

# Stimulating Adoption of Sustainable Innovation

What do Europeans look for in food innovation?

November 2021

## 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  
European Union

## METHODOLOGY



# STIMULATING ADOPTION OF SUSTAINABLE INNOVATION

What do Europeans look for in food innovation?



ATTITUDE



Need for sustainable innovation is clear



Weariness towards too industrial and unnatural, look for innovations closer to nature



Technological innovations associated with city-culture

## 5 LESSONS



Make benefits tangible in the present moment



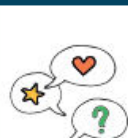
Verify claims of sustainability



Leverage consumers' existing behaviours



Consider all alternative motivations for adopting an innovation



Create opportunity for trial



## Attributes

based on Rogers' Theory of Diffusion of Innovation

Relative advantage



Compatibility



Complexity



Triability



Observability



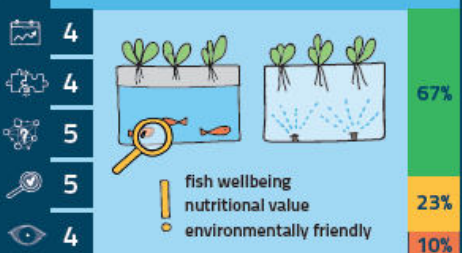
## ADOPTION POTENTIAL

HIGHEST POTENTIAL

### Plastic-free packaging



### Aquaponics / Aeroponics



### Smart stickers

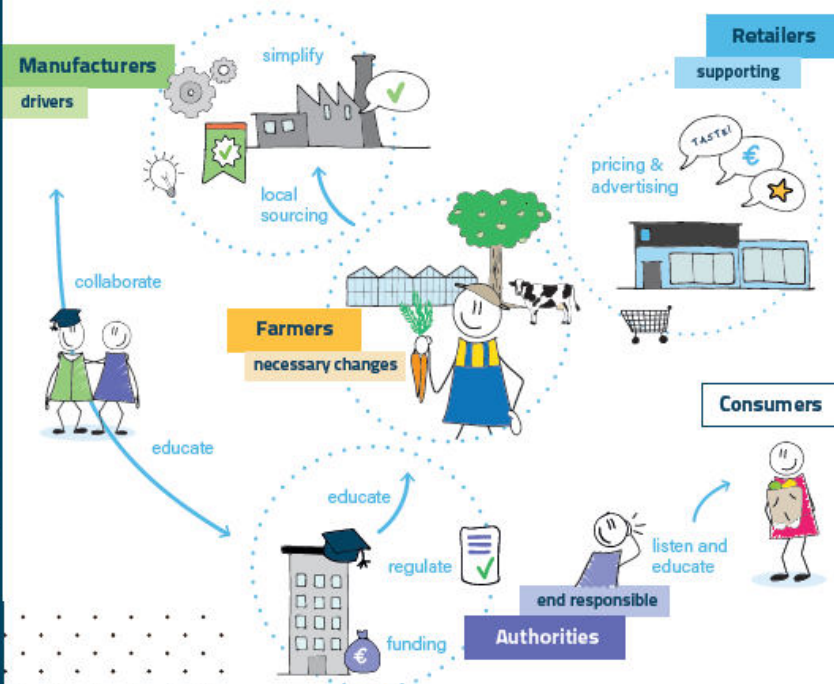


### Lab-grown meat



MOST CONTESTED WITH POTENTIAL

## ROLE OF FOOD CHAIN ACTORS



# Contents

1. [The study](#)
2. [Attitudes towards innovation](#)
3. [Role of the food chain actors](#)
4. [Four case studies](#)
5. [Attributes of a successful innovation](#)
6. [Methodology](#)
7. [Appendix](#)
8. [Blog post & summary](#)



# The study

## Aim

The aim of this study was to better understand consumer attitudes toward food innovation. Through four case-studies we analyse five attributes that influence the diffusion of an innovation based on Rogers' diffusion of innovation theory. On the basis of these case-studies we make concrete suggestions on how the different food chain actors can stimulate adoption of a sustainable innovation.

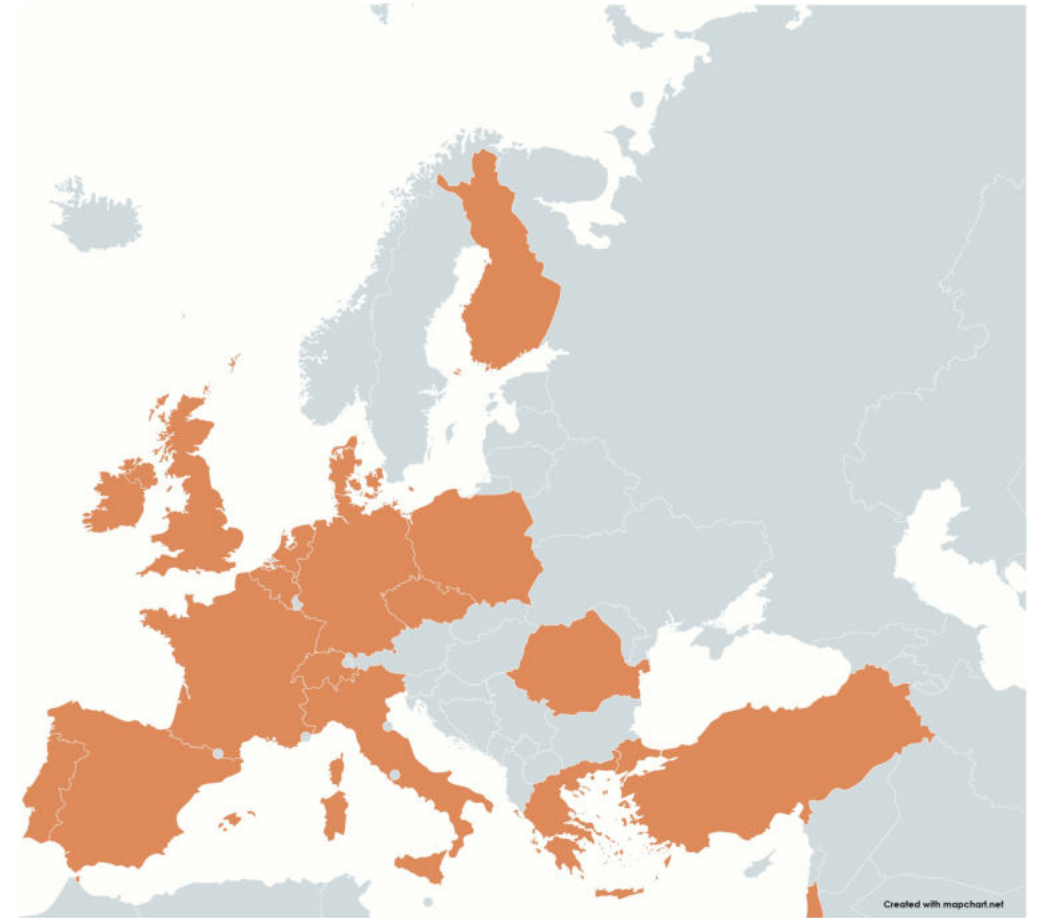
## Food chain actors

This study focusses on the main stakeholders in the food chain who can influence consumer attitudes and behaviour:

- Farmers
- Manufacturers
- Retailers
- Authorities

## Methodology

- Online community, made up of 232 participants from 18 countries.
- Participants rated and discussed four up and coming food innovations. They took part in open discussions, photo assignments, and questionnaires.
- Detailed procedure can be found in Methodology.



# Executive summary I

## Attitudes toward innovation

Consumers believe there is a need for more sustainable foods. However, there is also weariness towards innovations that are seen as too industrial and unnatural. Particularly technological food innovations are associated with yuppy, big-city culture and are not perceived as relevant to everyone. What also became clear is that the weariness is toward innovation in the food itself, but much less so toward methods of production.

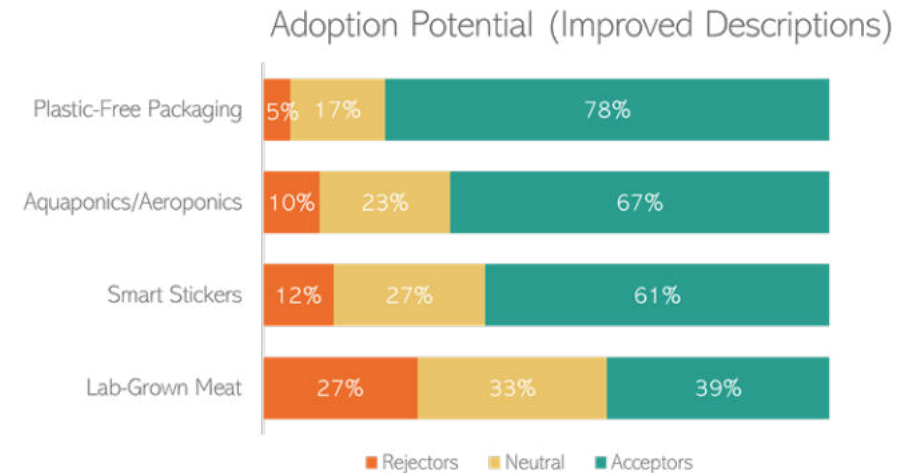
## The role of the food chain actors

- Farmers are seen by many as a food chain actor that is less associated with innovation, has more difficulty innovating and keeping up with the necessary changes for producing sustainable food.
- Manufacturers are perceived to be the drivers of innovation and have the most profit to make.
- Retailers are seen as having a highly involved role and can make sustainable, innovative food choices easier for consumers.
- Authorities are expected to guide the transition to new foods and methods of production through stricter regulation and by funding sustainable innovation.

## Adoption potential

Within the four innovations that the participants rated and discussed (plastic-free packaging, aquaponics/aeroponics, Smart Stickers, and lab-grown meat), the one with the highest potential for adoption (78%) is plastic-free packaging. Lab-grown meat is the most contested innovation, with potential for adoption by nearly 40% of consumers.

This study has shown that by listening to consumers, addressing their doubts and bringing forward the benefits in a better way, the adoption potential of innovation can be improved. Rogers' Diffusion of Innovation theory has proven to be a very valuable framework for this.



# Executive summary II

## Five attributes of an innovation

The innovator needs to have a good understanding of the stronger and weaker attributes of their innovation and improve them wherever possible. Clear communication of the stronger attributes of an innovation will reduce uncertainty in the consumer and help its diffusion. Particular attention needs to be paid to relative advantage, compatibility, and complexity, which are stronger predictors of an innovation's success.

### Plastic-free packaging

The relative advantage of plastic-free packaging needs emphasizing, particularly its benefits to the consumer in the present moment. In order for this innovation to be a success, innovators will also need to address complexity. Plastic-free packaging should not make products more complicated for consumers (e.g. planning groceries in more detail).

### Aquaponics/ Aeroponics

The tangible result of aquaponics/aeroponics, the crops, need to be better than crops grown in soil for this innovation to become worthwhile for consumers (e.g. more nutritious, safer, or tastier). Make the innovation observable, by for example installing small aeroponic systems in supermarkets or public spaces.

### Smart Stickers

Smart stickers can improve their relative advantage by offering a kind of guarantee or certification that the information presented is accurate. Clear instructions need to be presented to consumers who are not familiar with QR codes. Retailers and manufacturers can bring attention to the stickers which are discrete by design.

### Lab-grown meat

Lab-grown meat needs to develop to be at least as tasty, affordable, and healthy to be adopted by consumers. Consumers who refuse to eat technologically processed food have low compatibility with this innovation and should not be targeted in promotion. Ease with which lab-grown meat can be cooked should be emphasized, and finally lab-grown meat needs to be distinguishable (for example through packaging) from meat.

|                                                                                                                                                                                                | Plastic-free packaging | Aquaponics/ aeroponics | Smart Stickers | Lab-grown meat |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------------|----------------|----------------|
| <b>Relative advantage</b><br>The extent to which an idea or product is perceived as better than the existing options. How much of an improvement is it?                                        | ✓                      | ✓                      | =              | ?              |
| <b>Compatibility</b><br>The extent to which an innovation fits with the existing values, past experiences, and needs of potential adopters.                                                    | ✓✓                     | ✓                      | ✓✓             | ✓✓ or ✗        |
| <b>Complexity</b><br>The extent to which an innovation is perceived as easy or difficult to understand and use.                                                                                | ✓✓ or ✗                | ✓✓                     | ✓              | =              |
| <b>Trialability</b><br>The extent to which it is possible to try-out an innovation before committing to it. How much time, effort, or money do I need to invest to find out if this is for me? | ✓✓                     | ✓✓                     | ✓✓             | ✓✓             |
| <b>Observability</b><br>The extent to which the innovation is visible to potential adopters. Do my friends use it? Do I see it in the supermarket?                                             | ✓✓                     | ✓                      | ✓              | =              |



# Five lessons for making sustainable food innovations a success

## Bring attention to the here and now (relative advantage)

Innovations such as plastic-free packaging, and lab-grown meat target problems that are visible to consumers now. Seeing plastic in nature emphasizes the urgency of plastic-free packaging and the direct consequence of such packaging: less plastic in nature. Innovations that target distant problems, or future uncertainties need to communicate their value in the here and now.

## Verify sustainability claims (relative advantage)

Consumers have high expectations about upcoming sustainable developments. Importantly, they want to be able to quickly judge if the innovation is sustainable, but also to have some authority verify that it is truly sustainable and not 'greenwashing'. Innovations such as Smart Stickers will need to go the extra mile and offer that guarantee.

## Leverage consumers' existing behaviours (compatibility)

Consumers are willing to change their ways, but it's not easy to break patterns. Innovations need to leverage consumers' current behaviours and beliefs. Fortunately, the belief that there is need for sustainability is shared by many. New methods for producing vegetables, such as aeroponics and aquaponics fit consumers' patterns of behaviour and beliefs that it is important to eat healthily and sustainably.

## Consider consumers' different values and concerns (compatibility)

There are different reasons for which different consumers might opt for the same product. For example because they value different aspects of it, or because they see different benefits in the same feature. For example, the idea of lab-grown meat appeals to the environmentally conscious, the animal friendly, consumers concerned about meat safety, or about food security. Different, personalised messages need to target these different groups.

## Create opportunity for trial (trialability)

It is important that consumers can easily try out the innovation without having to commit to it. By providing opportunities to try, for example by including a novel food in popular food boxes or selling it in smaller quantities, consumers are able to have an impression of the innovation without committing to it.



# Consumer attitudes towards innovation

Are consumers eager for innovation in food?

# Consumer attitudes towards innovation

## Need for sustainability is clear

The need for innovation is understood – most participants perceive the current food system as not adequate, and understand the sustainability challenges we are facing. The majority hold positive attitudes towards technological innovations, however a small number of people believe that the solutions to true sustainability will not be found in more technology.

## Technology for young urbanites

Food innovations, particularly those based on technology (e.g. lab-grown meat) are associated with young, affluent, city-dwelling people. The sustainability driver is partly seen as caring for the planet, but also as a trend. Younger participants in this study have generally shown more optimism about the role that technology can play in producing sustainable, healthy food.

## Resentment towards 'forced' innovation

Some participants feel that they do not have much control on what kind of innovations make it to the market, and as a result on their plates. They feel that some innovations are forced onto consumers by campaigns and advertising. A small group of participants expressed concern for the future of food, and whether it will be completely artificial and overprocessed. Particularly whether meal drinks, insects, genetically modified crops, and lab-grown meat will be necessary sources for nutrients if the soil becomes depleted.

## Reinventing old ways

Many participants support innovation that is based on natural techniques and that besides providing healthy food takes care of the planet. There is a belief that innovation does not necessarily need to mean an advancing in technology. Innovation can also mean looking back at what worked in the past, for example fermenting foods for preservation, or going back to pre-industrial farming methods.

*"I would like to try more sustainable and green food. I would like to increase the consumption of products that have zero or little impact on the environment and on co2 emissions."*

Mariagisa (27), Italy

*"I believe that innovation is necessary and useful because it makes our lives easier, allows us to try and achieve more. Maybe they are a bit scary because they are new and unusual to us, and everything new scares us a little."*

Sandra (29), Switzerland

*"I think we all should have a responsibility to think and eat more sustainably [...]"*

Justine (53), Great Britain

*"I think it's crazy for mankind to search for "solutions" in labs, often without realizing or acknowledging we caused the problems to begin with. For example, we wouldn't need to play with genes and create stronger seeds, if we hadn't weakened them through intensive farming, which disregards all natural laws..."*

Davide (60), Ireland

*"It would be a younger person. Maybe students, green people or rich yuppies. Younger people are much more mind open to this new innovations."*

Karsten (56), Germany



“  
**The best innovation is respect for the planet.**”

Ana María (63), Spain

# Role of the food chain actors



## Farmers

Farmers are seen as an actor which needs to **remain central** in the food chain and not become side-lined by new developments, however that is seen as difficult. Consumers do not want farmers to have to bear the brunt of technological developments. There is a lot of **sympathy** for farmers who want to get involved in innovative, green, farming methods (e.g. aquaponics), but there is also a fear that those steps may be **too costly and effortful** for most farmers to make. When it comes to innovations such as lab-grown meat there is concern that farmers may be **taken out of the picture** altogether.



## Manufacturers

Manufacturers are perceived as the driver of food innovation with the most profit to make. They are expected to prove that the products they produce are safe and healthy. They can do this by providing **visual evidence**, as well as certification. Manufacturers are expected to put in the extra effort of sourcing local ingredients, and not using unnecessary packaging. Particularly when it comes to processed foods, participants are sceptical. Innovations such as lab-meat can only be successful if manufacturers, in **collaboration with authorities**, prove that it is not only safe, but nutritious and more sustainable than the alternative. Manufacturers also need to make sure that they reduce **complexity** of their communication where necessary, while remaining transparent. Innovations they design need to be in some way **familiar** and **intuitive**, without any question that they may be hiding information.



## Retailers

Retailers are seen as a **highly involved** party when it comes to food innovation. They are seen as a party which can influence food choices, through **pricing** and **advertising**. Helping normalize innovations through prominent placement, but also **tasting or sampling** (e.g. lab-grown meat) as well as staff availability to **help consumers** with using technological innovations (e.g. Smart Stickers). Retailers are not thought of as being at the **forefront of innovation**, but rather a **supporting** actor that is necessary in making innovation a success.



## Authorities

Authorities are considered the end responsible when it comes to food innovation. Support innovations deemed by consumers as 'good' and strictly **regulate** innovations where food safety, health, and sustainability are a concern. Authorities are mainly expected to show support for innovations through **funding**, tax-reductions, and **educational programs**, directed to farmers and manufacturers, but also to consumers.

Authorities are also expected to **listen** to consumers, and make sure that the promotion of innovations fits well with a **long-term vision** of health and sustainability. Participants do not want authorities to support short-term, corrective technological solutions which do not improve the health of the planet in the future.





# Four case studies

Attitudes toward plastic-free packaging, aquaponics and aeroponics, Smart Stickers, and lab-grown meat.

# The four innovations

## Plastic-free packaging

Using alternative materials to plastic or no packaging at all. The most popular innovation. Seen as urgently needed for the sake of the planet, but also as easy and inexpensive to establish. According to participants, the responsibility lies on authorities and manufacturers to make this happen.

*"I think it is a good idea, because [it] is the best alternative for the environment. I am completely against single-use plastic. However, I also don't see a great advantage in using single-use packaging made of other materials (such as paper)."*

Ana (29), Portugal

## Smart Stickers

QR codes that lead to food product's website with detailed information about the product. A desirable innovation in theory, though perhaps less adopted in practice. Seen as easy and cheap to set-up, with the responsibility lying on the manufacturers.

*"Using of these stickers can lead into raising awareness about sustainability and people may be more curious from where their lunch is coming in the future. Moreover you can get to know something new and it can make your world-view more broad."*

Hana (28), Czechia

## Aquaponics and aeroponics

Two methods of growing crops without soil. Seen as futuristic and "cool", without any perceived disadvantages. A challenge for innovative farmers who want to keep up with sustainable activities.

*"I like [aquaponics] because circular production is a good way to reduce energy and waste. We need such innovations to step towards a more sustainable future."*

Valérie (36), Switzerland

## Lab-grown meat

Growing meat in a laboratory with the use of animal cells. The most contested innovation out of the four. Authorities are considered end responsible for lab-grown meat's safety and sustainability.

*"Not everything what is technically an innovation turns out to be without a negative side effect, like you mention the solar cells, or lithium batteries. I just want to point out that lab-grown meat may reduce animal cruelty, but may have other negative impact."*

Michael (55), Germany



# Adoption Potential

The adoption potential of all four innovations increased when participants were presented with more complete descriptions of the innovations.

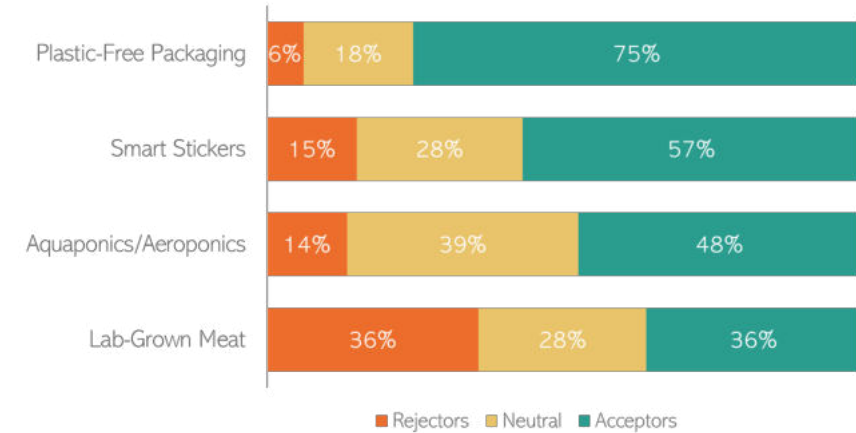
The improvements of the descriptions are based on participants' feedback on the original descriptions. They include clarifications about the strengths and of the innovation, address and/or improve their weaknesses, and identify the role food chain actors can play in making these innovations a success.

The adoption potential was measured after participants had taken part in a series of discussions about these innovations, and had a chance to think about them more carefully.

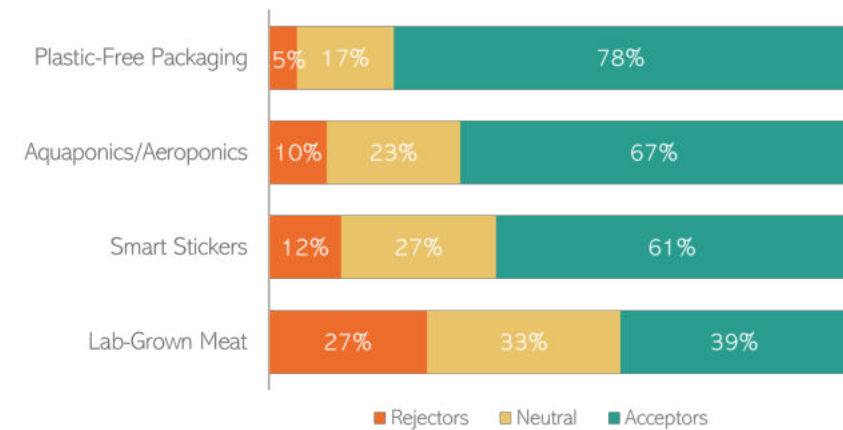
After reading the new descriptions, participants rated **all** innovations more positively than they did before.

This result suggests that engaging consumers in discussion about innovations, listening to their concerns, and making improvements based on their suggestions can increase the innovation's adoption potential. This may be partly caused by the fact that they became more familiar with the innovation, but also that the 'improved' innovation reflects their needs better. Finally, the approval of the innovation by peers may have influenced original rejectors or neutral consumers to view the innovation more positively.

Adoption Potential (Original Descriptions)



Adoption Potential (Improved Descriptions)



# Plastic-free packaging

Plastic-free packaging was the most popular innovation of the four.

This innovation is seen as solving one of the world's most pressing environmental problems: the overabundance of discarded plastic. Participants have a strong association of plastic-packaging with loose plastic in nature, particularly in the sea. A few also mentioned the effect of microplastics to the ecosystem and human health.

Some participants noted that plastic-free packaging will only be progress if it goes hand in hand with reduced packaging altogether, rather than simply replaced by another material. A small minority do not believe that this will be a realistic solution, as plastic does offer benefits as well (hygiene, low cost, convenient).

What kind of consumer would adopt this innovation?

This is one of the few innovations that is not particularly tied to city-dwellers and yuppies, but rather something anyone can adopt. Currently only a small number of participants makes serious attempts to shop for plastic-free food products, however the motivation is there.

How can food chain actors get involved?

Many participants have noted that they make an effort to take their reusable shopping bag with them, but they believe that things will only change if shops stop selling foods packaged in plastic and they are "forced" to come up with new solutions. Authorities are expected to set the tone and create regulations that encourage plastic-free packaging.



*"What I don't like in all this are the biodegradable straws made by paper. After a while inside a drink, they are starting to melt and you can't drink anything at all. I think on that, someone must come out with a new idea!"*

Alexandros (35), Greece

*"I think it is a good idea because it is easy to accomplish in many levels and many ways. And we can all take part in it. It is eye-opening to really see the amount of plastic in our lives - and a lot of it is totally unnecessary."*

Marja-Liisa (56), Finland



# Aquaponics & aeroponics

Aquaponics and aeroponics was generally a well-received innovation.

Most participants like the fact that through this method vegetables can grow in places without arable land. Fish and vegetables can be healthier because they don't need pesticides. A few participants also mentioned the fact that it looks "cool", and for that reason they would be willing to eat vegetables produced this way.

Participants raised a few concerns regarding fish welfare: they need to live in a way that resembles their natural life, not be cramped or eat unnatural food. Some participants also noted that the vegetables grown in aquaponic or aeroponic methods need to have at least as good a nutritional profile as vegetables grown in soil, if not better. Finally, aquaponics and aeroponics need to be environmentally friendly, not use more energy due to heating lamps and use less water than conventional agriculture.

**What kind of consumer would adopt this innovation?**

Aquaponics is seen as an innovation appealing to people who live in cities, and want their food to be sourced locally. It is seen as particularly appealing to more 'adventurous' people, who like to challenge the status quo. At the same time, it is considered as an innovation for the more affluent trend-followers.

**How can food chain actors get involved?**

Aquaponics and aeroponics are seen as a big financial investment, and participants do not believe that should fall only on the shoulders of farmers. Farmers need to be motivated to change their production methods, but they also need to be facilitated by authorities.



*"I love aquaponics, I don't just think of it as a "cool" innovation, but a necessary one. Intensive farming is ruining the soil and leading to desertification, and to reverse that process will take decades. I think the human race will be forced to look into methods which don't need soil, whether we like it or not..."*

David (37), Italy

*"I don't think it's a good idea because I'm not sure what it solves and it will just lead to a huge number of fish being commercially used without caring for their wellbeing."*

Sebastian (25), Switzerland



# Smart Stickers

Smart Stickers was an innovation received positively or neutrally.

There was not a single person who opposed this innovation, however a few participants mentioned that even though they like it in theory they do not see themselves using it.

What participants liked about this innovation is how much information they will be able to access easily. The codes take up little space on the packaging but can provide rich information. They mention that they are straightforward to use, and nearly everyone owns a smartphone. Participants also mentioned that they would be inclined to scan the codes of products they are familiar with, not only new products.

One concern that participants have is the verifiability of the information. A link to a website is useful, but there needs to be a third-party that verifies whether the information is true. Furthermore, this is not a very convenient system when doing grocery shopping in a rush, when not having a smartphone or internet connection.

When discussing this innovation participants also brought-up other labelling systems, such as the traffic light system. A few participants feel that that would be simpler and more convenient.

## What kind of consumer would adopt this innovation?

Participants believe that this app is perfect for people who want to know detailed information about their food – origin of production, allergens, whether pesticides are used, if farmers get a fair price. People who rely on supermarkets for convenience shopping are not seen as likely to use the app.

## How can food chain actors get involved?

Farmers and manufacturers had the chance to increase transparency about their products and production methods. Both actors can communicate all important information related to their product through their website, where the QR code will lead. Authorities are expected by participants to regulate and make sure that the information on the website is accurate. Participants would like retailers to assist people who are not familiar with this innovation to learn how to use it.



*"I would LOVE this innovation if it was absolutely trustful. I don't doubt that some producers would give the proper information, but I'm pretty sure that some will lie blatantly."*

Patricia (43), Ireland

*"For a while I used Yuka app. and I quickly noticed that it bored me. It was taking me too long to figure out whether this or that food was good or not. Moreover I was not convinced by the results given."*

Noelle (78), France

# Lab-grown meat

## The most highly contested innovation of the four.

Seen by many as a way to ethically produce meat, but by others as a step in the wrong direction. One camp considers it animal and environmentally friendly, as well as more hygienic. This group expects lab-grown meat to have the same nutritional value, and texture as 'real' meat. It is seen as a way to keep enjoying eating meat, but without the negative effects. It is also seen as a key to food security, and expected to be a cheap source of protein for people in developing countries.

The other camp considers it at best unnecessary, and at worst a dangerous innovation. Artificial, unhealthy, and too industrial. The process of creating this meat is seen as non-transparent to the consumer and too complex for the average person to understand. Criticism from vegans and vegetarians is that the quest for lab-grown meat perpetuates the idea that meat is a necessary component in a healthy/tasty diet. Another concern is that animals are still involved in the process.

## What kind of consumer would adopt this innovation?

Positive panel members envision a flexitarian consumer who enjoys eating meat, but feels guilty about animal suffering and the effect of meat on the environment. Vegetarians and vegans are less expected to opt for lab-grown meat than meat-eaters. Critical panel members see this person as someone who is willing to follow any technological development because it is trendy, without considering the greater consequences.

## How can food chain actors get involved?

A few participants are concerned about animal farmers and how they will need to adapt to this change. They do not really see a way for them to remain involved. Some mentioned the possibility that the meat of small, organic farmers may remain in demand and they can stay in business. Authorities are expected to carry full responsibility about the safety, healthiness, and environmental benefit of lab-grown meat. Retailers are expected to facilitate this product, have it on their shelves, and make sure it is clearly marked.



*"I LOVE this innovation: it is more efficient, better for the animal welfare. I am concerned about the impact on the climate because it is processing that is quite intense. I don't eat meat myself but would like to try it if I did."*

Sherien (43), United Kingdom

*"I see the usual suspect. Those young technical affine urban hipster, clinging to any new trend available - no matter what."*

Arthur (59), Germany



# Attributes of a successful innovation

Using Rogers' Innovation Theory we analyse the strengths and weaknesses of the four innovations.

# Rogers' Diffusion of Innovation theory

The diffusion of innovation theory was first developed by Everett Rogers and first published in 1962 ([1](#)). Since then it has been one of the most popular theoretical models to be used to analyse and predict how innovative ideas and technologies spread. Rogers' theory has been used widely in technology and education, political science, public health, communications([2,3,4](#)).

According to this theory, for an innovation to be adopted, it must have the following characteristics. These aspects are necessary to convince a consumer that the change is worthy:

1. **Relative advantage** is the extent to which an idea or product is perceived as better than the existing options. How much of an improvement is it?
2. **Compatibility** is the extent to which an innovation fits with the existing values, past experiences, and needs of potential adopters.
3. **Complexity** is the extent to which an innovation is perceived as easy or difficult to understand and use. How understandable is it?
4. **Trialability** is the extent to which it is possible to try-out an innovation before committing to it. How much time, effort, or money do I need to invest to find out if this is for me?
5. **Observability** is the extent to which the innovation is visible to potential adopters. Do my friends use it? Do I see it in the supermarket? The more visible the innovation is to consumers, the more likely it is to be adopted.

Rogers stated that the success of an innovation depends on individuals' perceptions of these characteristics. In order to optimize an innovation, the innovator has to make sure product scores highly on these dimensions and clearly communicate to the consumer how it does that.

The perceived attributes of an innovation are important predictors of the rate of adoption. A **review and meta-analysis** examining 75 articles measuring diffusion of innovation found the strongest support for **relative advantage**, **compatibility**, and **complexity**, while trialability and observability showed weaker relationships with adoption rate([5](#)).

In the [Citizen Participation Forum 2020](#), we examined the role of consumer trust in the food chain actors and how that influences attitudes towards food. We found that medium to high levels of trust are necessary for consumers to accept developments in the food chain. In Europe, trust is not a big concern when it comes to food safety, however it does affect consumer attitudes towards health and sustainability claims.

Rogers' Diffusion of Innovation theory examines the attributes of an innovation and how they are perceived by the potential consumer. The theory does not explore the relationship between the consumer and the innovator, for example whether or not there is trust.



## Overview of attributes of the four innovations

|                                                                                                                                                                                                                                          | Plastic-free packaging | Aquaponics/<br>Aeroponics | Smart Stickers | Lab-grown meat |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------------------|----------------|----------------|
| <b>Relative advantage</b><br>The extent to which an idea or product is perceived as better than the existing options. How much of an improvement is it?                                                                                  | ✓                      | ✓                         | =              | ?              |
| <b>Compatibility</b><br>The extent to which an innovation fits with the existing values, past experiences, and needs of potential adopters.                                                                                              | ✓✓                     | ✓                         | ✓✓             | ✓✓ or ✗        |
| <b>Complexity</b><br>The extent to which an innovation is perceived as easy or difficult to understand and use. How understandable is it?                                                                                                | ✓✓ or ✗                | ✓✓                        | ✓              | =              |
| <b>Trialability</b><br>is the extent to which it is possible to try-out an innovation before committing to it. How much time, effort, or money do I need to invest to find out if this is for me?                                        | ✓✓                     | ✓✓                        | ✓✓             | ✓✓             |
| <b>Observability</b><br>The extent to which the innovation is visible to potential adopters. Do my friends use it? Do I see it in the supermarket? The more visible the innovation is to consumers, the more likely it is to be adopted. | ✓✓                     | ✓                         | ✓              | =              |



# Relative advantage

Relative advantage is considered to be one of the best predictors of an innovation's rate of adoption.

In the case of the four food innovations, relative advantage can include **cost**, **convenience**, **taste**. However, some relative advantages, such as **health** and **sustainability**, are perceived as relevant at some future, unknown time. These advantages are therefore more difficult to show to potential adopters of an innovation, which may lead to lower rate of adoption.

In the case of **plastic-free packaging**, the relative advantage of sustainability is not only very **tangible**, it is also related to a sustainability issue that is seen as a problem **now**. Unlike global warming or rising sea levels, plastic is a problem now as much as it will be in the future. This motivates consumers to adopt an innovation which would help solve this current problem. Lack of packaging will mean **greater effort** by consumers to bring their own packaging and **plan** their groceries more carefully in advance, leading to relative **inconvenience**.

On the other hand, **aquaponics and aeroponics** do not solve a problem that is currently directly faced by consumers. Potentially unfertile soil in the near future is a possibility, not a certainty, and is not visible right now.

**Smart Stickers** offer an advantage: information about a product is easily and quickly available. However, relative to current labelling systems, the advantage may not be much greater. Additional advantages, such as **blockchain technology**, or further **regulation** to guarantee the information presented may be necessary to make it worthwhile to the consumer.

As **lab-grown meat** is still under development, little can be said about the relative advantages that are relevant to consumers in the present moment. Will it be more expensive than conventional meat? Will it taste the same? Will as many species, breeds and cuts be available? These questions need to be answered before the relative advantages become clear to the consumer.

| Relative advantage        |   |
|---------------------------|---|
| Plastic-free packaging    | ✓ |
| Aquaponics/<br>Aeroponics | ✓ |
| Smart Stickers            | = |
| Lab-grown meat            | ? |

*"I wouldn't say I LOVE this innovation because it's not an innovation! It's the way things were done in 'olden times'! I do think it's a step in the right direction though."*

Marion (64) United Kingdom

*"I love [Smart Stickers]. I think it's a good idea because you save time by not searching the product's label all the time And you can increase the font of the label's information on your smartphone."*

Radu (34), Romania



# Compatibility

Whether or not innovations are favoured by consumers depends to a large extent on their **cultural and personal values**. Furthermore, an innovation can be (in)compatible with previously adopted **practices**. **Adventurousness** is a value inherent to being open to innovations, but other values may increase or decrease the likelihood of adopting a specific innovation. Consumers who inherently value the **progress of technology** and enjoy novel technologies are more likely to adopt them.

When it comes to **plastic-free packaging**, the critical values are care for the environment. Plastic-free packaging needs to be developed taking into account that need for convenience will often, particularly in times of stress, overtake need for environmental care.

The value of **naturalness** affects the likelihood of consumers buying vegetables grown in **aquaponic and aeroponic** methods. Concern for animal friendliness may inhibit consumers from supporting aquaponic businesses. Valuing naturalness may make consumers sceptical toward the nutritional value of vegetables grown in an industrialised environment rather than directly in the earth.

**Smart Stickers** are associated with transparency, which is a value held by most consumers. Consumers are already familiar with reading and seeking out information about their food and therefore they are compatible with previously adopted ideas. Smart Stickers are compatible with consumers' need for transparency of the food chain: much more information will be available on the website than on a traditional label.

**Lab-grown meat** is (mostly) compatible with the value of **animal friendliness\***. Consumers who find this value important are more likely to adopt this innovation than consumers who do not. Another value strongly related, but opposed to lab-grown meat, is the value of **naturalness**. Consumers who place a high value on nature, and food produced in ways compatible with nature, are not likely to adopt lab-grown meat. The likelihood of persuading those consumers to adopt lab-grown meat is slim, at least at first.

In order to overcome these barriers, the four actors need to primarily target consumers who **share the values** promoted by the innovation, or communicate how these values are in fact compatible. For example, in the case of aquaponics they would need to communicate in what way this innovation can be animal friendly, and more nutritious compared to vegetables grown in soil.

| Compatibility             |         |
|---------------------------|---------|
| Plastic-free packaging    | ✓✓      |
| Aquaponics/<br>Aeroponics | ✓       |
| Smart Stickers            | ✓✓      |
| Lab-grown meat            | ✓✓ or x |

*"I do not find it right, it seems more correct for plants to grow in nature."*  
Dilara (41), Turkey

*"I LOVE [Smart Stickers] because I expect it to add more transparency to what ingredients the products have."*  
Katharina (28), Switzerland

<sup>23</sup>\*Some animals will still have to be reared to harvest cells for the production of in lab-grown meat.



# Complexity

How complicated is it to learn how to use this innovation? How many steps are involved? Complexity is related to the amount of effort potential adopters of an innovation have to put in to 1) learn how to use it, and 2) actually use it.

**Plastic-free packaging** may or may not pose complexity to the consumer. Packaging that is made of alternative materials, or lack of packaging, is not perceived as difficult to understand or use. However, if packaging is removed altogether, complexity might become an issue for consumers as they will need to remember to bring their own bags and containers.

**Aquaponics and aeroponics** offer **little complexity** for the consumer. If vegetables produced using this method can be purchased, cooked, and eaten in the same way as conventionally-grown vegetables then little needs to change for the consumer.

**Smart Stickers** may appear complex to consumers who are not familiar with QR codes. At first glance it may seem like QR codes add a layer of effort for consumers. Previously looking at the label would have been enough to gather important information about a product, but now they will need to use their phone. However, the information that QR codes will offer is additional to the information on the packaging, that they would otherwise find by searching online. It is important to emphasize that QR codes add **convenience**, not **complexity**.

**Lab-grown meat** will aim to minimize any complexity for the consumer as soon as it hits the shelves. However, complexity depends heavily on **perception**. The fact that lab-grown meat is produced in a very complex way may lead consumers to believe that it is also more complex to cook with than meat. It is important that communication around lab-grown meat focuses on similarities with meat and reduce **technical jargon** to a minimum.

|                           | Complexity |
|---------------------------|------------|
| Plastic-free packaging    | ✓✓<br>or × |
| Aquaponics/<br>Aeroponics | ✓✓         |
| Smart Stickers            | ✓          |
| Lab-grown meat            | =          |

*"I don't think this is a good idea because it is completely unrealistic. [...] A few bourgeois souls going to a nice little boutique and filling their own containers with cereals and shampoos is not going to cut it!"*

Rupert (56), Great Britain

*"I HATE [lab-grown meat]. I don't think this is a good idea because we will not know it is an artificial process, and we have no control or visualisation as end consumer how it was produced."*

Roberto (61), Belgium



# Trialability

Not all innovations are as easy to try out without committing to them for at least a period of time. In general, innovations that can be tried through instalments, or in small amounts, will be adopted more easily as they are less uncertain for the consumer.

In the case of the four innovations, all of them are possible to try-out with little commitment. Buying a product that is not packaged in plastic, trying-out vegetables that are produced through aeroponics, scanning a Smart Sticker for the first time, and even trying lab-grown meat.

However, trial still needs to be **made easy**. Smart Stickers need to be clearly explained so that consumers who are not tech savvy do not struggle while shopping. **Temporary price reductions** or even **free samples** offer consumers an opportunity to try lab-grown meat and aeroponic vegetables with lower risk. Small packages for trial, if not relatively more expensive, can also be a way to get consumers to try these innovations. Finally, being able to taste lab-grown meat or aquaponic vegetables at a **restaurant** is an easier way to get acquainted with the new food.

All in all, trialability is quite strong for the four innovations from the perspective of the consumer.

|                        | Trialability |
|------------------------|--------------|
| Plastic-free packaging | ✓✓           |
| Aquaponics/ Aeroponics | ✓✓           |
| Smart Stickers         | ✓✓           |
| Lab-grown meat         | ✓✓           |

*"There can be fair-style meetings for people to taste and try [lab-grown meat]."*  
Emine (51), Turkey

*"Some displays, commercials showing smart codes and how to use them - so people will know about those smart codes and will be willing to try them."*  
Julia (26), Poland



# Observability

The results of some innovations are more obvious and easy to communicate than others. For example, “hardware” is observable, whereas “software” not as much. Additionally, an innovation’s effects can also be more or less observable. Observable results of an innovation can be persuasive, as they “prove” that the innovation works, or delivers its promise.

Observability of an innovation can be increased, by making it distinct from its predecessor. The pitfall of making an innovation too observable is that it may mean it will differentiate itself too much from the status quo, which in the case of food is not always desirable. For example, for lab-grown meat to catch-on its similarity to meat needs to be emphasized. However, for consumers to notice other people adopting this new product it will have to be different enough from meat, if only in its packaging.

**Plastic-free packaging** is an easily observable innovation, with the exception of alternative materials made to look like plastic. Benefits of plastic-free packaging are inherent to the packaging being free of plastic, so they are also observable. However, the fact that this innovation is observable does not mean that it immediately catches attention. If products are not packaged in plastic, that should be **explicitly communicated** to the consumer.

The vegetables produced through **aquaponics and aeroponics** do not look any different than vegetables grown in soil. In that sense the innovation is not observable. It is possible to make this innovation more observable through **labelling** or **demonstration**. Supermarkets that have small vertical farms within their store, for herbs for example, can show what aeroponics looks like and what the product is.

**Smart Stickers** will be observable, but likely discrete. Manufacturers and retailers will need to help **increase awareness** about this innovation for consumers to notice it. The result of Smart Stickers more transparency, will be visible to consumers who are aware that the stickers exist. Consumers do not need to consistently use the stickers to know that products that have them offer more information about the production, origin of ingredients, etc.

It is unclear to what extent **lab-grown meat** will be an observable innovation. This will depend largely on legislation surrounding **labelling**, **placement** in shops, and **naming** on restaurant menus. The effectiveness of lab-grown meat in reducing emissions will not be observable to an average consumer, but will need to be measured by experts. Its effectiveness in reducing animal suffering will be observable by consumers.

| Observability             |    |
|---------------------------|----|
| Plastic-free packaging    | ✓✓ |
| Aquaponics/<br>Aeroponics | ✓  |
| Smart Stickers            | ✓  |
| Lab-grown meat            | =  |

*“Here in Denmark we have [aeroponically grown crops] actually grown inside a supermarket so it works. It’s only herbs, but nevertheless it’s possible to see them grow and buy them once they are big enough.”*  
Carola (44), Denmark

*“Plastic takes hundreds of years to degrade and contaminates the entire food chain. On earth, plastic is windswept and degrades landscapes too. [...] I have seen this and I felt very sad seeing how unaware people were of this nefarious pollution which spoils their landscapes, their rivers and their health.”*  
Noelle (77), France



# Conclusion

Consumers are aware of the need for a more sustainable food system, and believe that innovation can play a role in that. However, there is a preference for natural and traditional ways of producing food, over industrialized production.

Clear communication about an innovation's attributes can decrease uncertainty and hesitance towards that innovation. Focusing on a novel food's relative advantage and compatibility, or a new production method's (low) complexity can help gain adopters.

The entire food chain can help consumers adopt innovative foods. From the retailer who can guide consumer choices, to farmers and manufacturers who can produce sustainable foods, to authorities who can incentivize and regulate.

Consumers believe that the food chain has a responsibility to bring sustainable foods to the market, and that a combination of innovation and return to earth-friendly producing methods will be necessary to get there.



# Methodology

# Set-up of the study

## Qualitative online consumer research

- Target: minimum n=10 per market
- 18 markets
- Sufficient English proficiency
- Frontrunners in the area of food
- Sufficiently eloquent and outspoken
- 8 days of assignments

## Fieldwork

- Timeline: mid- to end-October 2021
- Online community: Open questions in a forum setting, probing participants to elaborate and converse with one another, submission of images
- Quantitative: questionnaires

## Desk research

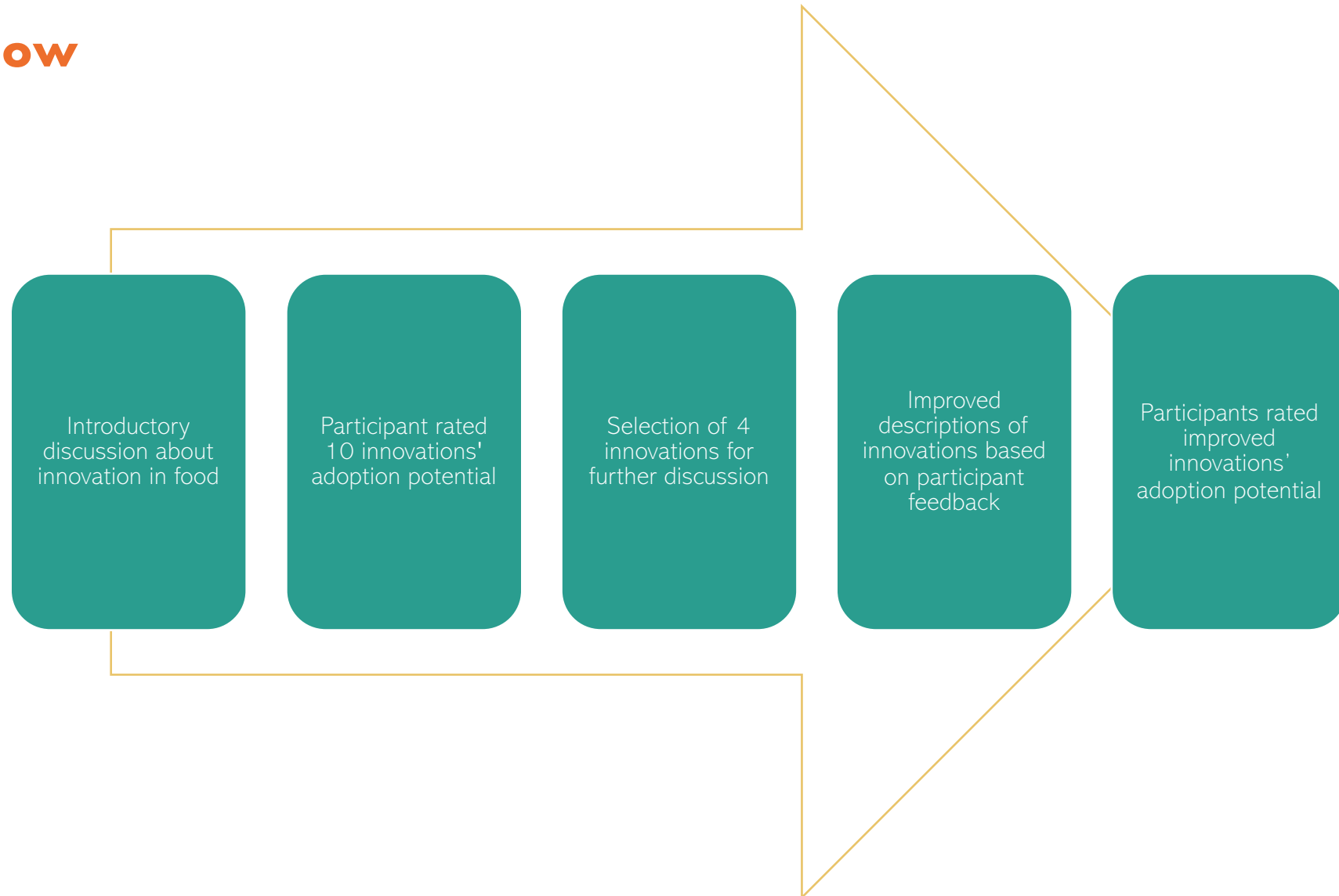
- Finding a theoretical framework for innovation adoption
- Understanding the psychological constructs underlying innovation adoption
- Learning about current practices in food innovation and communication

## Analysis and reporting

- Timeline: mid-November



## Study flow



# Measuring adoption potential

Adoption potential was not straightforward to measure for these four innovations.

The primary reason for that is that adoption can mean several things in this context: buying the innovation, buying a product produces using an innovation, or supporting an organization which has adopted this innovation.

For this reason we used a 3-item scale (5-point, completely disagree – completely agree) to measure liking of this innovation:

- I love this innovation
- I think this innovation leads to a positive change
- I would support organisations/companies that implement this innovation

Furthermore we asked participants to 'invest' 10,000 euro between the 4 innovations based on how much they like them (constant-sum). We divided the amounts into 5 ranges: (0-300, 300-1000, 1000-3000, 3000-5000, 5000+).

The adoption innovation score is the average score of the 3-item scale and constant-sum question.



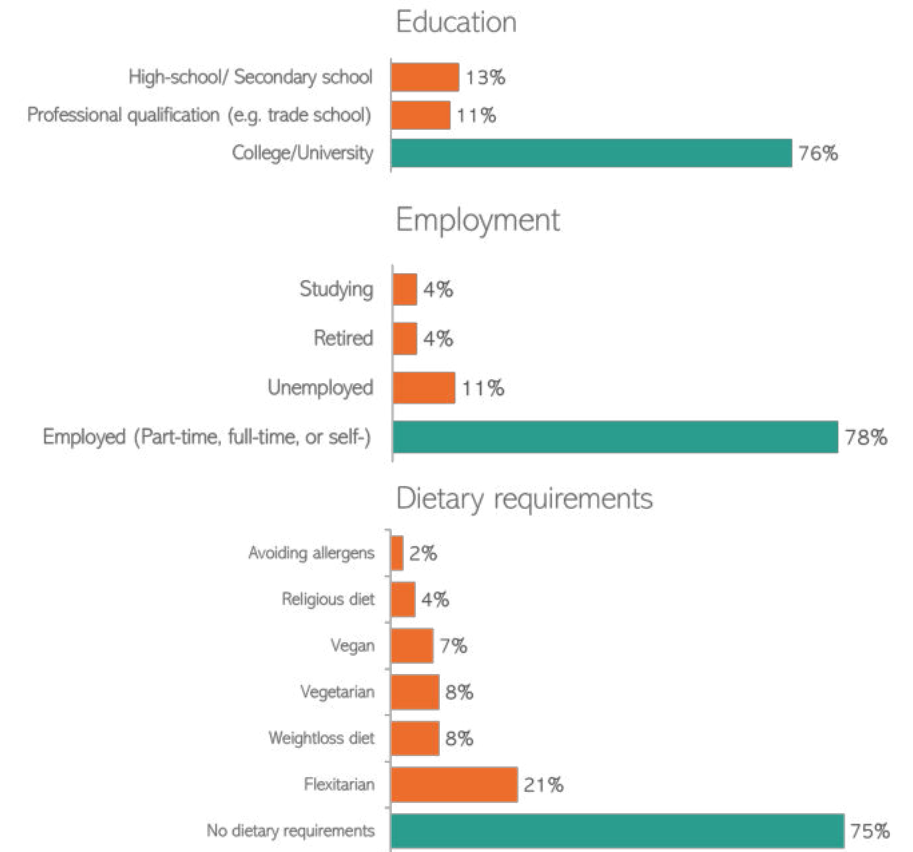
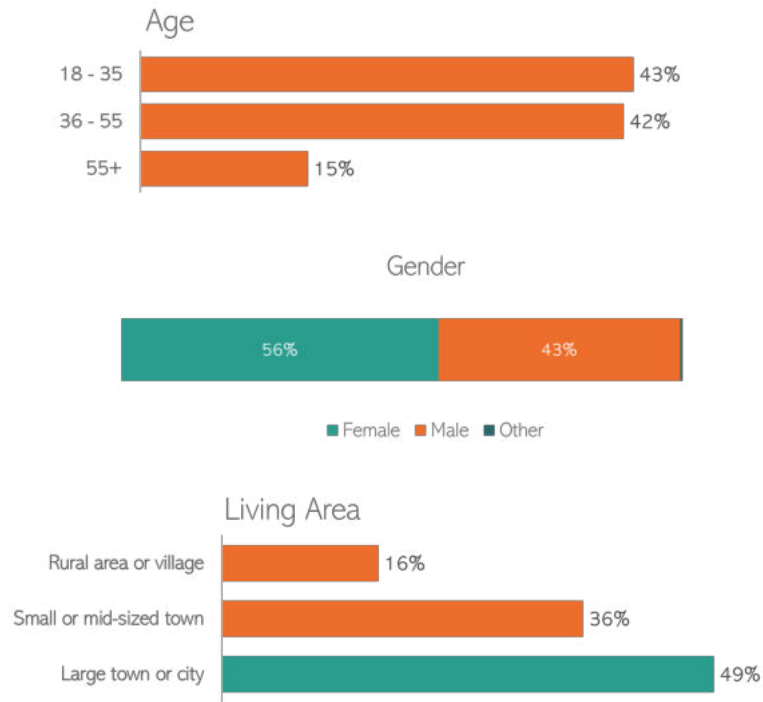
# Overview of respondents

| COUNTRY | NO. ACTIVE PARTICIPANTS | COUNTRY        | NO. ACTIVE PARTICIPANTS |
|---------|-------------------------|----------------|-------------------------|
| BELGIUM | 14                      | ITALY          | 15                      |
| CZECHIA | 12                      | NETHERLANDS    | 13                      |
| DENMARK | 10                      | POLAND         | 16                      |
| FINLAND | 14                      | PORTUGAL       | 11                      |
| FRANCE  | 11                      | ROMANIA        | 10                      |
| GERMANY | 12                      | SPAIN          | 13                      |
| GREECE  | 10                      | SWITZERLAND    | 11                      |
| IRELAND | 17                      | TURKEY         | 13                      |
| ISRAEL  | 13                      | UNITED KINGDOM | 17                      |
|         |                         | TOTAL          | 232                     |



# Overview of respondents in the community

The sample of participants was selected on a basis of **medium to high level of interest in the food chain**. In other words, the sample consists of frontrunners when it comes to food.



# Appendix

Descriptions of Innovations and Bibliography

# Original descriptions of innovations presented to the participants

## Plastic-free packaging

Foods will be packaged using materials alternative to plastic (e.g. paper, biodegradable material), or no packaging at all.

## Lab-grown meat

Cultured meat is grown in a lab from a few animal cells. Instead of raising an animal, animal cells are grown in a lab and arranged in the same structure as those of animal tissue.

## Aquaponics/ Aeroponic

Both are alternative ways of producing vegetables, without use of soil. In aquaponics, plants grow in the water in which fish live. The fish produce nutrients that are good for the plants, and the plants in turn purify the water for the fish. In aeroponics, plants grow in the air, in a misty environment. The roots and stem of the plant are sprayed with a nutrient-rich water solution.

## Smart Stickers

Consumers can scan QR stickers on food products with their smart phones to access information about the product. This could include information on how the food product was produced, the origin of ingredients, the environmental impacts of the production and/or healthy recipes using that food product.



# Improved descriptions of innovations presented to the participants I

## Lab-grown meat

Lab-grown meat is grown in a lab from a few animal cells. Instead of raising an animal, animal cells are grown in a lab and arranged in the same structure as those of animal tissue. Even though animals are still involved in the process, much fewer are needed to produce meat. This means that fewer or almost no animals are raised and slaughtered. Lab-grown meat is expected to need drastically lower amounts of water and farm land compared to breeding animals.

Currently the price of producing lab-grown meat is very high. The technology and process behind lab-grown meat is very complex and still being developed. Singapore is the first and only country until today that has approved the sale of lab-grown meat for consumers.

Authorities can help by making sure that lab-grown meat is completely safe for consumption and better for the environment. Manufacturers can help by being radically transparent about how lab-grown meat is produced.

## Aquaponics/Aeroponics

Both are alternative ways of producing vegetables, without the use of soil. In aquaponics, plants grow in water in which fish live. The fish produce nutrients that are good for the plants, and the plants in turn purify the water for the fish. In aeroponics, plants grow in the air, in a misty environment. The roots and stem of the plant are sprayed with a nutrient-rich water solution.

The advantage of aquaponics/aeroponics is that we can grow vegetables and raise fish in places without suitable soil (e.g. in cities, or deserts). Vegetables are healthier because they do not need artificial fertilizers. The fish live in tanks that look like their natural environment and get fed a healthy diet. No pesticides are needed because the plants grow in a controlled environment. Aquaponics use less energy and less water than traditional agriculture because it is recycled and does not evaporate.

This is an opportunity for innovative farmers to take on. Authorities can support them with financial incentives and campaigns educating about this method of producing vegetables.



# Improved descriptions of innovations presented to the participants II

## Plastic-Free Packaging

Foods will be packaged using materials alternative to plastic (e.g. paper, biodegradable material), or no packaging at all. Less plastic in the supermarket means less plastic on the landfills, and in the environment. Plastic releases microplastics in our food, land, and water, which break down but never disappear completely. Plastic-free packaging can reduce our carbon footprint.

Even though plastic does not decompose, other packaging materials may take up more energy and water to produce (e.g. cotton, paper, glass) and therefore can also be unsustainable. Other alternatives to plastic are also more expensive to produce. Lack of packaging means that foods do not last as long, or may be contaminated. Furthermore it may take some effort from consumers, as they are expected to bring their own packaging for some products.

Authorities can help by introducing laws and financial incentives to avoid plastic. Manufacturers can focus on campaigns to promote the new plastic-free packaging of their products and raise awareness about the benefits.

## Smart Stickers

Consumers can scan QR stickers on food products with their smart phones to access important information about the product. This could include information on how the food was produced, the origin of ingredients, the environmental impacts of the production and/or healthy recipes using that food product.

The advantages of this is that the QR code takes up little space on the label, and can be placed on retailers' labels when it comes to unpackaged products (e.g. fruit, vegetables). The QR codes are easy to scan, and many people have a smartphone on them when they go shopping or at home.

Like other labels, this system relies on the manufacturer or farmer to provide honest information about the produce and is checked by a third party. QR codes lead to reliably and secure websites and does not collect data from the consumers. This innovation is meant for people want to learn more about what they eat and gives them a convenient way to do so.

This is an opportunity for farmers and manufacturers to increase transparency about their products and production methods . Both actors can collect all the information related to their product and present it on their website, where the QR code will lead.



# Bibliography

- (1) Rogers, Everett M. (1962). Diffusion of innovations (1st ed.). New York: Free Press of Glencoe
- (2) Gonera, A.; Svanes, E.; Bugge, A.B.; Hatlebakk, M.M.; Prexl, K.-M.; Ueland, Ø. (2021) Moving Consumers along the Innovation Adoption Curve: A New Approach to Accelerate the Shift toward a More Sustainable Diet. *Sustainability* , 13, 4477.
- (3) Inwood, S.M., Sharp, J.S., Moore, R.H. et al. (2009). Restaurants, chefs and local foods: insights drawn from application of a diffusion of innovation framework. *Agricultural and Human Values*, 26, 177–191
- (4) Sherry, L. & Gibson, D. (2002). The Path to Teacher Leadership in Educational Technology. *Contemporary Issues in Technology and Teacher Education*, 2(2), 178-203.
- (5) Tornatzky, Louis G., and Katherine J. Klein. (1982). Innovation characteristics and innovation adoption implementation: A meta-analysis of findings. *IEEE Transactions on Engineering Management*, 29(1): 28–45.



# Blog post and summary

350- and 1000-word summaries of the study

# Summary: Stimulating Adoption of Sustainable Innovation

Consumers are aware of the need for a more sustainable food system, and believe that innovation can play a role in that. However, many prefer natural and traditional ways of producing food over industrialized, high tech ways of producing food. How can they be encouraged to try out and eventually adopt sustainable food innovations?

In this online community study, 232 participants from 18 countries discussed and rated 4 different food innovations. Using Rogers' Diffusion of Innovation Theory, we analysed the strengths and limitations of each innovation according to consumers.

This study has shown that by merely listening to consumers, addressing their doubts and bringing forward the benefits in a better way, the adoption potential of innovation can be improved. Rogers' Diffusion of Innovation theory has proven to be a very valuable framework for this.

Within the four innovations that the participants rated and discussed (plastic-free packaging, aquaponics/aeroponics, Smart Stickers, and lab-grown meat), the one with the highest potential for adoption (78%) is plastic-free packaging. Lab-grown meat is the most contested innovation, but still with a potential for adoption by nearly 40% of consumers.

Based on the participants input and Rogers' theoretical framework, we suggest that innovators take the 5 following tactics into account:

- o Bring attention to the here and now. Emphasize tangible short term benefits.
- o Verify sustainability claims
- o Leverage consumers' existing behaviours to make it easier to integrate in everyday life.
- o Consider consumers' different values and concerns. Different people might find a product appealing for different reasons.
- o Create easy, low-risk opportunities for trial

The entire food chain (farmers, manufacturers, retailers, and authorities) can help consumers adopt innovative foods. Farmers are currently perceived as the least innovative food chain actor, who has difficulty keeping up with changes necessary to produce sustainable food. Manufacturers on the other hand, are perceived to be the drivers of innovation and have the most to benefit. Retailers are seen as having a highly involved role and can make sustainable, innovative food choices easier for consumers. Finally, authorities are expected to guide the transition to new foods and methods of production through stricter regulation and by funding sustainable innovation.



# Stimulating Adoption of Sustainable Innovation I

Consumers believe there is a need for more sustainable foods. At the same time, there is some weariness towards innovations that are seen as too industrial and unnatural. Particularly technological food innovations are associated with yuppy, big-city culture and are not perceived as suitable for the average person. So how can we encourage consumers to try out and adopt sustainable food innovations?

## The study

In this study, we examined consumer attitudes toward food innovation. Through four case-studies we analysed five attributes that influence the diffusion of an innovation based on Rogers' [Diffusion of Innovation Theory](#). On the basis of these case-studies we make concrete suggestions on how the different food chain actors can stimulate adoption of a sustainable innovation.

The study took place online, in an online community made up of 232 participants from 18 countries (1). Data collected is quantitative (through short polls and questionnaires), and qualitative (through discussions, and photo assignments). Participants discussed and rated four up-and-coming food innovations. They talked about the strengths and limitations of these innovations, and made suggestions for improvement. Participants also talked about the role the food-chain actors (farmers, manufacturers, retailers, and authorities) can play in developing and popularizing food innovations.

## Adoption potential

This study has shown that by merely listening to consumers, addressing their doubts and bringing forward the benefits in a better way, the adoption potential of innovation can be improved. Rogers' Diffusion of Innovation theory has proven to be a very valuable framework for this.

Within the four innovations that the participants rated and discussed (plastic-free packaging, aquaponics/aeroponics, Smart Stickers, and lab-grown meat), the one with the highest potential for adoption (78%) is plastic-free packaging. Lab-grown meat is the most contested innovation, still with potential for adoption by nearly 40% of consumers.

Participants made suggestions for how innovations can be improved. In combination with the 5 elements of a successful innovation (relative advantage, compatibility, complexity, observability, and trialability) we make recommendations on how these innovations can be improved and communicated.

(1) Belgium Czechia, Denmark, Finland, France, Germany, Greece, Ireland, Israel, Italy, The Netherlands, Poland, Portugal, Romania, Spain, Switzerland, Turkey, United Kingdom



# Stimulating Adoption of Sustainable Innovation II

How can the four innovations be improved?

|                               |                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Plastic-free packaging</b> | The relative advantage of plastic-free packaging needs to be emphasized, particularly its benefits to the consumer in the present moment. In order for this innovation to be a success, innovators will also need to address complexity. Plastic-free packaging should not make products more complicated for consumers (e.g. planning groceries in more detail).                                                                 |
| <b>Aquaponics/ Aeroponics</b> | The tangible products of aquaponics/aeroponics, the crops, need to be better than crops grown in soil for this innovation to become worthwhile for consumers (e.g. more nutritious, safer, or tastier). Make the innovation observable, by for example installing small aeroponic systems in supermarkets or public spaces.                                                                                                       |
| <b>Smart Stickers</b>         | Smart stickers can improve their relative advantage by offering a kind of guarantee or certification that the information presented is accurate. Clear instructions need to be presented to consumers who are not familiar with QR codes. Retailers and manufacturers can bring attention to the stickers which are discrete by design.                                                                                           |
| <b>Lab-grown meat</b>         | Lab-grown meat needs to develop to be at least as tasty, affordable, and healthy to be adopted by consumers. Consumers who refuse to eat technologically processed food have low compatibility with this innovation and should not be targeted in promotion. Ease with which lab-grown meat can be cooked should be emphasized, and finally lab-grown meat needs to be distinguishable (for example through packaging) from meat. |



# Stimulating Adoption of Sustainable Innovation III

What is the role of the food chain actors?



**Farmers** are seen by many as a food chain actor that is less associated with innovation, has more difficulty innovating and keeping up with the necessary changes for producing sustainable food.



**Manufacturers** are perceived to be the drivers of innovation and have the most profit to make.



**Retailers** are seen as having a highly involved role and can make sustainable, innovative food choices easier for consumers.



**Authorities** are expected to guide the transition to new foods and methods of production through stricter regulation and by funding sustainable innovation.

## Five tactics to make food innovations a success

Based on Rogers' Innovation Theory and the participants discussions about the four innovations, we recommend 5 tactics that innovators can apply to make their products or services successful.

### Bring attention to the here and now (relative advantage)

Innovations such as plastic-free packaging, and lab-grown meat target problems that are visible to consumers now. Seeing plastic in nature emphasizes the urgency of plastic-free packaging and the direct consequence of such packaging: less plastic in nature. Innovations that target distant problems, or future uncertainties need to communicate their value in the here and now.

### Verify sustainability claims (relative advantage)

Consumers have high expectations about upcoming sustainable developments. Importantly, they want to be able to quickly judge if the innovation is sustainable, but also to have some authority verify that it is truly sustainable and not 'greenwashing'. Innovations such as Smart Stickers will need to go the extra mile and offer that guarantee.

### Leverage consumers' existing behaviours (compatibility)

Consumers are willing to change their ways, but it's not easy to break patterns. Innovations need to leverage consumers' current behaviours and beliefs. Fortunately, the belief that there is need for sustainability is shared by many. New methods for producing vegetables, such as aeroponics and aquaponics fit consumers patterns of behaviour and beliefs that it is important to eat healthily and sustainably.

### Consider consumers' different values and concerns (compatibility)

There are different reasons for which different consumers might opt for the same product. For example because they value different aspects of it, or because they see different benefits in the same feature. For example, the idea of lab-grown meat appeals to the environmentally conscious, the animal friendly, consumers concerned about meat safety, or about food security. Different, personalised messages need to target these different groups.

### Create opportunity for trial (trialability)

It is important that consumers can easily try out the innovation without having to commit to it. By providing low risk opportunities to try, for example by including a novel food in popular food boxes or selling it in smaller quantities, consumers are able to have an impression of the innovation without committing to it.