De Cecco durum wheat semolina egg pasta

Environmental Product Declaration

Rev. 3.2 of 2017-05-15

UN CPC 2371
UNCOOKED, NOT STUFFED OR OTHERWISE PREPARED PASTA

PCR 2010:01 VERSION 3.0

Geographic Scope: Europe and North America
Registration number: S-P-00534
Valid until 2020-06

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 analysed: 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 lees 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.

The choice of eggs

The company has decided to produce Egg Pasta only with Category A free range fresh eggs, and not caged eggs, to preserve the well-being of hens, so that they can live in a more natural way (caged hens are forced to live in tight spaces that prevent them from moving naturally).
The main features are:
• hens not in cages, but in a closed shed where they are free to move;
• there can be up to 9 hens per square meter;
• eggs are laid on nests or on the ground;
• perches and litters are used.

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%.

Therefore, data were not collected at the third-party factories, as this represents a 3.2% of the total egg pasta production.

For the analysis, the average egg 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

Egg semolina pasta must be produced with semolina and by adding at least four hen eggs, with no shell, for a total weight of not less than 200 grams of egg per kg of semolina. The moisture content should not exceed 12.5%. This pasta should be marketed as egg pasta.

Features of the pasta under analysis

The egg pasta covered by this declaration is made with semolina and water, and with a percentage of moisture content found on the product ranging from 9.0% to 11.0% (lower than the legal limit of 12.5%). Annex 2 includes two product analysis sheets showing moisture content values analyzed for two types of De Cecco egg pasta and eggs whose content ranges proportionally between 19.36 and 28, 27%. We use an egg mixture enriched with egg yolks in variable percentages to obtain three types with increasing levels of Sterols: Type 1) 0,400 %; type 2) 0,460 % and type 3) 0,500 %, used to produce pasta with 4 eggs/kg, 5 eggs/kg and 6 eggs/kg, respectively.

Nutritional values vary depending on the market to which egg pasta is destined. As for pasta exported to the United States, traditional ingredients are mixed with vitamin and mineral supplements.

Below are the tables (tables 1 and 2) showing the ingredients and two examples of labels (figures 1 and 2) with the nutritional values for durum wheat egg pasta, with a 28 to 27% egg content, 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	76,0%
Eggs	24,0%
Nutritional values	**Average values for 100g**
Calories (kcal)	371
Total fat (g)	4,3
Saturated fat (g)	1,3
Total carbohydrates (g)	66,5
food fiber (g)	2,8
Sugar (g)	2,4
Protein (g)	15,2
Salt	0,1

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

Nutritional values	**Average values for 100g**
Calories (kcal)	357
Fat calories	35,7
Total fat (g)	3,6
Saturated fat (g)	0,9
Trans fat	0,0
Cholesterol (mg)	196,4
Sodium (mg)	44,6
Total carbohydrates (g)	67,9
dietary fibre (g)	3,6
Sugar (g)	1,8
Protein (g)	14,3
	% 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	71,6%
Eggs	28,3%
Vitamin Mix (Iron, Thiamine, Riboflavin, Folic Acid)	0,1%

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

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

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

Nutrition Facts

Serving Size 2 oz.
(56g / 1 noodle nest)
Servings per Container about 4
Calories 200
Calories from Fat 20

Amount per Serving	%Daily Value*	Amount per Serving	%Daily Value*
Total Fat 2g	**3%**	**Total Carbohydrate** 38g	**13%**
Saturated Fat 0,5g	**3%**	Dietary Fiber 2g	**8%**
Trans Fat 0g		Sugars 1g	
Cholesterol 110mg	**37%**	**Protein** 8g	
Sodium 25mg	**1%**		

Vitamin A 2% - Vitamin C 0% - Calcium 2% - Iron 10% - Thiamin 35%
Riboflavin: 15% Niacin 20% - Folic Acid: 30%

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Calories per gram: Fat 9 - Carbohydrate 4 - Protein 4

Figure 2. A typical label with nutritional values for De Cecco egg pasta sold on the Italian market.

Lasagne all'uovo n° 112

INFORMAZIONI NUTRIZIONALI

(VALORI MEDI PER 100g / TYPICAL NUTRITION VALUES FOR 100g / VALEURS NUTRITIONNELLES MOYENNES POUR 100g / DURCHSCHNITTLICHE NÄHRWERTE PRO 100g / VALORES NUTRITIVOS MEDIOS POR 100g / VALORES NUTRICIONAIS MÉDIOS POR 100g / GEMIDDELDE VOEDINGSWAARDE PER 100g / GENNEMSNITLIGE NÆRINGSVÆRDIER PR. 100g / GENOMSNITTLIGA NÄRINGSVÄRDEN PER 100 g)

VALORE ENERGETICO - ENERGY - ENERGIE - ENERGIE - VALOR ENERGÉTICO - ENERGIA - ENERGIE - ENERGI - ENERGI	1545 kJ 365 kcal
GRASSI - FAT - GRAISSES - FETT - GRASAS - LÍPIDOS - VETTEN - FEDT - FETT	3,9 g
DI CUI: SATURI - OF WHICH: SATURATES - DONT: ACIDES GRAS SATURÉS - DAVON: GESÄTTIGTE FETTSÄUREN - DE LAS CUALES: SATURADAS - DOS QUAIS: SATURADOS - WAARVAN: VERZADIGDE VETZUREN - HERAF: MÆTTEDE FEDTSYRER - VARAV MÄTTAT FETT	1,2 g
CARBOIDRATI - CARBOHYDRATE - GLUCIDES - KOHLENHYDRATE - HIDRATOS DE CARBONO - HIDRATOS DE CARBONO - KOOLHYDRATEN - KULHYDRAT - KOLHYDRAT	66,3 g
DI CUI: ZUCCHERI - OF WHICH: SUGARS - DONT: SUCRES - DAVON: ZUCKER - DE LOS CUALES: AZÚCARES - DOS QUAIS: AÇÚCARES - WAARVAN: SUIKERS - HERAF: SUKKERARTER - VARAV SOCKERARTER	2,9 g
FIBRA ALIMENTARE - FIBRE - FIBRES ALIMENTAIRES - BALLASTSTOFFE - FIBRA ALIMENTARIA - FIBRA - VEZELS - KOSTFIBRE - FIBER	2,9 g
PROTEINE - PROTEIN - PROTÉINES - EIWEIß - PROTEÍNAS - PROTEÍNAS - EIWITTEN - PROTEIN - PROTEIN	14,7 g
SALE - SALT - SEL - SALZ - SAL - SAL - ZOUT - SALT - SALT	0,12 g

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, durum wheat semolina and eggs. In addition, these ingredients are in compliance with regional/local nutrition regulations.

ENVIRONMENTAL PERFORMANCE DECLARATION

Methodology

The data covered by this statement refers to pasta produced for the Italian and North American markets (USA, Canada) for the year 2015.

For the calculation of 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/)
- Granarolo FRESH ORGANIC EGGS Environmental Product Declaration (EPD- S-P 00127)

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
- Production and selection of eggs
- 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).

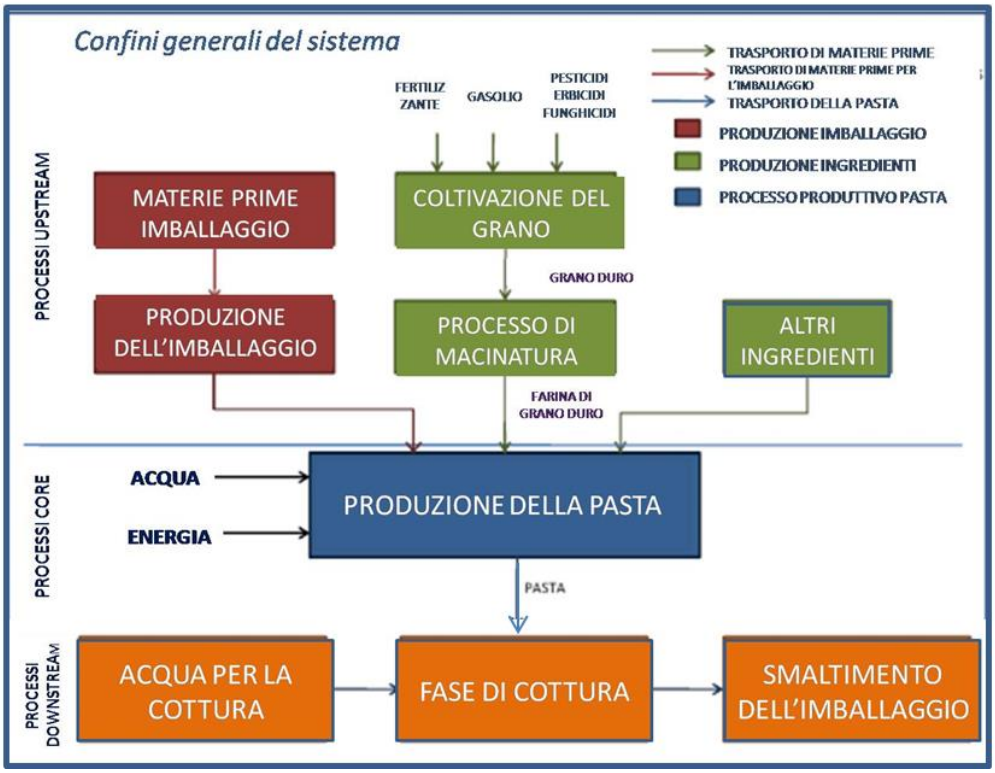

Figure 3. General system boundaries

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;
- Egg production.

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

- Production of machinery used in agriculture and production phase, given the difficulty and irrelevance, keeping in mind the functional unit used;
- Production of the materials used to clean the different systems, given the irrelevance in terms of quantity, keeping in mind 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 centre 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. The 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	Egg production	Packaging	Pasta production	Distribution	EoL packaging	
Gravel	0,0	2,2	35,0	0,3	7,9	0,0	0,0	45,4
Natural aggregate*	132,3	62,0	22,4	62,1	31,7	91,4	6,1	408,0
Sylvite	42,6	0,0	0,1	NA	0,0	0,0	0,0	42,7
Other	26,0	4,6	32,9	20,2	4,3	3,5	0,4	91,8
Total	200,9	68,8	90,4	82,6	43,8	94,9	6,5	587,9

* It includes calcite, silicate and granite

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	Egg production	Packaging	Pasta production	Distribution	EoL packaging	
Gravel	0,0	2,2	35,0	0,3	7,9	0,0	0,0	45,4
Natural aggregate*	132,3	62,0	22,4	62,1	31,7	48,7	12,3	371,4
Sylvite	42,6	0,0	0,1	NA	0,0	0,0	0,0	42,7
Other	26,0	4,6	32,9	20,2	4,3	3,0	1,7	92,7
Total	200,9	68,8	90,4	82,6	43,8	51,7	13,9	552,1

* It includes calcite, silicate and granite

Table 4A ITALY: Results for the consumption of non-renewable resources for energy use								
Consumption of non-renewable energy resources in grams	Upstream				Core	Downstream		**TOTAL**
	Field cultivation	Milling	Egg production	Packaging	Pasta production	Distribution	EoL packaging	
Natural gas	108,3	12,4	43,4	32,0	67,2	2,1	0,1	265,5
Oil	109,1	57,3	38,4	49,7	15,0	23,2	0,8	293,7
Coal	30,4	17,9	60,5	33,5	34,6	3,0	0,2	180,1
Uranium	0,0	0,0	0,0	NA	0,0	0,0	0,0	0,0
Other	43,3	12,6	39,4	NA	8,4	1,5	0,1	105,4
Total	291,2	100,3	181,8	115,2	125,2	29,8	1,2	844,6

Table 4B NORTH AMERICA: Results for the consumption of non-renewable resources for energy use								
Consumption of non-renewable resources in grams for energy	Upstream				Core	Downstream		TOTAL
	Field cultivation	Milling	Egg production	Packaging	Pasta production	Distribution	EoL packaging	
Natural gas	108,3	12,4	43,4	32,0	67,2	4,0	0,4	267,7
Oil	109,1	57,3	38,4	49,7	15,0	46,1	1,1	316,9
Coal	30,4	17,9	60,5	33,5	34,6	7,0	0,4	184,4
Uranium	0,0	0,0	0,0	NA	0,0	0,0	0,0	0,0
Other	43,3	12,6	39,4	NA	8,4	8,8	0,4	113,0
Total	291,2	100,3	181,8	115,2	125,2	65,9	2,4	881,9

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

Table 5A: ITALY Consumption of renewable material resources								
Consumption of renewable material resources in grams	Upstream				Core	Downstream		TOTAL
	Field cultivation	Milling	Egg production	Packaging	Pasta production	Distribution	EoL packaging	
Primary forest	0,0	0,0	0,0	NA	0,0	0,0	0,0	0,0
Total wood	3,9	0,9	221,3	NA	3,3	0,1	0,0	229,6
Total	3,9	0,9	221,3	NA	3,3	0,1	0,0	229,6

Table 5B: NORTH AMERICA Consumption of renewable material resources								
Consumption of material renewable resources in grams	Upstream				Core	Downstream		TOTAL
	Field cultivation	Milling	Egg production	Packaging	Pasta production	Distribution	EoL packaging	
Primary forest	0,0	0,0	0,0	NA	0,0	0,0	0,0	0,0
Total wood	3,9	0,9	221,3	NA	3,3	0,4	0,0	229,6
Total	3,9	0,9	221,3	NA	3,3	0,4	0,0	229,6

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	Egg production	Packaging	Pasta production	Distribution	EoL packaging	
Biomass	5,89E-04	9,76E-05	3,21E-03	NA	3,41E-04	3,69E-06	1,29E-07	4,24E-03
Aeolian	2,19E-02	1,77E-02	4,87E-02	3,02E-02	6,17E-02	5,86E-04	4,71E-05	1,81E-01
Hydroelectric	1,81E-01	6,94E-02	1,61E-01	2,71E-01	2,47E-01	1,32E-02	1,18E-03	9,44E-01
Total	1,68E-01	1,23E-01	2,13E-01	3,02E-01	3,09E-01	1,38E-02	1,23E-03	1,13E+00

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 NA
	Field cultivation	Milling	Egg production	Packaging	Pasta production	NA Distribution	NA EoL packaging	
Biomass	5,89E-04	9,76E-05	3,21E-03	NA	3,41E-04	4,20E-06	1,75E-07	4,24E-03
Aeolian	2,19E-02	1,77E-02	4,87E-02	3,02E-02	6,17E-02	3,59E-03	1,83E-04	1,84E-01
Hydroelectric	1,81E-01	6,94E-02	1,61E-01	2,71E-01	2,47E-01	2,71E-02	2,49E-03	9,59E-01
Total	1,68E-01	1,23E-01	2,13E-01	3,02E-01	3,09E-01	3,07E-02	2,67E-03	1,15E+00

Table 7A: ITALY Results for the consumption of renewable resources for energy use								
Consumption of renewable energy resources in g	Upstream				Core	Downstream		TOTAL NA
	Field cultivation	Milling	Egg production	Packaging	Pasta production	NA Distribution	NA EoL packaging	
Biomass	0,00E+00	1,31E+00	3,23E+02	0,00E+00	4,56E+00	0,00E+00	0,00E+00	3,32E+02

Table 7B: NORTH AMERICA Results for the consumption of renewable resources for energy use								
Consumption of renewable energy resources in g	Upstream				Core	Downstream		TOTAL NA
	Field cultivation	Milling	Egg production	Packaging	Pasta production	NA Distribution	NA EoL packaging	
Biomass	0,00E+00	1,31E+00	3,23E+02	0,00E+00	4,56E+00	0,00E+00	0,00E+00	3,32E+02

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	0,0	0,0

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

The following table shows the quantities of energy streams recovered over 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	0,0	0,0

The following table shows the consumption of water over the life cycle of 1000g of pasta.

Table 11A: ITALY Results for water consumption									
		Upstream				Core	Downstream		TOTAL
		Field cultivation	Milling	Egg production	Packaging	Pasta production	Distribution	EoL packaging	
Water consumption in l	Total	1226,0	634,6	1075,9	107,6	1358,5	95,1	288,0	4785,5
	Core Processes	NA	NA	NA	NA	1,6	0,0	NA	1,6

Table 11B NORTH AMERICA Results for water consumption									
		Upstream				Core	Downstream		TOTAL
		Field cultivation	Milling	Egg production	Packaging	Pasta production	Distribution	EoL packaging	
Water consumption in l	Total	1226,0	634,6	1075,9	107,6	1358,5	215,0	18,4	4636,0
	Core Processes	NA	NA	NA	NA	1,6	0,0	NA	1,6

Potential environmental impacts.

The table below shows 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	Egg production	Packaging	Pasta production	Distribution	EoL packaging	
Acidification	g SO2 eq	21,1	4,0	1,7	7,2	1,1	0,4	0,0	35,5
Eutrophication	gPO 4 --- eq	5,8	0,6	0,8	6,9	0,3	0,1	0,2	14,7
Global warming	g CO2 eq	708,1	259,8	351,0	693,5	322,8	78,2	44,3	2457,6
Photochemical Oxidation	g C2H4	0,3	0,2	0,1	0,2	0,1	0,0	0,0	1,1

TABLE 12B NORTH AMERICA Environmental Impact Categories									
Impact category	Unit	Upstream				Core	Downstream		TOTAL
		Field cultivation	Milling	Egg production	Packaging	Pasta production	Distribution	EoL packaging	
Acidification	g SO2 eq	21,1	4,0	1,7	7,2	1,1	3,1	0,1	38,2
Eutrophication	gPO 4 --- eq	5,8	0,6	0,8	6,9	0,3	0,4	0,5	15,4

Global warming	g CO2 eq	708,1	259,8	351,0	693,5	322,8	173,0	50,9	2559,0	
Photochemical Oxidation	g C2H4	0,3	0,2	0,1	0,2	0,1	0,2	0,4	0,0	1,6

During 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 210 g. 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 Egg 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	Egg production	Packaging	Pasta packaging	Distribution	EoL packaging	
Hazardous waste	0,0	0,0	0,0	NA	0,1	0,0	0,0	0,1
Non-hazardous waste	0,0	0,0	0,0	NA	0,0	0,0	38,5	38,5
Recyclable waste	0,0	0,0	0,0	148,6	6,8	0,0	118,6	274,1
Radioactive waste	0,0	0,0	0,0	0,0	0,0	0,0	0,0	1265,3
By-products*	0,0	606,1	0,0	NA	659,2	0,0	0,0	0,1

*Tritello, wheat meal, semolato, clean-up waste, granotto, broken durum wheat grains,..

Table 13B NORTH AMERICA Results for waste production								
Waste production in g	Upstream				Core	Downstream		TOTAL
	Field cultivation	Milling	Egg production	Packaging	Pasta packaging	Distribution	EoL packaging	
Hazardous waste	0,0	0,0	0,0	0,0	0,1	0,0	0,0	0,1
Non-hazardous waste	0,0	0,0	0,0	0,0	11,9	0,0	157,1	157,1
Recyclable waste	0,0	0,0	0,0	0,0	6,8	0,0	0,0	155,5
Radioactive waste	0,0	0,0	0,0	0,0	0,0	0,0	0,0	1265,3
By-products *	0,0	606,1	0,0	0,0	659,2	0,0	0,0	0,1

* Tritello, wheat meal, semolato, clean-up waste, granotto, broken durum wheat grains,..

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, different emission factors for energy mixes compared to the previous version contributed to decreased values for the global warming indicator. The use of the results from the Granarolo "Fresh and organic eggs" EDP instead of generic data from databases resulted in a reduction in the impacts from the consumption of eggs for the production of pasta.

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.

PCR (Product Category Rules) reviewed by: *The Technical Committee of the International EPD® System. Chair: Filippo Sessa.* *Contact via info@environdec.com*
Independent audit of the declaration and data in accordance with ISO 14025:2006 □ EPD certification process X EPD audit
Independent Auditor: Mrs. Michela Gallo, Salita Bella Giovanna 1/13 Genoa - Italy, michela.gallo@unige.it

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