

## The raw materials in a pizza

In this chapter, we are focusing on raw materials. We will see that they represent part of manufacturing costs and we will make an initial assessment of their environmental impact.

The term **raw materials** means products extracted from nature in their raw state and that often require transformation before being used. Agricultural products such as wheat, rice and corn are examples of raw materials.

Raw materials can be used to obtain an **end product**. The products on supermarket shelves are end products, the result of a process of transformation and manufacturing that began with one or more raw materials. A pizza, for example, is an end product, ready for consumption, comprising several raw materials.

Five billion pizzas are consumed worldwide every year. That would be enough to cover the whole of Lake Geneva with pizzas, or 70 000 football pitches!

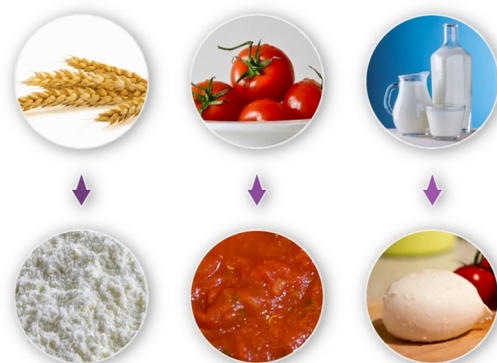
Take a Margherita pizza for example, one of consumers' favourite pizzas. If we want to make it from scratch, what ingredients do we need, and what are the raw materials behind them?

First off, we have to prepare the pizza dough. For that, we need flour, water and yeast. The raw material of flour is wheat.

We are going to spread tomato puree on the dough. Here, the raw material is, of course, tomatoes.

Lastly, we need mozzarella cheese made from cow's milk.

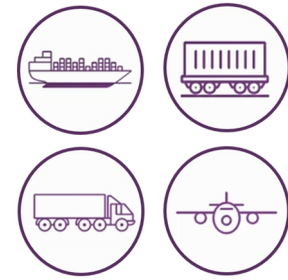
To summarise, a Margherita pizza uses three main raw materials: wheat, tomatoes and milk. These raw materials had been transformed into flour, tomato puree and mozzarella. Each raw material followed its own route to become part of these ingredients, from the farm to the shops, via factories or manufacturing plants.



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## THE GEOGRAPHICAL ORIGINS OF THE RAW MATERIALS OF PIZZAS

An end product may be consumed a considerable distance from the place of production of the raw materials used. A consumer country will sometimes import raw materials, either because it does not produce them in sufficient quantities, or because of production costs, if it is more advantageous to bring them from another country. Obviously, since importing raw materials implies transportation, this would have environmental consequences.

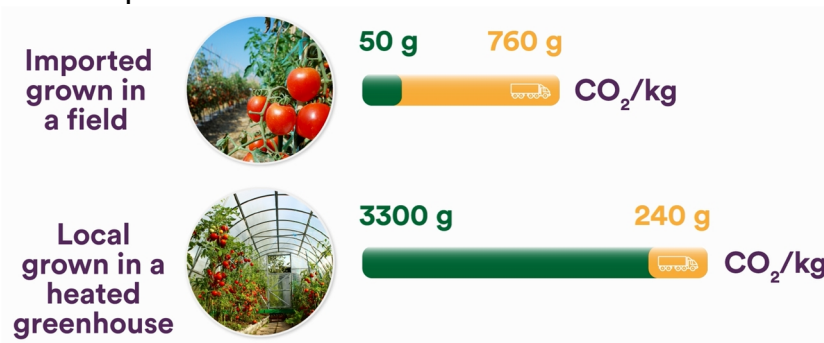


Let us go back to our example of a pizza in Switzerland.

Swiss wheat production is insufficient to cover the country's needs, so half of the wheat consumed is imported. The raw material of the flour used to prepare the pizza dough can therefore be wheat produced in Switzerland, but it is also possible that the wheat comes from another European country or even from North America. If it has travelled far, the transportation will affect the environmental impact.

Let us now look at the second ingredient, tomatoes. Again, tomato production in Switzerland is not enough to meet all needs, so Switzerland imports tomatoes, mainly from the European Union. This has an impact on the environment, especially if the tomatoes are transported fresh in refrigerated lorries.

Growing tomatoes also requires a considerable amount of water: The production of 1 kg of tomatoes requires 50 L of water. Growing them in heated greenhouses, as is the case in the Netherlands, can considerably increase energy consumption and CO<sub>2</sub> emissions. So, tomatoes produced locally but under heated greenhouses have a much higher environmental impact than imported tomatoes produced at natural ambient temperatures.



Another key ingredient in a Margherita pizza, mozzarella, is a typical Italian product. This ingredient may well be imported from Italy or from other countries of the European Union, or it can have been produced in Switzerland. It may also have been imported from the US, the world's largest producer of mozzarella. The decision may be for several reasons, such as price. Just like tomatoes, mozzarella needs to be refrigerated during transportation.

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On top of this, stockbreeding cattle to produce milk also has an environmental impact, owing to the high consumption of water and the emission of greenhouse gases.

This inventory of the ingredients and the raw materials used in manufacturing pizzas allows us to have an initial estimate of their impact on the environment. Just the ingredients alone for one pizza would be responsible, for example, for the emission of nearly 300 g of CO<sub>2</sub>, which is as much as driving a car for more than 2 km.

