
De Cecco durum wheat semolina pasta
Environmental product declaration

UN CPC 2371
UNCOOKED, NOT STUFFED OR OTHERWISE PREPARED PASTA

PCR 2010:01 VERSION 3.0

Geographic scope: Europe and North America

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For more information about the EPD program, visit the website www.environdec.com



INFORMATION ABOUT THE COMPANY AND THE PRODUCT

The company

Molino e Pastificio Fratelli De Cecco was founded in 1886 in the Abruzzo region, at the foot of the Maiella. Its founder, Nicola De Cecco, was known for producing “the best flour of the contado”, the result of experience and passion that had already been handed down by the previous generations.

His successor, Filippo De Cecco, by combining ancient craftsmanship and engineering intuitions, created a new model of low temperature dryer, thus overcoming the problem of meteorological conditions affecting production performance. Until then, pasta had always been dried in the sun, since it was the only way to ensure high quality and preservability of the product. It was thanks to this insight that De Cecco began to open up to new markets, thus starting the process of company internationalization.

In 1908, the farmer girl wearing the traditional female costumes of the women of Abruzzo and with some sheaves of wheat in her hands became the symbol of the Company. After World War II, De Cecco began to grow steadily to its current size: the plant, grounded by German bombings, was rebuilt and production was resumed, and it was increasingly oriented towards international markets. To support this productive revival, in the 1950s, the pasta factory was opened in Pescara to cope with the productive growth of those years. In 1980, the Fara San Martino plant was inaugurated as a new and modern production unit with a doubled potential, while in 1985 the Company, to meet the new market needs got ready for a fundamental step that sees it committed to the creation of its own sales network. Another important step was the constitution of "Società Olearia" in 1986, the first step towards a substantial differentiation in the product range, which will expand further in 1993. The nineties were marked by large investments: the new mill of Fara San Martino was built, characterized by a processing capacity of 11,000 quintals per day; in 1997 the Ortona plant was opened, a modern and technologically advanced unit to preserve ancient pasta making traditions. Over time, many things have changed: today, De Cecco is synonymous with high quality semolina pasta and De Cecco is a group with a turnover exceeding 411 million euros, of which more than one third is for export. The will to hand down, preserve and consolidate the founder's productive principles, however, has not changed: fine wheat, fresh semolina produced at its own mill, bronze dies, slow drying at low temperatures and constant quality control. Today, as in the past, all comes from strong passion and from the obstinate search for perfection that makes all De Cecco products unique..



The Social and Environmental Responsibility Policy of the Group

De Cecco social and environmental responsibility coincides with the orientation to excellence of its business style, starting from product quality, operating in absolute transparency and according to the principles of fair competition at the base of a free market, and meeting the needs and the requests of all stakeholder groups. That is why De Cecco got a series of certifications, including ISO 14001: 2004. Environmental certification is a voluntary self-control and accountability tool to pursue a continuous improvement of its environmental performance. This system allows to identify and, at the same time, protect significant environmental aspects, and thus to ensure that they are fully respected. Always aware of the ecosystem involved in its production activities, De Cecco has decided to develop an Environmental Management System complying with ISO 14001: 2004.

The implementation of this system is aimed at:

- Ensuring compliance with environmental regulations and continuous improvement of environmental performance;
- Monitoring environmental performance on a regular basis;
- Planning and implementing the improvement of such performance by reducing environmental impacts;
- Preventing possible environmental accidents.

Production process:

Wheat selection

The best pasta is made with quality raw materials, and, above all, good durum wheat. De Cecco experts go to the harvesting fields in person to check the wheat quality that will be processed at the Molino in Fara San Martino. De Cecco uses only straw yellow wheat, which is analyzed in the laboratory using the best techniques and the most advanced equipment to ensure the most accurate and strict controls. The shape and appearance of the grains are also carefully analyzed: the surface must be smooth, with no spots or imperfections, the color must be straw yellow.

Milling

All wheat is milled at the mill adjacent to the pasta factory. It is thanks to the mill that De Cecco can mix different types of wheat at the moment and use freshly ground semolina. Milling is when, after being properly cleaned to remove any residues, grains are broken and separated from their noble parts. In order to do this, all grain layers are "removed" to reach the central part. By removing all intermediate layers, up to 80% of semolina can be obtained. De Cecco, however, uses only 65% of it, which is less than usual, to exploit only the heart of wheat and ensure greater quality of semolina and, therefore, of its pasta.



Bronze die extrusion

Bronze die extrusion is a special procedure through which pasta takes shape, while bronze gives it that unique porosity that retains the seasonings. Bronze die extrusion is one of the peculiarities of De Cecco pasta that few still use: at De Cecco, this work is essential because the main objective is the quality of pasta and this also includes using bronze dies.

Drying

De Cecco pasta is slowly dried at low temperatures. According to old pasta making traditions, the drying process must be slow and at a low temperature to maintain the typical pale yellow color of wheat. That is why, for some formats, De Cecco prefers waiting up to 40 hours to avoid the risk of compromising the color, the scent, the flavor and firmness of its pasta.

Factories

Pasta covered by this statement is produced at the Italian factories in Fara San Martino and Ortona (both in the province of Chieti, Abruzzo)

The data collected refer to the situation of the factories located in Fara San Martino and Ortona.

In fact, De Cecco egg pasta is also produced at third-party factories, but in small quantities:

According to the reference PCR, data must be collected by covering a production percentage of at least 90%.

For the analysis, the average durum wheat semolina pasta production of a De Cecco factory was considered, which was achieved by mass allocation of raw material consumption, energy and emissions declared by the company for each of the two factories analyzed.

The product under analysis

According to Decree of the President of the Italian Republic no. 187 of 2001 (Article 6, paragraph 1), durum wheat semolina pasta is produced by bronze dying and drying doughs prepared with durum wheat semolina and water. Durum wheat covered by this study is composed only of semolina and water with a moisture content of less than 12,5%.

Features of pasta under analysis

Nutritional values vary depending on the market to which pasta is destined. As for pasta exported to North America, different ingredients are used (see tables 1 and 2); at least 99% of all ingredients required for the production of the product unit are in line with regional/local nutrition regulations. Below are the tables (tables 1 and 2) showing the ingredients and two examples of labels (figures 1 and 2) with nutritional values for durum wheat semolina, for the Italian/European and Canadian market (with no added vitamin and mineral supplements) and for the US market (with the addition of vitamin and mineral supplements), respectively.

Ingredients	%
Durum wheat semolina	100%
Nutritional values	Average values for 100 g
Calories (kcal)	352
Total fat (g)	1,5
Saturated fat (g)	0,3
Total carbohydrates (g)	69,5
food fiber (g)	2,9
Sugar (g)	3,4
Protein (g)	14
Salt	0,01

Table 1. Nutritional ingredients and average nutritional values of De Cecco durum wheat semolina pasta for the Italian market.

Nutritional values	Average values for 56 g
Calories (kcal)	200
Fat calories	20
Total fat (g)	2
Saturated fat (g)	0,5
Trans fat	0,0
Cholesterol (mg)	110
Sodium (mg)	25
Total carbohydrates (g)	38
dietary fiber (g)	2
Sugar (g)	1
Protein (g)	8
	% GDA (indicative daily quantities)
Vitamin A	2%
Vitamin C	0%
Calcium	2%
Iron	10%
Thiamine	35%
Riboflavin	15%
Niacin	20%
Folic Acid	30%
Ingredients	%
Durum wheat semolina	99,9%
Vitamin mix (Iron, Thiamine, Riboflavin, Folic Acid)	0,1%

Table 2. Nutritional ingredients and average nutritional values of De Cecco durum wheat semolina pasta for the US market.

Below are some examples of labelling for pasta sold on the European and the US markets.



Figure 1. A typical label with nutritional values for De Cecco pasta sold on the US market.



Figure 2. Examples of 500g of durum wheat semolina pasta packages.

This study refers to durum wheat semolina pasta produced at the two De Cecco Italian factories and mainly packed in 500g packs with polypropylene films for the Italian market and in cardboard boxes (500g) for the North American market. (Figure 2)

Functional unit

The declared unit (UD) is equal to 1 kg of pasta, packaging included. Environmental performance corresponding to all the quantities of marketed pasta can be identified with the appropriate proportions.

Content of materials and chemicals

This study takes into account at least 99% of all the ingredients required for the product unit, which include water and durum wheat semolina. In addition, these ingredients are in compliance with regional/local nutrition regulations.

ENVIRONMENTAL PERFORMANCE DECLARATION

Methodology

Data covered by this statement refers to pasta produced for the Italian and North American markets (USA, Canada) for the year 2016.

To calculate the results reported below in this EPD®, the Life-Cycle Assessment (LCA) methodology was used, referred to in ISO 14040 and PCR 2010:01 v.3.0, CPC 2371: UNCOOKED, NOT STUFFED OR OTHERWISE PREPARED PASTA.

LCA applied to a product system, therefore, addresses the efficiency study of the system in question to the protection of the environment and human health, and is also aimed at saving resources.

In particular, LCA allows us to estimate the result of impacts from all phases of the product life cycle, thus providing an exhaustive overview of the environmental characteristics of the product and a more realistic definition of environmental data that can be used when choosing between several products.

For the calculation model, GaBi 6 software by Think Step was used, as well as selected generic secondary data from databases:

- Ecoinvent (<http://www.ecoinvent.ch/>)
- LCAFood (<http://www.lcafood.dk/>)
- Agri-Footprint (<http://www.agri-footprint.com/>)

No proxy data were used.

System boundaries

The environmental data below refer to the whole life cycle of De Cecco pasta.

The following are the phases considered:

- Wheat cultivation
- Production of materials for primary and secondary packaging
- Production of primary and secondary packaging
- Milling
- Pasta production
- All transport stages
- Consumption of water and energy for cooking the dough

- Packaging disposal.

As for distribution, pasta cooking and packaging disposal, this report considered two scenarios of two representative geographic areas where our pasta is marketed. In particular, such scenarios refer to pasta produced and marketed in Italy or in the United States. Below are the diagrams for general boundaries of the system under analysis (Figure 3).

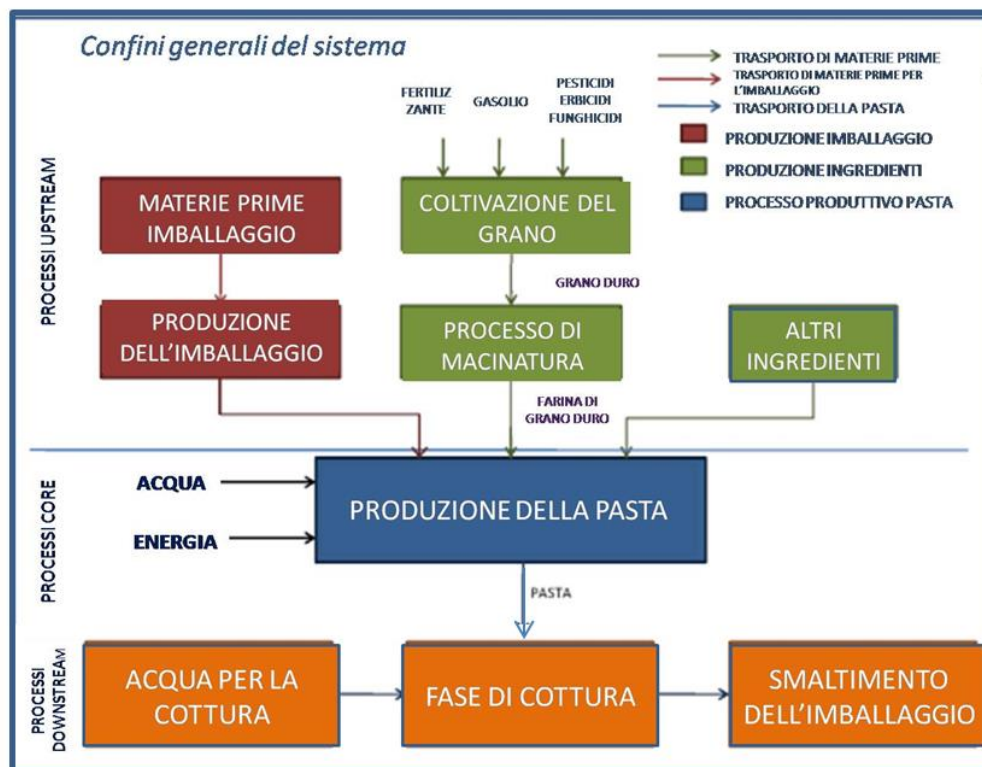


Figure 3. General system boundaries

Below the phases of the product under analysis are described in detail.

“Upstream” processes include the entry of raw materials used for the products into the system:

- Agriculture. This includes air and water emissions of machinery used in agriculture as well as air nitrous gas emissions and water phosphorus emissions. Agriculture includes soil preparation and cultivation;
- Fuel production (Diesel) used by agricultural machinery;
- Production of seeds for cultivation;
- Production of fertilizers, herbicides, pesticides and fungicides used in agriculture;
- Production of auxiliary products used;
- Production of primary and secondary packaging for auxiliary products.



The following processes, considered as irrelevant since the product being studied is only made with durum wheat semolina and eggs, are not included:

- Manufacture of machinery used in agriculture and production phase, given the difficulty and irrelevance, based on the functional unit used;
- Production of the materials used to clean the different systems, given the irrelevance in terms of quantity, based on the functional unit used, being less than one gram per kg of pasta;
- Production of vitamin supplements for pasta sold on the US market, taking into account that the quantities used do not in any case exceed 1% of the total (the added vitamin mix does not exceed 0.1% of the total weight).

“Core” processes include:

- Pasta production;
- Production of electricity used during the production of pasta considering the Italian electric mix;
- Production of thermal energy (understood as natural gas consumption) during the production of pasta;
- Production of electricity from the hydroelectric plant;
- Transport of raw materials and production equipment up to the production site;
- Wastewater purification;
- Transport and treatment of waste generated at the site of production.

Downstream processes include:

- Transport of pasta from the site of production to a distributor or an “average” distribution center within the geographical boundaries (average port of destination in North America);
- Recycling or disposal of primary packaging after use for the Italian and US scenarios according to ISPRA and US Environmental Protection Agency statistical data.

Use of resources

The tables below show the consumption of non-renewable, material resources intended for energy use. Data refer to the production of 1000g of pasta.

Table 3A ITALY: Results for the consumption of non-renewable material resources

Consumption of non-renewable material resources in grams	Upstream			Core	Downstream		TOTAL
	Field cultivation	Milling	Packaging	Pasta production	Distribution	EoL packaging	
Gravel	0,00	2,17	4,99	8,52	0,00	0,00	15,68
Natural aggregate	143,53	57,22	5,22	9,91	72,17	0,63	288,69
Sylvite*	45,20	<0,01	0,02	<0,01	<0,01	<0,01	45,22
Other	28,29	14,16	2,45	3,49	2,78	0,04	51,21
Total	217,02	73,55	12,68	21,92	74,96	0,68	400,80

Table 3B NORTH AMERICA: Results for the consumption of non-renewable material resources

Consumption of non-renewable material resources in grams	Upstream			Core	Downstream		TOTAL
	Field cultivation	Milling	Packaging	Pasta production	Distribution	EoL packaging	
Gravel	0,00	2,17	10,57	8,52	0,00	0,00	21,26
Natural aggregate	143,53	57,22	6,88	9,91	45,14	2,61	265,29
Sylvite*	45,20	<0,01	0,03	<0,01	<0,01	<0,01	45,24
Other	28,29	14,16	8,61	3,49	2,86	0,39	57,80
Total	217,02	73,55	26,10	21,92	48,00	3,00	389,58

* Potassium chloride (KCl)

Table 4A ITALY: Results for the consumption of non-renewable material resources							
Consumption of non-renewable material resources in grams	Upstream			Core	Downstream		TOTAL
	Field cultivation	Milling	Packaging	Pasta production	Distribution	EoL packaging	
Natural gas	117,97	12,50	14,29	63,35	1,65	0,02	209,78
Oil	119,87	60,28	14,56	9,29	18,36	0,07	222,44
Coal	33,16	18,13	6,31	33,19	2,34	0,02	93,14
Uranium	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
Other	47,24	13,05	6,05	7,92	1,16	0,01	75,44
Total	318,24	103,97	41,21	113,76	23,51	0,12	600,81

Table 4B NORTH AMERICA: Results for the consumption of non-renewable resources for energy use

Consumption of non-renewable resources for energy in grams	Upstream			Core	Downstream		TOTAL
	Field cultivation	Milling	Packaging	Pasta production	Distribution	EoL packaging	
Natural gas	117,97	12,50	13,68	63,35	3,79	0,09	211,39
Oil	119,87	60,28	8,63	9,29	43,79	0,25	242,10
Coal	33,16	18,13	15,85	33,19	6,65	0,10	107,08
Uranium	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
Other	47,24	13,05	11,19	7,92	8,36	0,10	87,86
Total	318,24	103,97	49,35	113,76	62,59	0,54	648,45

Table 4C ITALY: Results for the consumption of non-renewable resources for energy-nuclear energy use

Consumption of non-renewable resources for energy in MJ	Upstream			Core	Downstream		TOTAL
	Field cultivation	Milling	Packaging	Pasta production	Distribution	EoL packaging	
Uranium	1,38	0,12	0,17	0,41	0,06	<0,01	2,14

Table 4D NORTH AMERICA: Results for the consumption of non-renewable resources for energy-nuclear energy use							
Consumption of non-renewable resources for energy in MJ	Upstream			Core	Downstream		TOTAL
	Field cultivation	Milling	Packaging	Pasta production	Distribution	EoL packaging	
Uranium	1,38	0,12	0,25	0,41	0,20	<0,01	2,38

The tables below show the consumption of renewable energy resources for energy use. Data refer to the production of 1000g of pasta.

Table 5A ITALY: Consumption of renewable resources for energy use							
Consumption of renewable energy resources in g	Upstream			Core	Downstream		TOTAL
	Field cultivation	Milling	Packaging	Pasta production	Distribution	EoL packaging	
Total wood	0,00	0,11	18,93	3,21	0,09	<0,01	22,34

Table 5B NORTH AMERICA: Consumption of renewable resources for energy use							
Consumption of renewable energy resources in g	Upstream			Core	Downstream		TOTAL
	Field cultivation	Milling	Packaging	Pasta production	Distribution	EoL packaging	
Total wood	0,00	0,11	59,81	3,21	0,35	0,01	63,48

Table 6A: ITALY Results for the consumption of renewable resources for energy use

Consumption of renewable resources for energy use in MJ	Upstream			Core	Downstream		TOTAL
	Field cultivation	Milling	Packaging	Pasta production	Distribution	EoL packaging	
Biomass	0,00	0,01	<0,01	0,04	0,00	0,00	0,05
Aeolian	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01
Hydroelectric	0,02	0,02	0,01	0,06	<0,01	<0,01	0,11
Total	0,02	0,03	0,01	0,10	<0,01	<0,01	0,16

Table 6B NORTH AMERICA Results for the consumption of renewable resources for energy use

Consumption of renewable resources for energy use in MJ	Upstream			Core	Downstream		TOTAL
	Field cultivation	Milling	Packaging	Pasta production	Distribution	EoL packaging	
Biomass	0,00	0,01	<0,01	0,04	0,00	0,00	0,05
Aeolian	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01	0,00
Hydroelectric	0,02	0,02	0,01	0,06	<0,01	<0,01	0,11
Total	0,02	0,03	0,02	0,10	<0,01	<0,01	0,17

Table 7A: ITALY Results for the consumption of renewable resources for energy use

Consumption of renewable resources for energy use in g	Upstream			Core	Downstream		TOTAL
	Field cultivation	Milling	Packaging	Pasta production	Distribution	EoL packaging	
Biomass	0,00	1,28	28,86	4,45	0,00	0,00	34,59

Table 7B: NORTH AMERICA Results for the consumption of renewable resources for energy use

Consumption of renewable resources for energy use in g	Upstream			Core	Downstream		TOTAL
	Field cultivation	Milling	Packaging	Pasta production	Distribution	EoL packaging	
Biomass	0,00	1,28	88,62	4,45	0,00	0,00	94,35

The tables below show the consumption of secondary material resources intended for energy use, referring to the production of 1000 g of pasta.

TABLE 8 : Consumption of secondary resources for energy use

Consumption of secondary resources for energy use in grams	TOTAL Italy	TOTAL NORTH AMERICA
Total	0,00	0,00

TABLE 9 : Consumption of secondary resources		
Consumption of secondary material resources in grams	TOTAL Italy	TOTAL NORTH AMERICA
Total	0,00	0,00

The following table shows the quantities of energy flows recovered throughout the life cycle of 1000 kg of pasta

TABLE 10 : Results for recovery of energy flows		
Results for the recovery of energy flows in MJ	TOTAL Italy	TOTAL NORTH AMERICA
Total	0,00	0,00

The following tables show the consumption of water throughout the life cycle of 1000g of pasta, except for water used for energy purposes (turbines).

Table 11A: ITALY Results for water consumption

Water consumption in l		Upstream			Core	Downstream		TOTAL
		Field cultivation	Milling	Packaging	Pasta production	Distribution	EoL packaging	
	Total	10,85	5,08	<0,01	18,26	<0,01	<0,01	34,20
	Direct Core consumption	NA	NA	NA	1,18	NA	NA	1,18

Table 11B: NORTH AMERICA Results for water consumption

Water consumption in l		Upstream			Core	Downstream		TOTAL
		Field cultivation	Milling	Packaging	Pasta production	Distribution	EoL packaging	
	Total	10,85	5,08	8,30	18,26	1,45	0,06	44,02
	Direct Core consumption	NA	NA	NA	1,18	NA	NA	1,18

Potential environmental impacts.

The tables below show the potential environmental impacts according to the categories described in the PCR. Data refer to the production of 1000g of pasta.

TABLE 12A ITALY Environmental Impact Categories								
Impact category	Unit	Upstream			Core	Downstream		TOTAL
		Field cultivation	Milling	Packaging	Pasta production	Distribution	EoL packaging	
Acidification	g SO ₂ eq	22,70	4,12	0,28	0,96	0,34	<0,01	28,39
Eutrophication	gPO ₄ --- eq	6,32	0,59	0,15	0,25	0,10	0,03	7,45
Global warming	g CO ₂ eq	775,00	269,52	76,00	294,00	61,70	12,80	1489,02
Photochemical Oxidation	g C ₂ H ₄	0,38	0,25	0,03	0,07	0,04	<0,01	0,77

TABLE 12B NORTH AMERICA Environmental Impact Categories

Impact category	Unit	Upstream			Core	Downstream		TOTAL
		Field cultivation	Milling	Packaging	Pasta production	Distribution	EoL packaging	
Acidification	g SO ₂ eq	22,70	4,12	0,47	0,96	3,00	0,01	31,26
Eutrophication	gPO ₄ --- eq	6,32	0,59	0,26	0,25	0,41	0,11	7,92
Global warming	g CO ₂ eq	775,00	269,52	101,00	294,00	164,00	11,20	1614,72
Photochemical Oxidation	g C ₂ H ₄	0,38	0,25	0,04	0,07	0,18	<0,01	0,92

Through the life cycle of the product, biotic resources are used, especially for the production of semolina and paper packaging. CO₂ captured for these resources is equal to 1694g for the Italian production and to 2313 g for the US market production. This value has not been deducted from the Global Heating Potential values given in Tables 12A and 12B, as they do not take into account the potential of CO₂ that is captured at the different stages of the life cycle of durum wheat semolina Pasta. If this captured CO₂ value is to be considered, it should be subtracted from the total value of the Global Warming Potential shown in the tables above.

Production of waste and by-products

The table below shows the quantities of waste and by-products allocated to other food chains resulting from the life cycle of 1000g of Pasta.

Table 13A: ITALY Results for waste production

Waste production in g	Upstream			Core	Downstream		TOTAL
	Field cultivation	Milling	Packaging	Pasta production	Distribution	EoL packaging	
Hazardous waste	0,00	0,00	0,00	0,06	0,00	0,00	0,06
Non-hazardous waste	0,00	0,00	0,00	1,70	0,00	0,00	1,70
By-products	0,00	612,00	0,00	0,08	0,00	0,00	612,08
Radioactive waste	0,00	0,00	0,00	0,00	0,00	0,00	0,00

Table 13B: NORTH AMERICA Results for waste production

Waste production in g	Upstream			Core	Downstream		TOTAL
	Field cultivation	Milling	Packaging	Pasta production	Distribution	EoL packaging	
Hazardous waste	0,00	0,00	0,00	0,06	0,00	0,00	0,06
Non-hazardous waste	0,00	0,00	0,00	1,70	0,00	0,00	1,70
By-products	0,00	612,00	0,00	0,08	0,00	0,00	612,08
Radioactive waste	0,00	0,00	0,00	0,00	0,00	0,00	0,00

COMPARISON WITH PREVIOUS VERSIONS

The differences from the previous EPD versions are due to the use of up-to-date yields for the cultivation of durum wheat from FAO data (and consequently the difference in fertilizer consumption) resulting in an increase in values for acidification, eutrophication and photochemical oxidation indicators. In addition, data concerning wheat and pasta production processes was updated in 2016, and this contributed to the change in the results of this EPD compared to the previous version.

MANDATORY DEFINITION

EPD® should be reviewed every three years.

EPD®s are a useful tool for comparing the declared environmental performance of products belonging to the same category of goods. However, only EPD®s that have been built following the specific rules (PCRs) published by the International EPD® Consortium - IEC can be compared (www.environdec.com).

This EPD® was prepared according to PCR: 2010:01 v 3.0; CPC 2371: UNCOOKED, NOT STUFFED OR OTHERWISE PREPARED PASTA. EPDs within the same category of products, but from different programs may not be compared.

This EPD and its LCA study were carried out with the collaboration and support of Greenactions.

<p>PCR (Product Category Rules) reviewed by:</p> <p><i>The Technical Committee of the International EPD® System. Chair: Filippo Sessa.</i></p> <p><i>Contact via info@environdec.com</i></p>
<p>Independent audit of the declaration and data in accordance with ISO 14025:2006</p> <p><input type="checkbox"/> EPD certification process <input checked="" type="checkbox"/> EPD audit</p>
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