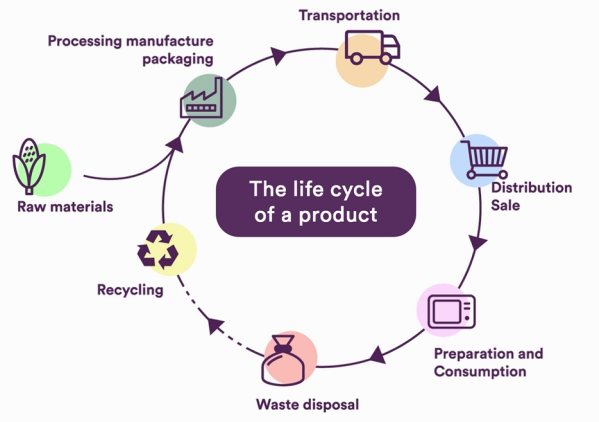
5.3.4

Ecological balance sheet

INTRODUCTION: LIFE CYCLE ASSESSMENT OR 'ECO BALANCE SHEET'

All the products we consume have an impact on the environment, but this impact varies according to the type of product and its life cycle, from its production to its disposal.

To better understand a product's ecological balance sheet, we need to start by listing all the stages, from extraction of the raw materials, to processing and refining, transformation into the finished product, packaging, distribution, consumption and disposal or recycling. Plus, of course, transportation, which may be involved in several of these stages.



The ultimate goal is to identify the steps that have the most negative influence on the environment, in order to put actions in place to mitigate their impact. Measurements are taken throughout the cycle, from the raw materials used, to the energy consumed, emissions into the environment and generated waste. All these steps can influence air, water and soil quality. The depletion of natural resources must also be taken into account.

Let us try to weigh up the environmental impact of our Margherita pizza.

CARBON FOOTPRINT

Let us first talk about the carbon footprint, which is used to evaluate the impact of a product on global warming. The goal is to measure greenhouse gas emissions at each stage of manufacturing a product.

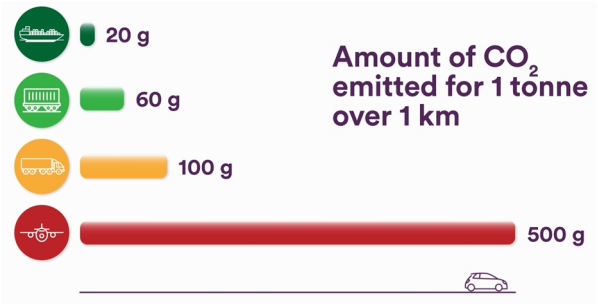
Let us look at the activities that contribute to the production of greenhouse gases in the life cycle of a pizza.

Farming is primarily responsible. Growing tomatoes and wheat generates emissions, mainly due to the use of agricultural machines that consume fuel, releasing CO_2 into the atmosphere.

Stockbreeding also has an impact, as milk is the raw material for mozzarella and cows emit methane.

The energy used for processing raw materials and for cooking, packaging and refrigeration, also contributes to the emission of greenhouse gases.

Of course, the transportation of products also requires fuel. Some means of transport contaminate more than others: Aircraft and lorries, for example, pollute heavily. Finally, many consumers use their cars to go shopping, which adds even more pollution to the life cycle of products.



WATER CONSUMPTION

There is also considerable impact on water consumption. Water is used at all stages of a product's life cycle, whether crop farming or stockbreeding, manufacturing, packaging, cooking or disposal. Making a Margherita pizza consumes an average of a 1200 litres of water, i.e. the equivalent amount of water you would use if you spent one and a half hours in the shower.

Water consumption of course begins with cultivating plants. It is also very high in stockbreeding, whether used directly by the animals or in growing their food.

Large quantities of water are also used for washing the tomatoes, in livestock housing, for machines and utensils, for preserving the mozzarella, refrigerating food, and so on.

During a product's life cycle, as well as consuming water and emitting greenhouse gases, it also releases substances that can damage the environment. Pesticides used to prevent insects from ruining crops, and fertilisers used to improve plant growth can pollute soils and rivers. Stockbreeding also releases substances, nitrates and phosphates, which accumulate in water and disrupt biodiversity. Some industries discharge polluted water into streams during the manufacturing process.

A MORE ECO-FRIENDLY PIZZA?

What can we do to get a pizza whose life cycle will have the best ecological balance sheet?

As you now realise, it is necessary to act at several levels, including the raw material production models, the manufacturing processes, the choice of packaging, the distribution circuits, etc. Consumers also have a role to play, by preferring products that are environmentally friendly, for example by choosing local and seasonal products.

When a vegetable is produced off-season, in a greenhouse, heating and lighting that greenhouse consumes energy. Today, tomatoes grown in greenhouses produce twenty times more greenhouse gases than seasonal tomatoes.

The pizza toppings will also influence its environmental impact. For example, a pizza with salami, ham, mushrooms and peppers pollutes more than a Margherita pizza. Firstly, simply because of the number of ingredients, as each item has its environmental impact, but also because it contains animal products whose production generally has a greater ecological impact than that of vegetable cultivation.

Finally, cooking the pizza will have an equally significant impact. Every time we prepare a pizza at home, we preheat and then use our oven. The energy used here can be much higher than the energy required for growing the ingredients and making the pizza in a factory. The type of home oven and the energy source are paramount. We may use a gas oven or an electric oven in a country where the electricity comes from a renewable source, or from the combustion of coal, or nuclear power.

As far as packaging is concerned, the least polluting is...no packaging at all! Packaging consumes energy from when it is produced to when it is disposed of, or even recycled. It is therefore more ecological to favour products without packaging, or, if this is impossible, products with recyclable packaging.

Assessing product life cycles and, as such, their ecological balance sheet, is part of the actions producers and distributors are now taking in order to reduce the environmental impact of food. Based on this diagnosis, they can identify changes to make to reduce the environmental impact, while maintaining production capacity and controlling costs. This is a process improvement approach, as has already been undertaken for decades in the economic sphere, only now taking the environmental aspect into account.

As consumers, what can we do to reduce our negative impact on the environment? We can adopt new habits, no matter how small the change may seem because, together, they will eventually have an effect.

First, go shopping by bike or on foot, or use car sharing.

We can choose pizzas with seasonal ingredients, grown in a region close to where the pizzas are then made. Also, we can make sure we have an energy-efficient oven for cooking our pizzas.

This reasoning obviously applies to all kinds of food!

Changing our habits to promote sustainable consumption is a principle that we can apply to all types of products.

5.3.4

Ecological balance sheet

To carry out an environmental assessment of a product, we need to...

- O compare it to an equivalent product
- O know how much it costs
- O know its life cycle

Carrying out an environmental assessment involves measuring the impact of the stages of the life cycle against various criteria.

- O True
- O False

On average, the production of a pizza Margherita requires...

- O 1 litre of water
- O almost 100 litres of water
- O just over 1000 litres of water

The comparison of environmental assessments shows, for example, that...

- O a pizza Margherita has less impact on the environment than a Hawaiian pizza
- O the production of a pizza uses more energy than consuming it
- O taking numerous criteria into account, there is no real difference between a pizza topped with salami and one with bell peppers

Which action will only have a small impact on the environmental assessment of a product?

- O Going shopping on foot or by public transport
- O Choosing an energy efficient oven
- O Choosing only gluten-free or lactose-free products

Answers

To carry out an environmental assessment of a product, we need to...

- ○ **compare it to an equivalent product**
  Wrong! This is not necessary, although it is very often useful to compare several products.
- ○ **know how much it costs**
  Wrong! This is not necessary for the assessment. However, this information is useful for designing feasible solutions.
- ● **know its life cycle**
  Well done! To perform an accurate environmental assessment of a product, it is necessary to list all the stages from start to finish. These stages are the product's life cycle.

Carrying out an environmental assessment involves measuring the impact of the stages of the life cycle against various criteria.

- ● **True**
  Well done! These criteria include greenhouse gas emissions, water consumption, the pollution of water and soil, and the use of non-renewable resources such as rare metals or oil.
- ○ **False**
  Wrong! Measuring the impact against a single criterion, such as the pollution of water, can be relevant but is not enough for an environmental assessment.

On average, the production of a pizza Margherita requires...

- ○ **1 litre of water**
  Wrong! Even though making a pizza ourselves requires very little water, we must also consider all the water needed to produce the ingredients.
- ○ **almost 100 litres of water**
  Wrong! Try again.
- ● **just over 1000 litres of water**
  Well done! By taking into account the whole life cycle, we can see that the production and consumption of just one pizza requires almost 1200 litres of water. That is equivalent to a 90-minute shower!

The comparison of environmental assessments shows, for example, that...

- ● **a pizza Margherita has less impact on the environment than a Hawaiian pizza**
  Well done! That's right. A Hawaiian pizza will have a greater impact because it has more ingredients, such as ham.
- ○ **the production of a pizza uses more energy than consuming it**
  Wrong! Often the reverse is true. The transportation from the point of sale and cooking the pizza in an oven use more non-renewable energy than cultivating the raw materials and manufacturing the pizza.
- ○ **taking numerous criteria into account, there is no real difference between a pizza topped with salami and one with bell peppers**
  Wrong! On the contrary, the salami pizza has a greater impact on numerous criteria such as water consumption, the farmland required, greenhouse gas emissions, the use of non-renewable energy and the quality of the soil.

Which action will only have a small impact on the environmental assessment of a product?

- ○ **Going shopping on foot or by public transport**
  Wrong! Choosing an alternative form of transport to our own private car has significant impact on the assessment, particularly with regard to greenhouse gas emissions.
- ○ **Choosing an energy efficient oven**
  Wrong! Optimising this stage would have considerable impact. Cooking food has a high impact, especially if the oven has to be preheated.
- ● **Choosing only gluten-free or lactose-free products**
  Well done! Although these choices may be justified from a nutritional point of view, they may not have a significant positive impact on the environmental assessment.

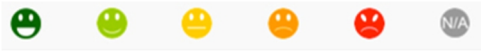
ACTT05C03L04_A

Estimating the environmental impact

[11-13 years old and 14-16 years old]

Choose a food product and estimate the environmental impact of the following elements.

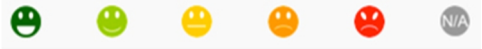
Ingredients: impact in terms of water consumption, soil pollution, greenhouse gas emissions, etc.



Explain your reasoning:

_____
_____
_____

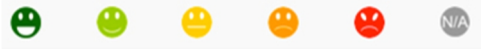
Packaging: cardboard, plastic, etc.



Explain your reasoning:

_____
_____
_____

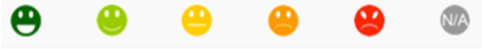
Manufacture: manual labour or industrial process



Explain your reasoning:

_____
_____
_____

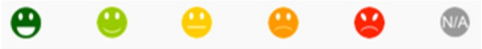
Distribution and storage: transportation, refrigeration, etc.



Explain your reasoning:

_____
_____
_____

Consumption: cooking, disposal, packaging, etc.



Explain your reasoning:

_____
_____
_____

ACTT05C03L04_B

Reducing the environmental impact

[11-13 years old and 14-16 years old]

How could we reduce the environmental impact of consuming food products?
(Think about the raw materials, packaging, transportation, etc.)

Answers

Reducing the environmental impact

[11-13 years old and 14-16 years old]

How could we reduce the environmental impact of consuming food products?
(Think about the raw materials, packaging, transportation, etc.)

Examples of correct answers: reducing packaging and favouring products without packaging (buying in bulk); reducing consumption of water; favouring seasonal and local produce; going shopping on foot, by bike or car sharing.

ACTT05C03L04_D

Gaps in the impact assessment

[11-13 years old and 14-16 years old]

Fill in the gaps with the correct word.

producers – reduce – warming – impact – greenhouse gas – water – carbon – disposal – transportation – life cycle – harvesting – steps

To better understand a product's ecological balance sheet, we need to start by listing all the stages, from _____ the raw materials, to processing and refining, transformation into the finished product, packaging, distribution, consumption and _____or recycling. Plus, of course, _____, which may be involved in several of these stages.

The ultimate goal is to identify the _____that have the most negative influence on the environment, in order to put actions in place to mitigate their _____.

The _____footprint is used to evaluate the impact of a product on global _____. The goal is to measure _____emissions at each stage of manufacturing a product.

There is also considerable impact on _____consumption. Water is used at all stages of a product's life cycle, whether crop farming or stockbreeding, manufacturing, packaging, cooking or disposal.

During a product's _____, as well as consuming water and emitting greenhouse gases, it also releases substances that can harm the environment.

Assessing product life cycles and, as such, their ecological balance sheet, is part of the actions _____and distributors are now taking in order to _____the environmental impact of food.

Answers

Gaps in the impact assessment

[11-13 years old and 14-16 years old]

Fill in the gaps with the correct word.

producers – reduce – warming – impact – greenhouse gas – water – carbon – disposal – transportation – life cycle – harvesting – steps

To better understand a product's ecological balance sheet, we need to start by listing all the stages, from **harvesting** the raw materials, to processing and refining, transformation into the finished product, packaging, distribution, consumption and **disposal** or recycling. Plus, of course, **transportation**, which may be involved in several of these stages.

The ultimate goal is to identify the **steps** that have the most negative influence on the environment, in order to put actions in place to mitigate their **impact**.

The **carbon** footprint is used to evaluate the impact of a product on global **warming**. The goal is to measure **greenhouse gas** emissions at each stage of manufacturing a product.

There is also considerable impact on **water** consumption. Water is used at all stages of a product's life cycle, whether crop farming or stockbreeding, manufacturing, packaging, cooking or disposal.

During a product's **life cycle**, as well as consuming water and emitting greenhouse gases, it also releases substances that can harm the environment.

Assessing product life cycles and, as such, their ecological balance sheet, is part of the actions **producers** and distributors are now taking in order to **reduce** the environmental impact of food.