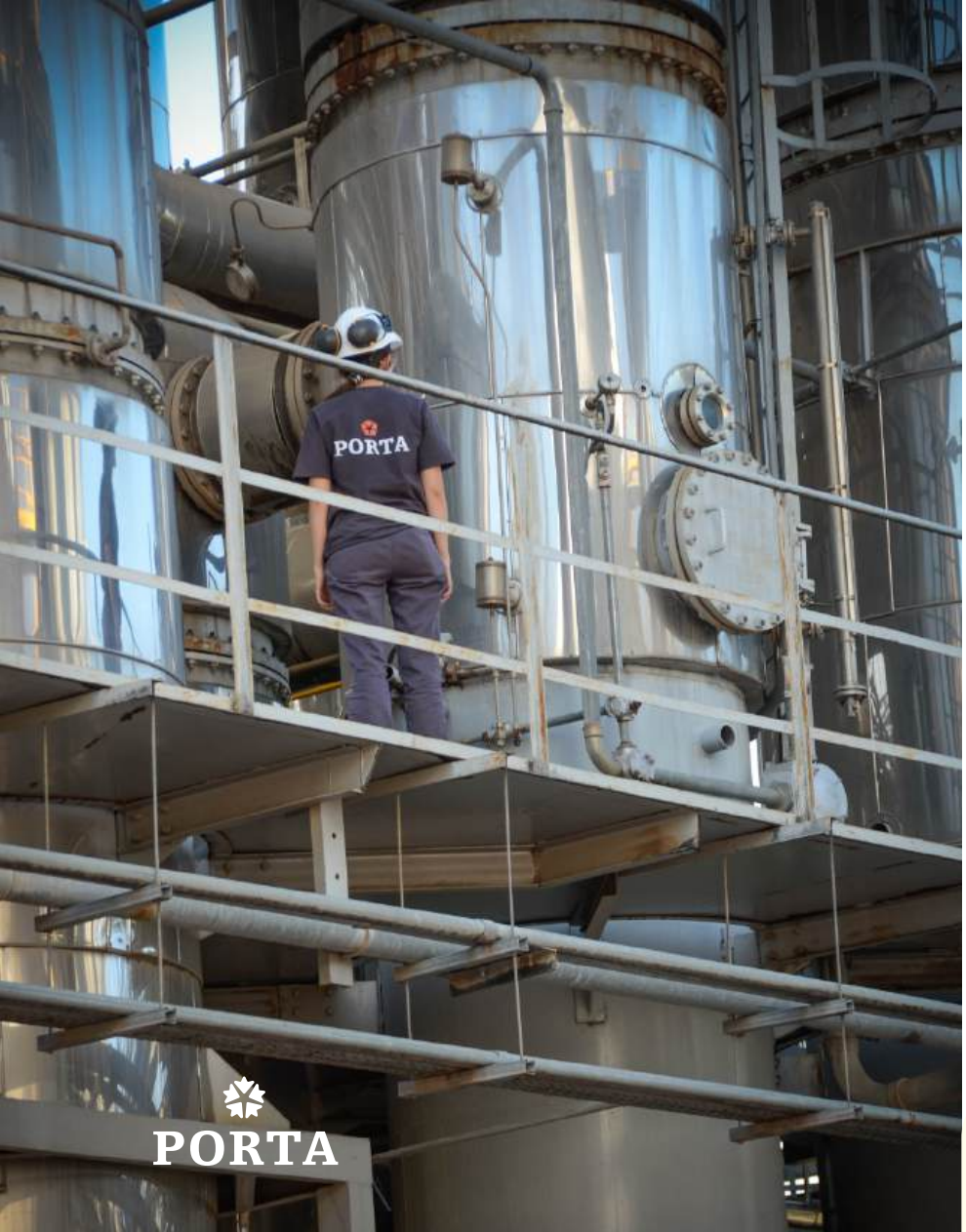
Certifications of our Company

ISO 9001 QUALITY MANAGEMENT SINCE 1997

ISO 14001 ENVIRONMENTAL MANAGEMENT

ISO 45001 OCCUPATIONAL HEALTH & SAFETY MANAGEMENT

FSSC 22000



Innovative and sustainable industrial processes

We work following strict international quality, sustainability, security and safety regulations.

Vegetable Protein Concentrates: We provide innovative and functional plant-based ingredients for the food industry using state-of-the-art technology designed by our own team of engineers, and a strong commitment to sustainability and good nutrition. We are the first Argentine company to produce soybean protein concentrates and among the first in Latin America to produce pea protein concentrates on an industrial scale.
AGBM's plant-based proteins offer a better texture, scent, and flavour; they have multiple applications in the meat industry, as meat analogues and as protein beverages.

Our processing plant is designed to take full advantage of the potential of our main raw materials. We obtain soybean flour from soybeans; then soybean flour is processed into soybean protein concentrate for the food industry, soybean oil for the biodiesel industry and highly nutritional by-products for the feed industry.

Better food
for a better planet

AGBM®

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Description of the Product: Soybean Protein Concentrate

UN CPC code: 23999 "other food products"

High-functional soybean protein concentrate, with multiple applications in the meat industry, as analogue of meats and as protein beverage.

- High protein solubility
- Low flavour profile for all types of uses.
- Highly functional, superior fat emulsification, good dispersibility and water-binding properties.

NUTRITIONAL INFORMATION (per 100g)		
Energy	394.0 (1649)	kcal (kJ)
Carbohydrates	30.1	grams
Proteins	66.0	grams
Total fats	1,0	grams
Saturated fats	0.1	grams
Trans fats	0.0	grams
Nutritional fibres	1.5	grams
Dietary fibres	1.5	grams
Sodium	590.0	milligrams
Potasium	624.0	milligrams
Cholesterol	< 10	milligrams
Sugars	< 1	grams





We are the first company to produce soybean protein concentrates and isolates in Argentina.

LCA Information

This document refers to the production of food-grade soybean protein concentrate, a plant-based product obtained by grinding the raw material and its subsequent extraction, washing, neutralization, and dying of drying.

Declared unit: One kilogram of packaged soybean protein concentrate. The weight of packging is not included in the weight.

Geographical scope: Global.

Temporal scope: The reference period for the analysis includes 2022/2023 for the crop season and 2023 for industrial data.

Database(s) and LCA Software: Data of agricultural production technology was sourced from the Bolsa de Cereales de Córdoba. Data of soybean meal production was obtained from Ecoinvent V 3.9.1 profiles, database for SIMAPRO 9.5.0.1. The production process was based on primary data reported by the company.

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Impact assessment methodology

Environmental performance was evaluated through the Life Cycle Assessment (LCA). The product analysed is marketed under the Business-to-Business (B2B) business model, and the scope of the analysis is from “cradle to grave”.

The study considers the following impacts:

- Global warming potential
- Ozone layer depletion
- Acidification potential
- Eutrophication potential
- Photochemical oxidant creation potential
- Abiotic depletion potential (metals and minerals)
- Abiotic depletion potential (fossil fuels)
- Water deprivation potential

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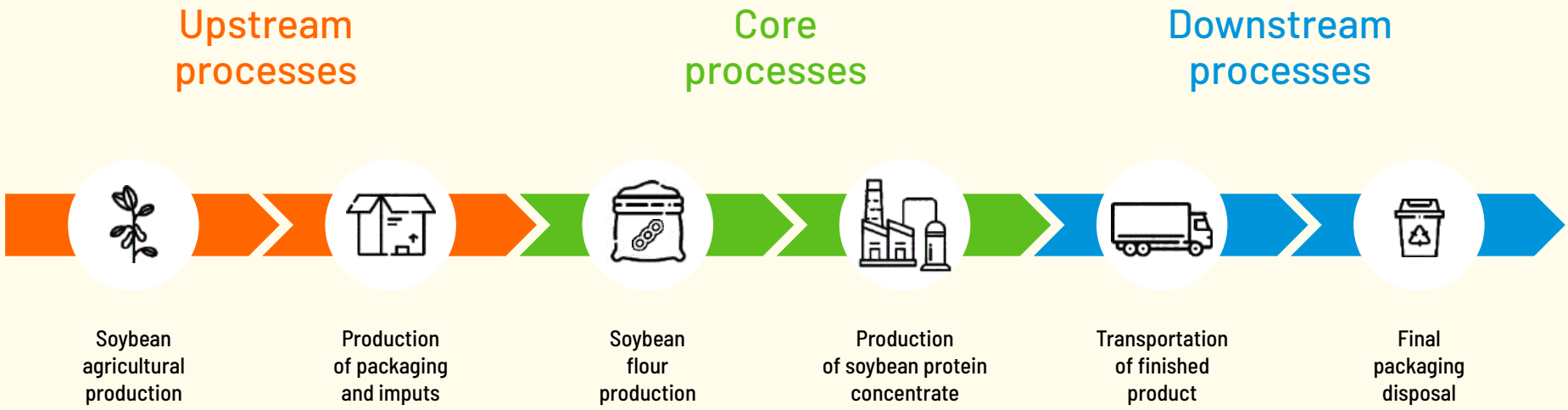
System boundaries: Cradle to grave



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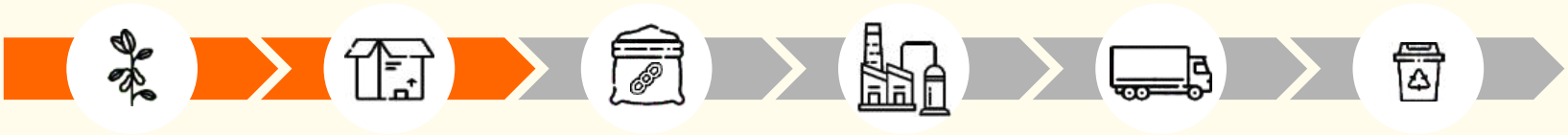
Upstream processes



Soybean Production:

The environmental impacts derived from soybean agricultural production were modeled with data from the Cordoba Grain Exchange, using information available from the provincial departments that produced soybean in the 2022/2023 crop season.
The total result was weighted according to the total production obtained in department.

Production of inputs and packaging

Inputs

- Seeds
- Agrochemicals
- Fertilizers
- Fuel

Outputs

- Atmospheric emissions
- Emissions to soil
- Emissions to water
- Waste

Core processes

Soybean Flour Production:

After the soybean is harvested, the grains are ground into flour, which is then transported to the plant in flatbed trucks and stored in silos.

Inputs
- Water
- Electric Energy
- Natural Gas
- Transports

Outputs
- Atmospheric emissions
- Waste

Production of soybean protein concentrate

For the analysis of the environmental impacts derived from the production process, data were collected from all stages of the process.

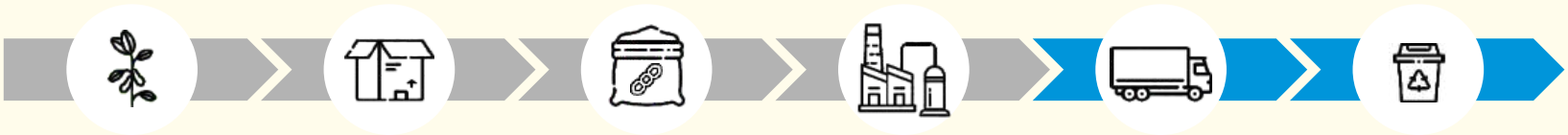
These stages include the grinding of the raw material, extraction, washing and neutralization, and drying of the protein, and finally bagging and storage of the soybean protein concentrate.

The following aspects were considered in this analysis:

Inputs
- Water
- Electric Energy
- Natural Gas
- Fuel
- Transports

Outputs
- Atmospheric emissions
- Waste

Downstream processes



Transport of finished product:

For the environmental impact analysis frequent customers were considered. Soybean protein concentrate is distributed in Argentina and several Latin American countries.

Final disposal of packaging:

It is assumed that all the required packaging, including wrappers, plastics, and cardboard, will be is disposed of in a landfill at the end of life cycle.

Nevertheless, this materials are recyclable.

Inputs

- Electric Energy
- Natural Gas
- Fuel
- Transports

Outputs

- Atmospheric emissions
- Waste
- Effluents

Results of the environmental performance indicators

Impact category indicators

Declared unit: 1 kg of soybean protein concentrate

PARAMETER		UNIT	UPSTREAM			CORE			DOWNSTREAM		TOTAL
			SOYBEAN AGRICULTURAL PRODUCTION	PRODUCTION OF INPUTS	PRODUCTION OF PACKAGING	SOYBEAN FLOUR PRODUCTION	INTERNAL TRANSPORT	PRODUCTION OF SOYBEAN PROTEIN CONCENTRATE	TRANSPORT OF FINISHED PRODUCT	FINAL PACKAGING DISPOSAL	
Global warming potential (GWP)	Fossil	kg CO_2 eq.	2,11 E-1	3,35E-2	3,96E-2	1,41E-1	7,38E-2	1,68E+0	1,11E-1	7,24E-4	2,29E+0
	Biogenic	kg CO_2 eq.	9,97 E-5	8,88E-4	4,96E-4	4,74E-3	3,96E-6	2,70E-4	5,93E-6	4,68E-8	6,50E-3
	Land use and land transformation	kg CO_2 eq.	4,31 E-3	4,71E-5	2,41E-4	5,88E-4	2,53E-6	1,54E-4	3,81E-6	2,72E-8	5,35E-3
	Global warming potential	**kg CO_2 eq.**	2,15 E-1	3,44E-2	4,03E-2	1,46E-1	7,38E-2	1,69E+0	1,11E-1	7,24E-4	2,30E+0
Ozone layer depletion (ODP)		kg CFC 11 eq.	1,05 E-8	9,22E-9	4,75E-9	5,24E-9	1,01E-9	4,44E-8	1,52E-9	1,00E-11	7,67E-8
Acidification potential (AP)		mol H^+ eq.	1,19 E-3	3,33E-4	2,32E-4	3,30E-4	2,16E-4	1,26E-3	4,89E-4	3,06E-6	4,04E-3
Eutrophication potential (EP)	Acidification potential	kg P eq.	2,01 E-3	1,43E-5	1,86E-5	4,00E-6	1,45E-6	1,54E-5	2,10E-6	1,58E-8	2,06E-3
	Aquatic marine	kg N eq.	7,63 E-4	3,71E-5	6,53E-5	1,25E-4	7,93E-5	4,11E-4	1,54E-4	1,24E-6	1,64E-3
	Aquatic terrestrial	mol N eq.	1,88 E-2	3,74E-4	6,37E-4	1,29E-3	8,41E-4	4,47E-3	1,66E-3	1,34E-5	2,81E-2
Photochemical oxidant creation potential (POCP)		kg NMVOC eq.	8,98 E-4	1,31E-4	2,31E-4	4,53E-4	3,02E-4	3,13E-3	5,54E-4	4,40E-6	5,71E-3
Abiotic depletion potential (ADP)*	Metals and minerals	kg Sb eq.	6,54 E-7	1,05E-6	2,98E-8	1,57E-7	4,38E-9	3,36E-8	6,28E-9	3,97E-11	1,94E-6
	Fossil resources	MJ, net calorific value	1,69 E+0	4,54E-1	7,47E-1	2,11E+0	9,84E-1	2,52E+1	1,47E+0	9,52E-3	3,27E+1
Water deprivation potential (WDP)*		m^3 world eq. deprived	5,40 E-2	6,28E-2	1,98E-2	3,61E-2	1,39E-3	3,26E-2	2,04E-3	1,34E-5	2,09E-1

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Results of the environmental performance indicators

Resource use indicators

Declared unit: 1 kg of soybean protein concentrate

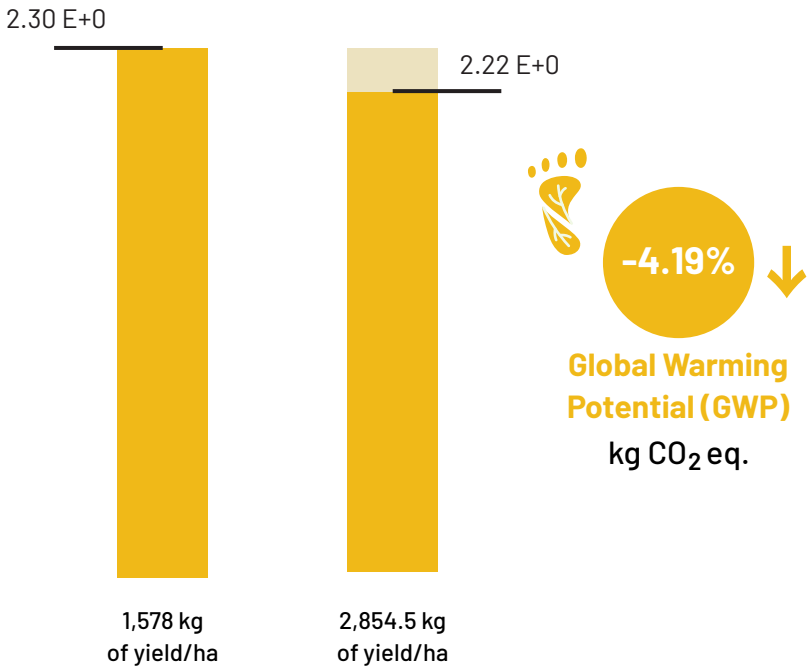
PARAMETER		UNIT	UPSTREAM			CORE			DOWNSTREAM		TOTAL
			SOYBEAN AGRICULTURAL PRODUCTION	PRODUCTION OF INPUTS	PRODUCTION OF PACKAGING	SOYBEAN FLOUR PRODUCTION	INTERNAL TRANSPORT	PRODUCTION OF SOYBEAN PROTEIN CONCENTRATE	TRANSPORT OF FINISHED PRODUCT	FINAL PACKAGING DISPOSAL	
Primary energy resources - Renewable -	Use as energy carrier	MJ, net calorific value	3,55E-2	2,21E-2	1,64E-2	8,33E-2	9,61E-4	4,11E-2	1,45E-3	5,49E-6	2,01E-1
	Used as raw materials	MJ, net calorific value	1,36E+0	5,55E-3	1,56E+0	1,39E-3	1,63E-4	5,91E-3	2,45E-4	5,78E-6	2,93E+0
	TOTAL	MJ, net calorific value	1,40E+0	2,76E-2	1,57E+0	8,47E-2	1,12E-3	4,70E-2	1,69E-3	1,13E-5	3,13E+0
Primary energy resources - Non renewable -	Use as energy carrier	MJ, net calorific value	5,83E-3	3,96E-5	3,13E-4	5,05E-6	3,23E-7	2,25E-5	5,99E-7	7,50E-3	1,37E-2
	Used as raw materials	MJ, net calorific value	1,49E+0	4,09E-1	7,03E-1	2,06E+0	9,82E-1	2,51E+1	1,47E+0	2,17E-3	3,22E+1
	TOTAL	MJ, net calorific value	1,49E+0	4,09E-1	7,03E-1	2,06E+0	9,82E-1	2,51E+1	1,47E+0	9,67E-3	3,22E+1

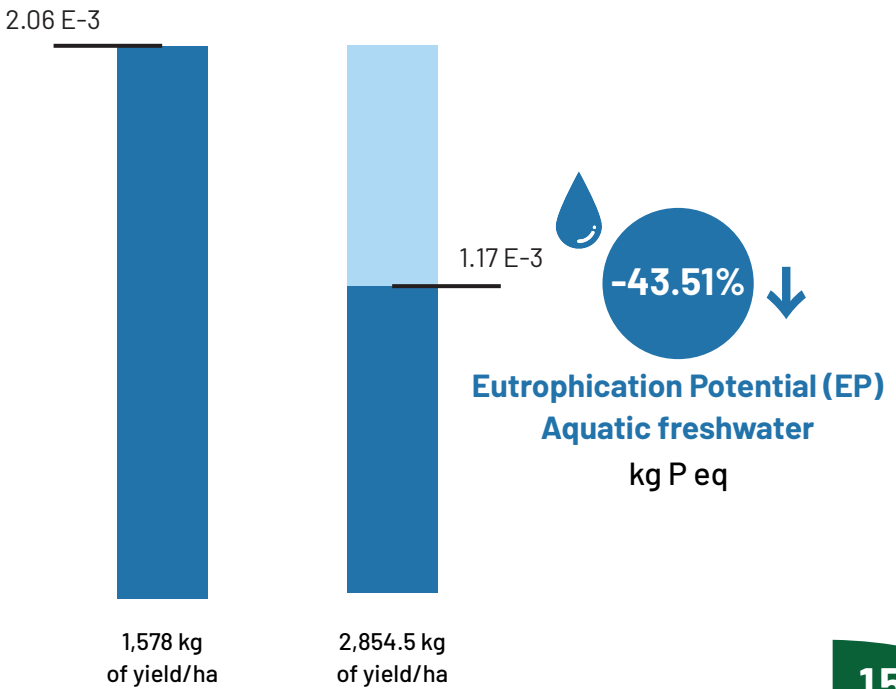
Analysis of the results

The analysis consists of modifying variables of interest and analyzing the effects of changes on the result of each environmental impact category.

Case 1: Increase in soybean performance

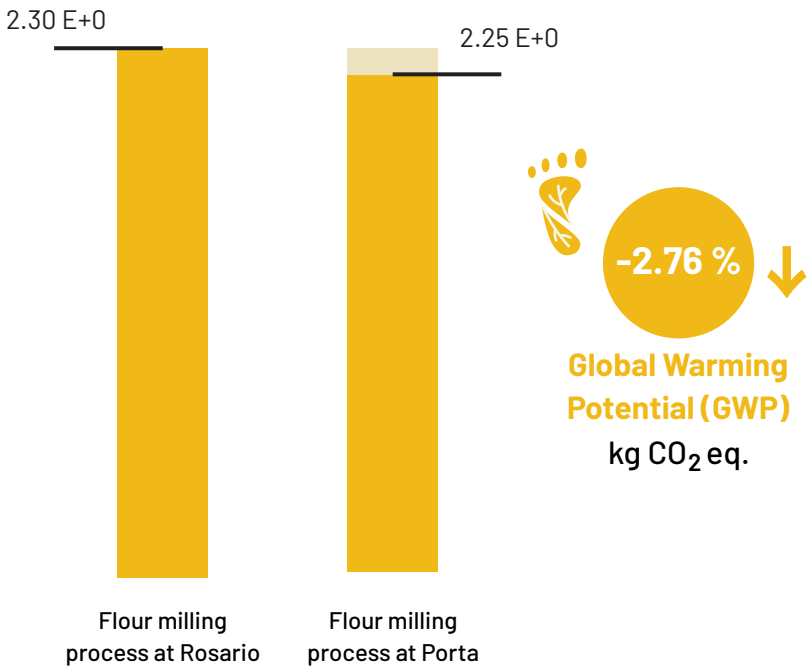
The crop season considered for the EPD study, 2022/2023 was one of the worst in the last years; due to the drough conditions, soybean performance was much lower than normal values. Case 1 models the impact of an increase in harvested soybean yield compared to the 2022/2023 crop season.

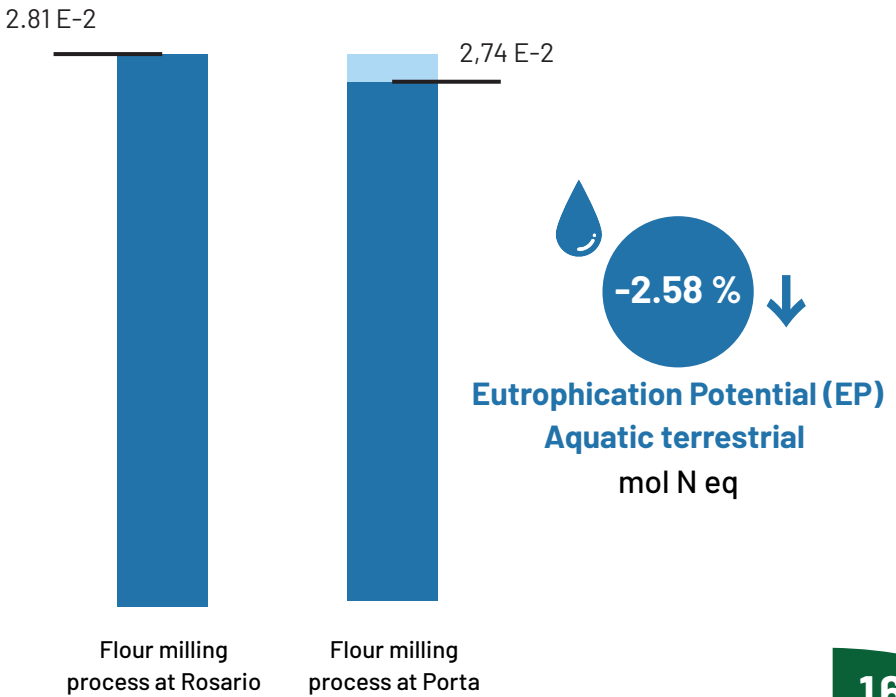




Case 2: Flour milling process at Porta Hnos. S.A.

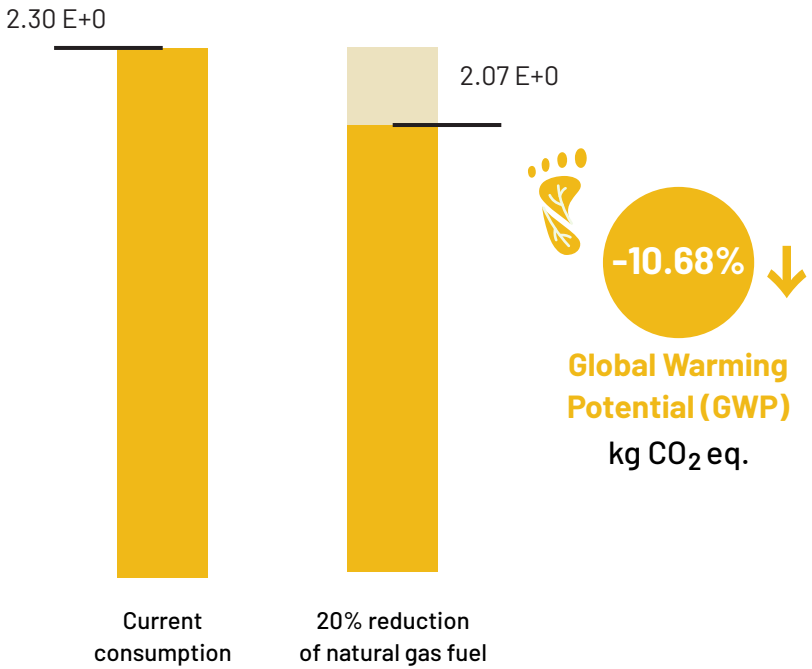
The second scenario is characterized by a reduction of transport between Rosario and Córdoba by implementing a flour milling process directly at the PORTA HNOS. S.A. facilities in Córdoba. Thus, it would be necesary to transport only the grain significantly reducing the need to transport the flour.

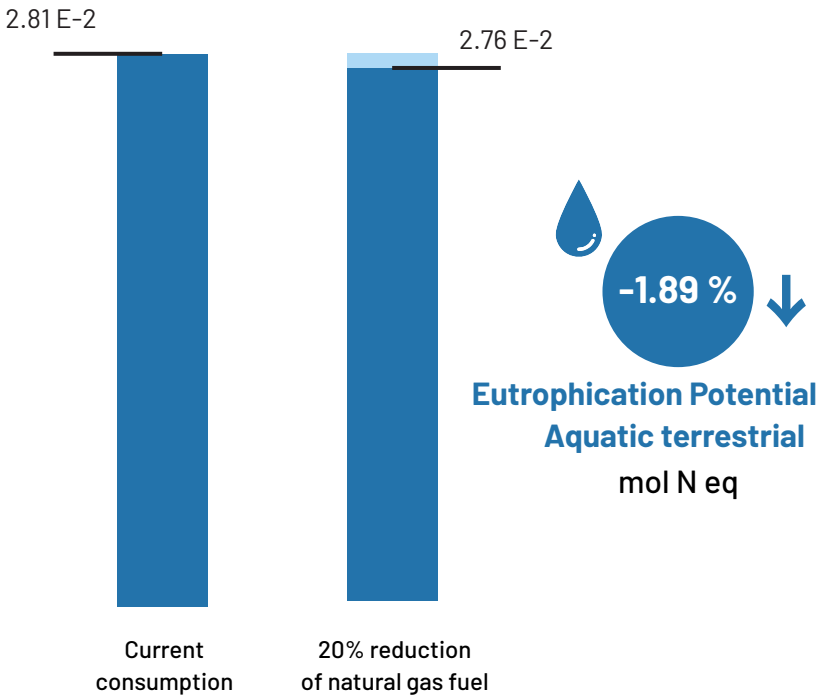




Case 3: Reduction of natural gas consumed in the process

This third scenario is defined to model a 20% reduction in the consumption of natural gas fuel used in the protein production process through the implementation of a more efficient drying technology.





Methodological framework

Reference regulations

ISO 14040:2006: Environmental management.
Life cycle assessment.
Principles and framework.

ISO 14044:2006: Environmental management.
Life cycle assessment.
Requirements and guidelines.

ISO 14046:2014: Environmental management.
Water footprint.
Principles, requirements and guidelines.

ISO 14067:2018: Greenhouse gases.
Carbon footprint of products.
Requirements and guidelines
for their quantification.

ISO 14025:2006: Environmental
labels and declarations.
Type III environmental declaration.
Principles and procedure.

Guidelines & Intructions

General Programme Instructions (GPI) 4
of the International EPD System

2019 Refinement Guidelines (IPCC 2019)
of the 2006 Intergovernmental Panel on Climate Change (IPCC) guidelines for national greenhouse gas inventories.

Calculation tools and database

SimaPro 9.5.0.1

Ecoinvent V 3.9.1
(database for SimaPro)

Agri-footprint V 6.0
(database for SimaPro)

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