

# Consumer perspectives on agriculture:

## How different agricultural methods rank in the eyes of the consumer



### Purpose statement

The Consumer Observatory, powered by EIT Food, drives food systems transformation by providing consumer insights and guidance for agri-food stakeholders and offering market trend services to enable informed actions and decision-making toward a healthier, more sustainable and resilient future.



Food  
Consumer Observatory



Co-funded by the  
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# 1

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## Executive summary

# Background

There is an increasing urgency to improve our global food system, in the face of climate change, water scarcity, biodiversity loss and more. However, in order for sustainable farming systems to be successful, they need to be accepted consumers, and preferred over alternative conventional systems.

In order to help consumers make sustainable, healthy choices, we need to first understand what their current perceptions are of different agricultural methods. With a comprehensive knowledge of consumer preferences, stakeholders of the different methods can improve their framing and positioning. This will help them reach out to consumers more effectively. Which will in the end lead to consumer preference for products grown in a more sustainable way.

## Aim of study:

The aim of this study is to learn how consumers think and feel about four agricultural methods: indoor (vertical), precision, organic and regenerative.

Furthermore, in this study we aimed to learn about the importance consumers place on specific aspects of agriculture that affect the food system (e.g. food security, use of resources, biodiversity).

## Methodology:

The results of this study are based on two sources of data. The main source has been the [Citizen Participation Forum](#), an online community of consumers, with 86 community members from 18 countries. As part of the study, they completed online assignments, including forum discussions, questionnaires and photo challenges. Data that have been marked with a cross (✕) are from a larger [quantitative study](#) commissioned by [FoodUnfolded®](#) with 2468 participants from 6 countries.



# Key Insights

**About half of European consumers believe that our current farming systems are not resilient enough to handle changes in climate.**

At the same time, half of European consumers believe that our food supply system are becoming more fragile. This indicates that Europeans believe that changes in our food system are required for it to become more resilient. It means they are open for change. About half of European consumers believe that agriculture should combine high tech and traditional farming methods for optimum results.

**When it comes to their own consumption, participants prefer organically and regeneratively produced food, primarily for health reasons.**

The lack of pesticides and higher (perceived) nutritional values, make organic and regenerative produce the ideal choice for participants. However, price is a big barrier, and the main reason for not purchasing this produce as much as they would like to. Participants also associate organic and regenerative agriculture with small-scale farming - both romanticising it, but also seeing its limitations.

**However, when they consider feeding the global population, indoor agriculture and precision agriculture come forward as more efficient solutions for participants.**

The lower amount of resources used (particularly land in indoor agriculture) in combination with the ability to grow food regardless of weather conditions (indoor agriculture), or increased yields without excessive use of synthetic chemicals (precision agriculture), make these better candidates for large-scale food production. They also see these technological methods as realistic solutions for large-scale farmers, but not small-scale farmers.

**'Naturalness' is the most important aspect in food, while food security ranks low on participants' priorities.**

Naturalness is rated as the most important aspect of food, particularly when it comes to whole foods and is related to safety, health, and taste. The most important aspect of sustainability for participants is the use of synthetic fertilisers and pesticides, which is directly related to their perception of healthiness of food as well. An aspect of food that ranked surprisingly low, was food security, which is not a priority for participants.

**Participants see the benefit in supporting small-scale farmers and are open to alternative ways to get their produce than the supermarket.**

Supermarkets are the overwhelmingly preferred choice when it comes to food shopping as this is convenient and can be easily integrated into participants' everyday life. Participants can imagine that under certain conditions, they would be willing to shop directly from farmers and producers. Purchasing directly from small-scale farmers gives participants a positive feeling, and participants imagine scenarios where buying produce from them becomes a recreational activity, or more convenient through food-box subscriptions.

# Evaluation of agricultural methods (matrix)

**T**his table provides an overview of how different types of agriculture score on participants' perception of different aspects of food and food production. The aspects of production are ordered from highest to lowest in importance based on the [evaluations of participants](#).

	Organic	Regenerative	Precision	Indoor
Safety	✓✓	✓✓	✓	X
Taste	✓✓	✓	X	X
Health	✓✓	✓✓	✓	X
Price	X	X	✓	✓
Animal-friendly	✓✓	N/A	N/A	N/A
Without synthetic pesticides/fertilisers	✓	✓✓	X	✓
Farmer-friendly	✓✓	✓	X	X
Biodiversity	✓	✓✓	X	X
Use of resources (land, water)	✓	✓	✓✓	✓✓
Food security	X	✓	✓✓	✓✓

✓ = Participants believe that it is better than conventional agriculture

✓✓ = Participants believe that it is much better than conventional agriculture

X = Participants believe that it is similar, or worse than, conventional agriculture

N/A = Not brought up by participants in the discussions

# Insights and recommendations for indoor agriculture: The secure method

More than half of Europeans believe that high-tech agricultural methods are much more productive than traditional farming methods. The biggest concern participants have about indoor agriculture is the healthiness of the produce. Participants are concerned that plants that do not grow in soil and do not see daylight, therefore they will be inferior in nutrition compared to those grown in organic, regenerative, and conventional farming.

- Educate about the safety of indoor grown crops. Make sure to promote the nutrition of produce grown in vertical farming to alleviate concerns, but do not focus too much assuring consumers about the safety of these crops as that can be taken as a given in Europe.

Participants are not sure what they can expect in terms of price. On the one hand they feel that efficiency should make food more affordable, but on the other hand they are worried about the instability of energy prices and how this would affect the cost of indoor farming.

- Find ways to reduce energy use, and/or indicate to consumers that fossil fuel use is lower or similar to that of conventional agriculture, which uses more fertiliser.

Another suspicion that participants have about produce grown in indoor agriculture, is that it may not be very tasty. This concern is linked to the lack of soil and sunlight, but also growth speed of the vegetables and fruits.

- Proof that indoor (vertical) grown crops are just as flavourful as those grown in full soil. Allow participants to taste such crops and experience first-hand that there is no reason to be concerned about inferior taste.

The biggest benefit participants see in indoor agriculture is the ability to grow food in places where this would normally not be possible (e.g. desert climates, urban areas)

- Make efforts to prove that indoor agriculture can be a viable solution for feeding the world, not only in theory.

The benefits of this type of agriculture are currently considered the least important by the participants.

- Provide access to education and learning about the importance of resource use and

# Insights and recommendations for precision agriculture: The efficient method

Precision agriculture was the least-known method for participants at the beginning of the study. When discussed, this form of agriculture was met with the most scepticism. It is not seen as producing fruits and vegetables as tasty as organic, is not considered as environmentally friendly as regenerative, and not thought to be as secure for feeding the world as indoor agriculture.

- There is a big knowledge gap in consumers about what this form of agriculture entails, and in which ways it is better than conventional agriculture or other alternative forms of agriculture.

The biggest perceived advantage of precision agriculture is the lower usage of resources compared to conventional agriculture. The lower usage of water and land are seen as beneficial for the environment, and the reduced use of fertilisers and pesticides is seen as beneficial for the healthfulness of the crops. However, there is lack of clarity about how precise exactly this is, and how much less resources and inputs are necessary compared to conventional – or more, compared to organic and regenerative.

- Clarify the quantities of fertiliser and pesticides needed for precision agriculture and share this knowledge with consumers about how the amount is a big improvement compared to that used though conventional agriculture.

Importantly, participants assume that this technology can offer a solution for large companies, making it even more difficult for small-scale farmers to participate.

- Show consumers that small-scale farmers can also implement elements of precision farming in their work, and that this is not only available for large agricultural producers.



# Insights and recommendations for organic agriculture: The flavourful method

Organic is the most known form of “alternative” agriculture, due to its higher availability in supermarkets compared to the other types of agriculture.

- Leverage the existing familiarity of consumers with this agricultural method.

Organic agriculture is primarily appreciated for not using synthetic fertilisers and pesticides during plant growth, and growth-hormones and antibiotics in animal farming. As a result it is considered to be tastier, healthier, and better for animal welfare.

The biggest barrier for participants to shop more organic or regenerative produce, is the price. On the one hand the cost-of-living crisis has placed sustainability lower on the priority list for many consumers, and on the other hand some are not convinced that the price tag reflects the real value of organic/regenerative produce.

- Producers need to convince consumers that they are paying a “true price” for their produce, not an inflated “marketing” price.
- Authorities need to support organic agriculture to be able to compete (more) with conventional agriculture.

Another important concern is that organic agriculture might not be able to be implemented on a large enough scale to feed the world. Furthermore, it is felt that this agricultural method could be vulnerable to harsh weather conditions or climate, meaning that it is not (perceived) as being as secure as the other alternatives or even conventional agriculture.

- Organic agriculture needs to prove itself when it comes to yields and food security. It is not seen as a prolific enough method of food production and needs to convince consumers that it is possible for more than a minority to eat organically.

# Insights and recommendations for regenerative agriculture: The planet-friendly method

Slightly over half of European consumers believe that agriculture should return to traditional farming methods for environmental reasons.

Regenerative is less known than organic agriculture, but the two methods share many benefits in the eyes of participants. Next to the benefits mentioned in organic agriculture, regenerative is perceived as a step further in its environmental benefits, due to the focus on soil health. However, this was not a very known fact at the beginning of the study.

- Regenerative agriculture can be better promoted for the benefits it will have on the soil on the long term.

Compared to organic agriculture, this method is less known. There is currently no recognition in the supermarket or other shops, and consumers are not familiar with any labels or logos that indicate that a food was grown through regenerative agriculture methods.

- Create a uniform certification and labelling system for regenerative agriculture.

Like organic agriculture, the biggest perceived drawback is that it is not scalable, and therefore cannot feed the entire world.

- Regenerative agriculture needs to prove itself when it comes to yields and food security. It needs to convince consumers that it is not only an option for the “elite”, particularly as soil health will increase yields and should lower prices.

However, compared to organic agriculture, this method's focus on soil health gives it potential to keep feeding at least part of the world in the future. Furthermore, the fact that regenerative agriculture increases the soil's ability to sequester carbon is seen as a big benefit.

- Educate consumers on the carbon capturing benefits of regenerative agriculture.

Importantly, regenerative and organic agriculture were somewhat seen as interchangeable by participants.

- Educate consumers on the differences between organic and regenerative farming, and explain in which ways regenerative farming is more beneficial.



# 2

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## About the study

# Background

The world is increasingly confronted with the effects of climate change (water scarcity, floods and dry periods ) which affect crop growth, endangering global food security<sup>1</sup>. At the same time, much of the food currently produced is unevenly distributed across the globe, leading to inequalities in access to nutritious, sustainable food between different parts of the world..

The increased use of irrigation and agricultural chemicals, played a significant role in the expansion of agricultural production during the Green Revolution. However, this development consequently led to a high amount of negative side effects, including biodiversity loss, salinisation of irrigated areas, and over-use of groundwater, all of which threatens food security and environmental health today. Additionally, the intensive cultivation of fields has led to soil degradation and therefore significantly-reduced yields compared to 50 years ago<sup>2</sup>.

These developments demonstrate that there is a high urgency to improve the contemporary food system and make use of more sustainable farming methods. There is a pressing need to move away from intensive, conventional agriculture and shift towards more environmentally-friendly, resource-conserving approaches.

The average consumer notices little of these development and urgency in daily life. After all, the shelves are full of fresh products. People may have heard the alarm bells, but do not know what the core of the problem is and what conceivable solutions entail. This is especially the case because consumers are predominantly confronted with a limited product range of food produced through conventional agriculture.

Paradoxically, the shift to a more sustainable and future-proof food system is largely determined by consumers, through the products they buy and thus support. In order to help consumers make sustainable, healthy choices, we need to learn what their current perceptions are of different agricultural methods and aspects of farming. Having understood consumer preferences, stakeholders of the different methods can improve their communication, and reach out to consumers in more targeted, effective ways.

<sup>1</sup>Intergovernmental Panel on Climate Change (IPCC), Climate Change and Land, IPCC Special Report 2019, <http://www.ipcc.ch/srccl>.

<sup>2</sup>FAO. 2017. The future of food and agriculture – Trends and challenges. Rome.



## Different agricultural methods

There are several methods of farming. The more natural methods, like organic and regenerative farming, avoid the use of synthetic fertilisers, and consider soil health, biodiversity and producing seasonally. Tech-based farming methods, such as indoor agriculture and precision farming, focus on high yields, efficiency, and reducing use of resources. Conventional agriculture uses classical methods that, up to present-day, still achieve high yields against low investments. This method includes the use of chemical fertilisers and pesticides, as well as intensive animal husbandry aided by antibiotics and hormones.

Each farming system has a certain impact on the planet, the population and of course the consumer. Some farming methods lead to a more sustainable and resilient food chain compared to others, but this may come at higher production costs. Consequently, this could lead to a higher price for consumers, which they may not be willing (or able) to pay.

Consumer preference for certain products or production methods can be encouraged through specific messaging and promotions. If this is done effectively, it can increase the willingness to pay for products from a specific production method. Or it can lead to a higher demand which could lead to economies of scale, which could then lead to a lower price. Hence, it is necessary to understand the consumers' motivations regarding the purchasing and usage preferences. Whether they believe the products are tastier, healthier or because they believe they are better for the planet.

In order to understand consumer perceptions of different agricultural systems, we need to learn how consumers see the full spectrum of possibilities, which is what this research project sets out to achieve.

# Aim

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To support farmers in meeting sustainability requirements and to shift their practices into more sustainable approaches, it is important to create awareness and demand about alternative food production methods amongst consumers. This includes increasing knowledge about how food is grown in order to help consumers make informed decisions, with the goal to build a future-proof agricultural system.

To achieve this goal, we analysed and evaluated the consumer perceptions of different agricultural systems:

1. Indoor (vertical) agriculture
2. Precision agriculture
3. Organic agriculture
4. Regenerative agriculture

We gained insights into consumer perception, consumer acceptance, willingness to pay and shopping differences regarding the different farming systems. It is important to understand what kind of agricultural systems the consumers distinguish, which associations they have with the different agricultural systems, what they see as their strengths and weaknesses, and which agricultural system is preferred overall (and why).

We discussed these topics with 86 consumers from 18 different countries. The topics and questions were informed by interviews with 4 experts from different organisations within the agricultural domain. By obtaining insights on how consumers view the agricultural methods, we advise on how to develop more tailored consumer-centric promotion and communication as a step towards achieving a healthier, more sustainable food system. When we report findings about the participants, we refer to findings from this study.

In parallel, we conducted a larger-scale quantitative study for Food Unfolded, EIT Food's citizen-facing platform, where we measured consumer attitudes regarding agriculture. In this study, 2468 participants from six European countries took part. A few from those findings are shared in this report. When we refer to 'European consumers' we are referring to findings from this large quantitative study.

This work forms part of a series of studies to gain consumer insights for EIT Food and the EU.



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## High-tech agriculture

Slightly over half of European consumers believe that high-tech agricultural methods are much more productive than traditional farming methods. †

**I believe modern, high-tech ways of farming are much more productive, use less resources and yield more produce.**



■ Strongly Agree ■ Agree ■ Neither disagree or agree ■ Disagree ■ Strongly disagree



## Indoor (vertical) agriculture

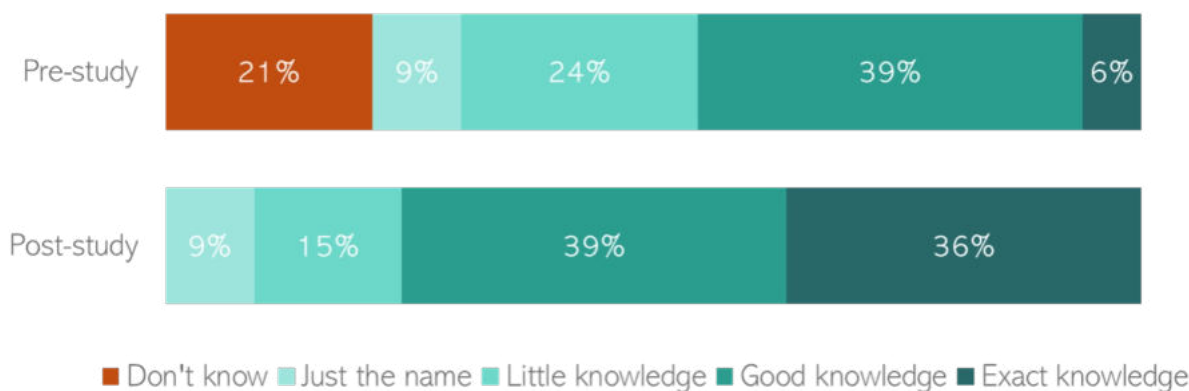
At the start of the study, more than half of participants were at least a little bit familiar with indoor agriculture. However, in the discussion it became clear that some participants confused it with greenhouse farming.

*“Well, for me big plastic or glass houses come to mind, where plants are grown over one another. Saw that once in Spain.”*

Sebastian (39), Germany

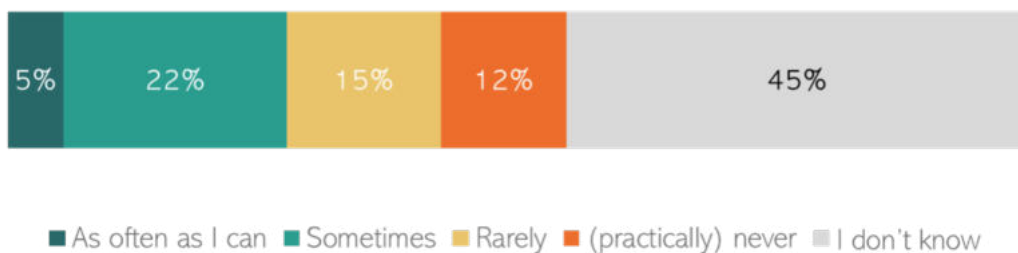
After reading a description explaining the difference with greenhouse farming, participants understood the difference.

### Could you indicate how well you know the difference between indoor (vertical) and conventional farming?



Just under half of participants claim to not know whether they buy foods produced with indoor agriculture.

### How often do you buy foods produced with indoor agriculture?



## The biggest benefit of indoor agriculture is food availability and security

Participants perceive indoor (vertical) agriculture as **capable of feeding more people** in any place in the world, as indoor farming makes it possible to grow plants indoors regardless of land and climate conditions.

*“The most important factor is that healthy food can be created in places where there is a need and the land cannot be cultivated, this can solve the problem of malnutrition in many countries.”*

Giannis (40), Greece

*“With every year population over earth is growing while the usable soil and water sources getting smaller. In the future solutions like indoor agriculture will be mainstream so we can have enough farm products to feed the whole world.”*

Bugra (26), Turkey

This is also related to food security in case of unfavourable weather or climate conditions, making indoor agriculture **resilient** to climate change.

*“So the weather and any disasters that would, for example, destroy the harvest, will not have an effect. That’s totally cool for me.”*

Jiří (31), Czechia

The complete control of temperature, light and other growing conditions means that **food can be grown year-round**, and countries do not depend on importing crops from other continents, reducing in this way their greenhouse gas emissions.

*“Growing food in warmer climates and transportation it to a different country I think is a lot worse.”*

Jose (52), Netherlands

Indoor agriculture also offers more possibilities for **local production**, and growing produce out of season.

*“The benefit of vertical farming for me may be to find a variety of vegetables and fruits in every season, because the food that grows in winter cannot grow in summer.”*

Ebru (47), Turkey

This has **an impact on the GHG emissions** of indoor farming production. Participants believe that the fact that food can be grown anywhere means there is no reason to transport as much produce, which reduces GHG emissions.

*“They can grow food where is it not possible normally. This allows to reduce the kilometres the products need to do before being bought”*

Michael (43) France

## Minimal use of pesticides and fertilisers are considered to have potential health and cost benefits

Furthermore, as production takes place indoors, participants believe there is little to no need for pesticide use. This is a benefit for the **healthiness** of the produce grown, but also the expected price tag in the supermarket.

*“Yeah less insects also mean less pesticide used! So that also give you better healthy products and no cost on buying pesticides must be affecting the cost directly.”*

Bugra (26), Turkey

Another benefit brought up by participants is that as it does not take up as much space, meaning it can **save land for uses other than agriculture**.

*“Not using as much land and growing [food] in cities is a good society benefit.”* Phil (55), United Kingdom

*“Less use of land is important to society and that it can grow in cities and deserts, leaves more place for green fields, places to travel, etc.”*

Mila (42), Israel

Indoor farming was also mentioned by a couple of participants as **being economically more advantageous for producers**. As they do not depend on weather conditions and have more control over the produce they grow, they do not need to make as many losses as conventional farmers sometimes do.

*“The person who grows his products can produce profit all year long and also can harvest any product he wants.”*

Kostas (23), Greece

Finally, a couple of participants perceive the controlled environment within indoor farming as beneficial for **consistent quality** of the products.

*“Constant quality - I think the quality of everything grown is quite constant. So I know what I buy.”*

Sebastian (39), Germany



## The biggest concern about indoor farming is its reliance on energy, and with the current gas prices, the direct consequence on price

As indoor agriculture is dependent on **energy** to grow the crops indoors, increase in these prices is worrisome for participants. In times of the **increasing energy and gas prices**, this is expected to affect the price-tag on the final product.

*"This process needs artificial energy to work and with the rising price of energy worldwide, the produce could end up being more expensive than expected. This would have a direct effect on my financial situation."*

Patricia (41), Spain

Participants have mixed perceptions regarding the implementation of new technologies and its influence on the end price of the products indoor farming. Participants are concerned that the cost of **implementing new technologies** will fall on the consumer:

*"Vertical agriculture means incurring many fees: the development of new rooms of production with the installation of adaptive robots, paying for artificial lights and artificial air during the growing process, train a new kind of staff, etc. I guess vertical agriculture would cost more than traditional agriculture."*

Florence (52), France

However, many participants believe that indoor agriculture can provide a larger amount of food, which could lead to lower prices in the long run.

*"It will allow a greater production overall and thus reduce prices: we are all feeling the pinch with the cost of living rising so this will help"*

Lisa(49), Ireland

Even though indoor agriculture is mostly perceived as being healthy, primarily due to the lower use of synthetic chemicals during plant growth, there are nevertheless some **nutritional concerns** of indoor agriculture because the plants grow in an artificial environment.

*"But do indoor fruits and vegetables contain as much vitamins as fruits and vegetables produced in soil? I'm not sure."*

France

Isabelle (48),

*"It seems to be no season anymore for the fruits and the vegetables growing in this way. I am very annoyed about this, because I think that this food would be less nutritious (less vitamins, less nutrients and more water inside of this food)."*

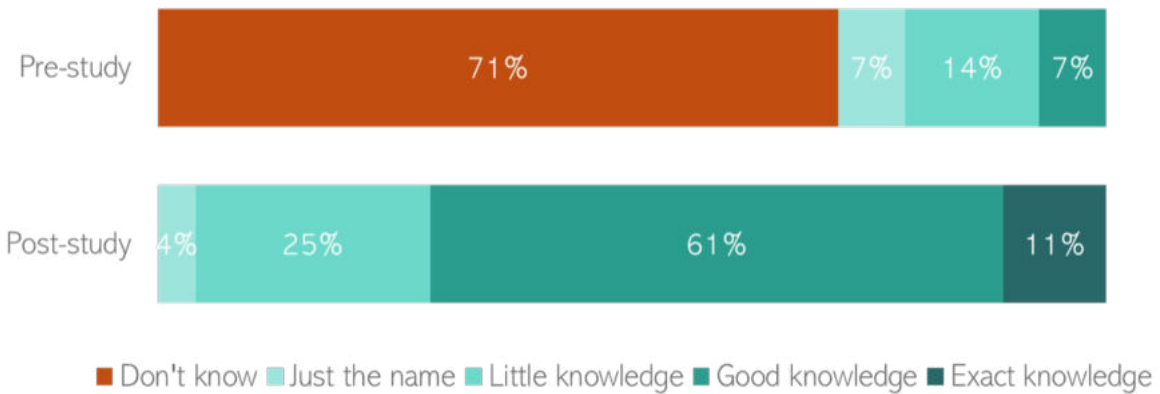
Markus (40), Finland

Participants were also generally not convinced about the taste of plants grown in indoor farming. They suspect that the lack of fertile soil and sunlight might influence the **taste** of fruits and vegetables. There is also a belief that the growth of indoor crops is faster than

# Precision agriculture

Before the study, nearly two-thirds of all participants had never heard of precision agriculture, making it the least known type of the four.

## Could you indicate how well you know the difference between precision and conventional farming?



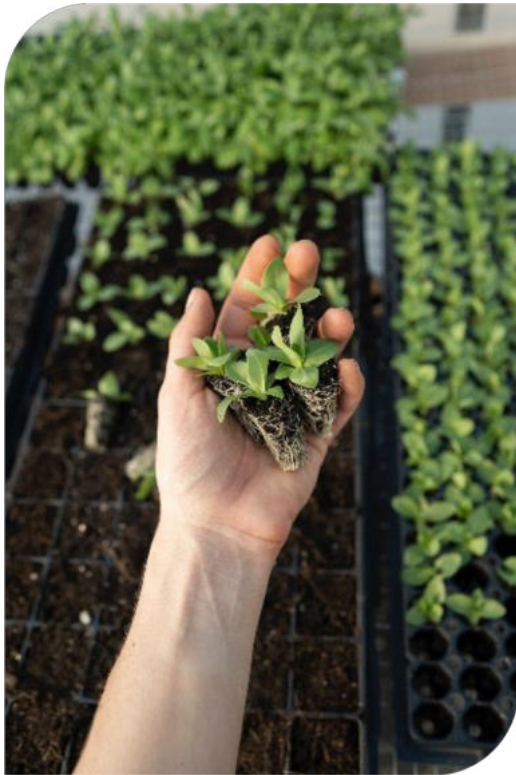
Two-thirds of participants do not know whether they buy foods that have been produced with precision agriculture.

## How often do you buy foods produced with precision agriculture?



## Participants are positive about the low use of resources in precision farming, which they expect will influence prices on the long term

Participants expect that **efficient use of resources** might mean lower prices on the long term. By creating optimal growing conditions through sensor technology, plants can grow faster and more efficiently, which participants expect may result in lower product prices.



*“The price of this kind of food can be lower, because it is grown in an optimised way. Everybody will enjoy to pay lower prices.”*

Michael (43), France

Besides a financial benefit, efficient use of resources in precision agriculture is also appreciated for the **environmental benefit**. Saving water is particularly seen as an important benefit for precision agriculture, as water is recognised as a finite resource.

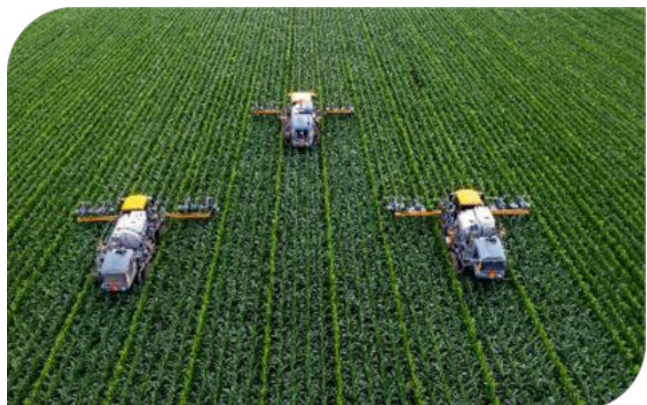
*“The first reason is the need to use less water. We are going through times in which, with climate change, we have fewer and fewer water resources and this is the most important reason.”*

Téofilo (54), Spain

Participants also believe that in precision agriculture **less land is needed** than in conventional agriculture, due to the technology which can make optimal use of the arable land in order to achieve the greatest possible yields.

*“Maximum utilisation of geographical conditions - in each geographical area they will be able to grow the appropriate crops and thus save open and agricultural areas.”*

Maya (46), Israel



## The biggest drawback is the cost and ability of (smaller-scale) farmers to adopt this technology

The fact that fewer pesticides and fertilisers are used than in conventional agriculture is considered to be a benefit to the **healthiness** of the produce.

*“[A benefit of precision agriculture is the] reduction of pesticides and fertiliser. The less, the better for me as the consumer of the food.” Lital (30), Israel*

Even though fertilisers and pesticides are used to a lesser extent in precision agriculture, there are participants that **do not believe this is good enough**. They perceive a negative ecological impact of precision agriculture due to the use of chemical additives

*“I am not sure that this type of farming is very 'green' or organic. It just helps the wealthiest farmers save money.” Rupert (57), United Kingdom*

*“I always worry about fertilisers and pesticides even though they in this form of agriculture is used precisely. But how precise can it get? Residue of chemicals can seep down through the layers of soil and contaminate our drinking water.”*

Henriette (51), Denmark

*“Problem is, how will they bring harmony to the soil to get the best productivity? More chemicals?” Elisabete (53), Portugal*

Furthermore, even though precision agriculture may be **more lucrative in the long run**, participants are concerned that the **initial costs** of developing and implementing this technology **will fall on consumers**.

*“The initial cost could be high, which means that the products will have higher prices as well.” Andreea (41), Switzerland*

However the biggest concern is that only **large businesses** with larger financial reserves can afford the high investments necessary to implement precision agriculture.

*“These technologies are not for the smaller farmers because of their input costs and complicated collection of data and their management.” Veronika (37), Czechia*

This is a social concern for smaller-scale farmers' businesses, and that they will not be able to keep up with the competition. This will also influence **local rural economies**, and work opportunities.

*“It will be unfeasible for the small farmer. It will be another way of strangling local economies.”*

Jose (61), Portugal



# 5

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## ‘Old-fashioned’ agriculture



Slightly over half of European consumers believe that agriculture should return to traditional farming methods for environmental reasons. †

**I believe we should go back to old-fashioned ways of farming as much as possible for environmental reasons**



■ Strongly Agree ■ Agree ■ Neither disagree or agree ■ Disagree ■ Strongly disagree

# Organic and regenerative agriculture were found to overlap on most benefits and drawbacks

Even though organic agriculture and regenerative agriculture have differences between them, many of the benefits and drawbacks that participants see in these two methods overlap.

For this reason, in this chapter, organic and regenerative agriculture are grouped into one type of agriculture, and a few distinctions are made for points that are relevant for either one.

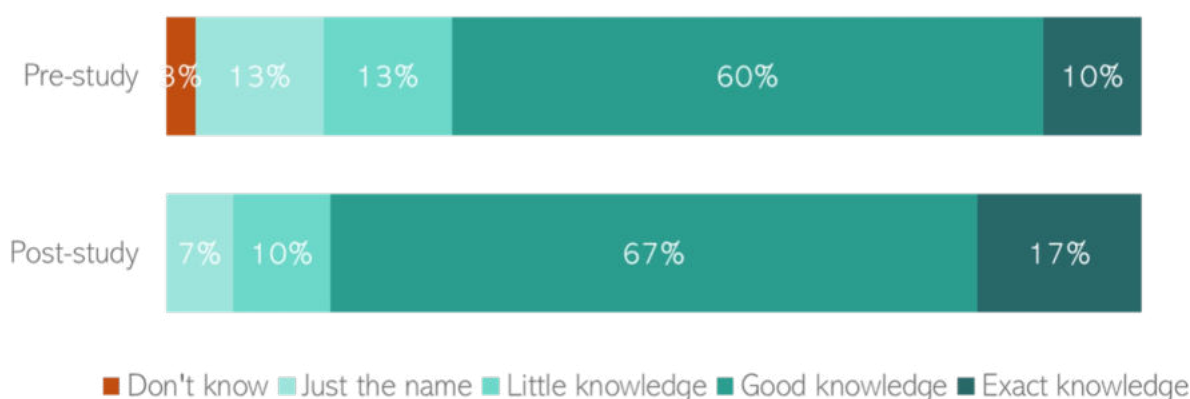
One of the challenges that proponents of these two forms of agriculture have to face is communicating the differences effectively. Both organic and regenerative agriculture have their strengths and weaknesses, but these are not yet clear to many consumers.



# Familiarity with organic agriculture

Organic agriculture was the agricultural system the participants were most familiar with, before and after the discussions took place.

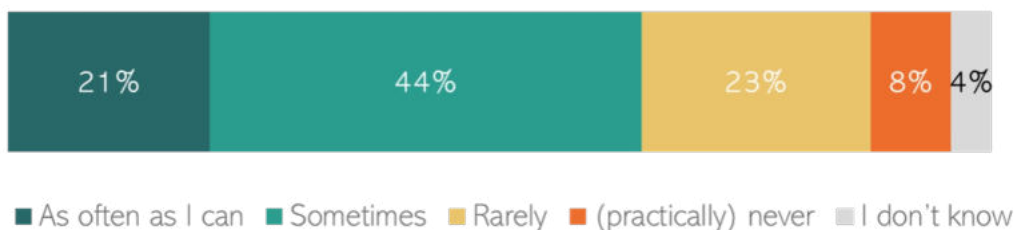
## Could you indicate how well you know the difference between organic and conventional farming?



Even participants who did not know how organic agriculture differs from conventional agriculture, are familiar with the name and labels they see in the supermarket.

*"I always try to buy things with safety seals (bio, fairtrade) if the price allows, because unfortunately all these products are still very expensive."* Lilian (48), Switzerland

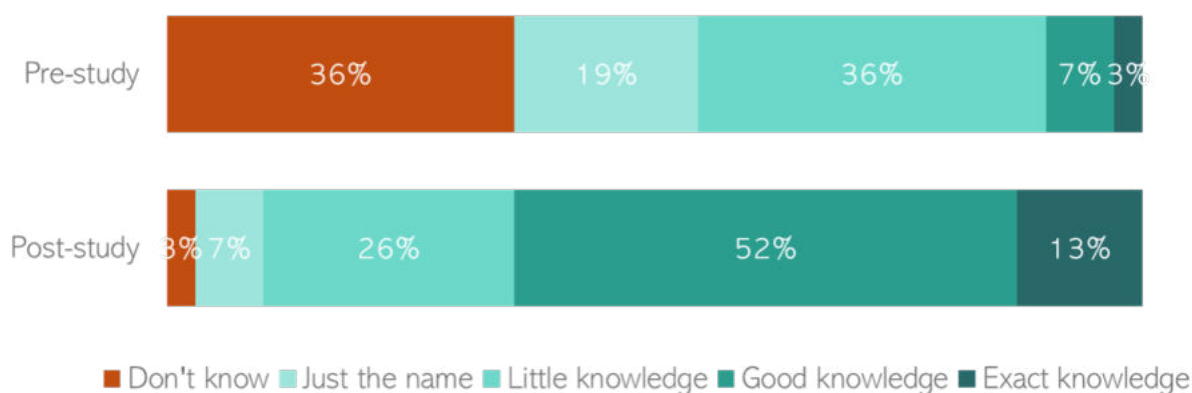
## How often do you buy foods produced with organic agriculture?



# Familiarity with regenerative agriculture

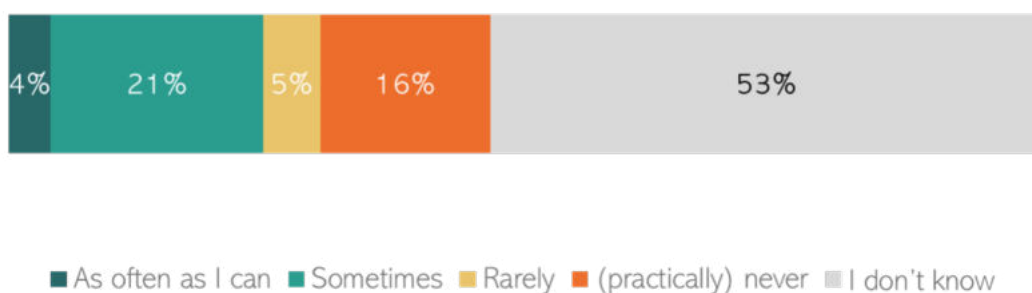
Most participants were not familiar with regenerative agriculture at the beginning of the study, with over half of participants only knowing it by name or not at all. After reading a short description and discussing this agriculture method, two thirds of participants stated that they have at least a good amount of knowledge about regenerative agriculture.

## Could you indicate how well you know the difference between regenerative and conventional farming?



Just over half of participants are not aware of buying regenerative produce in the supermarket, meaning that this agriculture method is underrepresented on the shelves, or not clearly communicated.

## How often do you buy foods produced with regenerative agriculture?



# Organic and regenerative agriculture are perceived as being the two 'natural' methods of agriculture

The biggest benefit of organic and regenerative farming according to participants, is the **naturalness** and **healthiness** of the products.

*"The benefits of organic agriculture for me is, that I've a security that my food isn't poisoned with a lots of synthetic pesticides or other foreign substances!"*

Tommy (44), Denmark

The fact that they are **grown using fewer or no synthetic pesticides, fertilisers, and growth hormones** gives participants the impression that they will be healthier than products grown in conventional agriculture.

*"Organic agriculture by using less synthetic substances, fertilisers and pesticides it is going to be better for the overall health because everything that is used on the production process is passing to us through consumption so it will have a direct impact on our own health and well being to use organic materials on agricultural products."*

Bugra (26), Turkey

Participants believe that foods grown in organic and regenerative agriculture are also **more nutritious** than foods grown in conventional agriculture. Many expect that the regenerative and organic production process lead to a **higher nutrient density** due to the non-use of synthetic additives, and see this as a **healthier growing environment** for the plants.

*"Organic agriculture allows for the development of foods that are of better nutritional quality and that respect the seasonal cycles of plants."*

Luis (35), Portugal

Participants were also **positive** about the fact that **genetically modified seeds are not used** in organic and regenerative agriculture.

*"Does not contain pesticides, fertilisers, or GMO - it is good for my health"*

Markéta (34), Czech Republic

Next to being healthier, many participants perceive **organically grown products** to be **tastier**. They believe that use of fertilisers and pesticides can affect the taste negatively, but also associate **"traditional"** and **"natural" seeds** and the way of production in resulting in a **better taste**.

*"The most important thing is that the products are healthy, not stuffed with chemicals and garbage. This translates into taste and quality."*

## Protection of soil, water resources, and biodiversity are strongly associated with organic and regenerative farming

Participants associate **soil protection** with organic and regenerative agriculture, as neither of these methods allow the use of synthetic fertiliser. Protecting the soil is seen as important for food production, as a healthy soil can produce higher yields and does not become depleted.

*“Not using pesticides etc. and growing cover plants will prolong the season for insects etc., being a benefit for biodiversity in all the food chain.”*

Benny (62), Denmark

*“Also the soil quality won't get corrupted by other synthetic materials or things like chemical fertiliser so you can use the same area for farming for longer when you use organic sources on your agricultural production.”*

Bugra (26), Turkey

Another benefit of organic and regenerative agriculture is the **protection of biodiversity**. The participants perceive organic and regenerative beneficial (or at least less harmful) for biodiversity than conventional agriculture.



Participants also named organic and regenerative farming as beneficial for the **protection of water resources**, as no synthetic fertiliser and pesticides are used. This means that there **is no risk of water sources being polluted** with these substances, and drinking water remains clean.

*“The benefits for me are also that our drinking water is way better protected with this form of agriculture, because there are not used chemicals. This is so important. It is such a privilege to drink uncleansed water directly from our underground. No smell of chlorine here.”*

Henriette (51), Denmark

## Organic and regenerative farming are seen as more social ways of farming: they offer better animal welfare conditions, and are fairer to farmers

Participants perceive organic agriculture as offering **better living conditions for animals**. They assume that within the organic approach animals have more space, get better and more natural foods, and are less stressed.

*“Organic agriculture is concerned about animal welfare, because animals are treated as ‘creatures’, there is no lack of space in stables, natural feeding and field lairage wherever possible.”* Clemens (69), Switzerland

Some participants perceived the better living conditions not only in the context of animal welfare but especially as a relief for their conscience when consuming meat.

*“Animals have better living conditions. That makes me feel good, or at least less guilty.”* Jaakko (44), Finland

Within **animal farming**, the use of **growth hormones** and **antibiotics** is perceived as a very big concern, affecting health and potential antibiotic resistance, and therefore organic and regenerative agriculture are seen as more beneficial.

*“And the other benefit is about animals, because when farmers use antibiotics, it can stay in the body of the animal so we eat it and it can cause damage in our body, so in organic agriculture this shouldn’t be a problem.”*  
Zuzana (26), Czech Republic

Furthermore, participants associate organic agriculture with **local food production**, which **supports small-scale farmers** and the **rural economy**.

*“[Another] societal benefit of organic agriculture is to keep the countryside alive. Organic agriculture means small farms which mean people living in the country can stay in the country, can keep small farms and are not obliged to move to the city.”*  
Isabelle (48), France

# Regenerative farming is appreciated for its focus on healthy soil, and the consequences for carbon emissions, yields, and biodiversity

A small number of participants is familiar with the concept of **carbon capture**, and see regenerative agriculture as a way not only to save CO<sub>2</sub> through more sustainable farming, but even to **reduce the amount of CO<sub>2</sub>** in the atmosphere through cover cropping.

*“It is a great way to bind CO<sub>2</sub> helping the country to reach CO<sub>2</sub> goals”*

Benny (62), Denmark

*“It is far better for the environment using the cover crops to protect the soil and stop CO<sub>2</sub> emissions.”*

Petrina (39), United Kingdom

A couple of participants brought up the fact that **biodiversity** can flourish under regenerative agriculture, through practices like crop rotation or cultivation of local species.

*“Nature will be preserved in your area because the fields are being taken care of in a responsible way. So the fields will continue to deliver food, flowers and insects.*

Jose (52), Netherlands

Responsible use of resources is also seen as an advantage of regenerative farming. Specifically producing as little waste as possible and reusing resources when possible, for example organic waste as compost.

*“Reduce waste because instead of incinerate organics waste we will use it in fields.”*

Lucille (21), France

*“The circular economy means less wastage, which makes everything more economical and also increases the satisfaction of the population.”*

Saskia (37), Germany

Finally, there was some dispute about the ability of regenerative farming to feed the world in the long run. On the one hand it **requires more land**, and due to the lack of synthetic fertiliser, its **crops are more vulnerable**. However some participants believe that due to the focus on soil health, it has potential to feed the world on the longer term.



## The primary concern about both farming methods is affordability

Nearly all participants mentioned that organic products are more **expensive** than their conventionally grown counterparts, and as a result most participants cannot afford them on a daily basis.

*“The main disadvantage is the fact that organic, natural, biological products are much more expensive so I can’t always go for these options because of budget limits.”* Kristian (47), France

*“I would like to do a lot more organic groceries but they are twice as expensive so that has to change too.”* Ginette (52), Netherlands

After discussing these agricultural methods, 97% of the participants pointed out that organic is **less affordable** than conventional agriculture, while 68% believe conventional to be more affordable than regenerative.



*“In my opinion it will be an agriculture for more affluent social classes, the products will be expensive because the expenses to produce will be greater. It will not be accessible to many people because the production costs are high and so is the final product.”*  
Elisabetta (32), Italy

One of the mentioned reasons for which specifically organic products are perceived to be more expensive, is the perception that **yields are smaller**. Furthermore, organic and regenerative agriculture are associated with **small-scale farming** compared to conventional agriculture, and this is expected to have a negative impact on price as well.

Primarily this is related to the fact that organic and regenerative agriculture do not make use of **synthetic fertilisers, pesticides, or growth hormones**. Participants believe that as a result crops and animals grow more slowly, are smaller, and are **less resilient** to pests and weather conditions, which all affect the **final price for the consumer**.

*“It also seems that this way of farming is more vulnerable to wind and weather. So that could lead to huge differences in prices from season to season. One year the harvest of potatoes did not go so well so the prices will go up. Another year it went splendid, so the prices are lower. I need a stable price development for something as basic as food.”*  
Henriette (51), Denmark

## Price is also a concern for those who are not convinced about the added value of organic farming

Another reason for which organic and regenerative products are perceived to be more expensive is the assumption that these methods consume **more time**, **more labor** and therefore **higher costs** during the growth and production.

*“All the process is much more time consuming, hence the price is higher for the whole supply chain and eventually to final customer.”*

Ela (40), Israel

*“Organic is more expensive and this is reflected in several aspects. Farmers have higher costs, consumers have higher prices.”*

Jiří (31), Czech Republic



A small group of participants believe that organic products have **higher profit margins** than conventionally grown products. There is also a belief that ‘organic’ is a **marketing label**, and an **excuse to increase margins**, rather than an agricultural method that is **genuinely more costly to the farmer**.

Some participants mentioned a perceived lack of transparency within the organic certification, as well as a distrust in organic labelling in general. This is particularly because of lack of traceability and possibility for consumers to validate the positive claims.

*“Labelling a product as organic does not necessarily mean that it actually is. To me there is a lot of marketing behind it.”*

Andreea (41), Switzerland

*“Firstly would be the trust, (or lack of it), in the whole ‘Organic’ labelling. The dilemma for me personally is ‘trust’. I should know the organic choice is the right one. I can’t do a 1,2,3. list, as I feel the Trust Issue, is the only thing I find important.”* Brian (63), Ireland

*“Moreover sometimes there is a lack of traceability and transparency that makes people doubt about the product itself.”* Maria (28), Italy

## There is also concern that these methods are unable to provide enough food for a growing population

Most participants perceive organic and regenerative agriculture to **require a lot more land** to achieve yields similar to those of conventional farming. This has a negative impact on the **alternative use of land** for people and nature, for example for rewilding.

*“I also think that these methods may be counter-productive. If yields are lower then more land may be required leading to more deforestation which would undermine any positive impact of the regenerative farming.”* Rupert (57), United Kingdom

Even though participants perceived organic agriculture as a more sustainable farming method, they believe that it is **not suitable for feeding large populations**. They pointed out that this farming method is mostly used on a small scale. Furthermore, the lack of resilience in different climates is a cause for concern for the poorer regions of the planet.

*“And depending on how big you define society, if we look at it globally, will there be enough food for everyone with this kind of lower yield agriculture? In the worst case, it can intensify the hunger crisis.”*

Henriette (51), Denmark

*“The biggest drawback is that organic farming is not done on a large scale. In other words, it is not possible to feed a large population with it.”*

Lilian (48), Switzerland



# 6

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## Aspects of food production

About half of European consumers believe that agriculture should combine high tech and traditional farming methods.



**New, high-tech farming solutions can and should coexist with older & more traditional approaches**



■ Strongly Agree ■ Agree ■ Neither disagree or agree ■ Disagree ■ Strongly disagree

## When it comes to food production, 'naturalness' is the most important aspect

When participants were asked to think of which aspects of food and food production are important to them, the most common answers were related to natural ingredients and growing conditions.

- **Natural is better...**

In general, most participants associate 'natural' production processes as better for their health and the environment. This means that no chemical additives should be used during the growth period, but also no preservatives added during the further production.

*"First important thing about food I think about is, if it is 'natural' or 'chemical'. Like how near it still is to nature. I know that almost all food is produced by the industry and not grown in pure nature - but there is a large scale from 'nature near' to '100% chemical and industrial', which I think about. And nearer to nature is positive here, while too much industry seems negative."* Sebastian (39), Germany

- **...but it is more important for fruits and vegetables than processed foods**

However, this association is particularly strong when it comes to fruits and vegetables – or other unprocessed foods. Even participants who look natural production methods when they buy fresh foods, are less interested in doing so when it comes to processed foods.

*"In the case of fresh/raw products (fruits, vegetables, meat, fish...): it is important to know how it is been produced"* Laetitia (40), France

*"Normally I do not think about how food is produced. However, this is different for vegetable and fruits where I rather choose BIO products where there is high probability (of course not 100%) that it was grown with respect to nature and limited usage of artificial supplements"* Ivan (35), Czech Republic



- **Buying locally produced vegetables and fruits is also an important rule-of-thumb**

Many participants try to purchase locally produced foods, but this too is primarily the case for fruits and vegetables.

*“I think it is very important that our food is local, so no green beans from Turkey but simply from the Netherlands. Local and unsprayed that is what I want, but there is hardly any or very expensive. This is the world upside down and not ok.”*

Ginette (52), Netherlands

- **Taste is important – and related to naturalness, seasonality, and being locally produced**

The motivation to buy locally, or seasonally produced food is not only related to wanting to eat healthily or sustainably. For many participants, better growing conditions are reflected in the product’s flavour.

*“When buying vegetables or fish I manage to buy them when they are on season most of the time they are more tasty.”*

Christos (32), Greece

*“When the product is not fresh, it can be felt in the taste and texture”* Lital (30), Israel

- **Animal welfare, and farmer and labourer wellbeing is important for few**

For a few participants these aspects are of primary importance, but they are a minority.

*“I think the most important thing is the wellbeing of farm animals.”* Markus (40), Finland

*“I also want everyone in the chain to have fair working conditions including fair wage”* Sherien (44), United Kingdom





- **Food security, and particularly the resilience of a kind of agriculture, were not often mentioned**

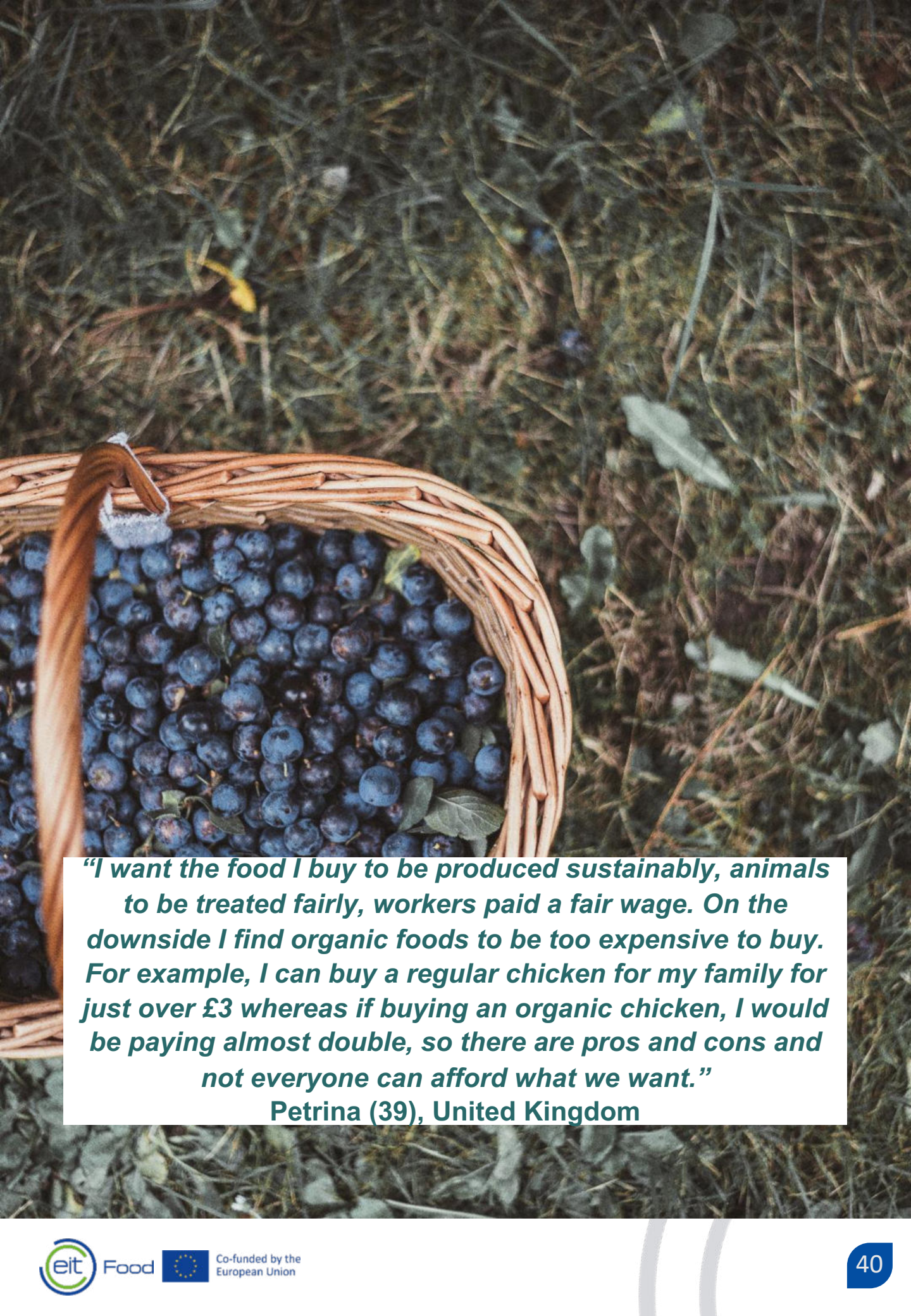
Having enough food, or having a guarantee of food in the future, is not an aspect of food and agriculture that came up often in the discussions. It is not top of mind for the participants, and is possibly related to taking availability of enough food for granted. Food security for other parts of the world, for example developing countries, did come up.

- **A small number of participants do not consider growing conditions when they buy food**

For many participants, aspects of food production are part of the value of food: they influence taste, healthiness, and make them feel better about their environmental impact. However, a small group of participants admits that aspects of food production are not relevant when it comes to their daily food shopping.

*“I am a very bad consumer!! I never give much thought to where things come from or how they have been grown. If it looks nice and tastes nice and the price is ok then I will purchase.”* Rupert (57), United Kingdom





***“I want the food I buy to be produced sustainably, animals to be treated fairly, workers paid a fair wage. On the downside I find organic foods to be too expensive to buy. For example, I can buy a regular chicken for my family for just over £3 whereas if buying an organic chicken, I would be paying almost double, so there are pros and cons and not everyone can afford what we want.”***

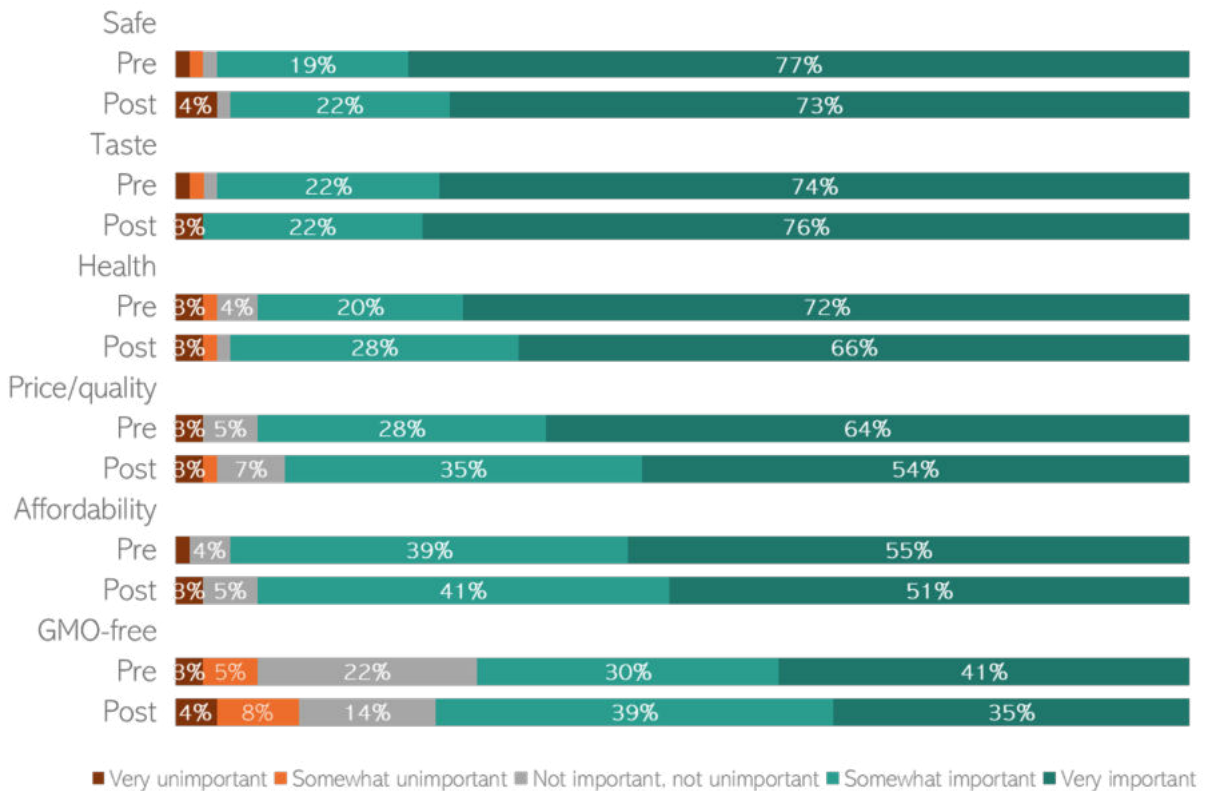
**Petrina (39), United Kingdom**

# Aspects of agriculture that influence participants directly are rated as most important

**A**t the beginning and end of the study, we asked participants to rate the importance of a series of aspects of food production.

Personal aspects (safety, taste, healthiness, price-quality ratio, affordability, and presence of GMO) were generally rated as most important, with safety being rated number one, followed by taste and healthiness.

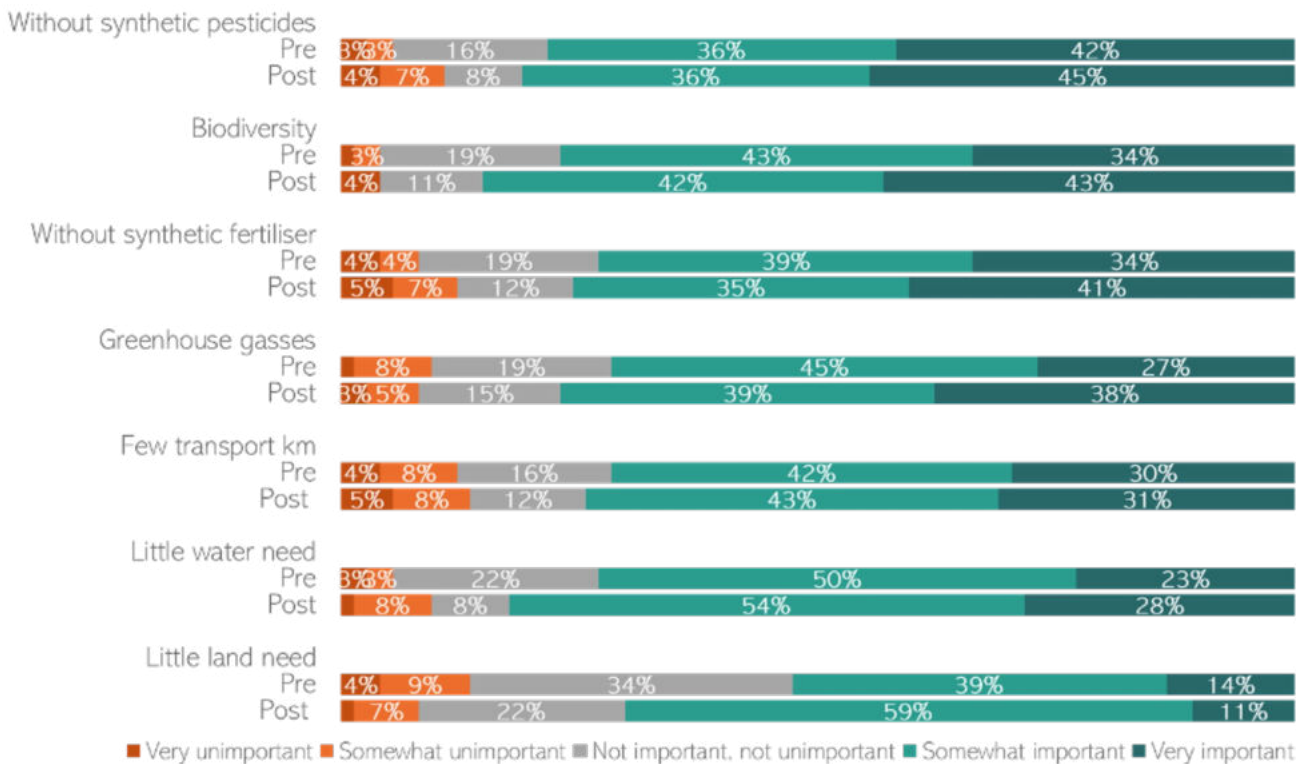
**Importance of personal aspects of food (production)**



Price/quality ratio and affordability score very similarly to one another, however affordability is rated “very important” by fewer participants (55%) than the ratio between quality and price (64%) in the first measurement. However, when participants discussed which aspects of food production are most important to them in the different agricultural systems, affordability was mentioned by everyone. Healthiness of the produce was the second most mentioned aspect, followed by taste and quality.

# Rating the importance of environmental aspects related to food production

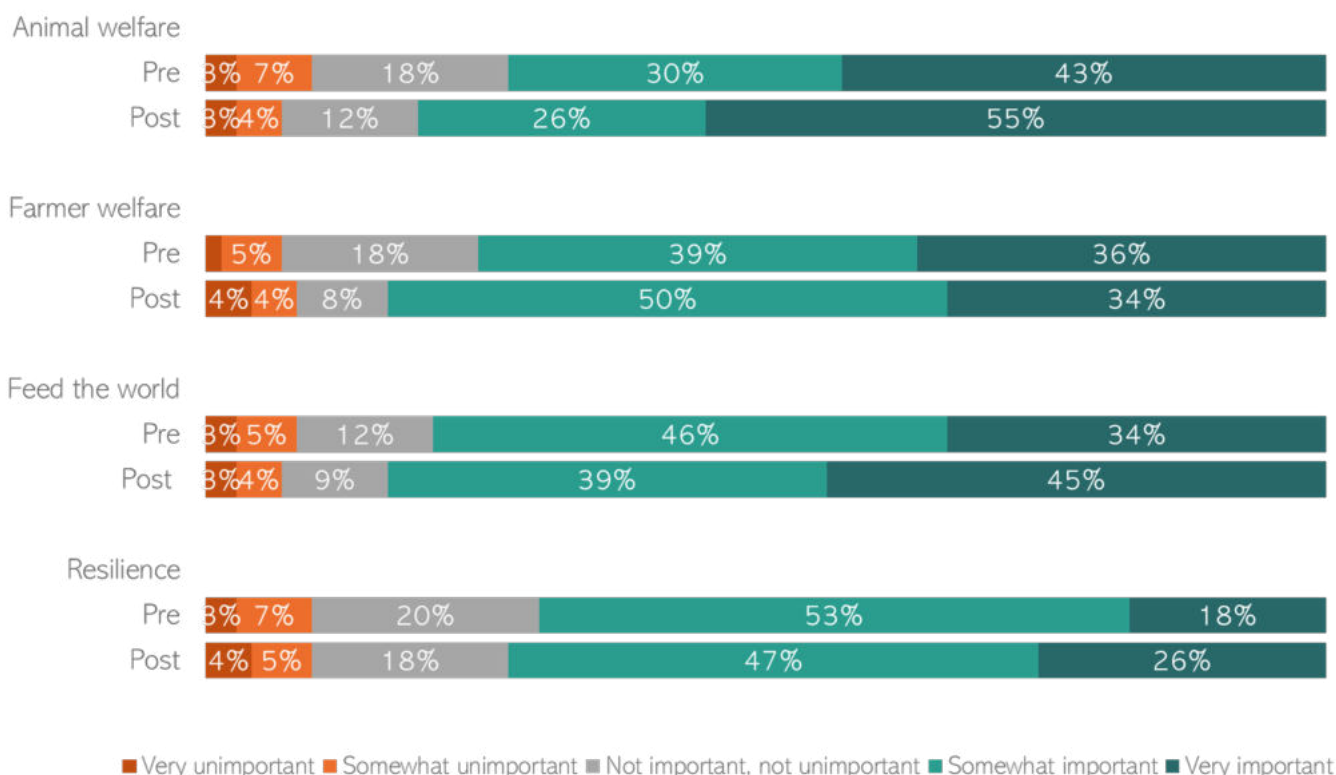
## Importance of environmental aspects of food (production)



# Rating the importance of societal aspects related to agriculture

When participants evaluate the different factors influenced by food production, animal-friendly food production comes first, followed by farmer-friendly production while the resilience of crops comes last.

## Importance of societal aspects of food (production)



All the questioned social aspects are scored similarly when summarising the evaluated importance. Around two-thirds of the participants rated every factor as important.

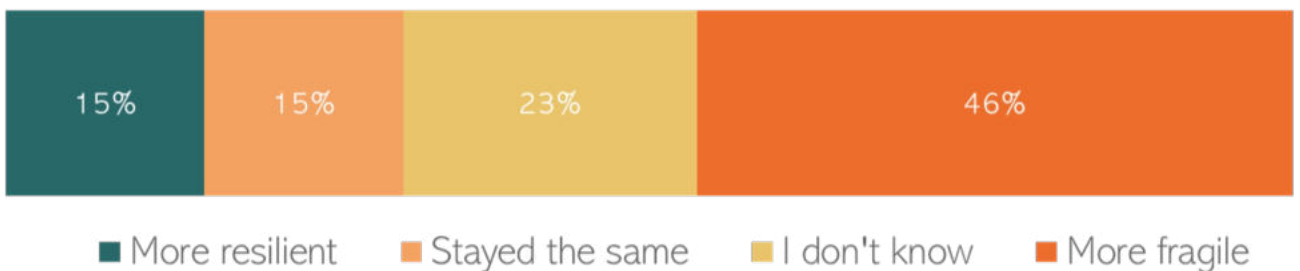
Resilience was not further discussed as an isolated factor but more in the context of feeding the world.

Nearly half of European consumers believe that our food supply systems are becoming more fragile.

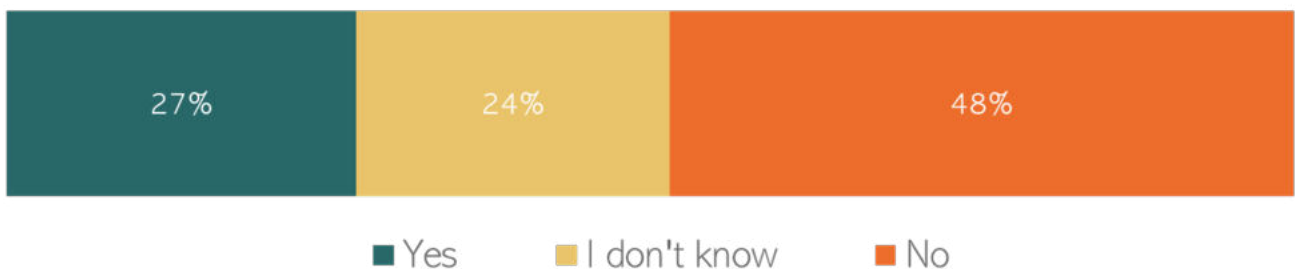
At the same time, about half of European consumers do not believe that our current farming systems are resilient enough to handle changes in climate.

This suggests that Europeans believe that changes in our food system are required to make it more resilient. †

**Do you believe that our food supply systems are becoming more fragile, more resilient or stayed the same?**



**Do you think our current farming systems are resilient enough to handle changes in our climate?**





# 7

## Alternative ways to reach the consumer's plate

## Alternative food chains

Currently, farmers that produce food using these alternative methods are under-represented in supermarkets. The costs of production are currently too high to compete with conventional agriculture. Alternative ways to reach the consumer may be the key for small- and medium-scale farmers to sell their produce. However, consumers need to be open to points-of-sale other than the supermarket, and perhaps different shopping experiences.

Most participants buy (most of) their food in the supermarket. This shopping decision is mainly based on convenience, as supermarkets are seen as a one-stop-shop that offers a great variety of products to choose from. A few participants go to farmers markets or purchase directly from the farmers, but these options are perceived as more expensive and inconvenient.

During food shopping most consumers experience having to decide between the cheaper conventional options or the more expensive organic products. They do not see produce grown in the other alternative production methods offered in the supermarket. When they are confronted with prices they often have to opt for the less expensive versions, which are ones produced using conventional agriculture.

However, new ways of offering agricultural products could reduce these costs for the consumer while the direct purchasing option also would be beneficial for the farmers themselves. Participants suggested several alternative options for buying food, but evaluate them differently in regard to the end-prices of the foods.

These alternative business models could have a positive impact on farmers. This is because farmers have a higher profit margin due to the direct purchase without going over a middleman.

Half of the panel participants believe the logistics chains between consumers and farmers need to be shorter. Furthermore, about half of the participants believe that farmers need more support from retailers and authorities.

### Which aspects of our food systems do you think need to improve most if we're to create more climate resilient growing systems?





## Ideas for alternative food chains I

- **Farmers' markets are the most used supermarket alternative**

Some consumers already have experience in buying at farmer's markets or directly from the producer, especially fruits and vegetables, but also eggs or meat. The perception of the prices varies between participants, and particularly between different countries.

However, the prices are mostly perceived as higher than those in the supermarket.

*"I often buy fruits, vegetables and meat at local markets or directly at the farm. I love doing that: I buy local (I support my area economy), the products are excellent... but the prices are high, most of the time higher than at the supermarket."* Laetitia (40), France

Some consumers had experience of the fact that it's possible to purchase fresh, local, organic produced foods cheaper when going directly to the farmer than in the supermarket

*"In Spain we usually buy from farmers, they are close to cities and much cheaper than supermarkets."* Eduardo (40), Spain

- **Box subscriptions**

A few participants currently pick-up, or receive, boxes with various fruits and vegetables that are in season. In this setup, consumers may not have as much flexibility in what they receive, but they know they are buying (nearly) directly from the farmer, and that produce is recently harvested and in season.

*"I used to have a subscription on a vegetable + fruit box. A box was delivered every week at my home with organically grown fruit and vegetables."* Manon (58), Netherlands

*"Now I buy the vegetable in unpackaged shop. There is a box filled with various types of vegetable directly from the farm. I prefer this way because we eat more vegetables now and we consume more types of vegetables. I would not buy some of them normally in supermarket."* Veronika (37), Czech Republic

Participants suggested the option of producers selling to consumers directly, and bypassing the supermarket. This could be made more convenient for consumers if the products are ordered online on a weekly basis, and delivered at a specific timeslot every week.

*"Farmers or farming cooperations could drive around with a bus that acts as a shop for their products. The bus can have a regular schedule e.g. every Monday in city A on place X every Tuesday in city B on place Y."* Christian (39), Germany

## Ideas for alternative food chains II

### Combine food shopping with an excursion

A small number of participants mentioned that it is possible to make the food shopping a family-friendly event where consumers can see where and how their food is produced. This can be educational, and support the farmer at the same time.

*“Here in France certain times of the year you can go and take a guided visit to farms that organise visits and it's a great activity with the kids. The visit is free but the farmers have a small shop just next to where you park the car so even though there's no obligation to purchase anything or even go into the shop.”* Kristian (47), France

*“I think this business opportunity could be more exploited by some medium-large farms; in other words, doing agrotourism, they allow customers to get to know the product up close, to see how it is produced, to be ‘seduced’ to personally pick up their products (and have a lower price) and thus retain and reward their customers.”* Luis (35), Portugal

- **Harvest the produce yourself**

One or two participants mentioned the possibility of harvesting produce yourself. This is seen as more of a fun activity rather than a way to do the daily food shopping, but nonetheless a creative way to support local farmers.

*“In Belgium you can now go to some farms/fields where you can gather yourself the products you want and then pay them at weight. You know this way where the product comes and you buy direct at the producer by gathering yourself and so it the product cheaper than in supermarket. I never tried as there is no farm doing this close to my place but I would like to try it.”* Roberto (62), Belgium

## Motivations for consumers

**P**articipants have different reasons for expressing interest in buying directly from farmers, compared to via the supermarket. Perceived quality of the produce, connection with the food, and a sense of perceived fairness play the biggest roles in this.

- **Buying directly from the farmer is associated with better quality products**

For most participants, buying directly from the farmer, for example at a farmer's market, is associated with better quality food than the supermarket. Taste is seen as better, and produce as fresher. This is the main motivator to spend the extra time and money on shopping.

*"I prefer to buy directly from the producer local products also organic. Buying from the farmer allows you to always have high quality, fresh and healthy food. I already buy from the farmer and I will not stop doing it: their products are excellent and tasty."*  
Elisabett  
a (32), Italy

*"For sure the quality is higher, but unfortunately my budget doesn't let me eat farm chicken, for example, every week."*

Laetitia (40), France

- **Buying directly from the producer feels good**

Even though for many participants buying directly from the farmer is a more expensive option, they still prefer it because of the quality and the connection with the producer.

*"Personally, I buy food from local farmers and our family like it so much."* Mirek (40), Czech Republic

*"Even so, I prefer to give to the hard worker than to give to the middleman."* Jose (61), Portugal

*"Ethically, it's what I prefer to do all the time."* Kevin (32), Ireland  
(about shopping at the farmer's market)

## Barriers for consumers

**E**ven though most participants like the idea of buying directly from farmers, or alternative solutions that bypass the supermarket, in reality they struggle to do so. Price is one barrier, but lack of convenience was mentioned just as often.

- **Inconvenience and time spent food shopping are barriers**

Compared to the supermarket, buying directly from farmers is seen as less convenient, and more time consuming. Particularly if it means having to shop at a market during normal working hours, or having to go to various locations to pick up different products.

*“The problem is that one farmer has fish, other carrot and other something else so I think It would be almost impossible to buy everything directly from farmers I do not have enough time to only buy food.”* Markéta (34), Czech Republic

*“In Greece there are markets where you can buy directly from the farmers! The cost is lower but they are not convenient due to the hours they work (8am-2pm). Our mothers and our grandmothers used to shop from there because the produce was fresher also but nowadays I cannot go there because I work these hours.”* Nora (30), Greece

*“There used to be quite a few farm shops in my local area, one by one over the last years they have disappeared. Call me cynical but I doubt people would make the effort to go to several shops when they can go to one enormous supermarket once a week.”* Toni (61), United Kingdom

- **Ordering online means not being able to select produce yourself**

Another barrier that was mentioned by participants is that in the case of receiving a food box, or ordering groceries online, they are unable to select the produce themselves. They want to have more control over what they exactly receive, and are not convinced the seller will have their best interest in mind.

*“I would really have doubts buying really fresh food via the internet because I do not really know how fresh it really is - I cannot touch/check it, I have to rely on the choice the producer/deliverer makes for me.”* Christian (39), Germany

*“Good suggestions but I would never use the internet to buy food. I really want to see what I am buying.”* Rupert (57), United Kingdom



# 8

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## Methodology

## Set up of the study

**T**his report is based on the findings of a multinational study that took place in the Citizen Participation Forum, an online community of consumers, with 86 community members from 18 countries participating. As part of the study, they completed online assignments, including forum discussions, questionnaires and photo challenges.

As a preparation for the study, interviews were conducted with experts of the different agricultural systems. The findings were used as general and specific background knowledge whilst setting up the study.

At the start of the study, the participants completed a warming-up activity, which included a reflection of their view on food production. After this discussion, the participants filled out a pre-questionnaire, where they shared their current perceptions on specific food aspects and how those are influenced by the different agricultural systems. Within the questionnaire they also shared their current impression of the four agricultural systems - indoor (vertical) farming, precision agriculture, regenerative agriculture, and organic agriculture. After the pre-testing the participants were split up in four groups, in which they were introduced to two of the four agricultural methods. This set up resulted in a control group for each method which provides the opportunity for analysis of the extent of the influence on the perception of the agricultural systems based on the provided information.

Once the participants had completed the activities for each method, they filled out a post-questionnaire, with the goal to analyse how their perception of the agricultural methods has changed through the information which was provided. To round up the study, the participants came back together as a group, and discussed which information was new, which information made an impression, and which information has stuck with them. Finally they discussed an optimal combination of the systems to feed the world.

Experts in the field of agriculture with a focus on regenerative, organic, precision, and indoor were interviewed as part of this study.

Their insights and advice informed the selection of food aspects, as well as the descriptions of the different agricultural methods. Furthermore, their input was used to shape the activities and questions asked of the participants.

The following agricultural experts were consulted during this project:

Thomas Engel – John Deere

Joep de Roo – De Nieuwe Bodem

Merle Koomans v.d. Dries – Odin Foodcoop

Gus van der Feltz – Farm Tech Society

# Citizen Participation Forum Participants

**A** total of 86 participants from 18 countries were collected in November 2022

The participants in this study are front-runners when it comes to food. They are generally well-informed about the food they are consuming and think about aspects of health and sustainability when making food choices.

In other words, the participants in this study are more likely to inform themselves and consider sustainable food production systems when making a food choice, compared to the average consumer.

Country	No. of participants
Belgium	5
Czech Republic	7
Denmark	5
Finland	4
France	8
Germany	6
Greece	7
Ireland	4
Israel	4
Italy	4
Netherlands	4
Poland	4
Portugal	5
Romania	4
Spain	4
Switzerland	4
Turkey	2
United Kingdom	5
<b>Total</b>	<b>86</b>

# Citizen Participation Forum Participants

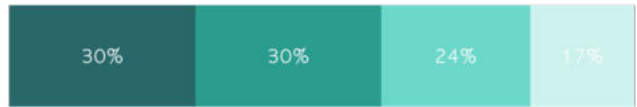
n=86

## Gender



■ Female ■ Male ■ Other

## Age



■ 18-35 ■ 36-45 ■ 46-55 ■ 55+

## Living area



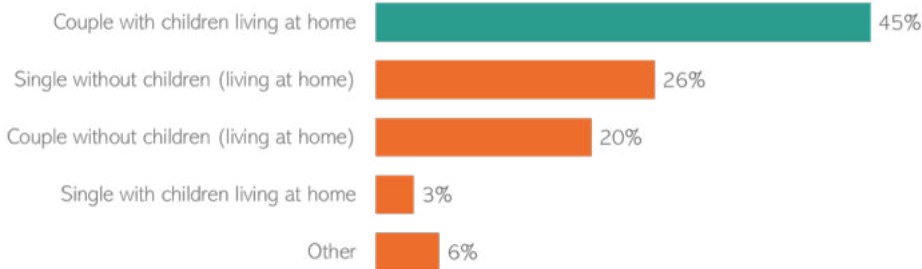
■ Large town or city ■ Small or mid-sized town ■ Rural area or village

## Education



■ College/University ■ High-school/Secondary school ■ Professional qualification (e.g. trade school)

## Household status





# European consumers (FoodUnfolded® study)

**A** total of 2468 participants from 6 countries took part in this study.

Data for this study was collected in August 2022 through an online survey. Participants for this survey were recruited through a professional panel.

The group of participants for this study was not pre-selected on any characteristics. Gender and age distributions are nationally representative per country.

Country	No. of participants
The Netherlands	410
United Kingdom	414
France	407
Germany	418
Italy	409
Spain	410
<b>Total</b>	<b>2468</b>

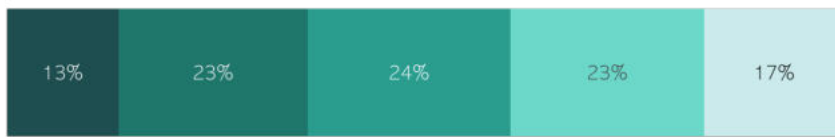
# Demographics for European consumers (FoodUnfolded® study)

## Gender



## Gender

■ Female ■ Male



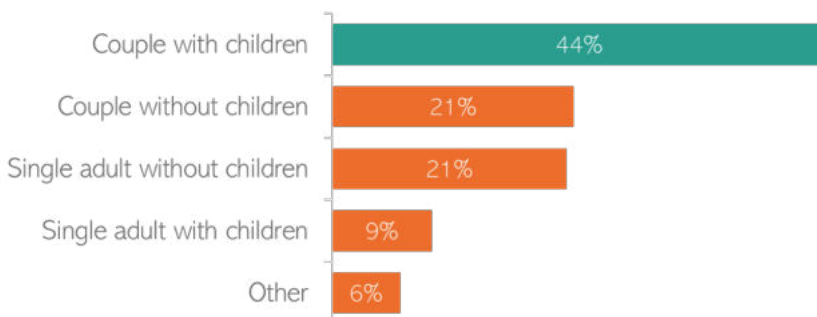
■ Under 25 ■ 26 - 35 ■ 35 - 45 ■ 45 - 55 ■ 55+

## Education



■ Low ■ Middle ■ High

## Household





# 9



## Appendices

# Descriptions of the farming systems: precision and regenerative agriculture

## Precision agriculture:

Precision agriculture is an innovative and information-guided management concept of crop farming, based on various new technologies (e.g. satellite-based positioning systems, sensor technologies for data acquisition and geoinformation systems). With precision agriculture, the existing soil conditions (e.g. dryness, amount of nitrogen) of the plant are recorded and based on this information the plant gets 'personalised' care. This means that less fertiliser and pesticides are used, as they are not sprayed on the whole area.

## Regenerative agriculture:

Regenerative agriculture is an organic form of crop and livestock farming with the goal of restoring and maintaining soil health and fertility, protecting water, and supporting biodiversity. Techniques which are used for restoring the soil include moving CO<sub>2</sub> from the atmosphere into the ground through cover crops (plants that are planted to cover the soil during winter rather than for the purpose of being harvested). In this form of agriculture there is no use of (synthetic) pesticides or fertilisers, but the soil is fertilised from plant and animal waste.

## Organic agriculture:

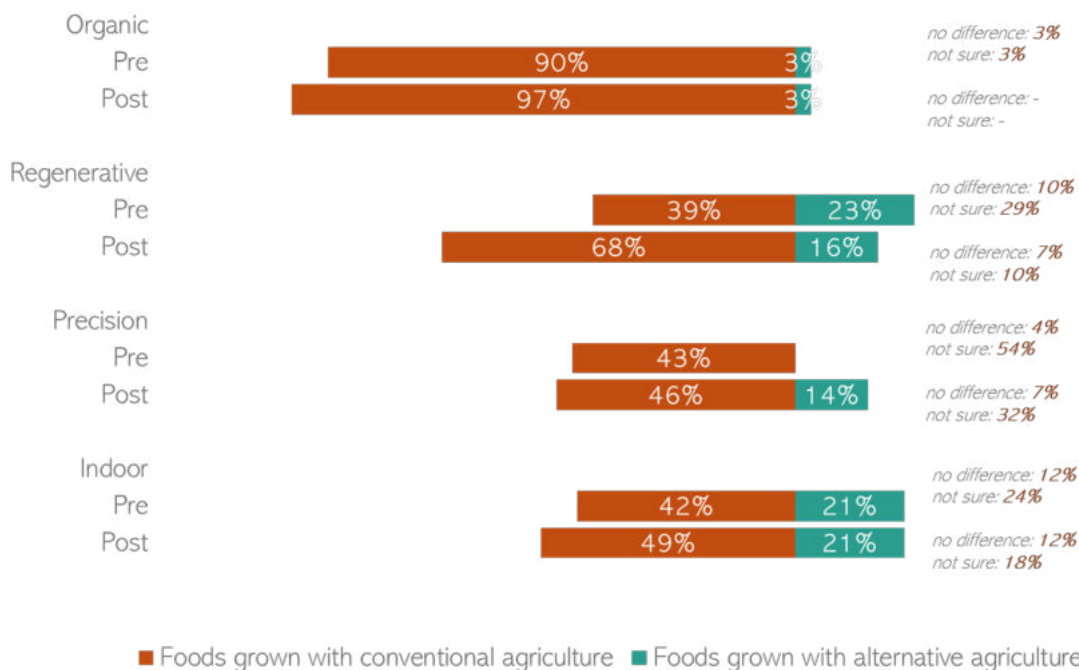
Organic agriculture is the farming of crops or livestock without the use of synthetic pesticides, fertilisers or GMO. Organic farming is not entirely chemical-free, but the fertilisers used are largely derived from animal and plant wastes. Animals that are farmed organically are not given growth hormones or preventative antibiotics through their lifetime (unless there is illness). The feed they are given needs to be certified organic.

## Indoor (vertical) agriculture:

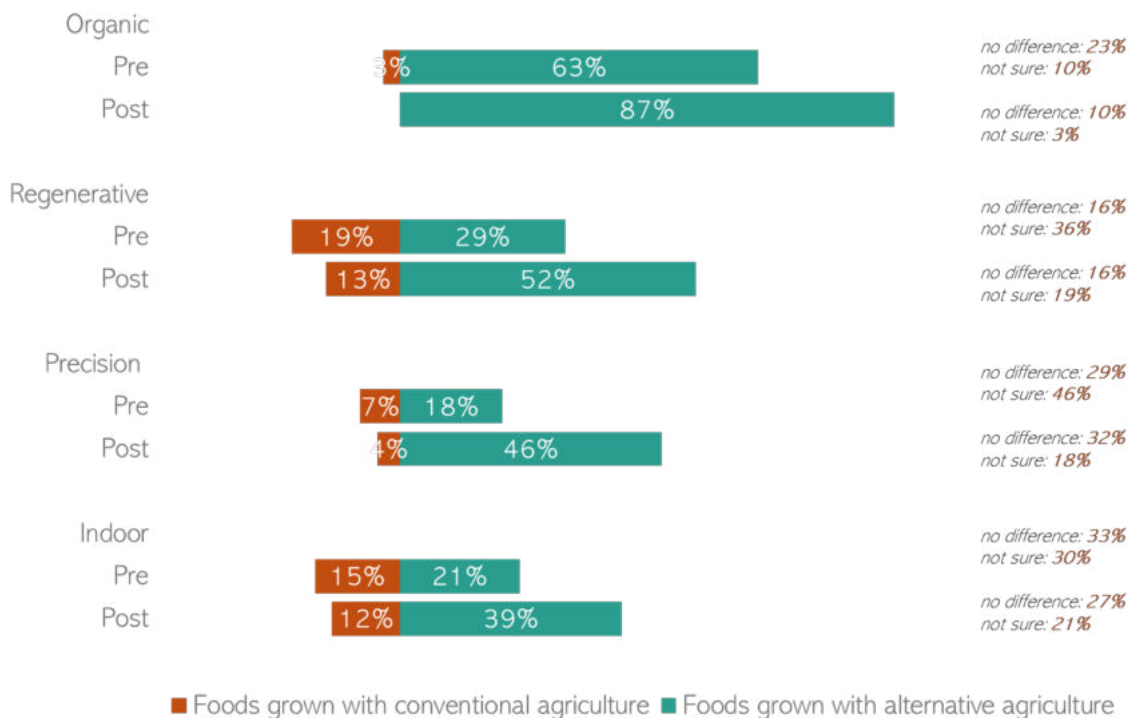
Indoor farming in its most common form, vertical farming, involves growing crops in controlled indoor environments, with precise light, nutrients, and temperatures. In vertical farming, the plants are stacked in layers that can reach several stories tall, meaning less land is needed. Not all crops are suitable for indoor farming. Crops farmed this way need to grow quickly, and be relatively small, for example spinach, lettuce, basil, microgreens or strawberries. Because of the control of growing conditions, crops can be grown year-round, and there is no need for pesticides.

# Perceptions of different types of agriculture I

## Which foods are more affordable?

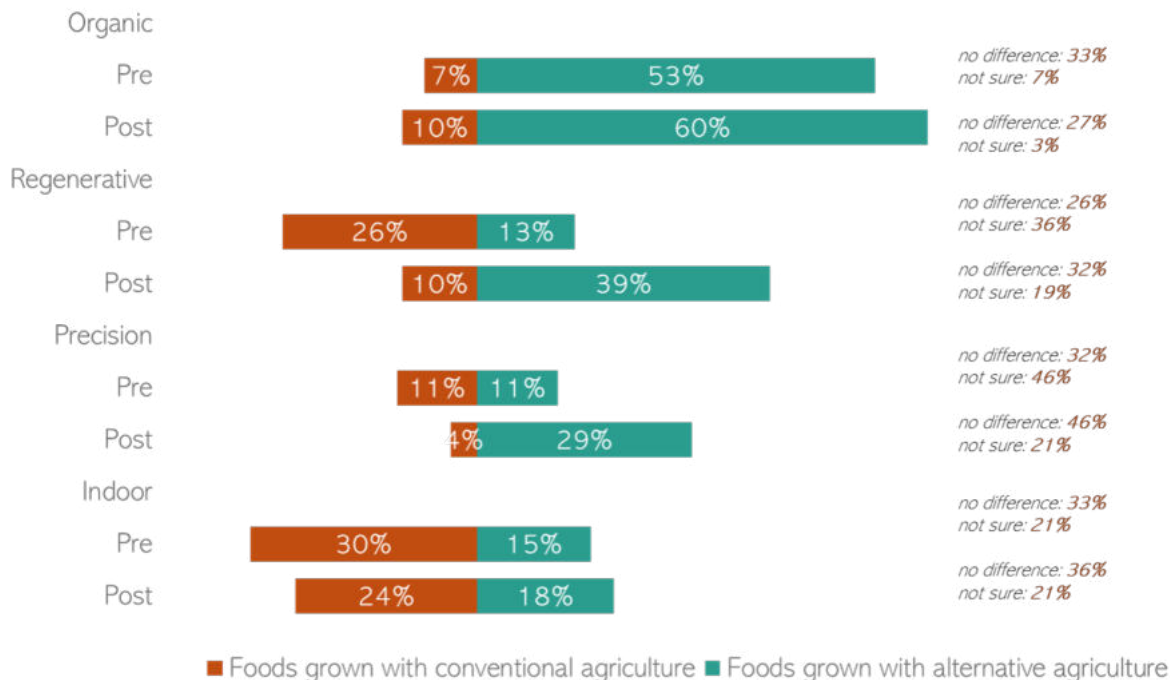


## Which products are healthier?

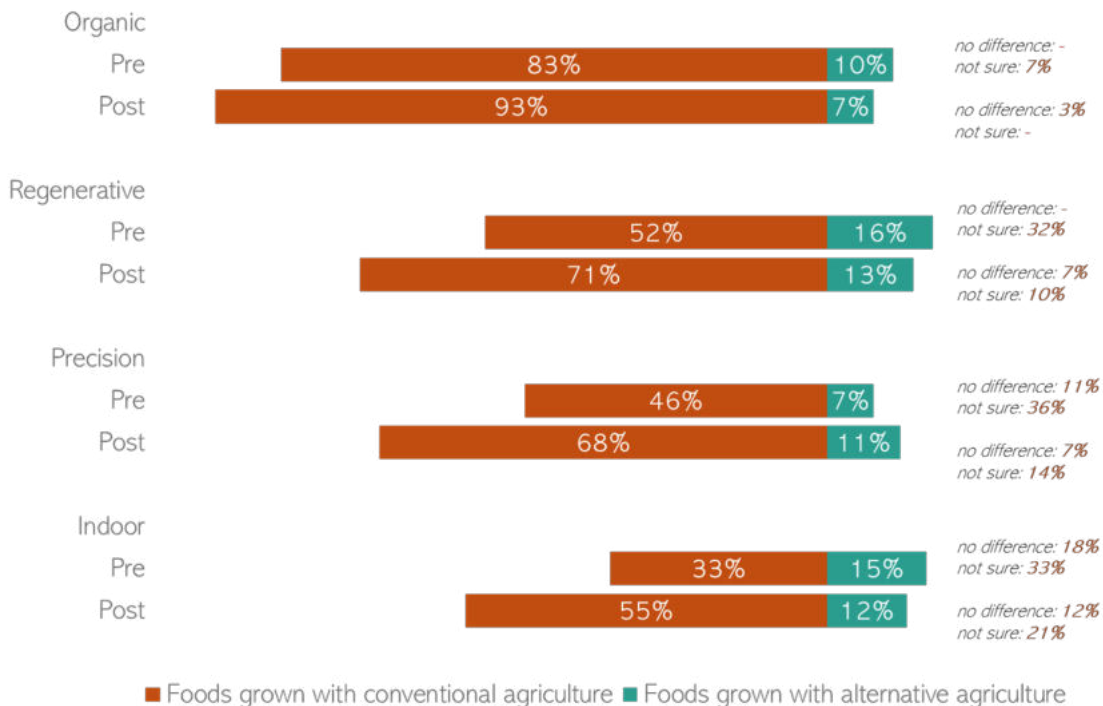


# Perceptions of different types of agriculture II

## Which products are tastier?

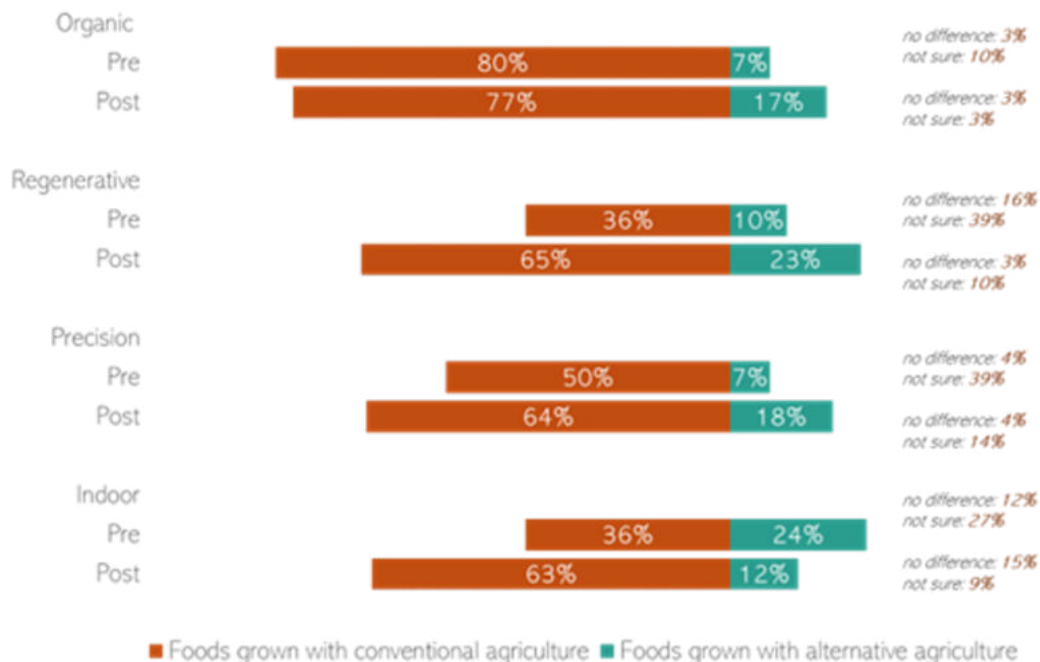


## Which method uses more synthetic fertiliser?

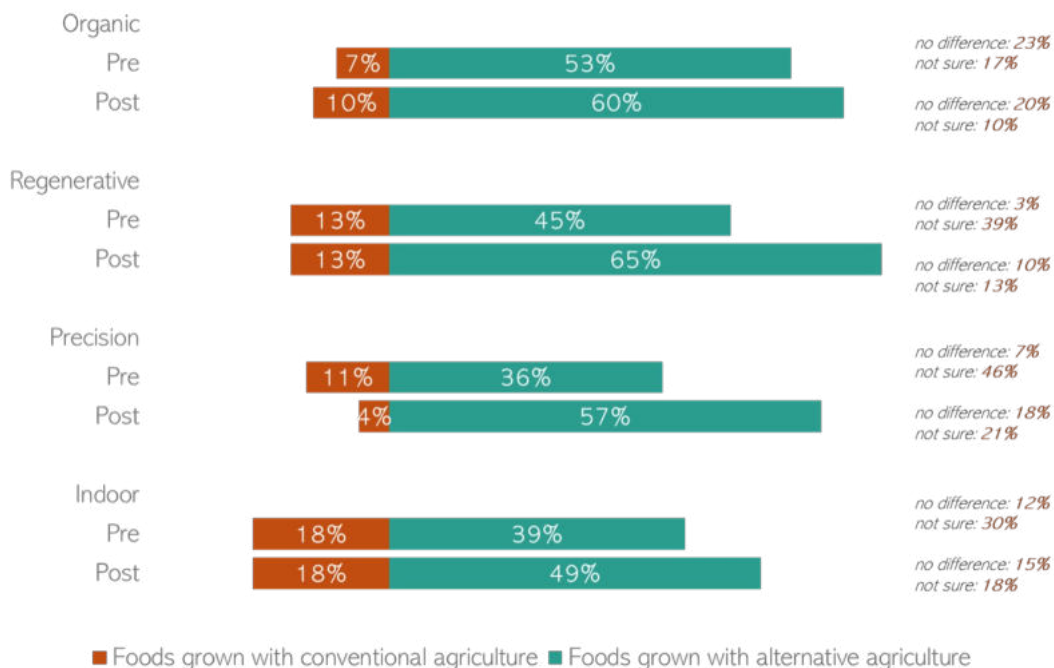


# Perceptions of different types of agriculture III

## Which method uses more synthetic pesticides?

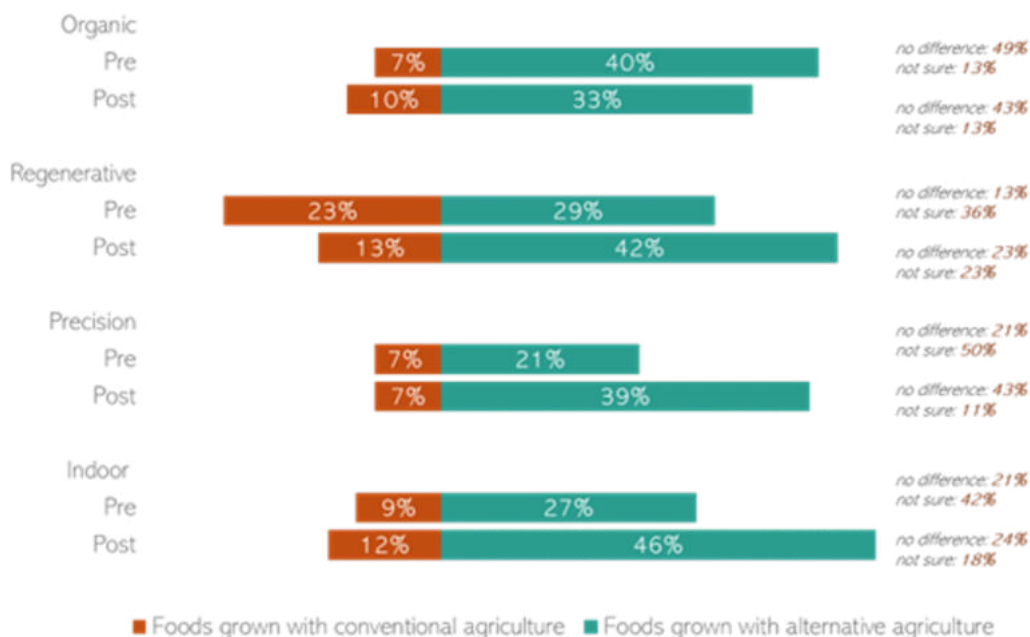


## Which method produces less green house gasses?

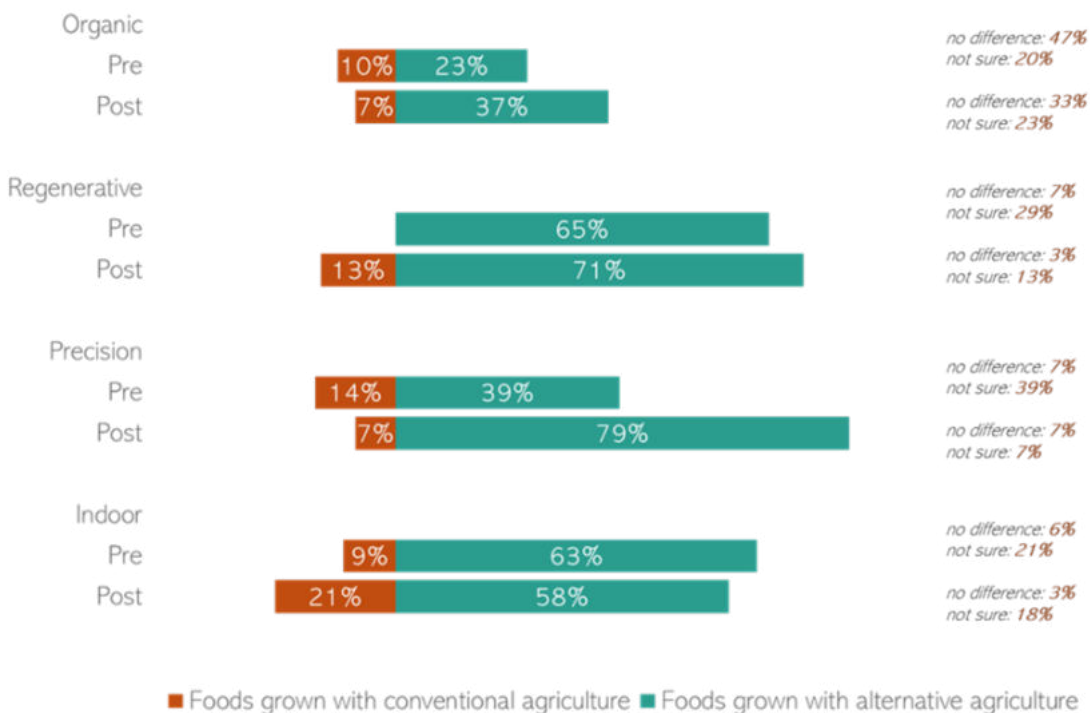


# Perceptions of different types of agriculture IV

## Which food has travelled fewer kilometres?



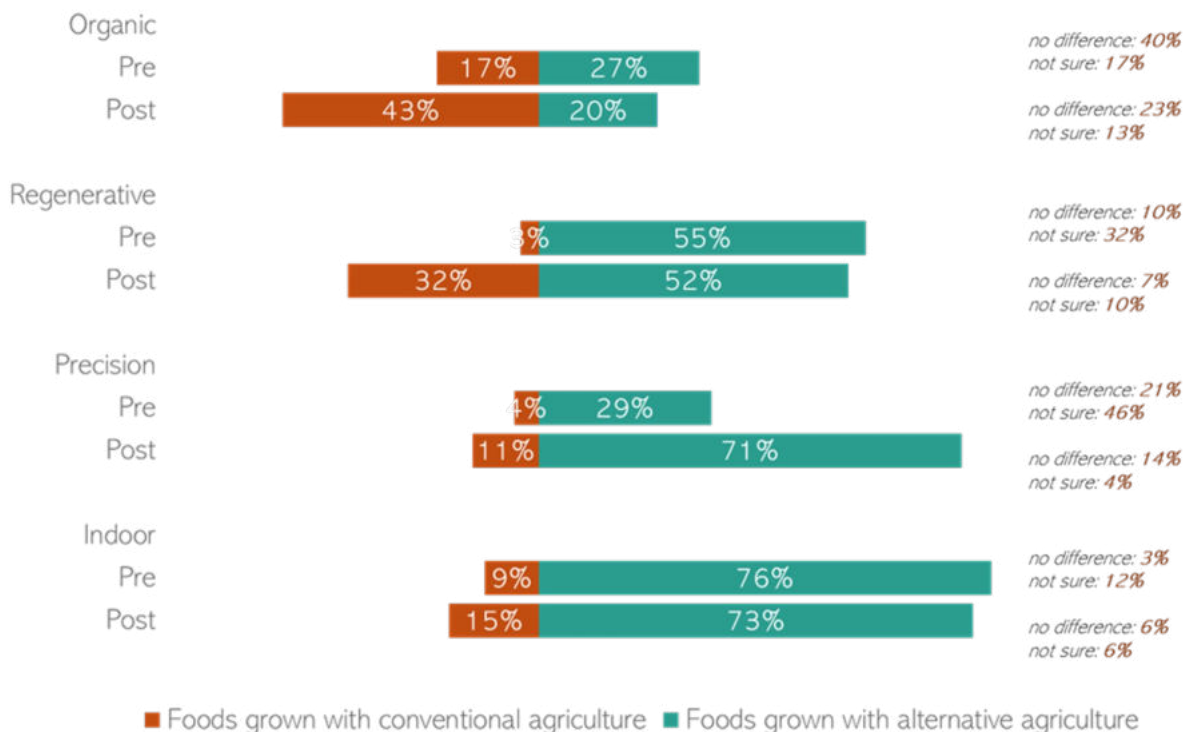
## Which food is produced using less water?



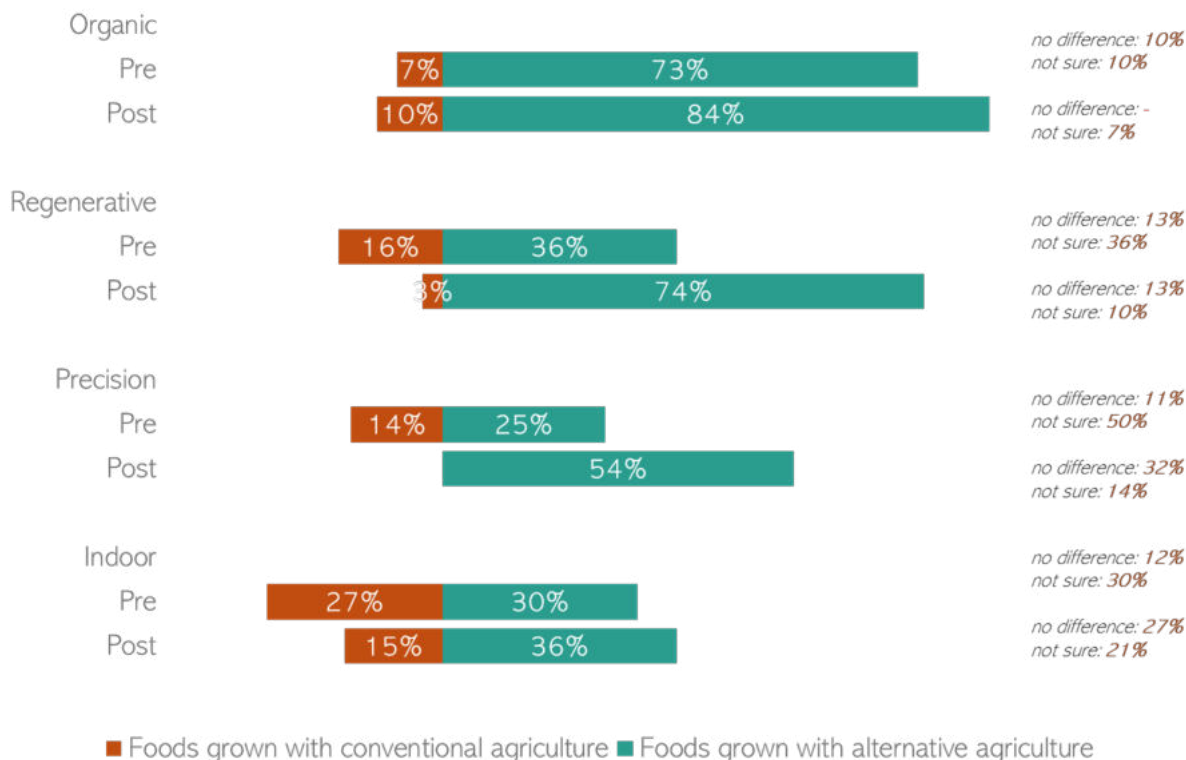


# Perceptions of different types of agriculture V

## Which food is produced using less land?

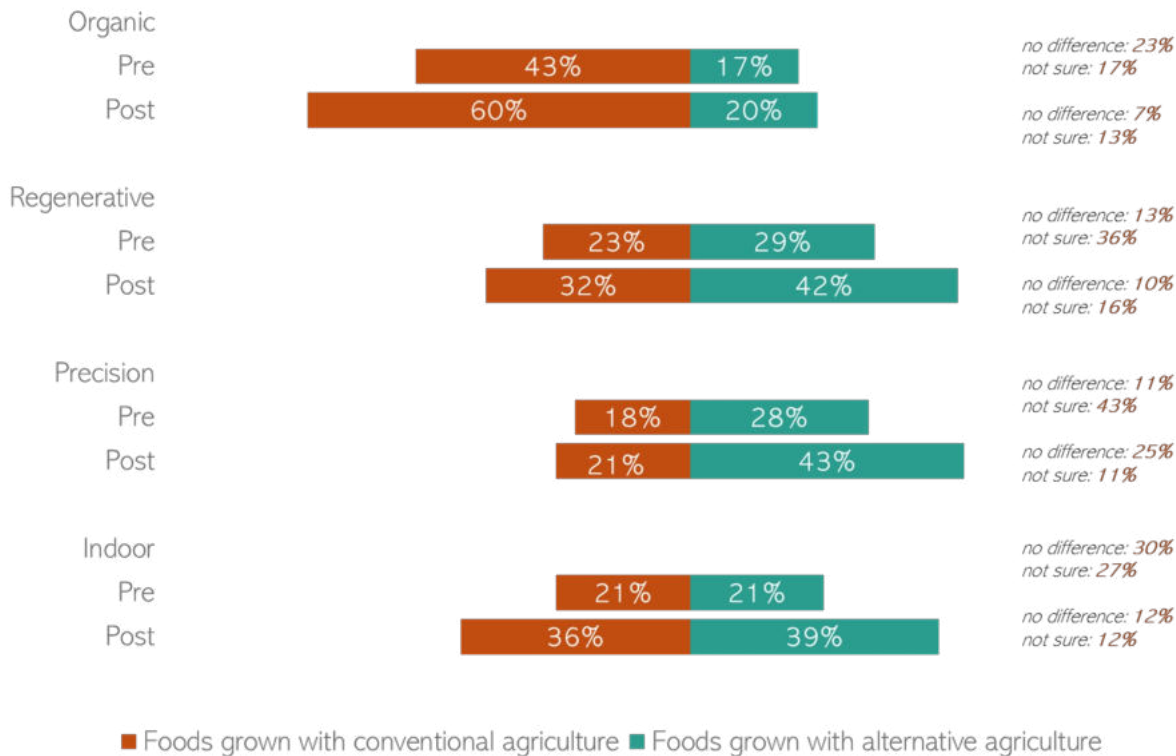


## Which foods are more animal-friendly?

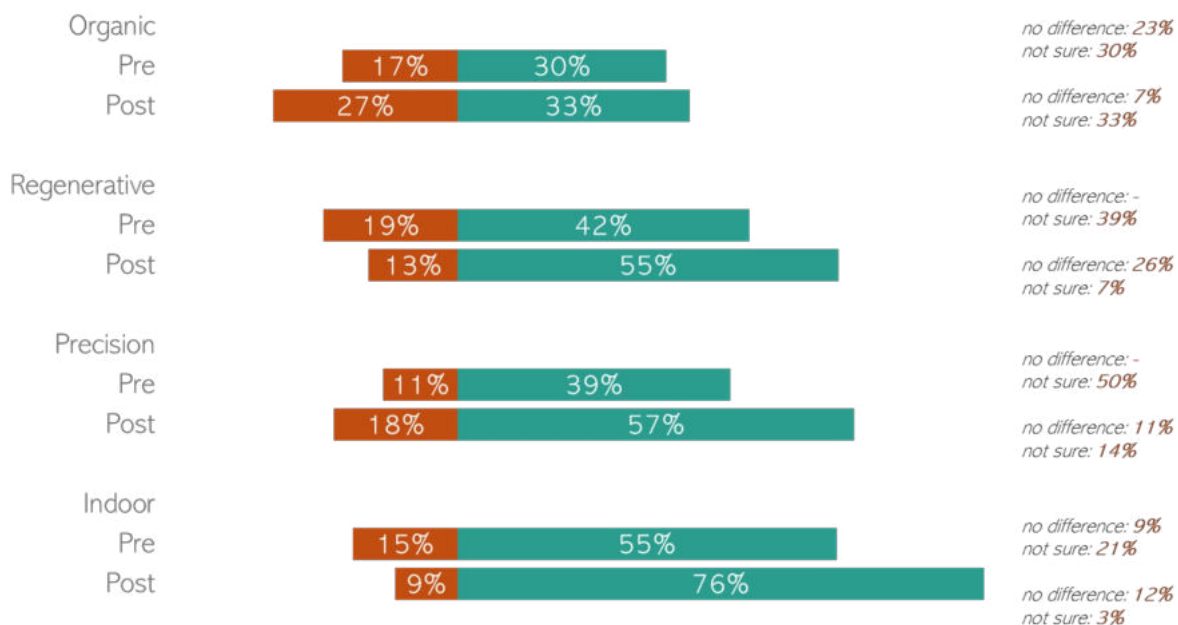


# Perceptions of different types of agriculture VI

## Which method of production can feed the world?

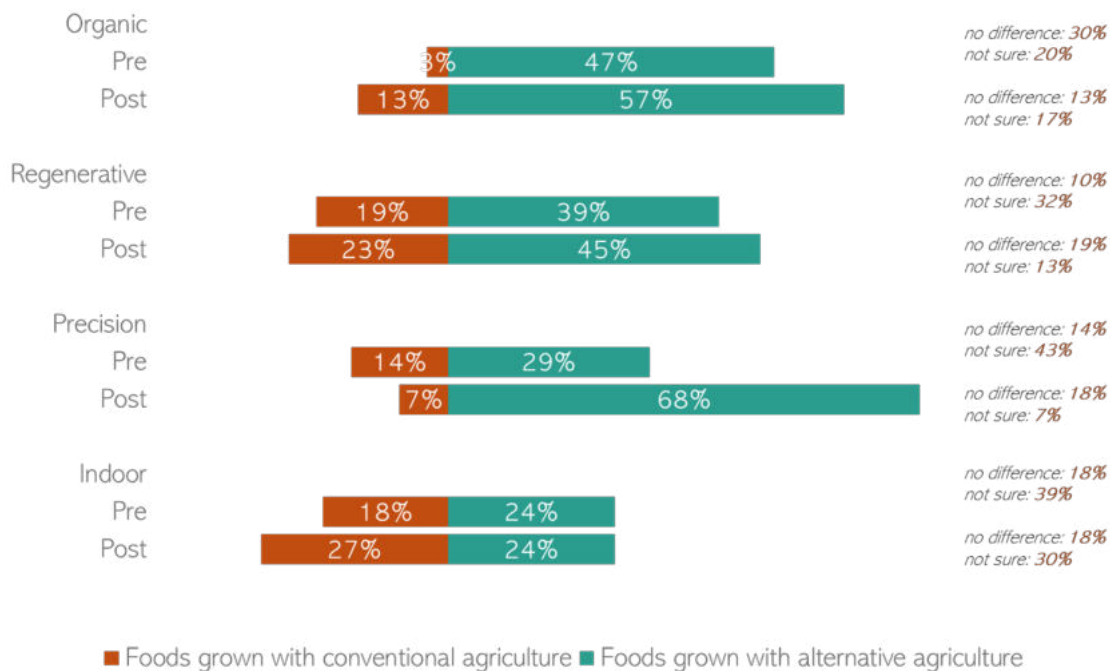


## Which method of production is resilient to change in weather conditions?



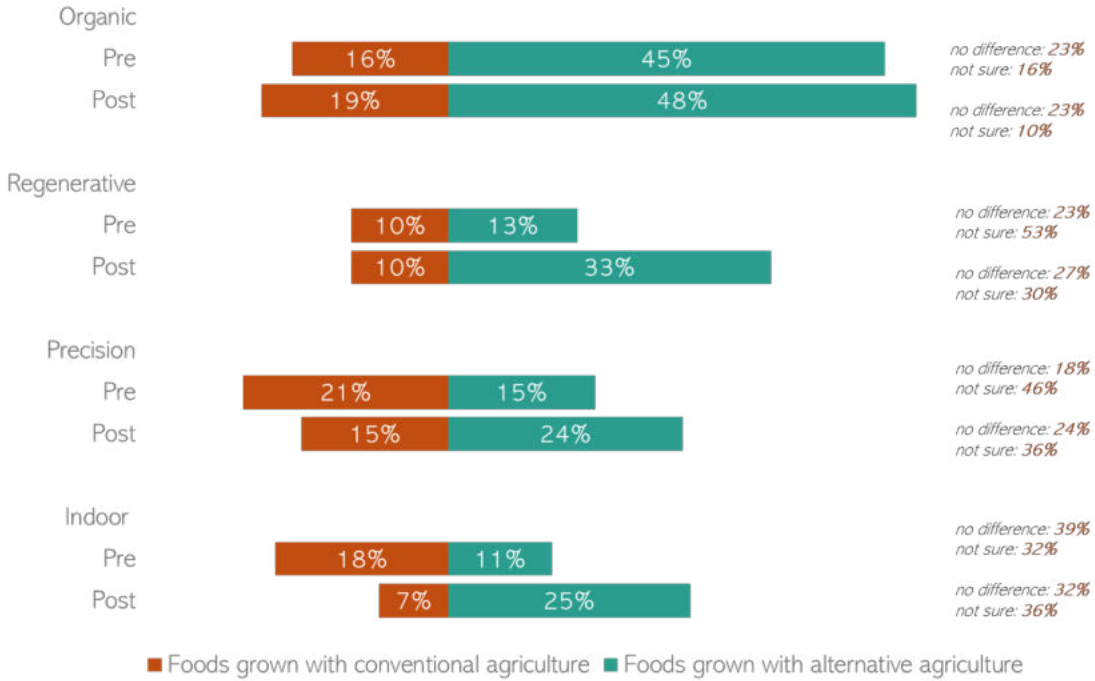
# Perceptions of different types of agriculture VII

## Which method of production is better for farmer/labourer welfare?

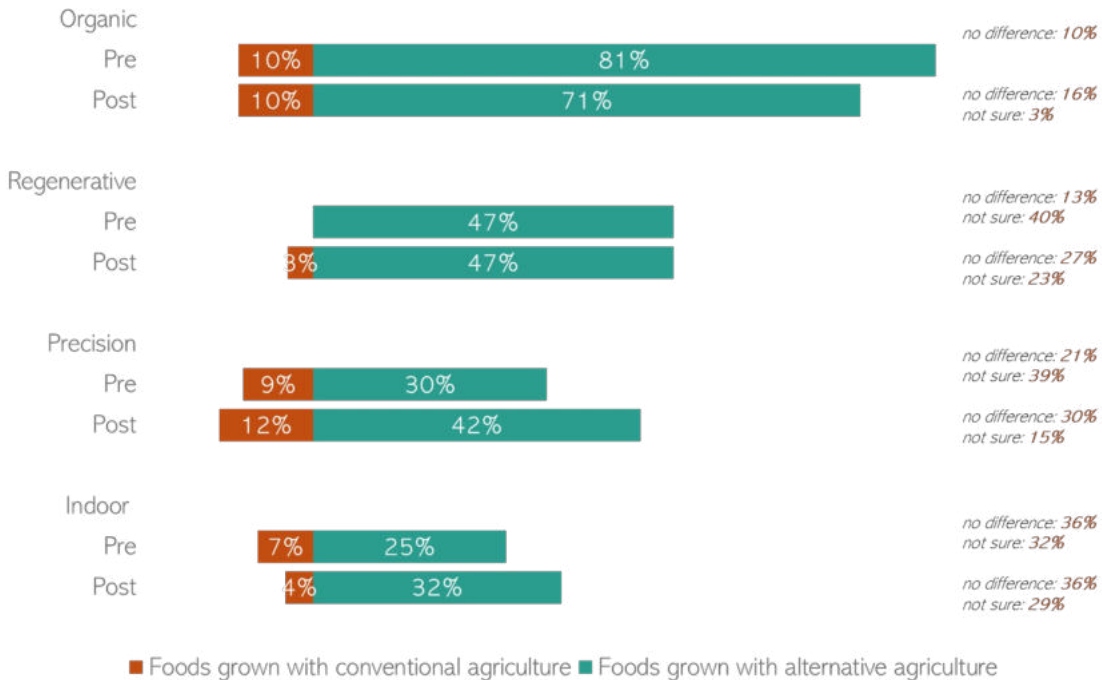


# Attitudes of control group I (did not discuss specific types of agriculture)

## Which foods taste better?

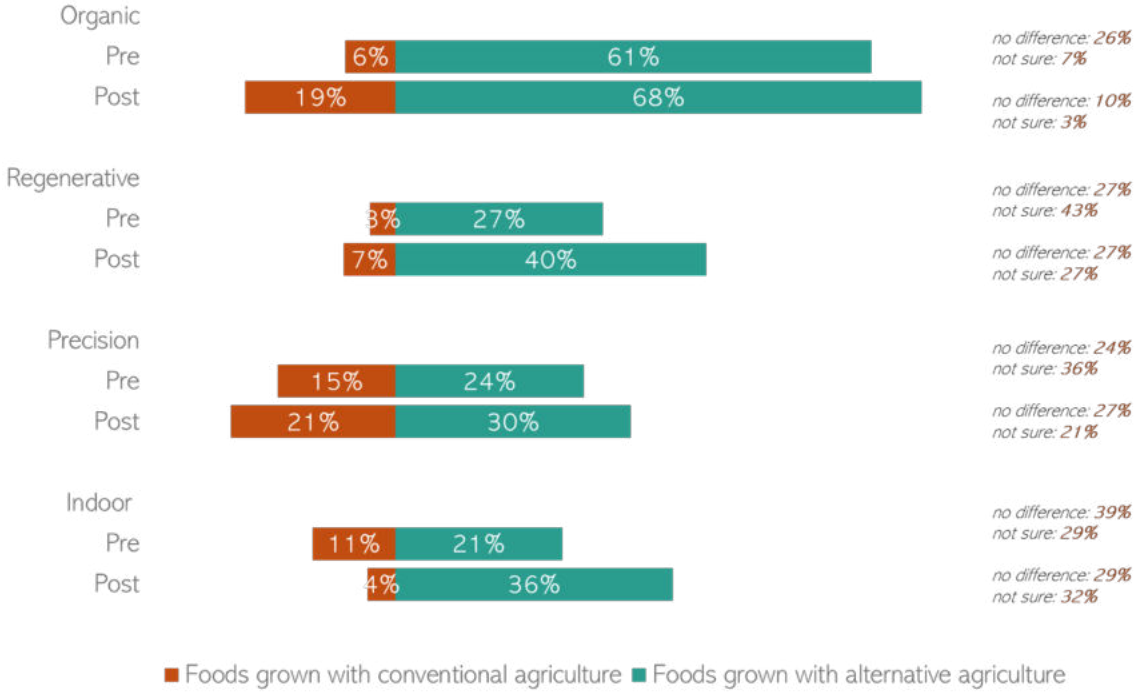


## Which foods are healthier?

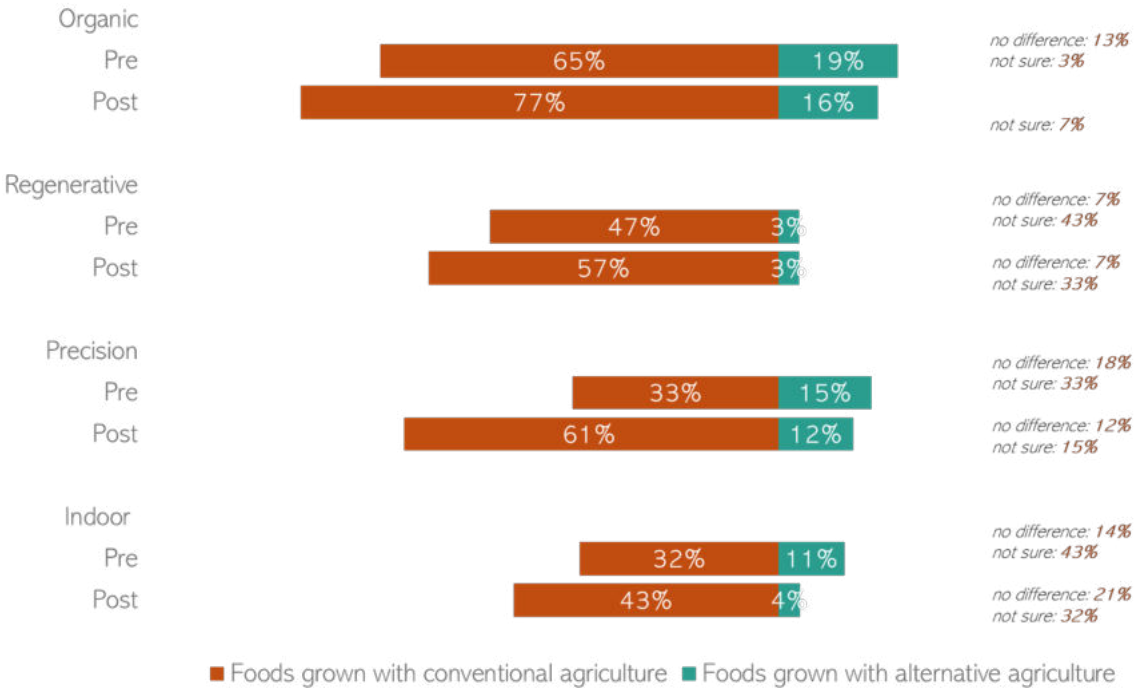


# Attitudes of control group II

## Which foods are safer?

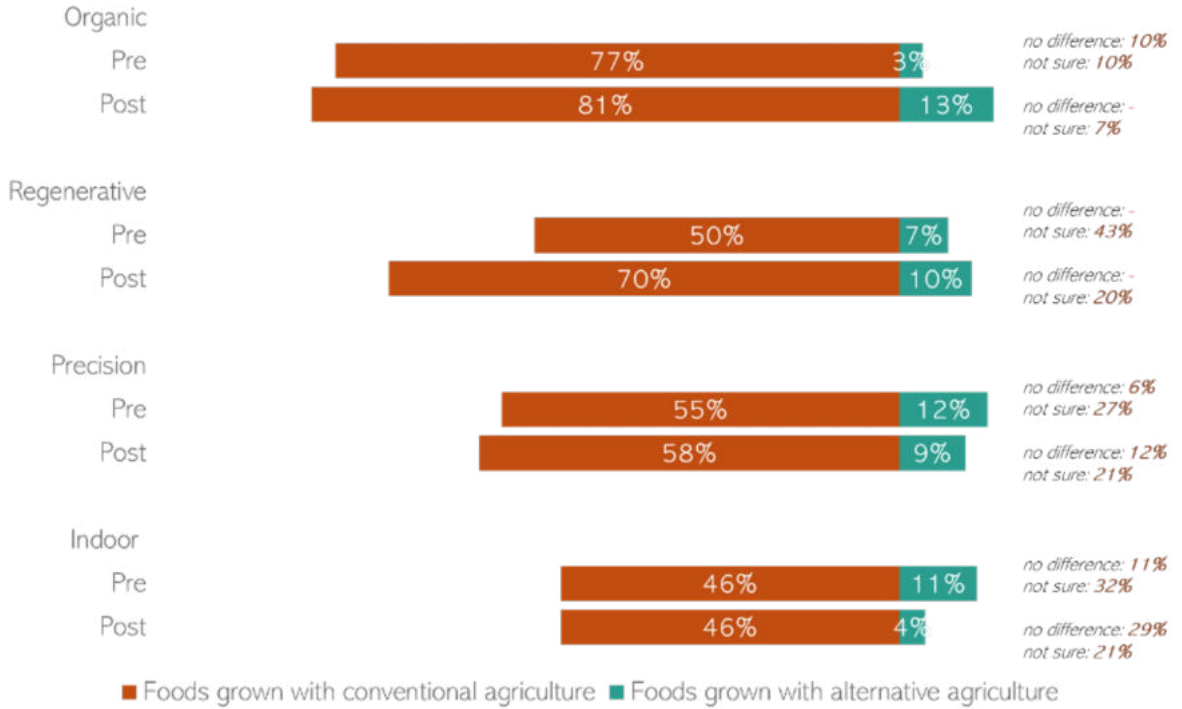


## Which foods are more affordable?

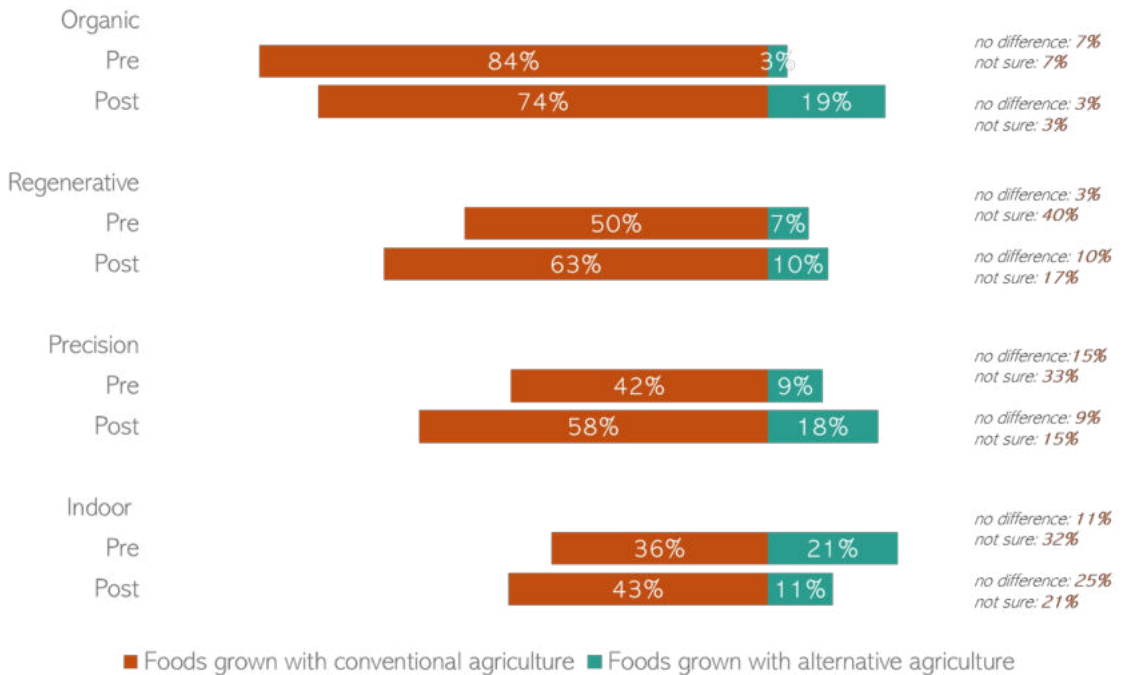


# Attitudes of control group III

## Which method uses more synthetic fertiliser?

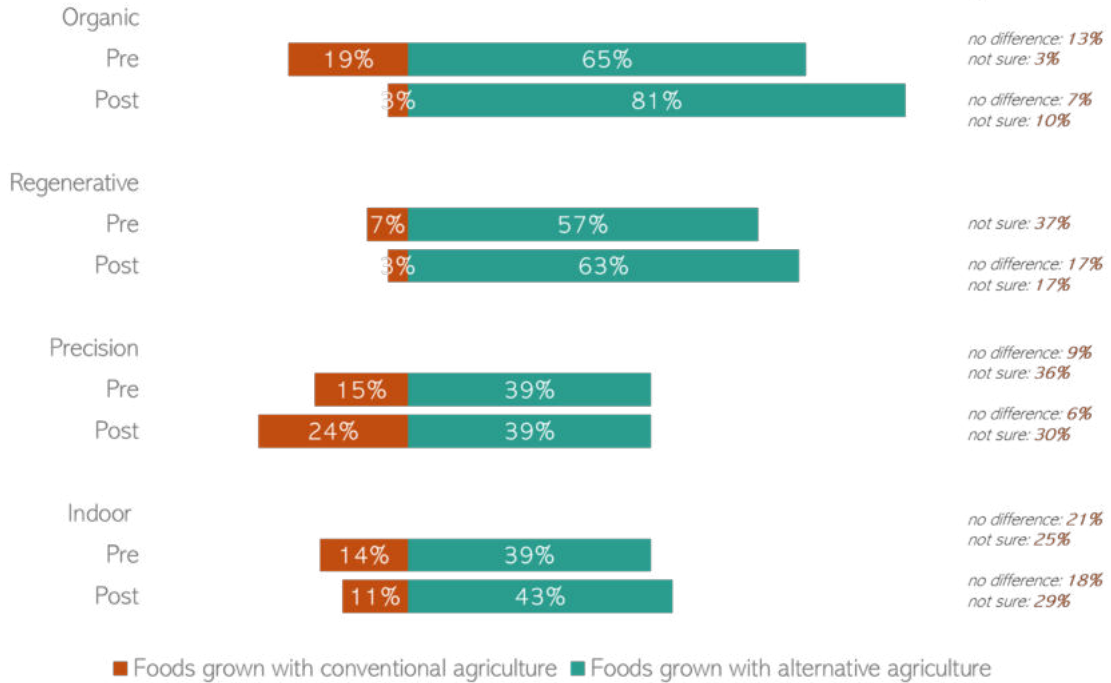


## Which method uses more synthetic pesticides?

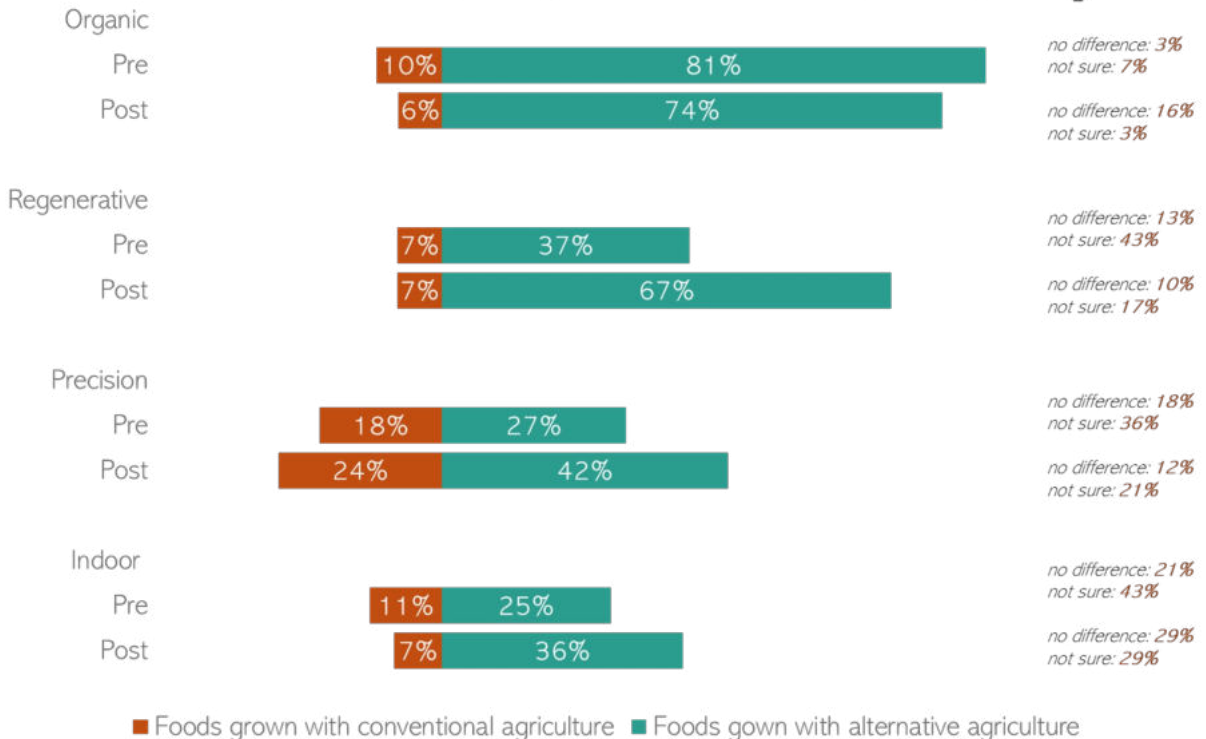


# Attitudes of control group IV

## Which foods are better for biodiversity?

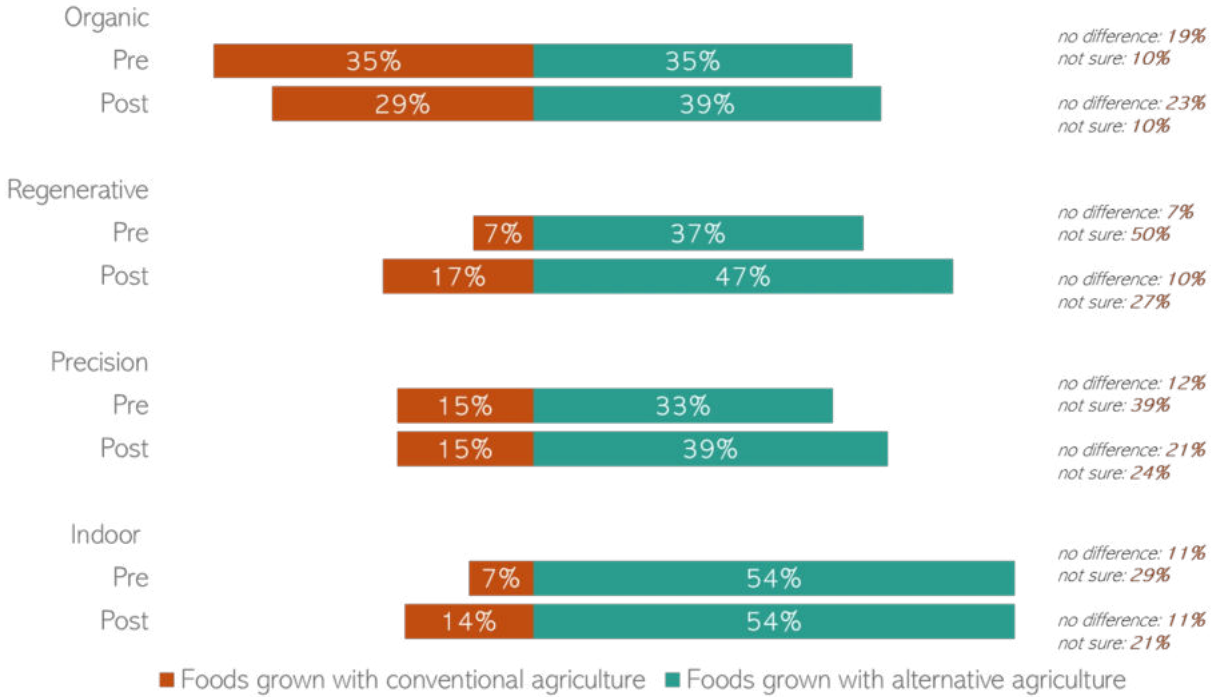


## Which foods are more animal friendly?

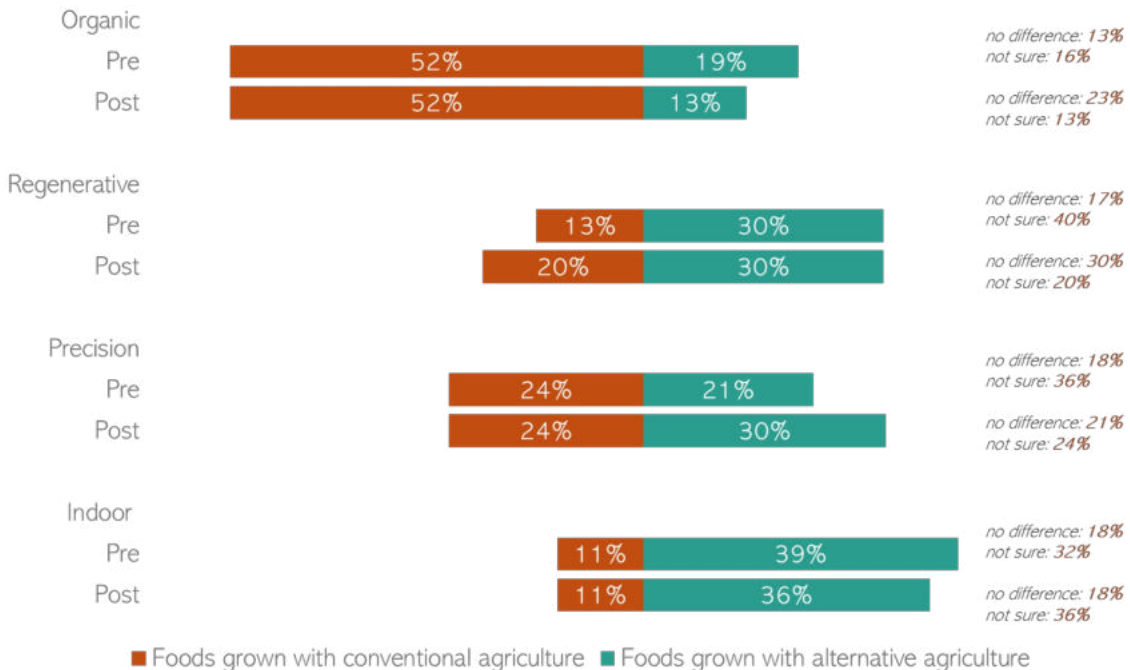


# Attitudes of control group V

## Which method of production is resilient to change in weather conditions?



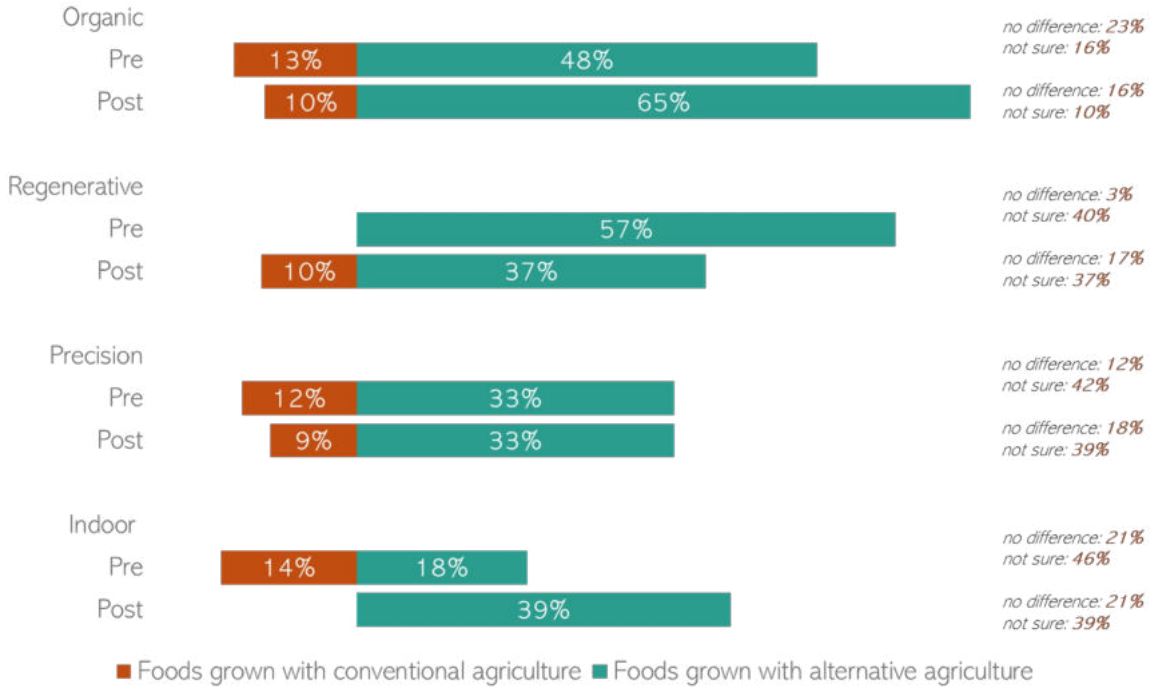
## Which method of production can feed the world?



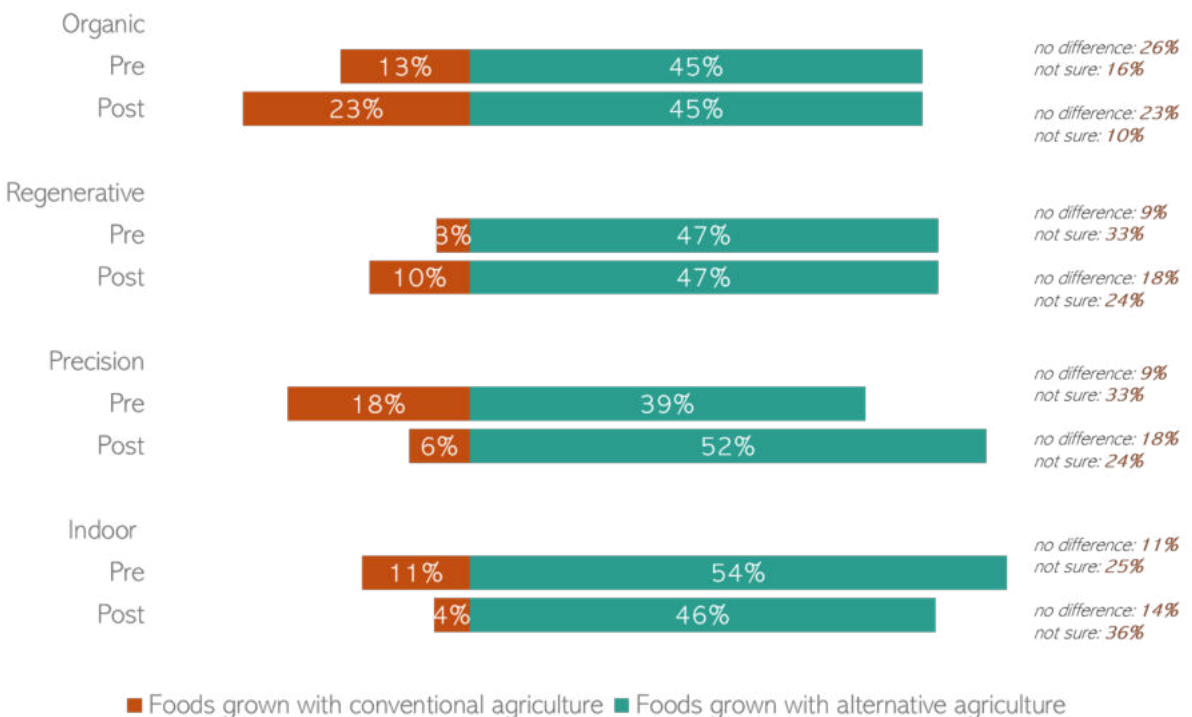


# Attitudes of control group VI

## Which food produces less greenhouse gasses?

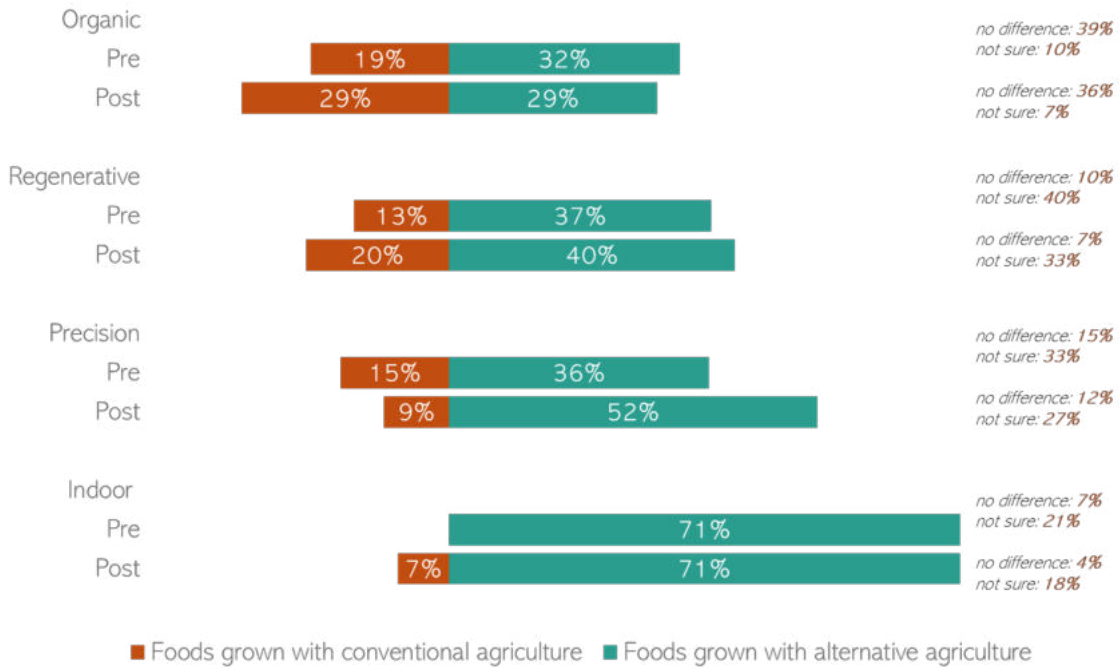


## Which food is produced using less water?

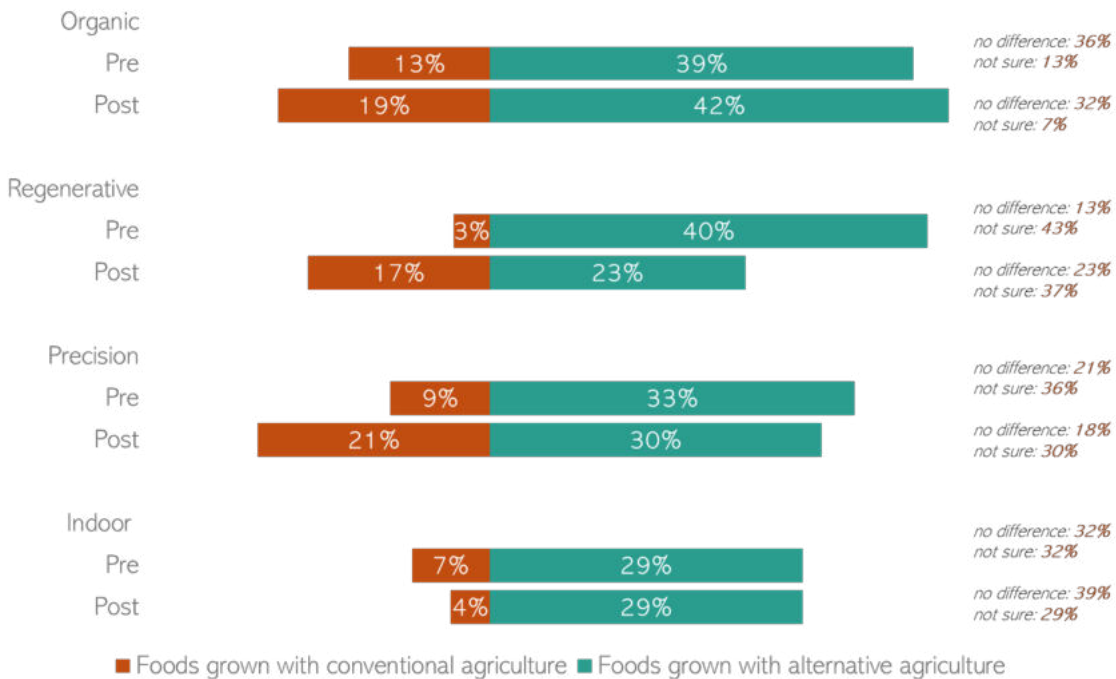


# Attitudes of control group VII

## Which food is produced using less land?

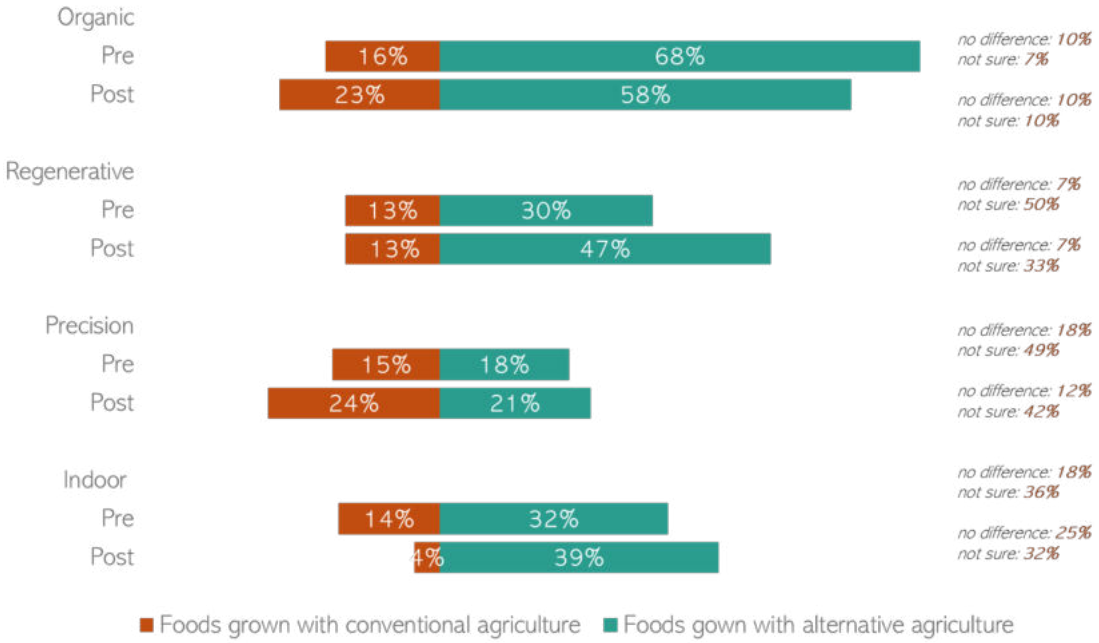


## Which food has travelled fewer kilometers?



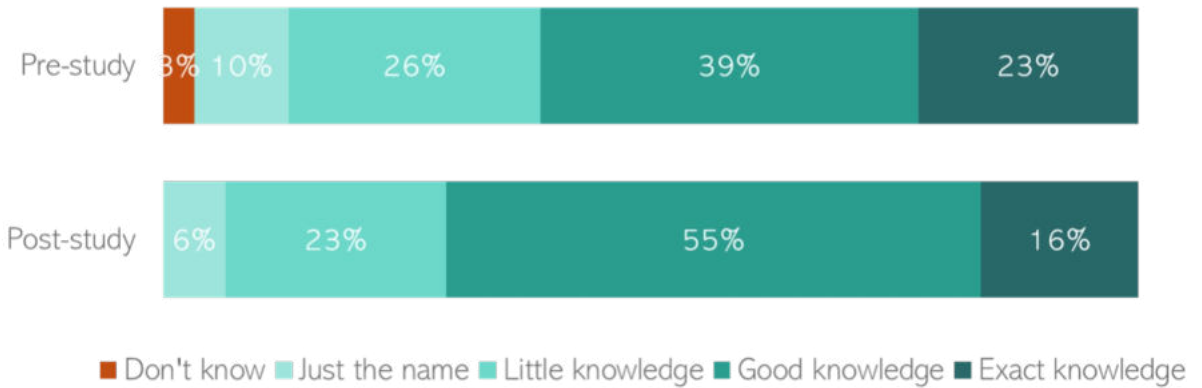
# Attitudes of control group VIII

## Which foods are better for farmer/labourer welfare?

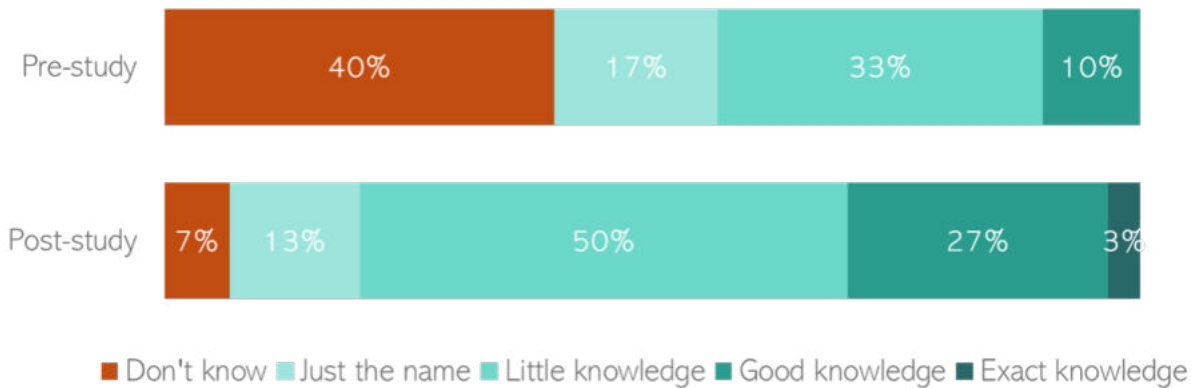


# Knowledge of control group I

**Could you indicate how well you know the difference between organic and conventional farming?**

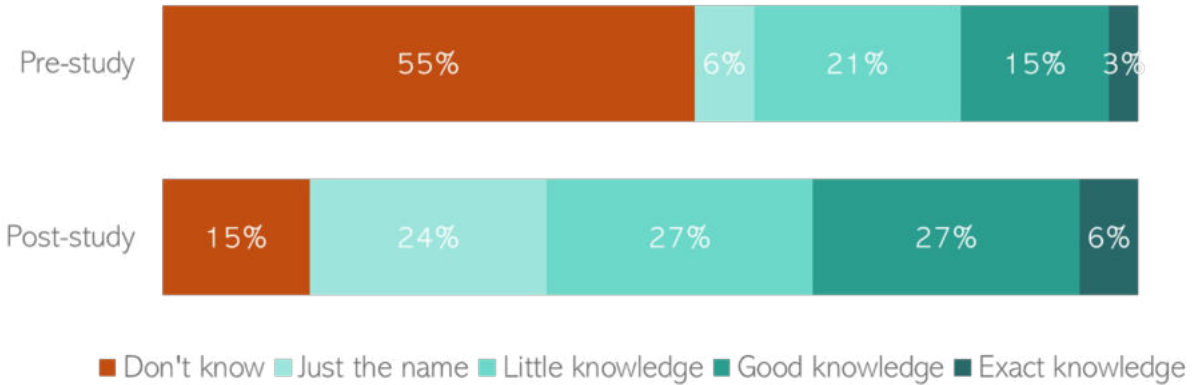


**Could you indicate how well you know the difference between regenerative and conventional farming?**

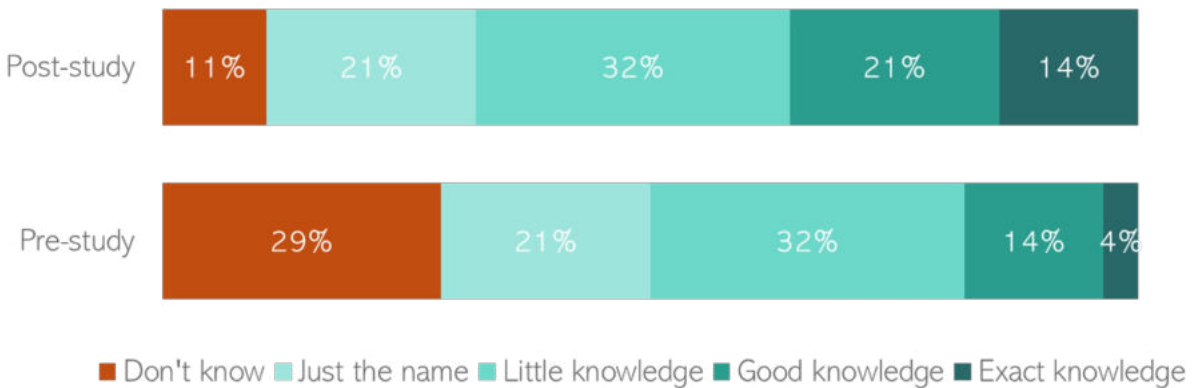


# Knowledge of control group II

## Could you indicate how well you know the difference between precision and conventional farming?



## Could you indicate how well you know the difference between indoor (vertical) and conventional farming?





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