

## 5. Ecology and food economy

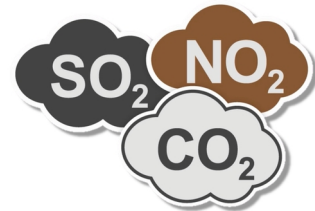
### 5.1 The rise of agriculture: Challenges for our diet and the environment

5.1.3

## Agriculture: Leads for the future

The demand for food products is constantly increasing. The challenge we face is to increase agricultural production while limiting damage to the environment.

Agriculture emits greenhouse gases, responsible for global warming, and contributes to the degradation of soil and the pollution of water, thus decreasing reserves. So, how can we ensure food security for a constantly increasing global population?



### SUSTAINABLE FARMING



Sustainable farming aims to satisfy food requirements by guaranteeing the lasting quality of natural resources so that they can also feed future generations. It seeks to reduce the environmental impact of agricultural activities and to protect biodiversity, water and soil. Organic farming is the most widely known form of sustainable farming.

Although large organic farms are beginning to emerge, particularly in the United States, organic farming is generally practised on relatively small areas. It currently requires more labour and labourers, and renders lower yields than conventional farming. With the techniques currently used in organic farming, it would be necessary to cultivate a larger area to give the same amount of produce as conventional farming. The world's currently exploitable areas would not suffice.



### INCREASE IN YIELDS AND RATIONALISATION

Integrated farming can offer a solution. Inspired by organic farming, its objective is to achieve ecological intensification, which means reconciling food requirements and respect for the environment.

This approach aims to improve overall yields, by producing greater quantities on a same surface for the same cost, whilst integrating a new element, that of neutral or reduced ecological impact.

This involves rationalising farms, i.e. improving the efficiency of labour and machines, and the performance of farming techniques. Such rationalisation of agriculture also aims at sustainability, by preserving the environment and natural

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resources. This requires the development of new agricultural techniques and practices, which master the use of pesticides, fertilisers and water. The use of renewable energies will also contribute to the long-term sustainability of production processes.

## THE CHALLENGES OF STOCKBREEDING

While it is evident that the stockbreeding industry must find solutions to reduce its contribution to global warming, we, as individuals, can all play our part too, by adjusting our consumption of animal products. In western countries, where meat consumption is often much higher than actual requirements, one solution would be simply to reduce consumption of meat.



Favouring plant proteins would complement this approach, especially since arable farming is generally more environmentally friendly, in particular because it gives higher yields. It is estimated that it would take 10 kg of plant protein to produce a single kilogram of beef protein. Other sources of protein are currently being developed: In the near future, insect cultivation could represent a partial alternative to classical stockbreeding.

It is important to note, however, that stockbreeding plays a significant role in the food ecosystem. For a start, it transforms proteins that are of average quality for humans into proteins of better quality. It would be necessary to consume 15 to 25% more plant proteins than animal proteins to cover our basic requirements in amino acids.



In addition, stockbreeding recovers a percentage of plant production, as humans cannot consume a substantial proportion of food used as animal fodder. Bred extensively, animals help maintain landscapes and pastures, and fertilise the soil with their droppings. They thus play a role in biodiversity and can even produce renewable energy. In any case, they are part of our culture and society, our culinary heritage and our expertise.



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Once again, a reduction in the consumption of products of animal origin, and hence in their production, can only be envisaged if all these elements are taken into consideration, sensibly.

## LOSS AND WASTE

In terms of food losses and waste, initial studies show losses in all sectors and at all stages, from production to storage, transformation and distribution. A first approach would be to measure the losses correctly and understand the exact reasons for such losses.

Where cereal production is concerned, this could, for example, consist of improving the use of harvesting equipment, as incorrect settings on corn harvesters already result in a 4% loss.



As for distribution, this may include initiatives such as donating unsold products that are still consumable to various associations, prioritising products with a short use-by period on supermarket shelves, selling products in bulk (loose, not packaged), singly or in small quantities, and recovering waste plant matter to produce biogas.

Finally, we, as consumers, could stop buying more than necessary and learn more about how to better store our food.

## CONCLUSION

In this chapter, we addressed the challenges agriculture currently faces, in particular with regard to increasing production to cope with population growth, and the environmental impact. Sustainable farming is constantly improving. Its aim is to make agricultural techniques more efficient, to increase production and improve yields, while working towards reducing environmental cost and greenhouse gas emission.

## Agriculture: Leads for the future

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Organic farming is...

- the most widespread type of farming in the world
- farming without pesticides
- a type of sustainable farming

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Organic farming generally produces lower yields than conventional farming.

- True
- False

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What is the term used to describe making the production of large amounts of food compatible with respect for the environment?

- Ecological decline
- Ecological intensification
- Ecological distribution

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How could we reduce the impact agriculture has on the environment and ensure everyone has enough food?

- By no longer consuming manufactured products
- By favouring products with the furthest expiry date
- By not eating meat at every meal

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Animals eat plants that are inedible for humans.

- True
- False

## Answers

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### Organic farming is...

- the most widespread type of farming in the world**  
*Wrong! Although organic farming is developing, for the moment it only represents a small proportion of farming around the world.*
- farming without pesticides**  
*Wrong! Organic farming uses herbicides and insecticides against weeds and insects. However, it does not use synthetic chemicals.*
- a type of sustainable farming**  
*Well done! Organic farming is a form of sustainable farming, which aims to produce food while ensuring the lasting quality of natural resources.*

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### Organic farming generally produces lower yields than conventional farming.

- True**  
*Well done! From an economic point of view, organic farming generally produces lower yields. This partly explains the higher prices of organic products, but this may change in years to come.*
- False**  
*Wrong! Try again!*

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### What is the term used to describe making the production of large amounts of food compatible with respect for the environment?

- Ecological decline**  
*Wrong! Although a decline in production is ecological, it means less food is made.*
- Ecological intensification**  
*Well done! This refers to integrating the constraints of respecting the environment and protecting natural resources while seeking to maintain high levels of production.*
- Ecological distribution**  
*Wrong! Try again.*

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### How could we reduce the impact agriculture has on the environment and ensure everyone has enough food?

- By no longer consuming manufactured products**  
*Wrong! That would have little or no impact.*
- By favouring products with the furthest expiry date**  
*Wrong! By doing that, nobody would buy products with a shorter use-by date and retailers would end up having to throw them away. That would increase food waste.*
- By not eating meat at every meal**  
*Well done! It is not actually necessary to eat meat at every meal, especially beef. It is better to favour vegetable proteins.*

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### Animals eat plants that are inedible for humans.

- True**  
*Well done! That's right! To draw full benefit of all plants and to reduce wastage, many plants that are not fit for human consumption serve as fodder for animals.*
- False**  
*Wrong! Try again.*

## Sustainable jumble

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

(a) What is sustainable farming? Put the boxes in the correct order to make a sentence that describes sustainable farming. Each box can only be used once.

TION	LATI	<del>TYFO</del>	SFYT	GENE	NGAI
LONG	<del>ONSW</del>	TERM	ARMI	<del>QUIR</del>	<del>LING</del>
MSTO	RATI	<del>ENTA</del>	ODRE	NDFU	ENAB
<del>SUST</del>	PERI	RTHE	HEFO	PROS	HILE
SATI	EMEN	TURE	<del>POPU</del>	AINA	BLEF
TSOF	.	CURR			

SUST					
				QUIR	
		ENTA			
	ONSW			LING	
			TYFO		POPU

b) What is missing in the definition you found? Choose the correct sentence:

- Sustainable farming is not interested in increasing agricultural output.
- Sustainable farming also seeks to reduce the impact on the environment and to protect biodiversity, water and soils as much as possible.
- Sustainable farming is organic.
- Sustainable farming does not contribute to limiting food loss and waste.

### Sustainable jumble

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TERM	PROS	PERI	TYFO	RTHE	POPU
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**SUSTAINABLE FARMING AIMS TO SATISFY THE FOOD REQUIREMENTS OF CURRENT AND FUTURE GENERATIONS WHILE ENABLING LONG-TERM PROSPERITY FOR THE POPULATION.**

b) What is missing in the definition you found? Choose the correct sentence:

- Sustainable farming is not interested in increasing agricultural output.  
*Explanation: Sustainable farming does in fact seek to improve yields, but not at the expense of the environment.*
- Sustainable farming also seeks to reduce the impact on the environment and to protect biodiversity, water and soils as much as possible.**
- Sustainable farming is organic.  
*Explanation: Although organic farming is a form of sustainable farming, the latter does not necessarily exclude the use of synthetic phytosanitary products or GMOs. Sustainable farming is therefore not always organic.*
- Sustainable farming does not contribute to limiting food loss and waste.  
*Explanation: On the contrary, the reduction of food loss and waste and the implementation of recycling systems are a key part of sustainable farming.*

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## What kind of consumer are you?

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*[8-10 years old, 11-13 years old and 14-16 years old]*

What are your eating habits? Do the quiz to discover your consumer profile.

**1) When you go to the supermarket with your parents, what do you buy?**

- A. Just the essentials
- B. Plenty of food, in case you invite friends over for a meal
- C. As much as you can fit in the fridge

**2) When you help yourself from the fridge, what do you choose?**

- A. The food with the nearest expiry date
- B. Whatever you fancy
- C. The food with the furthest expiry date

**3) Do you try to keep the leftovers of a meal?**

- A. Always
- B. Sometimes
- C. Never. I throw leftovers away.

**4) How often do you eat meat?**

- A. Never or rarely
- B. Up to three times a week
- C. More than three times a week

**5) I often eat vegetables.**

- A. True
- B. Partly true
- C. False

**6) When you cook at home, with or without your parents you...**

- A. usually cook just the right amount
- B. sometimes cook a bit too much
- C. always cook too much

Your profile:

Mostly As:  
**A conscious consumer**

Well done! You are an attentive consumer and you do your best to reduce food waste and the environmental impact of food production.

Mostly Bs:  
**An average consumer**

Not bad, you are trying your best to be a responsible consumer, but you could waste less food and thus help protect the environment.

Mostly Cs:  
**An oblivious consumer**

Oh dear... It seems like you waste a bit too much food. But don't worry! You can still change your habits to help reduce waste and protect the environment.