

# Organic Consumers' Opinions About New Types of Recirculation in Organic Production

Qualitative Study  
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## Management summary

If organic agricultural production is to be increased and conventional manure use reduced, it is necessary to find alternative fertilizer inputs to use i.e. recycled household waste compost, sewage bio-solids and potential industrial resources. This might also fit well with a desire to be part of the emerging circular economy. However, how will this type of recycling impact the credibility of organic agriculture in the eyes of consumers? Answering this question is the overriding aim of this qualitative study conducted by The Danish Agriculture and Food Council.

The qualitative study explores beliefs and attitudes among a specific target group, 20 consumers who (by their own account) either 'often' or 'always' buy organic food and beverages – in this analysis referred to as 'organic consumers'. The qualitative study is part of a large project in corporation with scientists at the University of Copenhagen, funded partly by the Green Development and Demonstration Programme (GUDP), a fund under the Danish Ministry of Environment. The study will be followed by a large, representative quantitative study among Danish consumers conducted by scientists at the University of Copenhagen. Findings in this qualitative analysis should, therefore, be seen as indicative, awaiting further studies.

The most important findings are:

- From the outset there was a general acceptance of the use of compost, sewage bio-solids and potential industrial resources in food production as long as these are of natural origin and can be composted. Materials containing microplastics were, however, not acceptable to be used as fertilizer input.
- Similarly, from the outset, there was an acceptance of the use of these materials in organic production. The use of organic manure is a known fact and seems to have paved the way for accepting other materials.
- However, very importantly, this acceptance was based on the assumption that the material used is of *organic origin* and will be *filtered/purified* to ensure that no unwanted/unsafe substances (such as artificial dyes, preservatives and additives in foods) are recycled into organic production.
- Presented with the possibility that the material cannot be of purely organic origin or purified before being used as fertilizer input, 'organic-consumers' fell into two groups of equal size:
- A group for whom it is *not acceptable* to use non-organic materials: They perceive organic agricultural production as a guarantee for purity and a cleaner, more natural way of producing what needs to be protected. For this group, recycling non-organic material into organic production is, therefore, not acceptable, as it compromises the purity of the organic, ideal way of producing.
- A group for whom it is *acceptable* to use non-organic materials: For these, organic agricultural production is perceived as a path to a more sustainable society among many other paths. The most responsible choice in favor of both a consideration of humans, animals, the environment and nature today and also the future ability of generations to survive for tomorrow. For this group, recycling non-organic material into organic production is, therefore, acceptable as it will raise the sustainability of food production in general - for the benefit of future generations.

Information material provided at the end of the interview about the use of conventional manure in organic agricultural production today, as well as the dilemmas associated with the use of alternative fertilizer inputs surprised participants and caused some to change their opinions:

- After reading the information material, most accept the use of non-organic, biological materials in organic agricultural production, since conventional manure is already used today: Either these materials can be used alongside conventional manure or they could replace conventional manure. Rules and regulations would need to be adjusted accordingly, but this is acceptable provided that scientists are able to guarantee the safety of implementing these materials.
- After reading the information material, a minority rejects the use non-organic, biological materials in organic agricultural production and find that it is better to implement this in conventional agricultural production or, alternatively, a new, third way of production. A few among these even find that the use of conventional manure should be prohibited. If it is not possible to replace conventional manure with other biological waste material of an entirely organic origin, organic agricultural production ought to be decreased to a level that can be sustained using organic manure only.

In conclusion, the findings of this qualitative study indicate difficult decisions ahead:

- The reactions and conflicting opinions among organic consumers concerning the dilemmas surrounding the recycling of materials into organic food production implies that not all consumers who often or always buy organic foods today will be able to support this way of developing organic agricultural production further. Thus, moving forward will potentially alienate some of those in the key target group.
- Moving forward, it is vital to consider which types of material to use as not all material carries an equal level of acceptance. Furthermore, the decision must be made as to whether these materials should be used alongside conventional manure or replace it.
- The fact that conventional manure is used in organic production today is not general knowledge. This information has the potential to alienate some organic consumers, but on the other hand, with time, it can also pave the way for acceptance of alternative fertilizer inputs. Thus, consideration should be given as to whether any future communication about alternative fertilizer input should be accompanied by information concerning ways of organic agricultural production today.
- Last but not least, *how* it is communicated is of vital importance and would require further exploring: Firstly, for several participants, opinions mature during the interview. This would indicate that communication over time (possibly in several phases) could be beneficial. Secondly, findings in this qualitative study suggest that the specific wording seems important for acceptance. Transparency is of crucial importance, but on the other hand, too much information has the potential to distance consumers as it touches on subjects which they feel ambivalent about. Regardless, framing the use of alternative fertilizer inputs in a larger context of responsible production, sustainability and circularity would aid acceptance among this key target group as it is a context in which they find organic agricultural production to have crucial relevance.

## Background and purpose

Currently, we are near the limit for how much area can be cultivated organically, due to an increasing shortage of nutrients. The shortage of organic nutrients means that organic farming increasingly needs to use fertilizer inputs – namely, manure – from conventional pigs and cows, because there is not enough organic fertilizer input. Organic farmers wish to limit the use of conventional manure and preferably, to stop using it entirely. However, the lack of nutrients remains a real challenge. If organic production is to be expanded to cover a larger area than it does today, it is necessary to find alternative sources of nutrients.

Research is currently being conducted into whether recirculation is a viable route for further developing organic farming – primarily, studying whether there are health and environmental risks due to the use of the following:

- Composted household waste from urban areas
- Biosolids from wastewater
- Human urine
- Waste products from industry, e.g., dairies, meat processing, breweries

One of the goals that researchers are basing their work on is that the advantages of recirculation must clearly outweigh the disadvantages and the adverse effects must be either impossible to detect or practically negligible.

However, it is one thing to talk about what we can responsibly do in terms of cultivation, but what do the consumers think? How will implementing recirculation using the aforementioned fertilizer inputs affect consumer opinion regarding organic products, particularly the trust consumers have in the red organic (Ø) label? This is central to this qualitative study of Danish organic consumers.

### THIS REPORT FOCUSES ON:

How do organic consumers feel about sustainability and the role organic farming plays in this? Is organic production always sustainable? Can something be sustainable without being organic?

How do organic consumers see the opportunities for recirculation in food production? Can all material be recirculated or are there some things that should not be recirculated?

What do organic consumers think about the idea of recirculated material containing microplastics?

Do organic consumers see any differences between organic and conventional production with regard to what can be recirculated?

What do organic consumers think about the thought of using fertilizer inputs and recirculated materials of non-organic origin in organic production?

## Study design

In order to study consumers' opinions on recirculation in organic production, we have strived for a study design that provides both an in-depth understanding of opinions and reactions in regard to recirculation in organic production, but also makes it possible to say something about the Danes' opinions on future fertilizer inputs in general. We have thus chosen a combination of quantitative and qualitative methods, wherein the Danish Agriculture & Food Council are responsible for the qualitative part.



**IN-DEPTH INTERVIEW:** We start by exploring 20 organic consumers' thoughts concerning organic production, sustainability, recirculation, waste sorting and recycling of waste materials in the food industry. The same semi-structured guide is used for all the interviews, which ensures that all topics are covered whilst at the same time allowing us to explore the individual respondent's experiences, use of language and framework of reference.



**QUANTITATIVE STUDY:** Out of a wish to be able to say something about the Danes' opinions concerning recirculation in organic production in general, a quantitative study will be subsequently carried out among approx. 1500 Danish consumers. The study will: 1) Map consumers' knowledge of current fertilizing methods and their opinions on this in organic production. 2) Through a choice experiment, identify the future fertilizer inputs that are most acceptable to consumers. 3) Compare the level of acceptance between those who buy organic food with those who do not.

This report gathers experiences and insights from the first phase; 20 in-depth interviews conducted in February 2021 by the Danish Agriculture & Food Council. The quantitative study is to be carried out subsequently in spring and autumn 2021 by the Department of Food and Resource Economics at the University of Copenhagen (IFRO). At the time of this writing, the quantitative study is still being planned.

### SELECTION AND RECRUITMENT OF RESPONDENTS

For the qualitative in-depth interview, participants have been selected after being identified as having a particularly valuable perspective based on a combination of criteria using an online electronic questionnaire – a screener – developed by Norstat on behalf of The Danish Agriculture & Food Council. After identifying potential respondents, Norstat then contacted them by telephone and arranged a date for an interview.

As the interviews deal with the continued development of organic production, an essential criterion for the selection has been ensuring the 20 respondents are consumers of organic food. It is to be expected, that any further development of organic production is going to be relevant for those consumers who have currently embraced organic food products. They have already formed an understanding of what 'organic' means prior to being interviewed, and their reactions and opinions on the subject will therefore naturally be coloured by this understanding. Specifically, they have been identified by their responses during screening being that they 'often' or 'always' buy organic products – from now on referred to as 'organic consumers'. In the most recent representative poll carried out by Epinion on behalf of the Danish Agriculture & Food Council in February 2021, this particular group of consumers made up 40 percent of Danes, a share that has remained

relatively stable at 35-40 percent over recent years. Therefore, it has been assumed from the start that organic consumers could be relatively easy to find through screening.

In selecting which organic consumers should be invited to an in-depth interview, priority was given to ensuring a good spread of both gender and age. It was also a requirement that three out of four of the participants should be in full-time or part-time employment as previous experience has shown that these people are more likely to say no to being interviewed during daytime hours and we then risked having an interview bias with only people outside of employment taking part in the interview. Because of these considerations, the screening included questions on gender, age, and employment.

Geographically, all respondents who filled out the electronic questionnaire (the screener) lived in either the Zealand Region or the Capital Region of Denmark as it was originally planned that the interviews would take place in Copenhagen. Due to COVID-19 restrictions, however, it was decided at the last minute to hold interviews online instead via the Microsoft Teams tool for online meetings using a webcam. In previous surveys on consumer attitudes towards organic products, we have repeatedly seen that organic consumers are more often found in the Capital Region compared to the rest of the country. In the latest survey in February 2021<sup>1</sup>, 51 percent of respondents who lived in the Capital Region replied that they often or always bought organic products, while the same applied to 38 percent of consumers in the Zealand Region and 31 percent in the Central Jutland Region. Therefore, the assumption has been that organic consumers would be easiest to find in the Capitol Region.

Naturally, we cannot rule out potential regional differences in opinions, but in previous studies, there have rarely been notable, significant differences when respondents were asked about their reasons for buying organic products. We have, therefore, assumed that the motives for buying organic products do not depend significantly on where one lives. The quantitative study following this present qualitative study may be able to confirm or deny this assumption.

The 20 in-depth interviews were distributed according to the following criteria:

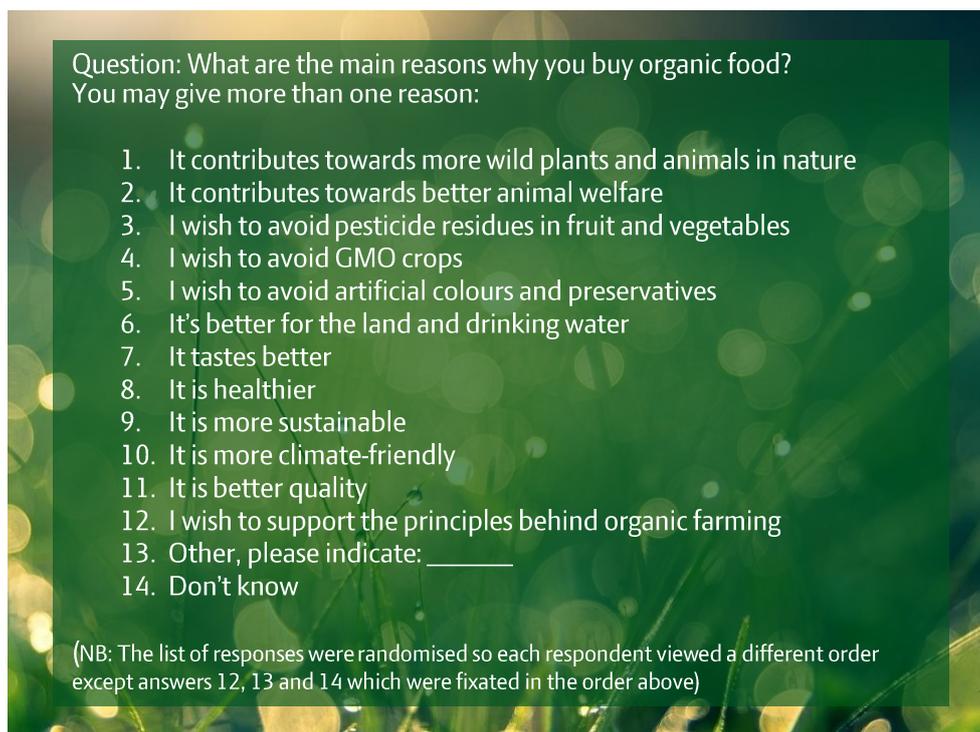
	Women	10		Always buy organic products	9
	Men	10		Often buy organic products	11
	20-29 yrs	5		Live in Capitol Region	13
	30-39 yrs	5		Live in Zealand Region	7
	40-49 yrs	5		Working full/part-time	15
	50-60 yrs	5		Not working	5

Experience from previous studies shows that there can be many different reasons for buying organic products. These range from personal health reasons to environmental considerations or concerns for animal welfare.<sup>2</sup> Their predispositions and personal beliefs regarding the benefits of organic products is therefore naturally expected to colour their opinions on the topics touched upon in the interview. The screener, therefore, included a question on reasons for buying organic food. In the final selection, to determine who should be invited to take part, an attempt was made to establish a diverse range of

<sup>1</sup> Epinion's study was carried out in February 2021. The question regarding purchasing organic products was included as part of a broader survey about food culture, which was carried out several times that year. The February survey comprised approx. 1000 Danish participants across a broad range of gender, age, region, employment and education.

<sup>2</sup> See among other our market analysis 'Organic products are popular with Danish consumers', published in October 2019, which can be found at [www.lf.dk/tal-og-analyser/forbrugere-og-trends/2019](http://www.lf.dk/tal-og-analyser/forbrugere-og-trends/2019).

motivations for buying organic products so that multiple reasons could be represented among the 20 interviews. Specifically, the screener included the following question:

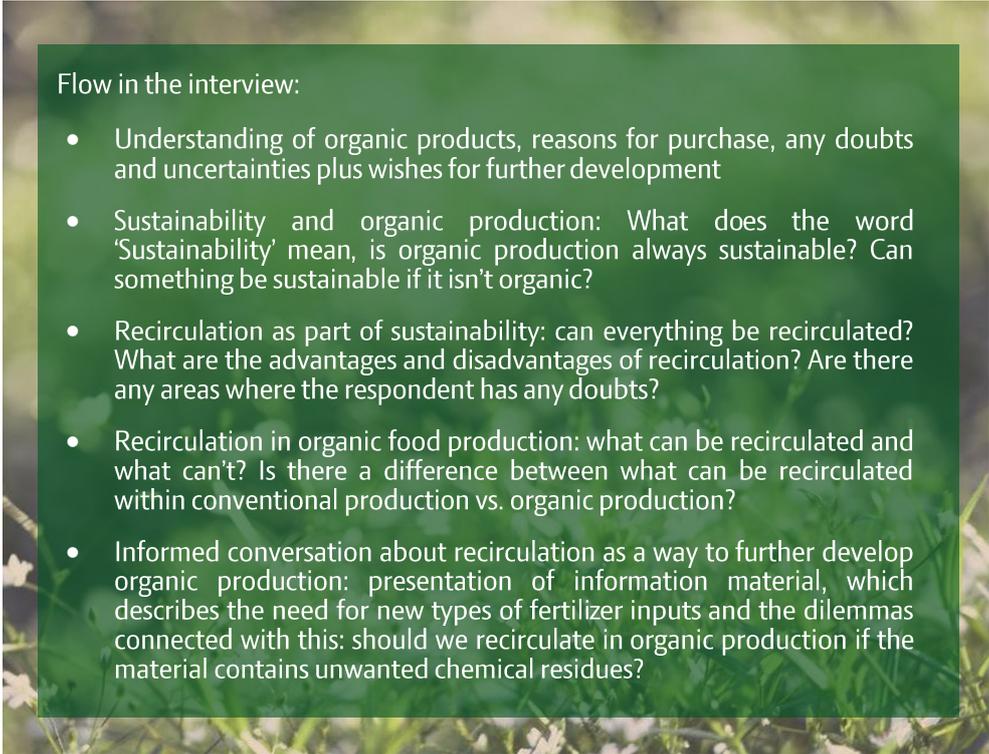


In order to ensure that the interview subjects' understanding of organic products and motives for choosing organic food would at least to a minimum match the subject of the interview, it has been ensured that each person invited to participate mentioned at least one of the following reasons: "It contributes towards more wild plants and animals in nature", "It's better for the land and drinking water", "It's more sustainable," "It's more climate-friendly" and "I want to support the principles behind organic farming". In reality, these requirements proved to be relatively easy to fulfil, in that each of those invited to participate mentioned a minimum of five of these reasons, with the answer "It's more sustainable" being mentioned by all 20 interview subjects.

### **FLOW OG FOCUS IN THE INTERVIEW**

All the interviews follow the same semi-structured interview guide where several topics are introduced along with follow-up questions. There is also a time indicator for each topic indicating how long a topic can be explored in order to ensure that all areas are touched upon during the hour which is available. As the strength of the qualitative interview lies in the exploration of various phenomenon, each conversation was centred around the interview subject's starting point and type of language used and follow-up questions were asked about interesting aspects when they occurred naturally in the conversation. This means that no interview is completely identical and not all interview subjects answered all the follow-up questions for each subject.

The interview guide is enclosed in the appendix and follows this overall structure:



Flow in the interview:

- Understanding of organic products, reasons for purchase, any doubts and uncertainties plus wishes for further development
- Sustainability and organic production: What does the word 'Sustainability' mean, is organic production always sustainable? Can something be sustainable if it isn't organic?
- Recirculation as part of sustainability: can everything be recirculated? What are the advantages and disadvantages of recirculation? Are there any areas where the respondent has any doubts?
- Recirculation in organic food production: what can be recirculated and what can't? Is there a difference between what can be recirculated within conventional production vs. organic production?
- Informed conversation about recirculation as a way to further develop organic production: presentation of information material, which describes the need for new types of fertilizer inputs and the dilemmas connected with this: should we recirculate in organic production if the material contains unwanted chemical residues?

### **RESERVATIONS AND POINTS WORTH NOTING**

The qualitative method is ideal for covering nuances and explanations for specific phenomena, which would otherwise be difficult to observe and measure. For example, these could be a deeper understanding of the background and reasons for a consumer's behaviour and reactions, or a more in-depth look at the definitions, language used and framework of understanding for consumers. Aspects which could quite possibly have gotten lost in a quantitative study. Its strength is a deeper insight into phenomena where opinions and values are the turning point. On the other hand, its weakness is that due to the selection of respondents and size of the sample, as well as the interview techniques that are used, the results cannot be expressed in proportions or percentages. It can only be seen as explorations and interpretations of the opinions of a selected target group. For this study, all those interviewed have been selected based on quite a specific profile – they are organic consumers aged between 20 and 60 and live east of the Great Belt Bridge. Therefore, any insights that emerge from this study are not suitable for generalizations about the opinions and priorities of all Danes.

Due to COVID-19 restrictions, the interviews were carried out using the online tool Teams instead of face-to-face meetings. There are both advantages and disadvantages to this approach. One of the advantages is that the interview has had far less impact on the subject's daily life – the interviews were scheduled to take an hour and the subjects could sit at home in familiar surroundings without having to spend time getting to the location in Copenhagen where the interviews should otherwise have taken place. During the interview, we used a webcam, which made it possible to decode non-verbal reactions. Another advantage to the study design was that we were able to reach respondents living in towns from Copenhagen. Thus, we have talked to people in Lolland, as well as various towns on Zealand, including Sorø, Næstved and Frederikssund. On the other hand, one clear disadvantage of online interviews is that they do not have the same intimacy as they would have had face-to-face despite attempts at creating more relaxed and laid-back atmosphere by placing the camera at eye height and by talking briefly about other topics during the interview whenever this came naturally. There were also some technical

problems with a small number of the interviews with disruptions to sound or image, which created a sense of distance and made it harder to catch non-verbal indicators.

Naturally, there is also a bias caused by the fact that the qualitative study was carried out by employees from the Danish Agriculture & Food Council. Consumer sociologist Nina Preus was responsible for interviews and analysis, while Frederikke Mortensen assisted with the study and carried out a small number of the 20 interviews. Despite our attempts at creating an open and sincere space where there were room for criticism and ensuring respondents, that there were no 'right' or 'wrong' answers, we cannot rule out that those being interviewed were influenced in their responses by *who* were interviewing them. While detailed notes were taken during the interviews, the interviews were not recorded electronically. Quotes in the report are, therefore, provided from memory based on these notes. Some minor adjustments have also been made so that quotes appear with full and coherent sentences and in a form that should be regarded as being how the respondents would wish to express themselves in writing. This interpretation has been carried out by the Danish Agriculture & Food Council's team of analysts.

Last but not least, it is also worth noting that the topic of the interview is difficult to discuss with laypersons such as those we have interviewed in this study. Organic consumers have been recruited on the basis on their positive outlook towards organic products. Naturally, their understanding of organic production has had an influence on their reactions to the various topics in the interview – in the same way as Danish consumers' understandings generally affect their reaction to different subjects. When organic consumers form an opinion on the use of different types of fertilizer and the consequences of using microplastic, for example, this will always be a subjective opinion and normally one given spontaneously without any prior knowledge of the subject. During some of the interviews, the reaction has been based on assumptions about the requirements of organic production, for example the use of fertilizer, which do not match the actual conditions. Similarly, some of those interviewed expressed a very idealised impression of organic production. All of this goes to show the reality in which organic production operates, and it is something which a further development of organic production has to take into account. It is interesting, however, to see whether organic consumers change these expressed opinions when they find out more about the production. For this reason, an 'information paper' was prepared by the University of Copenhagen that briefly explains the current situation and the dilemmas connected with recirculation. This document was shown at the last part of each interview and the content was then discussed. In some cases, analysis and conclusions have included the adjusted reactions to different topics that emerged after the respondent was given more information. In the report, we have strived to clarify when a particular reaction has occurred after reading the documentation.

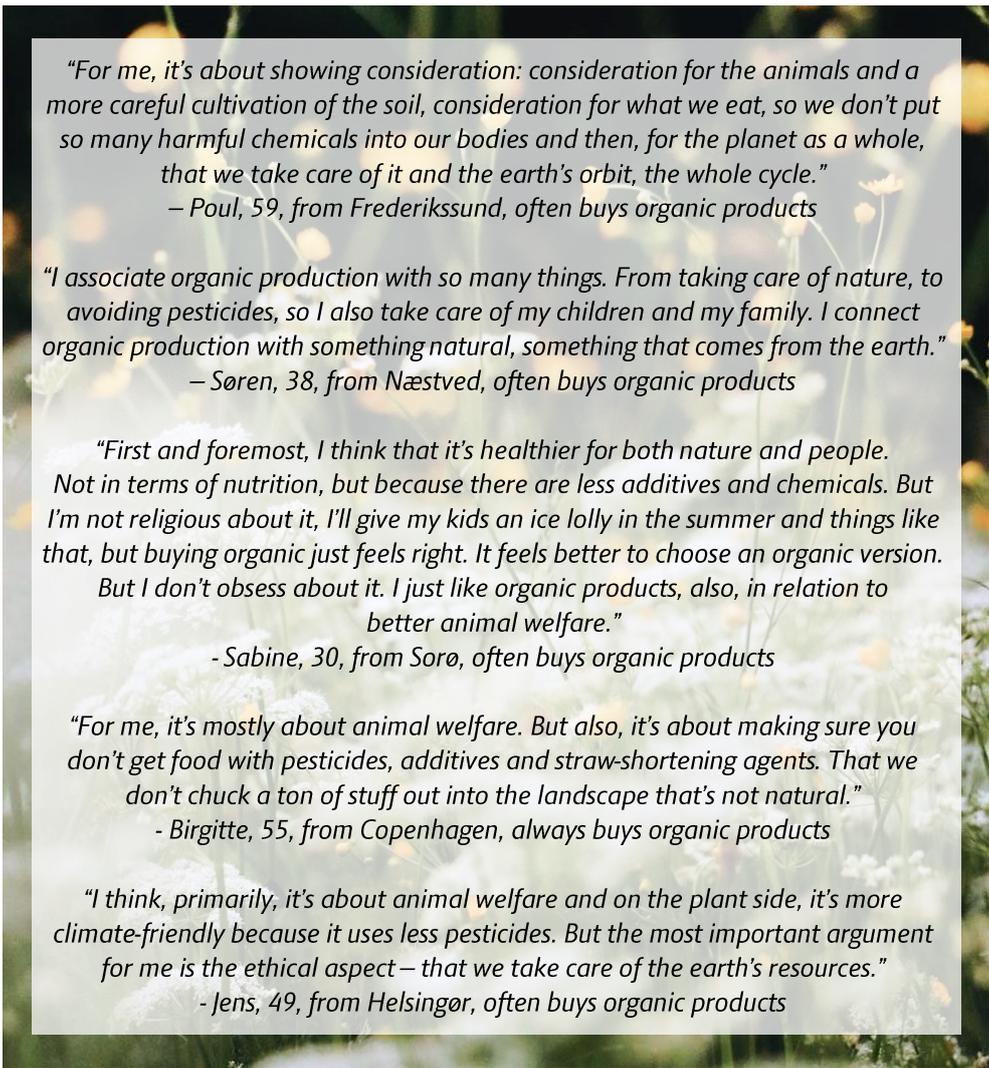
# Insights from the qualitative interview

## 1. The starting point: Opinions about organic products and sustainability

In order to create a framework of reference for the rest of the interview, all conversations started with a chat about organic produce, with focus on the subject's impression of organic produce, their reason for choosing this and any doubts they might have about it or areas where they might like to see a further development of organic production.

### MANY VALID REASONS FOR BUYING ORGANIC PRODUCE

As previous studies have also shown, there can be many reasons for buying organically produced food and drink, from a perception of getting better quality or a wish to avoid residues from pesticides or additives to the conviction that organic produce is better for the environment or animal welfare. Not surprisingly, the interview subjects gave many different reasons for their purchasing choices and mentioned both their own health and a consideration for both animals and the world around them being primary drivers for this, often without being able to pinpoint one primary reason. The diversity of these reasons for buying organic products illustrates the broad appeal of organic production among these consumers.



*"For me, it's about showing consideration: consideration for the animals and a more careful cultivation of the soil, consideration for what we eat, so we don't put so many harmful chemicals into our bodies and then, for the planet as a whole, that we take care of it and the earth's orbit, the whole cycle."*

*– Poul, 59, from Frederikssund, often buys organic products*

*"I associate organic production with so many things. From taking care of nature, to avoiding pesticides, so I also take care of my children and my family. I connect organic production with something natural, something that comes from the earth."*

*– Søren, 38, from Næstved, often buys organic products*

*"First and foremost, I think that it's healthier for both nature and people. Not in terms of nutrition, but because there are less additives and chemicals. But I'm not religious about it, I'll give my kids an ice lolly in the summer and things like that, but buying organic just feels right. It feels better to choose an organic version. But I don't obsess about it. I just like organic products, also, in relation to better animal welfare."*

*- Sabine, 30, from Sorø, often buys organic products*

*"For me, it's mostly about animal welfare. But also, it's about making sure you don't get food with pesticides, additives and straw-shortening agents. That we don't chuck a ton of stuff out into the landscape that's not natural."*

*- Birgitte, 55, from Copenhagen, always buys organic products*

*"I think, primarily, it's about animal welfare and on the plant side, it's more climate-friendly because it uses less pesticides. But the most important argument for me is the ethical aspect – that we take care of the earth's resources."*

*- Jens, 49, from Helsingør, often buys organic products*

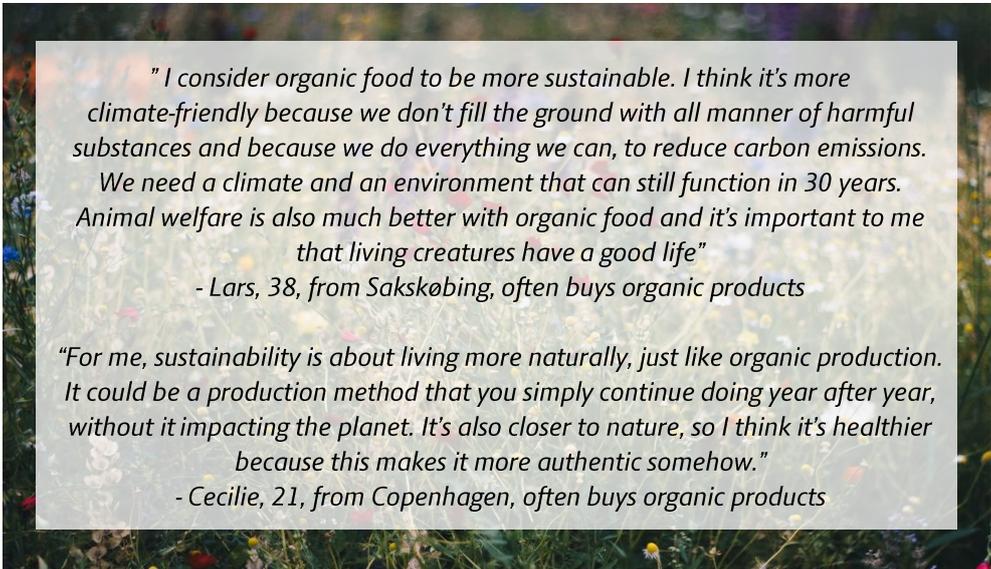
As the interview progresses, however, two groups start to dominate, each with their own subconscious basis for preferring organically produced food and drink:

1. Those who primarily purchase organic products because they associate these with something that is inherently *clean and natural*: for this group of organic consumers, organic production is a guarantee of clean and healthy products that are better and more sustainable for nature, the environment, animals and people than other forms of production. It is a form of production that is closer to nature, clean and free from harmful elements in a closed cycle. For this group, organic production is a goal in itself, a goal for sustainability, and its cleanliness and naturalness must therefore be protected and guarded.
2. Those who primarily purchase organic products because they associate the organic production with something that is a *part of a greater context*. For this group, the purchase of organic products is the most responsible choice based on the 'bigger picture', that includes not only consideration for the environment, animals and people of today, but also for the planet and future generations to come. They see the organic production as being an important part of a larger cycle factoring in the society around it. It is one means among many needed to ensure the entire planet's continued viability.

A significant finding in this qualitative study is that these fundamental differences first become apparent when the organic consumer is asked to give his or her opinion on specific suggestions as to how organic production could be further developed. Organic consumers do not appear to be consciously aware of this viewing of organic production of being either 1) *Inherently clean and natural (= a single goal)*. Or: 2) *One means among many others needed to ensure continued viability for the planet*. But when presented with the suggested ways to develop organic production, their reactions seem to depend heavily on whether they view organic production as being either a goal for sustainability in itself or a means to ensuring sustainability among other means. We will return to this later.

### ORGANIC PRODUCTION AND SUSTAINABILITY ARE NOT SYNONYMOUS

Previous studies undertaken by the Danish Agriculture & Food Council have shown that a wish for more sustainability is something that has a big impact on Danes' consumption habits, but that it can be very different as to how this translates into actual behaviour.<sup>3</sup> Not surprisingly, organic consumers in this study view organic production and sustainability as two things that are closely connected, although for most of them, sustainability is much more far-reaching than organic production in itself:



*"I consider organic food to be more sustainable. I think it's more climate-friendly because we don't fill the ground with all manner of harmful substances and because we do everything we can, to reduce carbon emissions. We need a climate and an environment that can still function in 30 years. Animal welfare is also much better with organic food and it's important to me that living creatures have a good life"*

*- Lars, 38, from Sakskøbing, often buys organic products*

*"For me, sustainability is about living more naturally, just like organic production. It could be a production method that you simply continue doing year after year, without it impacting the planet. It's also closer to nature, so I think it's healthier because this makes it more authentic somehow."*

*- Cecilie, 21, from Copenhagen, often buys organic products*



*"Sustainability is much more than just organic production, but as a starting point, then I think that, if something is to be sustainable, it also needs to be organic. Being organic implies certain principles that protect the natural world. When I think of sustainability, I think, for example, about more freedom for nature and here, the organic way of cultivating the ground is more beneficial than conventional methods."*

*- Andreas, 29, from Ølstykke, always buys organic products*

By definition, sustainability encompasses much more according to the participants than can be covered by organic production methods and also includes areas outside of organic production, depending on product and history. The subjects mentioned, for example:

- **Smart use of resources and materials:** A focus on the optimal utilisation of resources and biodegradable products, minimising waste.
- **Waste sorting and recycling:** Responsible disposal and recycling of materials wherever possible.
- **Biodiversity:** Natural diversity, positive additional bonuses of production. Space for wildlife, herbs, weeds, and wildflowers, as well as bees.
- **Minimal environmental impact:** A production with the least impact on the environment, our water supply, the natural landscapes, and wildlife. A production that does not overuse the planet's resources.
- **Shortest possible transportation:** To minimize and, if possible, entirely eliminate transportation over long distances as this is not good for the environment, the climate nor the animals.
- **Animal welfare:** Respect for animals as living creatures that should be allowed to live naturally and does not suffer, for example, with diseases.
- **Seasons:** A production carried out according to the climate and the seasons, with a natural rhythm and variation.
- **Smart use of packaging:** As little as possible, using recyclable materials and with a clear indication of how this should be sorted. The manufacturer must express their views through actions.
- **Danish food:** If something can be grown in Denmark, you should buy the Danish variety only. Importing food only increases carbon emissions.
- **Fair treatment:** Production needs happen under fair conditions to anyone involved, with no exploitation of either animals or people.
- **Fertilisation of fields:** Natural fertilizing without the use of chemicals. No 'overfertilization'.

Summed up, it is a philosophy about *coherence* for everyone involved. Every part of the value chain has been factored in, everyone gets a fair share and nothing and no one is exploited. You use the resources in the smartest way possible and give back to the society and planet wherever you can. Here, it can be difficult for the interview subjects to see all the links in the chain. For many organic consumers, buying organic presumably acts as a sort of 'short cut' to sustainable consumption.

*"For me, sustainability is about consuming the least amount of the resources we have available. It's something that causes the least pollution. In my opinion, it's a condition for being able to call something organic, that it's also sustainable. For me, organic means that something has been produced in a sustainable way where you take and use the organic resources that are available. But there are things that can be sustainable without being organic and while not everything can be produced organically, it can still be 100 percent sustainable."*

*- Malthe, 25, from Copenhagen, always buys organic products*

*"That you don't use too many resources but rather use what you have. You consider the entire process, from the cradle to the grave."*

*- Helene, 56, from Jægerspris, often buys organic products*

*"It's about a lot of things but we must consider our use of resources, save these, avoid food waste, consider how long a product can last for. It's sustainable when it's resource-saving, when it has used the least possible fuel or energy, where you use everything in the best way possible. My perception is that organic food is far more sustainable than non-organic food, but that something can also be sustainable without being organic if there's a focus on resource consumption and minimal waste, for example."*

*- Peter, 49, from Lille Skensved, often buys organic products*

*"For me, the concepts of organic and sustainable are very much linked, which is why I think that organic food is always sustainable. When I'm out shopping, the red 'eco' label acts as a sort of short-cut for me, so I don't need to think any more about it. But I do sometimes check as well to see if something is locally produced, because I think that also ties in with being sustainable. But it can put me off buying something locally produced if it isn't organic as well."*

*- Heidi, 21, from Roskilde, often buys organic products"*

There can also be aspects of organic production that, as they are today, the interview subjects did not consider as being sustainable or where they had doubts about the sustainability of these aspects. For most of the participants, organic is synonymous with a more sustainable form of production, but the two concepts are not identical and there can be weaknesses or doubts raised about organic production that can challenge or compromise its sustainability:

- **Resources:** Concerns about the extent to which resources are wasted in production.
- **Manufacturing conditions:** Doubts about fair working conditions for employees.
- **Transport:** Organic food that is transported over long distances, the use of imported organic ingredients in convenience food and drink.
- **Animal welfare:** Concerns about the lack of treatment for sick animals and the transport of animals over long distances.
- **Season:** The sale of organic crops outside of season challenges and compromises the sustainability of organic production.

- **Packaging:** The packing of organic products, especially the use of plastic.
- **Differences in legislation/checks:** Doubts about the differences in legislation and the quality of inspections in Danish vs foreign organic production.

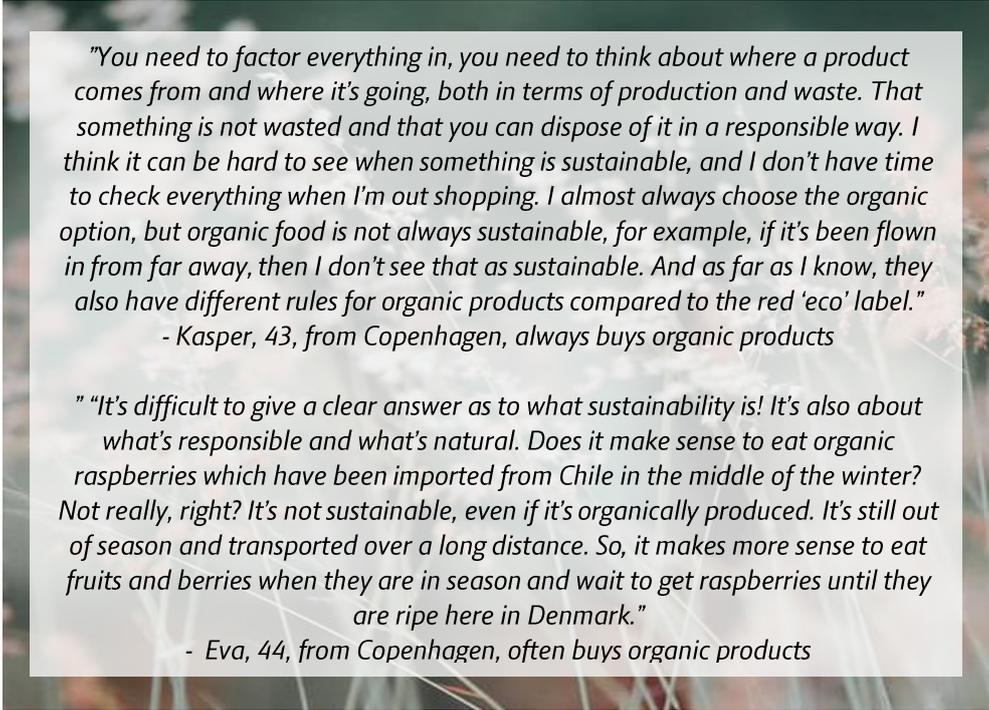
*"I like the fact that there's more consideration for the environment, that no pesticides are used and that it's better for the animals. But I've also heard that there can be a lot of waste and I think that's a problem."  
- Mie, 31, from Copenhagen, always buys organic products*

A classic dilemma is the choice between foreign vs. Danish-produced organic food and drink. If both options are available, unsurprisingly, the vast majority of respondents, would choose to buy Danish organic food. The preference for Danish products can be explained by, among others:

- **Trust:** The participants all have confidence in Danish production and faith in the fact that checks are made regularly, and legislation is followed.
- **Shorter transport:** Transportation of food continues to be an important marker in the assessment of sustainability, upon which the organic consumers in this study base many of their decisions.
- **Better quality:** For many consumers in this study, the red 'eco' label is a guarantee of good quality and they also feel that Danish fruits and vegetables taste better as they are allowed to ripen more before being picked/harvested.
- **Supporting the Danish economy/Danish workplaces:** This may be an effect of the COVID-19 pandemic, but interview subjects expressed an unprompted wish to support Danish food production.
- **Closer to you/at eye level:** Buying local, for example, from roadside stands in the summer.

In particular, the transport of food was mentioned spontaneously as something that can challenge the sustainability of organic products. As in other surveys, the transportation of food over long distances has been, and continues to be, a matter of some concern to consumers, and in this study, they also aired their frustrations about organic food being imported over long distances, especially when not in season here in Denmark:

*"I can think of something where organic doesn't equate with sustainability, for example in convenience food, where they have used organic ingredients that have been produced somewhere else in the world. And then there's the issue of being able to buy strawberries all year round, I have a bit of a problem with that. If they are organically grown strawberries that you can buy in January, then they don't have anything to do with sustainability."  
- Jens, 49, from Helsingør, often buys organic products*



*"You need to factor everything in, you need to think about where a product comes from and where it's going, both in terms of production and waste. That something is not wasted and that you can dispose of it in a responsible way. I think it can be hard to see when something is sustainable, and I don't have time to check everything when I'm out shopping. I almost always choose the organic option, but organic food is not always sustainable, for example, if it's been flown in from far away, then I don't see that as sustainable. And as far as I know, they also have different rules for organic products compared to the red 'eco' label."*

*- Kasper, 43, from Copenhagen, always buys organic products*

*"It's difficult to give a clear answer as to what sustainability is! It's also about what's responsible and what's natural. Does it make sense to eat organic raspberries which have been imported from Chile in the middle of the winter? Not really, right? It's not sustainable, even if it's organically produced. It's still out of season and transported over a long distance. So, it makes more sense to eat fruits and berries when they are in season and wait to get raspberries until they are ripe here in Denmark."*

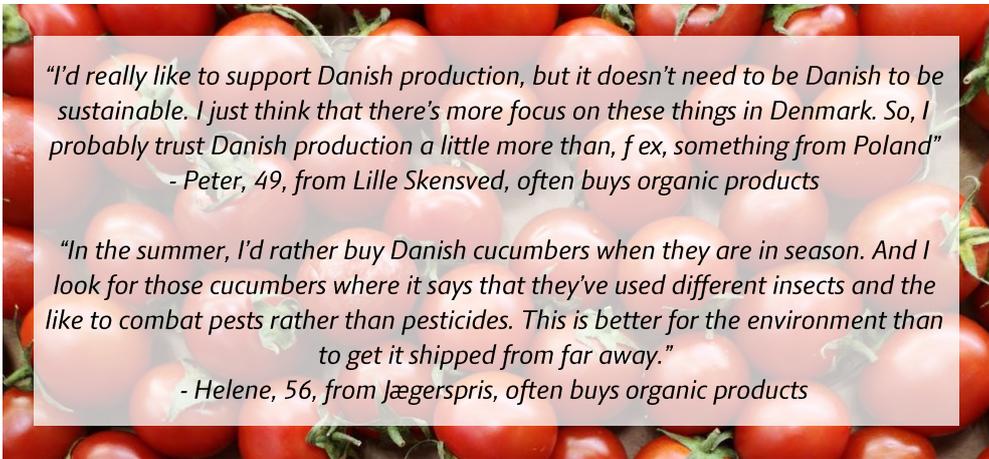
*- Eva, 44, from Copenhagen, often buys organic products*

It can be especially challenging when you can't find an organic version of a particular Danish vegetable or fruit. Here, it's up to the individuals' own decision matrix and assessment of what is most sustainable.

For those who view organic production as being 'the best path' regardless of the country of origin, the organic variety would normally be preferred, based on a wish to promote organic production globally.

For those who have a focus on health and avoiding the use of pesticides in fruit and vegetables, Danish conventional vegetables and fruit may be chosen over foreign organic produce if it states on the packaging that natural plant protection has been used in the form of insects rather than pesticides.

For those who are focused on minimizing carbon emissions as much as possible, Danish conventional production may be preferable, as this does not involve the food being transported over long distances. Here, confidence is expressed in responsible manufacturing conditions in Denmark regardless of production type.

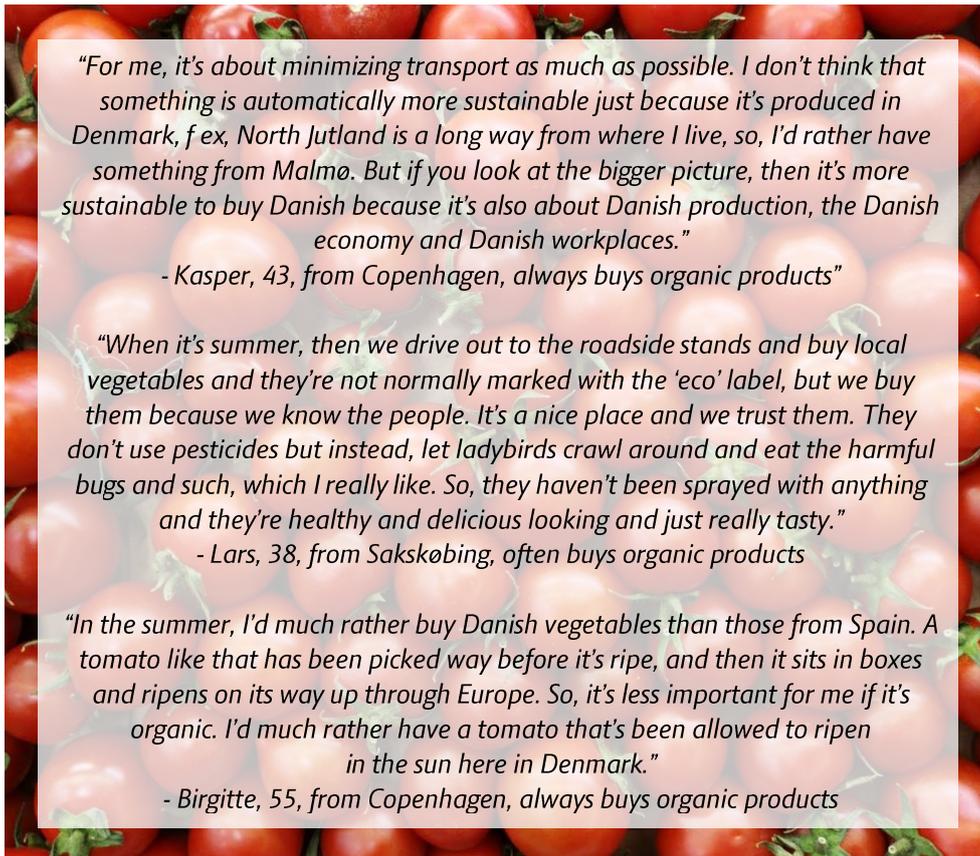


*"I'd really like to support Danish production, but it doesn't need to be Danish to be sustainable. I just think that there's more focus on these things in Denmark. So, I probably trust Danish production a little more than, f ex, something from Poland"*

*- Peter, 49, from Lille Skensved, often buys organic products*

*"In the summer, I'd rather buy Danish cucumbers when they are in season. And I look for those cucumbers where it says that they've used different insects and the like to combat pests rather than pesticides. This is better for the environment than to get it shipped from far away."*

*- Helene, 56, from Jægerspris, often buys organic products*



*“For me, it’s about minimizing transport as much as possible. I don’t think that something is automatically more sustainable just because it’s produced in Denmark, f ex, North Jutland is a long way from where I live, so, I’d rather have something from Malmø. But if you look at the bigger picture, then it’s more sustainable to buy Danish because it’s also about Danish production, the Danish economy and Danish workplaces.”*

*- Kasper, 43, from Copenhagen, always buys organic products”*

*“When it’s summer, then we drive out to the roadside stands and buy local vegetables and they’re not normally marked with the ‘eco’ label, but we buy them because we know the people. It’s a nice place and we trust them. They don’t use pesticides but instead, let ladybirds crawl around and eat the harmful bugs and such, which I really like. So, they haven’t been sprayed with anything and they’re healthy and delicious looking and just really tasty.”*

*- Lars, 38, from Sakskøbing, often buys organic products*

*“In the summer, I’d much rather buy Danish vegetables than those from Spain. A tomato like that has been picked way before it’s ripe, and then it sits in boxes and ripens on its way up through Europe. So, it’s less important for me if it’s organic. I’d much rather have a tomato that’s been allowed to ripen in the sun here in Denmark.”*

*- Birgitte, 55, from Copenhagen, always buys organic products*

## **USING PLASTIC ONLY WITH CONSIDERATION**

For many consumers, avoiding waste and pollution is closely connected with minimizing the use of plastic. Unprompted, many organic consumers in the study also expressed great awareness of the problems of the build-up of plastic in nature and a concern about the use of plastic in the food industry. Here, the use of plastic packaging for organic foodstuffs frustrates consumers and especially the packaging of fresh vegetables is a constant source of bewilderment for many. Many of the respondents are also aware, however, that the discussion around plastic is not entirely straightforward as the packaging also helps the product to last longer, so the food is not wasted – which is another very important agenda for organic consumers in the study. So, it’s important instead to look at what type of plastic is being used.

In other words, organic consumers are well aware of the dilemmas attached to the use of plastic and that it should be used with consideration. They critically consider what type of plastic is used in packaging and whether this plastic is necessary, or if another type of packaging could serve the same purpose. For manufacturers, it is important to consider how the plastic used in packaging can be disposed of or responsibly recycled. The use of plastic in the packaging of organic food and beverages has to *make sense*, otherwise it challenges the sustainability of the organic product:

*"We use such an enormous amount of plastic, and I just think that there's so much that could be done differently. This also applies to the packaging of organic food. It's clear that new solutions could be considered here. For ex, I remember this really nice organic tea that I bought once. And every single little tea bag was wrapped in plastic and then they were all packed in this really nice cardboard box with a beautiful pattern. And then, the whole thing was again wrapped in sealed plastic and... it made no sense! I mean, fair enough that you grow the tea organically, but when you then decide to wrap plastic AROUND other plastic, the wheels come off the wagon a bit."*

*- Eva, 44, from Copenhagen, often buys organic products.*

*"We ought to have far better opportunities to sort our food packaging, and there needs to be much more consideration shown to this. There's paper and plastic and tin foil mixed together in the same packaging without it being possible to separate them and so it all just ends up in the dustbin. So, it would actually be a lot better if it was just purely plastic packaging without the other stuff. Otherwise, I think the manufacturer should write 'this should be sorted as xx', so they're forced to take a stand. And thus, also to take responsibility for ensuring it can be disposed of responsibly."*

*- Martin, 45, from Copenhagen, always buys organic products*

*"In the store, conventional vegetables are on one side and organic are on the other, and all the organic vegetables are wrapped in plastic. And this really baffles me, that they need so much packaging? I mean, it doesn't make sense that there should be so much waste when using organic vegetables, that's not good for the environment."*

*- Mie, 31, from Copenhagen, always buys organic products*

*"The packaging improves the durability, so I'm generally okay about the fact organic produce is packaged in plastic, but I definitely think that things could be improved. Work with types of plastic that are completely recyclable. I'm not okay with just throwing them away into nature but using plastic can be perfectly okay if it's part of a circular system."*

*- Søren, 38, from Næstved, often buys organic products*

## 2. Recirculation in food production

During the discussion on sustainability, most respondents brought up the topics of *responsible disposal* and *recycling of materials and resources* without any prompting. This is something that they use to help define whether something is sustainable. For the organic consumer, it's about *using wisely* and finding new ways of *making resources useful again* once they have served their original purpose. When the conversation then turned to recirculation in the food industry, all participants thus responded positively to the idea, although only a few of them use this specific word – *recycling* or *re-using* appears to be much more intuitively understood.

Most participants spontaneously mention using recycled materials in packaging and the possibility of being able to sort used packaging properly, while the recycling of other materials and for other purposes was not often discussed without prompting. Common to all participants was the fact that they felt it important that the process of recirculation did not cost more for the earth's resources than the value gained from it. This is, however, a complex calculation that can be hard to fully grasp, which is why many express this particular concern from the very start, before discussing the thought of recycling various materials. For example, it is important for many that the recycling of materials takes place within this country. If it is sent abroad to be treated and reused, then they do not see much point in doing it.

*"On the face of it, recirculation is a great idea. But it cannot cause more pollution. If something can be reused without polluting, then I think you should do it. Or... at least, it should only pollute a tiny bit."*

*- Helene, 56, from Jægerspris, often buys organic products*

*"There has to be a ton of waste in the food production that could potentially be reused. It probably has to be made more attractive for businesses to do it, before they're willing to give it a go. But really, I think it's quite irresponsible NOT to recirculate as much as possible."*

*Martin, 45, from Copenhagen, always buys organic products*

*"I believe that we should use everything that we have. A lot more than we do today actually. But at the same time, I'm a little sceptical about the process. I've heard that some of the things we sort into different waste bins has to be sent abroad to be recycled. And I wonder if this actually has a positive impact on our planet's resources? If I sort my waste, then it has to be used sensibly in the other end, otherwise it all feels like a waste of time."*

*- Jens, 49, from Helsingør, often buys organic products*

*"It pains me to hear that a company comes and collect the waste only to then transports it to the other side of the world. I mean, it sort of paints the picture that, if we can just get it out of the country then we've fixed the problem. And that just doesn't make any sense. You have to think about the WHOLE planet."*

*- Poul, 59, from Frederikssund, often buys organic products"*

### A CIRCULAR PROCESS WITH NATURE AT THE CENTRE

A general trend observed across all 20 interviews was that when it comes to the recirculation of materials to use as fertilizer on fields, the interview subjects were overwhelmingly positive to the idea as long as it concerned materials of *natural origin* – for example, food waste, manure, straw, plant roots, waste from dairies, meat processing and breweries etc. If, on the other hand, it concerned the recirculation of materials that could contain artificial materials such as microplastic, then the interview subjects did *not* approve of it.

Intuitively, participants associate materials of natural origin with composting, something that is biodegradable. Thus, it makes sense to use this for fertilizing fields. However, when the conversation turned specifically to the use of human urine and biological waste from wastewater, the spontaneous reaction was more mixed, although most participants approved of the idea after giving it some thought, referring to the use of manure for fertilizing fields, which takes place today. For all types of materials of natural origin, however, it is important for the participants that great care is taken with health and safety and that serious thought is given to whether the rewards outweigh the costs.

### ACCEPTANCE OF THE USE OF FOOD WASTE

In the interviews, food waste was often mentioned by the subjects without prompting as something that would make sense to be reusing. This applies to both food waste from large public and private canteens as well as food waste from private households. Everyone has at some point experienced throwing food away that could have been eaten, and some participants live in cities where food is already being sorted from other household waste into special bins. One would expect that the collected food waste would be used in some way as it would otherwise not be worth the effort. Of the possible uses, the organic consumers suggest biofuel, while a small number also mention, without prompting, animal feed in food production, as well as composting and subsequent use as a fertilizer input as ways of re-using food waste that would make sense to them.

*“I think that it’s particularly obvious to recirculate fruit and vegetables. I’ve grown up with compost bins at home in the garden and there has to be a great deal that can be used for compost, so that you get something back that can be used as fertilizer input. I’m not quite sure if you can reuse meat and dairy products. But if it’s biodegradable, then it should be compostable, I’d think.”*

*- Heidi, 21, from Roskilde, often buys organic products*

*“When it comes to food waste, then we already sort that now. I presume that this gets reused on some level or another, for example, as feed for pigs or to make biogas. Pigs are a kind of natural garbage disposal, so you can always give food waste to them.”*

*- Søren, 38, from Næstved, often buys organic products*

*“I don’t know what they do with the biowaste that I sort. Once, there was this system where you could turn in your food waste and it’d be given to the pigs. I think that was a really good idea. But today, I don’t actually know what happens to it. I do hope though that it’s recirculated in some way. I think that it’s awful that we throw so much food away while half the world goes hungry. It’s wonderful whenever anything is recirculated and it’s really good if it can be used for compost, for example.”*

*- Pia, 60, from Copenhagen, always buys organic products*

There can however also be some concerns about reusing food waste, especially among those who did not spontaneously mention food waste as something to be recycled. When these participants are asked their opinions about the thought of recycling of food waste, they spontaneously connect it to movements like Refood and Stop Wasting Food and imagine that food waste would be used in other forms directly for human consumption. This raises concerns for health and food safety. If food waste is used as fertilizer input on fields, then other respondents cast doubts and concerns as to how the food waste is to be treated before being used. For example, are there any preservatives or additives in the food? And would these in that case then be poured directly into nature? These worries raise doubts about the health of both humans, animals as well as nature itself—something of great importance to the organic consumers participating in this study. It is imagined that a very thorough cleaning process would be needed before being able to use this as fertilizer input. And then, would it be worth it in the end?

*"I find it a bit hard to imagine the recirculation of food waste. I mean, food that's too old needs to be thrown out, right? It can't be eaten again, that's for sure, but it's a good idea to recirculate it back again if this is at all possible."*

*- Mie, 31, from Copenhagen, always buys organic products"*

*"I'd think that it would be far easier to compost a piece of apple rather than a piece of candy. Because an apple is more natural, it's closer to its' natural form, whereas the candy is more processed, if you know what I mean? So, it's easier for the apple to return to nature. When it has a natural and thus more unprocessed origin, then it seems to me that it would be easier to recycle it."*

*- Cecilie, 21, from Copenhagen, often buys organic products*

*"If you're talking about fertilizing the fields, then I do feel a bit doubtful, as long as I don't know what it contains. I mean, they put f ex nitrite in lunch meat to prolong shelf life. And this worries me a bit. If it just gets ground up and thrown away into nature? If you throw tons of nitrite into nature, then it's not going to be especially natural anymore. But I can see the point. As long as it's done responsibly, and it's washed free from chemicals."*

*- Søren, 38, from Næstved, often buys organic products"*

### **ACCEPTANCE OF THE USE OF WASTE PRODUCTS FROM THE FOOD INDUSTRY**

Not many respondents mention this without prompting, but when they are asked directly about it, all of them spontaneously accept the idea of recirculating waste products from the food industry, for example from dairies, meat processing and breweries. They are positive not only about recycling waste products to make new food, but also about composting waste to use as fertilizer input on fields. Many remembers having seen products in the supermarkets that are made from the waste products of other foods, with the used hops from brewery production mentioned in particular here. For some, it seemed even more appropriate to use this for fertilizing than using food waste, where concerns were raised about preservatives and additives that may or may not be found in foods located on supermarket shelves. When it comes to waste products from food production, these organic consumers see it as the raw ingredients themselves that can be interpreted as something that is less processed and, therefore, 'cleaner' than most of the food and drink you can find in the shops. One single respondent hesitated, however, when the word 'industry' was mentioned as for her, 'industry' is synonymous with something unclean, mass production and processed food. She is however very positive when the discussion focuses specifically on raw ingredients such as hops from breweries

and whey from dairies. As with so much else, the specific wording used can also in this case influence the level of acceptance.

*"There's waste in food production where there are raw ingredients that don't go further than the production itself. This type of food waste could be used for energy generation or as a fertilizer input or something like that. If food is being wasted, then it's entirely natural to make better use of it."*

*- Malthe, 25, from Copenhagen, always buys organic products*

*"It makes a lot of sense to use waste products from the food industry. If the alternative is to burn it, then why not use it in a beneficial way? I've heard that hops from breweries make for an excellent fertilizer input, so they should just go ahead and use that."*

*- Sabine, 30, from Sorø, often buys organic products*

*"For example, I've heard of small companies that make biscuits out of the waste from breweries, or ones that grow oyster mushrooms in coffee grounds. Now that I think about it, I think it actually makes a product even more attractive if it's made from the waste of something else. It's more fun and interesting, although it can also be a bit too weird. It has to be a journey that people can comprehend."*

*- Kristine, 39, from Copenhagen, always buys organic products"*

### **ACCEPTANCE OF THE USE OF WASTE PRODUCTS FROM AGRICULTURE**

Waste products from agricultural production are what most respondents felt made most sense to use as biofuel and fertilizer input in fields. Here, there was only slight concern regarding food safety or a lack of naturalness in highly processed foods. These materials are intuitively seen as natural and are thus spontaneously associated with biogas, fertilizing and composting. As with other forms of waste products, however, the circulation of these must be done with care and a minimal negative impact on the environment.

*Plant waste* is intuitively seen as making the most sense for the participants as for many, this is seen as a circular process happening directly on the local farm. It makes good sense to them to use nature's raw materials as fertilizer input for new vegetables and plants. Similarly, the use of *straw from barns and animal pens* makes sense for the overwhelming majority both as biofuel and as fertilizer inputs on the fields. Some of them draw parallels with free range production, while others remember horse manure being used as a fertilizer input in kitchen gardens. *Manure from farm animals* is also something that is widely accepted, although some participants have a hard time being able to relate to it in details. Most of them are aware, however, that manure is already used as a fertilizer input and many remember the smell of manure in the early spring – something that is not especially welcomed, but which is accepted as a part of today's agricultural methods. Also, because it already happens, organic consumers are not worried about food safety. Here, they feel confident that the use of manure is carried out responsibly and that food products (for example vegetables and cereals) are not compromised by it. One concern that was mentioned, however, is the over-fertilization of fields where more nutrients are added than the soil can make use of and which then leach downwards into the groundwater. The use of manure must always be carried out with sense and consideration for the surrounding environment and wildlife.

*"My grandmother would use horse manure for her strawberry beds, she'd lay it down in the spring and in the summer, there'd be strawberries. I was 15 before I learned that it was horse manure that she'd been using, but they were the best strawberries on her street, and I was never able to taste that she'd used that type of fertilizer input."*

*- Heidi, 21, from Roskilde, often buys organic products"*

*"For me, it seems completely obvious to use waste from agriculture, plant waste and roots and such, as well as straw from the barns. It makes a lot of sense to use natural materials as fertilizer input instead of synthetic fertilizer inputs. And manure... yes, that happens already, but is it possible to do something about the smell? That would be nice."*

*- Jens, 49, from Helsingør, often buys organic products*

*"Manure from pigs doesn't sound appealing on the face of it, but I have to admit that it's fine as long as you ensure that it's carried out responsibly and without any harmful chemicals."*

*- Mie, 31, from Copenhagen, always buys organic products"*

*"I just think that it's much better with manure and straw rather than synthetic fertilizers, for example. When composted, there's a lot of good nourishment in it. I'd rather have it to be natural than artificial. I live in a place where there's a lot of farms and it's completely normal for me that this is used as a fertilizer input. But of course, there's also something in the manure from animals that's perhaps is not that good for the environment."*

*Lars, 38, from Sakskøbing, often buys organic products*

## **A PREDOMINANT – HOWEVER HESITANT – ACCEPTANCE OF THE USE OF HUMAN URINE AND BIOSOLIDS FROM WASTEWATER**

No one mentions this spontaneously and when the interview turns towards the use of human urine and biosolids from wastewater, the first reactions are somewhat mixed:

- Acceptance without any reservations
- Acceptance, but with (a number of) reservations
- Rejection, followed by hesitant acceptance after giving it some thought
- Rejection and sticking to this opinion until the very end of the interview, where they give a hesitant acceptance after having read the information material: Human urine and biosolids are, despite everything, natural, organic materials and, therefore, much better than something that might contain microplastic.

While some participants can accept the idea immediately, for others, the leap from 'farm animal manure' to 'human manure' can be a huge and associated with a certain degree of ambivalence. After some consideration, most people approve of the idea however, with reference to the use of manure to fertilize fields, as is the practice today. Apparently, a conscious awareness of the use of manure therefore seems to act as a 'bridge' towards the acceptance of a future use of urine and biosolids from wastewater. No interview subjects feel like dwelling on the details of this, but concede that if the spreading of manure from farm animals is commonplace today – then why not? The communication and the language itself used here is again extremely important, and this issue could constitute an entire future quantitative study in itself: precise and honest, but preferably without too many details.

*"Sure, I guess you can do that. It'd be a bit disgusting, but it's not all that different from manure from animals. So, I think it'd be okay. The only thing is the smell, but that's the only issue."*

*- Lærke, 20, from Greve, often buys organic products*

*"I've heard that you can make beer out of urine... I just think that so much is possible, so why not?"*

*- Pia, 60, from Copenhagen, always buys organic products*

*"I've actually discussed this with my teacher once. And I feel a bit like, why not? If it can be used, then I don't have anything against it. We use manure, and it's pretty much the same thing. Astronauts do it out in space and I've seen films where they use purified urine for drinking water. So, we can also use it to fertilize the soil. If it can help to optimize our food processes here in Denmark, then that's a plus."*

*Heidi, 21, from Copenhagen, often buys organic products"*

*"It's not exactly what I think of first in organic and sustainable production, but I think it could work. We already use manure today, so I don't see why we couldn't use human excrement as well."*

*- Malthe, 25, from Copenhagen, always buys organic products"*

*Well... I have to admit that it does sound a bit disgusting, but it's really not worse than when they spread the manure out on the fields. I mean, I've grown up with the smell of manure (laughs) as it's done today. In reality, the leap to using human urine as well really isn't so great."*

*Kristine, 39, from Copenhagen, always buys organic products"*

For some, the leap towards acceptance is greater than for others. They concede that it makes sense rationally, but to them it is still 'different' compared to the use of manure from farm animals. It can be hard for them to put this ambivalence into words, other than the idea of human urine is 'a little too close to home'. Some individuals mention a concern for infections, and whether human urine could contain hormone residues, for example, that would then leach out into nature? The same consumers do not, however, have the same concerns about manure from farm animals – either this isn't mentioned at all, or their perception is that all animal manure is cleaned of harmful substances before being used as a fertilizer input on the fields. Their acceptance is given with the reservations that the same purification processes are in play if 'human manure' is to be used responsibly.

Other reservations are, for example  
that it may only be spread at times of the year when there are no crops in the field  
that this type of fertilizer input is only suitable for above-ground crops (*not* for the cultivation of root vegetables!)  
that it can be used as a fertilizer if the alternative is even worse, based on what would otherwise have been used as fertilizer input, as well as on what this type of fertilizer input would otherwise have been used for

All of this goes to illustrate the ambivalence with which they agree 'in principle' because 'it makes sense rationally', but 'emotionally', however, it is associated with some barriers.



*"No, I can't see that happening. I just think that's too close to home. I mean, we don't see ourselves as animals. But on the other hand... (thinks for a while), then why not exactly? I'm part of the food chain, just like the animals are... but it would have to be implemented slowly, you'd have to be completely sure that it was carried out responsibly."*

*- Birgitte, 55, from Copenhagen, always buys organic products*

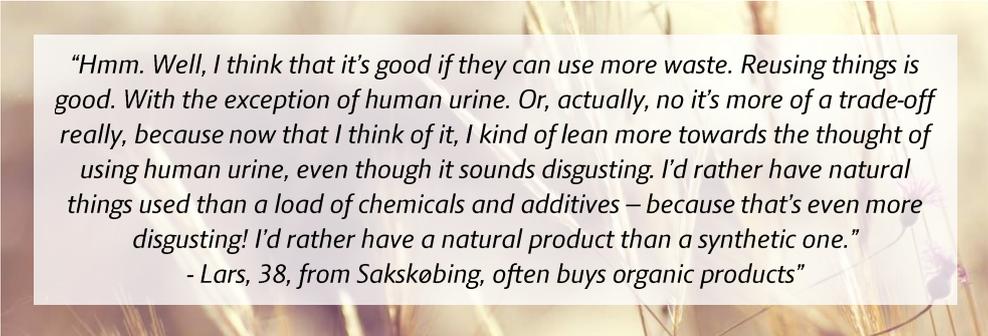
*"Hmm. Well, I agree. In principle. If you can use manure, then why not? But what about the ethics of it? And then I don't know... it's perhaps a little too close to home to be honest. I remember this one time – that is, there's this little patch of garden out front where we live – and I remember this one time I saw a drunk man peeing into our tomato bed. And that was just... no, I just did not feel like eating those tomatoes. Even though they weren't really ripe enough to eat yet. And I don't think that he peed directly on the tomatoes or anything, but more like into the ground, you know? And I could just rinse those tomatoes anyway, I mean, come on. But no, I just couldn't see past that."*

*Jens, 49, from Helsingør, often buys organic products"*

*"Yeah, I remember hearing about someone collecting urine at the Roskilde Festival. Maybe you could use it to make hand sanitizer? But I think that there's plenty of urine already coming from the livestock, so why can't we just stick with that? I'd only think that it should be recirculated into the soil if human urine otherwise risk polluting the drinking water. So, I can see that it makes more sense to use it as manure, for example. But I think that I'd have to see scientific evidence before I would think that this is an excellent idea."*

*- Thomas, 59, from Stege, often buys organic products"*

What's interesting here, however, is that after the participants have been presented with the information material at the end of the interview, the conversation returns to the use of human urine. Here, the more sceptical participants adjust their opinion: if the alternative is recycling waste that contains microplastic, then they would rather use human urine with a reference to the fact that urine and biosolids from wastewater are natural, organic materials and because we already use manure today. This may suggest that, despite their immediate rejection, organic consumers can 'mature' in their opinion on the use of urine and biosolids, if communication about the advantages and disadvantages happens gradually over time and in a wider context of nature, sustainability, and a circular process.



*"Hmm. Well, I think that it's good if they can use more waste. Reusing things is good. With the exception of human urine. Or, actually, no it's more of a trade-off really, because now that I think of it, I kind of lean more towards the thought of using human urine, even though it sounds disgusting. I'd rather have natural things used than a load of chemicals and additives – because that's even more disgusting! I'd rather have a natural product than a synthetic one."*

*- Lars, 38, from Sakskøbing, often buys organic products"*

## A 'NO THANK YOU' TO GROUND-UP WASTE THAT CONTAINS MICROPLASTIC

When the conversation turns to ground-up waste from households, there is a broad acceptance as long as this refers to organic material. When, on the other hand, they are asked exploringly if they would accept the recirculation of ground-up waste that could contain microplastic – a central part of the dilemma at hand – this thought is rejected by all 20 interview subjects. No one likes the idea of microplastic, and no one likes the idea of it being used as a fertilizer input on fields. If, however, it is impossible to separate it from the material, which is considered for recirculating, organic consumers disagree:

Some feel that microplastic is here to stay. It will be hard to avoid, so if it can be carried out responsibly (and not end up in food and drinking water), then it is okay to use it as fertilizer input. However, they are not happy about the idea.

Others think that it should not be permitted into the nature under any circumstances. There is already too much plastic out there. Why consciously add to it? If the material contains microplastic, then it cannot be used for fertilizing.

*"Hmm. I hear that it's found everywhere; in our lotions, cleaning cloths, everything that we use on a daily basis. And that it's now being found in our animals and our fish. Yes, even in our own bodies. But NO. I'd feel very bad about pouring something out into nature that turned out to contain microplastic."*

*- Eva, 44, from Copenhagen, often buys organic products*

*"I don't know how long it would take for it to break down in nature. But I'd imagine that it's a bad thing to put out there as part of something you use as fertilizer input. It would remain in the ground, I think, and perhaps also affect the plants grown in the soil."*

*- Andreas, 29, from Ølstykke, always buys organic products*

*"I think that first and foremost you have to look at minimizing the production of it, yes, eliminating the use of it entirely if possible. But we can't get away from it completely. And I don't think that it will show up in the food. Perhaps it would remain in the ground? Or get washed out to sea and into the groundwater? I don't know... If it was in the groundwater, then I would expect that it would be filtered away at the water treatment plant, I mean, I assume that there doesn't come microplastic out of my tap. So, I think that it's okay, as long as it does NOT get added to the cycle, but simply remains in the ground and doesn't do any harm but is just there."*

*- Poul, 59, from Frederikssund, often buys organic products"*

*"I don't have a problem with natural fertilizer inputs of natural origin, but if it contains microplastic, then I don't like it. But I guess... (thinks for a bit) if it doesn't disturb the process, and researchers can guarantee that it's okay, then it's probably okay... Microplastic is here to stay, we can't really escape from it. And what's harmful for me is that if we eat it, if we get it inside our bodies, the whales eat the plastic and fill up their stomachs with it, so it IS already around us. If you fertilize the soil with something that contains microplastic and the microplastic isn't transferred onwards to the water and the vegetables that are grown, then it's probably okay, but it does provoke me a little that we're pouring plastic out into nature."*

*Cecilie, 21, from Copenhagen, often buys organic products*

### 3. The use of recirculation in organic production

After discussing the possibilities for recirculation generally in the production of food, the interview zooms in on the potential for recirculation in organic production. Is it the same things that can be recirculated in both organic and conventional production or are there differences? And how does it affect the organic consumers' impression of organic production if recirculation is implemented as part of the production method?

#### EXPECTATION OF A CLOSED CIRCUIT

Across all 20 interviews, organic consumers respond positively to the idea of new types of recirculation in organic production, as long as this concerns natural, organic materials and takes into account the same reservations that the person had mentioned in the discussion about recirculation in food production generally. The use of other natural biodegradable, compostable materials as nourishment for new foodstuffs is in keeping with the organic consumers' impression of organic production. For many, it would actually be an improvement as it gives organic production an extra dimension by being something even more responsible and circular.

However, the instant acceptance of new forms of recirculation in organic production is given with one very important proviso, which for most of the consumers is only latent: It is not specifically expressed, but gradually comes to light as an underlying premise for acceptance: everyone seems to believe, completely instinctively, that recirculation can be contained in a closed circuit. That is, that it is exclusively organic, ecological material that is recirculated back into organic production. Alternatively, that all material is cleaned thoroughly, so that only pure, organic materials remain. An acceptance of any new forms of recirculation in organic production is given on this premise.

#### TWO SEGMENTS WITH DIFFERING VIEWPOINTS ON ORGANIC PRODUCTION

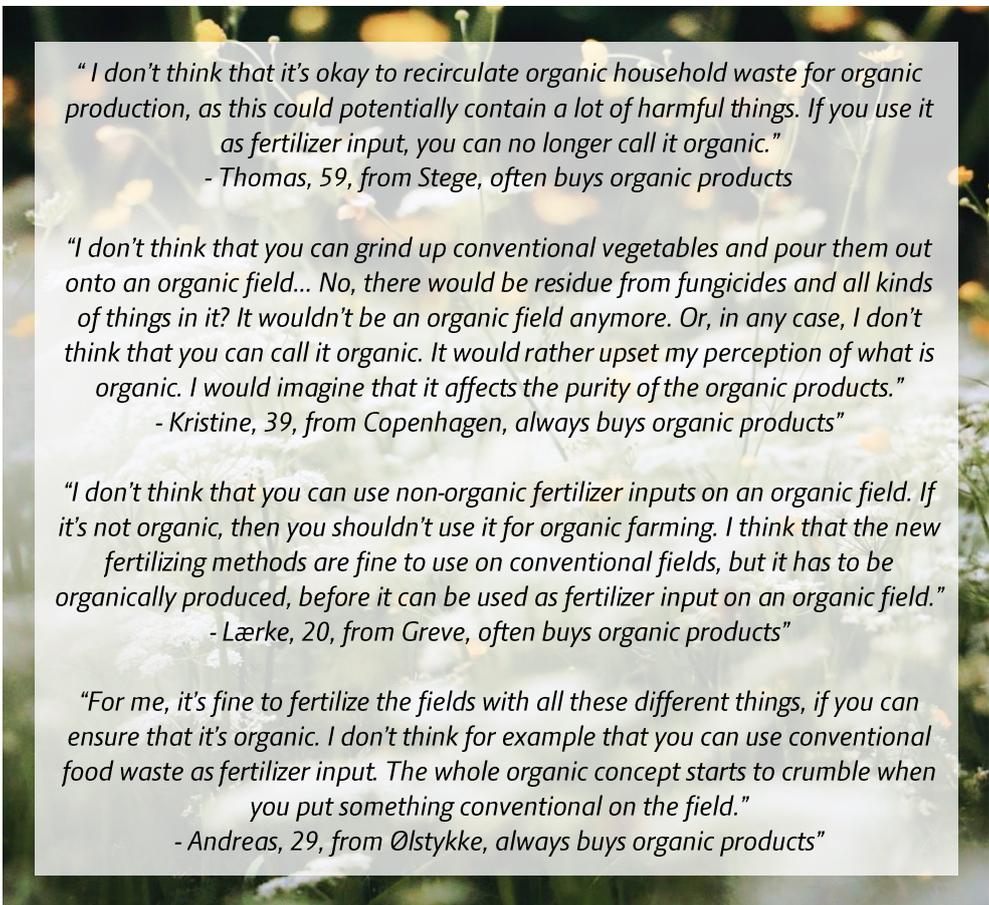
As the conversation progress, this premise is challenged through follow-up questions to their opinions. For example: what if you can't separate organic food waste from other food waste? Is it okay to use human urine on organic fields – it is natural, but cannot be organic, right? Through these questions, the participants start to reassess their premise for acceptance. And then, two equally sized segments begin to emerge, each with their own unconscious reasons for preferring organic food and drink. Segments which will be interesting to test and map out further in a subsequent quantitative study:

1. Those who associate organic production with something that is *pure* in a closed circuit: a production method, that is closer to nature, clean and free from harmful elements in a closed circuit. For this group, the purity and naturalness of organic products is a *goal in itself* and something that must be protected. This means that it is not acceptable to recirculate non-organic materials in organic production, as this compromises the purity of the organic form of production.
2. Those who associate organic production with something that is *part of a greater balance*. For this group, buying organic products is a better alternative, the most responsible choice in 'the bigger picture' of things, which includes both consideration for animals and people today, but also factoring in considerations for the planet and future generations. This group views organic production as one *means among many means* towards the goal of achieving future viability. This means that it is okay to recirculate non-organic materials in organic production as this lifts the sustainability of the whole society in general.

These two fundamentally different viewpoints on organic production are first exposed in that moment when each participant is considering the idea of using conventionally produced materials as fertilizer input in organic production. The decision of whether it is acceptable to 'compromise' on the perceived purity of organic production by including non-organic materials, appears here to happen based on whether the organic consumer sees organic production as being either *pure and natural in itself* or being a *means of viability in a broader cycle of life*. They do not appear themselves to be conscious of this fundamental viewpoint on organic production as being either a goal or a means. If the two segments are to be assessed quantitatively, it may, therefore, be necessary to challenge the respondents' viewpoint on organic production by presenting them with organic dilemmas and possible paths to take where organic production can be further developed, but where its 'purity' would perhaps be challenged.

### SEGMENT 1: THE ORGANIC PRODUCTION METHOD IS A GUARANTEE OF PURITY AND NATURALNESS AND IT CANNOT BE COMPROMISED

This type of organic consumer views organic production as a guarantee of a clean and healthy product, which is better for nature, the environment, animals, and people than non-organic food and drink. The motivations for buying organic products can (as with the other group) be diverse and range from one's own personal health, better quality due to the absence of harmful additives and chemicals, a cleaner, more diverse, and 'natural' nature, to a 'cleaner and better world'. Here, the two groups are not distinguished. However, for this group, being organic is a *goal* for any production, the best possible way of producing something that everyone ought to live up to. When thoughts are expressed about sustainability and the viability of future generations, these are centred around the fundamental idea that *'if only everything was produced organically, the world would be a better place.'* This group, therefore, rejects the idea of including 'non-organic material' as fertilizer inputs in organic production as this breaks the closed circuit and compromises the purity. It dilutes the organic – and where does that lead us?



*"I don't think that it's okay to recirculate organic household waste for organic production, as this could potentially contain a lot of harmful things. If you use it as fertilizer input, you can no longer call it organic."*

*- Thomas, 59, from Stege, often buys organic products*

*"I don't think that you can grind up conventional vegetables and pour them out onto an organic field... No, there would be residue from fungicides and all kinds of things in it? It wouldn't be an organic field anymore. Or, in any case, I don't think that you can call it organic. It would rather upset my perception of what is organic. I would imagine that it affects the purity of the organic products."*

*- Kristine, 39, from Copenhagen, always buys organic products"*

*"I don't think that you can use non-organic fertilizer inputs on an organic field. If it's not organic, then you shouldn't use it for organic farming. I think that the new fertilizing methods are fine to use on conventional fields, but it has to be organically produced, before it can be used as fertilizer input on an organic field."*

*- Lærke, 20, from Greve, often buys organic products"*

*"For me, it's fine to fertilize the fields with all these different things, if you can ensure that it's organic. I don't think for example that you can use conventional food waste as fertilizer input. The whole organic concept starts to crumble when you put something conventional on the field."*

*- Andreas, 29, from Ølstykke, always buys organic products"*

In situations where it is impossible to separate the non-organic material from the organic material, this segment of organic consumers would indeed prefer to completely avoid recirculation in organic production and instead use these materials only in conventional production. From their point of view, this would make conventional production more sustainable and one step closer to organic production, while organic production can remain as 'pure' as it is today. They are positive about the idea of recirculating natural material in food production generally. In their opinion, it makes 'everything' more sustainable, it is innovative and responsible, and it also contributes towards reducing waste and the global build-up of trash and waste materials. But everything must be done on the condition that you do not compromise the purity of the organic (ideal) production method. If you cannot separate organic from non-organic waste materials, you should instead focus on raising the level of sustainability in conventional production methods.

*"You should take care not to mess too much with the red 'eco' label. Because people trust it. In any case, it would devalue organic products for me. So, I'd much rather improve the conventional methods rather than mess with organic ones. If something is to be recirculated in organic production, it has to be organic materials and has to be kept clean. And if you don't do this, then the consumer has to be informed. Organic food that is produced in this way would have to be clearly marked, so that you can make an informed decision when you're buying it. You should have the option to reject it and simply purchase the ordinary organic food, in my opinion."*

*- Helene, 56, from Jægerspris, often buys organic products*

*"I think that it would affect the quality of organic products somewhat. I would consider whether it was worth it if it wasn't quite as healthy and clean as before. You should be able to trust it. I'd actually prefer it if the recirculation of all these things was used in conventional farming to develop that in a more sustainable and long-lasting direction and keep organic production as it is."*

*Peter, 49, from Lille Skensved, often buys organic products*

## **SEGMENT 2: ORGANIC PRODUCTION IS A MEANS TO MORE SUSTAINABILITY AND CAN BE ADJUSTED IF THIS IS IN EVERYONE'S BEST INTEREST**

The second group of organic consumers view organic production as something that is part of a bigger picture. Buying organic products is the better option; it is the most responsible choice when factoring in all aspects, which includes not only consideration for animals and people today, but also consideration for the planet and future generations tomorrow. The motivations for buying organic products are thus just as diverse as with the first group, but thoughts around sustainability and the viability of future generations are instead centred around the basic idea that *'things can constantly be done better and smarter – organic production is the best option for the globe right now, but something else might be a better solution tomorrow'*. For them, organic production is, therefore, a *means towards more sustainability among many others*. Hence, they accept the idea of including 'non-organic material' as fertilizer input in organic production. They would prefer that only waste material of organic origin is to be used, but at the same time appreciate that this may not be possible realistically. It is better to do this than not to do anything:

*"I really don't know whether you can just pour plant waste from conventional production, for example, out onto organic fields... but I think personally that I'd rather have all the waste go out onto the fields and do some good than just throw it all away instead. If they say that it's responsible, then I believe that. I like the thought of things going full circle where you use EVERYTHING. I don't like the feeling that we throw so much away. It's great if we can recycle more."  
- Sabine, 30, from Sorø, often buys organic products"*

*"There are so many good ideas tied in with organic production, but we shouldn't be fanatical about it. We should also apply common sense. If it can be done better than it's done today, that's a very convincing argument. It mustn't affect biodiversity, but if it can be done responsibly and is backed up by science, then that can only be good. It would be okay by me to use all kinds of waste if there's a good match and if you can actually make food production more sustainable."*

*- Kasper, 43, from Copenhagen, always buys organic products*

*"My immediate reaction is that it's best if only organic fertilizer inputs are used on organic fields. But if it can't be separated, then I can still see the point. The fact that biowaste is used for something can only be a good thing... I mean, for me, organic production is also about using what we have at hand with respect for nature. Just as the organic idea is connected with buying Danish produce that's local and in season."*

*Birgitte, 55, from Copenhagen, always buys organic products"*

*"Hmm. It's a fine line, the idea of recirculating something that's not organic in an organic production. Can you still call it organic? But, I mean, I think that it's always better to use something rather than to throw it away. Any organic material comes from nature, so it can only be a good thing if it's returned to nature. And I would assume that it would all be managed properly? In any case, it wouldn't affect my impression of organic production from my viewpoint it would only make it more sustainable."*

*Martin, 45, from Copenhagen, always buys organic products*

For this segment of organic consumers, this idea is in line with the organic approach of using waste that would otherwise be incinerated. It makes society more sustainable in general and for these organic consumers, it also makes organic production *even more* sustainable as it is now part of the bigger circuit on more parameters than it was before. As with the other group of organic consumers, this group is also highly conscious of the fact that organic production involves various rules and frameworks that guarantee purity and quality, and it is difficult to recirculate non-organic materials within these frameworks as things stand today. While the other segment sees these principles as unbreakable, however, these organic consumers accept the idea of adjusting the rules and frameworks in order to enable the recirculation of more types of organic waste materials. As long as it is carried out responsibly and within set thresholds, it can in their opinion help to futureproof food production for the benefit of the entire planet:

*"It would probably require changing the rules in relation to the 'eco' label, but that would be fine with me. I'd rather it was used than incinerated. Of course, it mustn't dilute the whole organic approach, but it makes sense to me. Within certain thresholds, naturally. It would actually reinforce my impression of organic production if you could recirculate something that would otherwise be incinerated. I'd probably not buy more organic food than I do now, but I'd think even more highly of it than I do today."*

*- Jens, 49, from Helsingør, often buys organic products*

*"There are some very strict requirements in organic production, perhaps too strict? It would be great if they could recycle more materials from food production. We need to recycle much more and if the research can back it up and show that it won't hurt anyone, then yes, definitely! It wouldn't make me think any less of organic production if we started to recirculate more or if conventional food and waste products from the food industry were used. It is perhaps a bit too difficult for them today with slightly too strict requirements, but if you can blur the edges a little in a more sustainable direction through recirculation, then it would be very rewarding in the bigger picture."*

*- Eva, 44, from Copenhagen, often buys organic products*

*"I'd definitely still buy organic products if they were fertilized with human urine, for example. I don't see a problem when we already spread manure on the fields and our organic vegetables don't taste of this, right? So, it's a natural thing that can be reused rather than just thrown away."*

*- Sabine, 30, from Sorø, often buys organic products*

*"It's better to use all these things instead of incinerating them. And I'd be fine with an organic production that was 90 percent organic and then make it more widespread by moving the threshold slightly."*

*- Martin, 45, from Copenhagen, always buys organic products*

*"I mean, I think we're moving closer and closer towards conventional production if we use conventional waste. In any case, you'd need to know what it is and how it would be accepted by the soil. But if it can be documented, then it's okay with me. Because we need to consider the future of the planet and how we can improve things. If it can be justified, then YES. It's okay. I have confidence that there'd be checks along the way and adjustments made if the thresholds were exceeded. And for me, organic production would be more sustainable, more climate friendly and more environmentally friendly than it is currently because you're recycling so many products that would otherwise be incinerated."*

*Poul, 59, from Frederikssund, often buys organic products*

## 4. Dilemmas regarding recirculation: how do organic consumers view these?

Organic consumers have been recruited based on displaying a behaviour that shows a support for organic production and, therefore, also having a prior understanding of what organic production is and stands for. The organic consumers in the study react to the topic of the interview armed with knowledge that they have acquired as completely ordinary consumers. They have no expert knowledge about general practices in organic production and their reactions and opinions on the subject can, therefore, *also* rely on misunderstandings or an idealised impression of organic production – same as with consumers in general. To make sure that opinions on the subject are not exclusively based on subjective interpretations of the concept of organic food, an information sheet was prepared beforehand by researchers from the RECONCILE project group at the University of Copenhagen. This briefly sketches out the situation for organic production today and some of the dilemmas that can arise from recirculation and the use of new fertilisation methods. The information is shown at the end of the interview and the rest of the conversation builds around reactions to and opinions on this content, which for some people was rather surprising.



**The current situation**

Currently, we are near the limit for how much area can be cultivated organically, due to an increasing shortage of nutrients.

For the time being, organic farmers need manure from conventional pigs and cows because there is not enough organic manure. They want to limit this use and preferably be independent of this source of nutrients.

Livestock manure contains pathogens, heavy metals, and medicinal residues - but the soil helps us so that they do not harm humans, and only to a limited extent harm the environment - if it is applied with care, taking the legal requirements into account.

**Developing organic farming using recirculation**

Research is currently being carried out into whether recycling is a viable way to further develop organic farming. Primarily, it is investigated whether there are problems (for health and the environment) with the use of

- urban fertilizers (composted household waste)
- biosolids from wastewater
- human urine
- residual products from the food industry, e.g. dairies, meat processing, breweries

The benefits of recycling must clearly outweigh the disadvantages. Negative effects must either be impossible to detect or be very small.

**What do you think?**

Should we recycle, well knowing that our waste and residue streams contain small amounts of unwanted substances, such as microplastics, heavy metals and drug residues - or should we dispose of / incinerate everything for safety's sake, knowing that it is unsustainable in the long run?

### SURPRISE ABOUT THE CURRENT SITUATION

How do organic consumers react to the information given? First and foremost, they express surprise about the lack of nutrients, which pushes organic production close to the limit of what is possible. Many express a prior assumption that the figures would improve with time, so that if more people would only buy organic products, more organic food would be produced to meet the growing demand.

Next, many are surprised about the use of manure from conventional production in organic farming today. Across both segments of organic consumers, this put their prior opinions into perspective: perhaps it was not as clean as we thought? Perhaps it was not as sustainable? Perhaps new types of materials in fertilization do not challenge the integrity of organic production as these steps have already been taken with the use of conventional manure? The consumers who had previously rejected the idea of using non-organic material for fertilizer input in organic production have their opinions challenged: If this is how things are today, then how problematic is it really to make fertilizer input from conventionally produced food waste from households, for example, when we already fertilize with conventional manure? It was especially the knowledge that manure can potentially contain small amounts of pathogens, heavy metals and drug residues that surprise organic consumers. No one have been aware of this beforehand, and many express regret that this is a part of organic production without them knowing about it.

*"It surprises me that there are not enough organic fertilizer inputs. I thought that many farms had gone over to organic production, but that it was being run better, so the fields can get fertilizer inputs from other organic farms. I know that it can take many years to switch from conventional to organic farming, but I'd thought that it had become easier for many of them."*

*- Pia, 60, from Copenhagen, always buys organic products*

*"I absolutely think that it would be better to recirculate food waste, waste products from meat processing and breweries instead of conventional manure. I'm actually a bit disappointed that they use manure from conventionally farmed pigs today. But it's hard to know how much is absorbed into the food and how much of this waste is found in the crops."*

*Martin, 45, from Copenhagen, always buys organic products*

*"It does surprise me a bit that things are done like this. I thought that we didn't have more organic products because consumers aren't buying enough, not because it's simply not possible to grow any more. I thought that you could just increase the amount if more people bought them. And it also surprises me that they use conventional manure at present. I did wonder about the medicine residue. I'd actually feel better if they used food waste and waste products from the food industry rather than manure."*

*- Cecilie, 21, from Copenhagen, often buys organic products*

*"I'm surprised by the current situation. It annoys me that as a consumer I wasn't aware of this. I think that the issue of drug residue is a big problem as this could have long-term consequences. It's far better to recirculate food waste – both organic and conventional, as I think that any harmful substances would present themselves in smaller amounts in food waste than in manure."*

*- Heidi, 21, from Roskilde, often buys organic products*

The reaction is the same amongst the majority of organic consumers in both segments, that is both among those viewing organic production as *'purer, better quality and more natural'* and those viewing organic production as *'a good means to more sustainability among many other means.'* The majority would prefer to avoid the risk of conventional manure and instead use food waste, plant waste and waste products from the food industry – including conventionally produced waste materials. If the use of conventional manure cannot be avoided, there must be solid research to support its responsible use

and to ensure that it is not transferred to groundwater and foodstuffs. The advantages must far outweigh the disadvantages otherwise organic consumers would prefer to avoid the use of conventional manure on organic fields entirely.

### **ARE WE DEALING WITH DEGREES OF ORGANIC – OR A NEW THIRD PATH?**

It is an important finding that *none* of the participants reject the idea of recirculation in food production. There is broad agreement that the various waste materials should be used as long as the negative effects are minimal, and all reservations and concerns are addressed and tackled. 'Rather use it than incinerate it' is the general opinion. The question remains, however, of whether there is room for new forms of recirculation in organic production or whether it should take place somewhere else? After having read the information material, the organic consumers disagree to a great extent and many discuss the various pros and cons with themselves and express great doubt. There can be arguments both for and against:

Some lean towards the opinion that *there is room in organic production for many of these new types of recirculation* discussed in the interview. It would require adjusting the framework and of course, it would have to be done responsibly, but a readjustment of the rules of organic production makes sense to them. This opinion is found primarily among the segment of organic consumers who view organic production as *a means to sustainability among many other means*. There were also individuals in the other segment of organic consumers, however, who share this opinion with reference to the fact that conventional manure is already used in organic production today and that they would actually prefer conventionally produced food waste and residual products from the food industry as well as biosolids from wastewater and human urine, and thus avoid the use of conventional manure. If the thresholds could be observed, then this would only make organic production more sustainable.

Others lean towards the opinion that *there is not room for recycling many of the new types of materials in organic production* and that recirculation of these materials should instead take place primarily within conventional production or alternatively, in a new, third production form, which could have sustainability and recirculation as its focus point. This opinion is found primarily among the segment organic consumers who view organic production as *a guarantee for purity and quality*. Some individual consumers among them even rejected the premise that more organic food should be produced. They would rather dial back and have this as a niche market than compromise its purity. We also find, however, the opinion that there is no place for this type of recirculation in organic farming among individuals in the segment that view organic production as *a means to more sustainability*. Their justification is that it would confuse people more than it would benefit if one were to change the rules for organic production. They would rather implement the recirculation of waste materials in a form of production with less stringent rules.

It would be interesting to verify these opinions quantitatively. Before reading the information material, an acceptance of recirculation in organic production is for many participants conditional upon an expectation that recirculation could be kept within a closed circuit, and that all waste material would be thoroughly cleaned prior to further use. After reading the material, many adjust their opinion. It would be interesting to compare the degree of acceptance among consumers who receive further information with a group who do not receive this same information about benefits, risks, and dilemmas. This, to see whether a future acceptance would be conditional on a concurrent information campaign: something, which this study cannot give conclusions on given the small sample size and qualitative research method.

*"It fits in with my impression of organic farming that you recirculate, but I also think that the purity is being compromised a bit here. I'd like to say that this has no influence on whether I would buy organic products, but I still think that I'd prefer a cleaner and more traditional form of organic farming. But on the other hand... any form of organic farming is better than conventional methods, even one where you recirculate conventional things. It's better as a whole. Actually, we should perhaps find a new term for it. Something that's better than the conventional form but is still not completely organic."*

*- Poul, 59, from Frederikssund, often buys organic products*

*"It's kind of the lesser of two evils, I think... And it's important to do it with consideration. These initiatives require some thoughts and maturity over time and I think that it's very positive that we're starting to think more about sustainability and the climate in organic production. It doesn't change anything about my opinion. I already knew that the certification has been very strict and that many have struggled to live up to it. I'd rather the rules were adjusted slightly so it became more meaningful with regard to being able to increase production."*

*- Eva, 44, from Copenhagen, often buys organic products*

*"It goes a little against my impression of organic farming that they use conventional fertilizer inputs. I thought that there were requirements for fertilization, so that you knew what was being put into the ground? I find it hard to see how something can be organic when it's done this way. Perhaps, there should be two types of organic production, one that makes use of recirculated materials and one that we know already. I also think it's a shame if all this goes to waste if it could actually be recirculated. I think recirculation is a huge benefit, but for me, organic farming is about it being natural, while recirculation is more about being sustainable."*

*- Andreas, 29, from Ølstykke, always buys organic products*

*"I find it reassuring that there is a clear way to distinguish between organic and conventional farming. It's reassuring that there's a level that organic production has to live up to. And I also think that it's a compromise between the organic and the conventional when we move into recirculated fertilization methods, so it's harder to know when something is organic. Unless the thresholds for organic can be maintained? In which case, we have found a method that's even better and that makes better use of resources."*

*- Malthe, 25, from Copenhagen, always buys organic products*

### **THE NEW INFORMATION CHANGES THE IMPRESSION OF ORGANIC PRODUCTION FOR SOME, BUT THERE IS STILL CONFIDENCE IN THE RED 'ECO' LABEL**

After having discussed the dilemmas attached to recirculation, the interview is concluded with a chat about organic farming in general and in some cases, the opinions expressed earlier in the interview are revised somewhat by the participant. Many organic consumers across both segments express that their impression of organic production have changed a bit after having read the information material. A couple of individuals from the group that viewed organic production as a guarantee for purity and quality expressed disappointment upon learning that organic farming was not as pure and clean as they had thought as it was fertilized using conventional manure. Even so, few expect to change

their behaviour and reduce their consumption of organic products as a consequence of their changed impressions. For them, it still remains the better option.

The majority of the participants express, however, that the new information does not make them lose faith in the organic production form and organic principles, even if it did not take place in exactly the way they'd believed. A further development of organic production through the recirculation of materials, which would otherwise be incinerated, fits in with their impression of organic farming as a responsible, considerate and more sustainable form of production. Acceptance and faith rest, however, on this being Danish organic products produced under the red 'eco' label, and that it's backed by solid research that clearly shows that the advantages far outweigh the disadvantages.

*"I think that it's a good way of thinking about the entire supply chain. It's good to use whatever can bring further value. And I'm assuming that everything is well-managed here in Denmark, so it all takes place responsibly... It would be something quite different if it was foreign organic farming. At any rate, it should only be from countries where I've faith that they have things under control."*

*Mie, 31, from Copenhagen, always buys organic products*

*"I do think differently about organic farming now that I know this about conventional manure. But I'd prefer to know it. I'll still buy organic products. I feel a bit like this is new knowledge that I'm getting rather than old knowledge that I didn't have. I'd rather make my decisions on an informed basis. And I definitely think that recirculation is a step in the right direction. I think that it's good to be honest and bring people closer to the food."*

*- Kasper, 43, from Copenhagen, always buys organic products*

*"It has changed my perception of organic farming slightly but it also makes a lot of sense. It just needs to be backed up by research as a guarantee. Come to think of it, it actually makes me want to buy organic products even more when the process is made more sustainable and a part of a greater cycle. It's important for me, however, that it's done under the red 'eco' label. I place a lot of trust in Danish organic production. I can sometimes be doubtful about whether the European labels are just as strict, so I'd trust the red Danish label and Danish production more. The checks are just better here and the rules are more strict."*

*Kristine, 39, from Copenhagen, always buys organic products*

*"I have to admit that organic farming has lost a little of its sheen or its sacred status now that I know this. I've kind of gone around imagining organic products as the holy grail, it was just the solution to everything, to health, ethics... and of course, it isn't. This brings organic farming a bit more down to ground level but it also makes it more honest in my eyes. I think that it's good that it's made it transparent and clear what the production involves. For me, it's actually quite liberating that organic farming isn't so holy and sacred."*

*- Sabine, 30, from Sorø, often buys organic products*

# Conclusion: Our learnings so far

## ACCEPTANCE OF RECIRCUCLATION AS A PART OF ORGANIC PRODUCTION

The organic consumers in this qualitative study are all extremely focused on sustainability and consider the organic production form as something that is more sustainable than other forms of production. Sustainability is, however, a much broader concept for them and colours other aspects than those that can be covered by organic production.

Two of these aspects are: 1) The most optimal, smartest use of resources. 2) Minimizing waste (or preferably eliminating it entirely) – an area where many organic consumers express concern about whether this is satisfactorily covered by organic farming as it takes place today. They all, therefore, react very positively to the idea of recirculating natural, organic materials such as food waste, plant waste and residual products from breweries, dairies, and meat processors: this addresses a concern that there is too much waste in the food production and that society could be more sustainable in general if more material could be used wisely rather than just thrown away or incinerated. It optimizes the use value of organic production and thus cements the relevance and licence to operate.

Knowledge about the use of manure as fertilizer input seems here to have paved the way among organic consumers for an acceptance of the use of other types of organic, compostable waste materials as fertilizer inputs. Many organic consumers do not see it as a big problem whether this is food waste from large canteens or human urine and biosolids from wastewater, despite the fact they would rather not dwell too much on the details. If it can be composted, it can also be used as a fertilizer input. They trust that it will be carried out responsibly and backed up by science, Danish legislation, and solid control mechanisms.

The only thing that most organic consumers in this study rejects is the thought of the waste material being at risk of containing microplastic. None of the 20 participants are happy about this. If microplastic cannot be avoided, most of them feel that you should avoid using it as a fertilizer input for new crops. A few individuals felt, however, that if it could be demonstrated that it would not harm nature, the environment, the animals or people, then it could be justified, despite the idea still being an upsetting one for them.

## ...HOWEVER, NOT EVERYTHING CAN BE RECIRCULATED WITHOUT IT CHANGING ORGANIC CONSUMERS' IMPRESSIONS OF AND (POSSIBLY) TRUST IN ORGANIC

As the interviews progress, it becomes clear, however, that there are a number of assumptions behind the initial enthusiasm over the different types of recirculation in organic production.

The two most important assumptions are:

That all raw materials that are recirculated back into organic production (e.g. as a fertilizer input on fields) are of *organic origin*. It must take place in a closed circuit where the purity of the organic way is not compromised.

That before being used as fertilizer input, all organic material has *undergone a form of purification process* to get rid of all 'undesirables', for example, the preservatives and additives used in many food products. If the term 'natural fertilizer' is used, the organic consumer will presume that this is as clean and natural as the leaves and branches one would find in a forest.

These assumptions testify to a great faith in organic products and the red 'eco' label in particular, which is regarded as a stamp of purity, quality, responsibility and consideration. If these assumptions are not immediately realized, however, the premise

for acceptance changes. Provided that it cannot be kept inside a closed circuit and cleaned before use, the acceptance depends on the participants' fundamental approach to organic production as either being *a goal in itself as a guarantee for purity, naturalness and quality* or as *a means towards more sustainability among other means*. This basic conviction is not something the participants are consciously aware of and only emerges after they have been confronted with the possibility that their expectations about a closed circuit and a purification process of materials cannot be realized.

When faced with this 'new reality', the latter group accept the idea of the recirculation of non-organic waste materials in organic production as in their eyes, this will help to make society more sustainable in general. They presume that it is safe and justifiable, that all control mechanisms are in place, and that the advantages far outweigh the disadvantages. The first group on the other hand does *not* accept the idea. As they see it, it would compromise the purity of the organic material when this closed circuit is broken. They would rather that the recirculated materials were used solely in conventional production as they feel that this would improve the sustainability of this production form.

### **DILEMMAS REGARDING RECIRCULATION CALL FOR DIFFICULT CHOICES THAT MAY RISK ALIENATING SOME ORGANIC CONSUMERS**

The vast majority of organic consumers in this qualitative study are not aware at the time of the interview that due to a shortage of nutrients, today's organic farming needs to use manure from conventional pigs and cows to fertilize organic fields. Their reaction to the idea of using other non-organic nutrients should, therefore, be seen in the light of this.

They receive this information at the end of the interview and for many of them, it puts their previous opinions into perspective. For the majority, learning about the use of conventional manure helps them to accept other forms of non-ecological, organic material as fertilizer inputs. For some, these materials can be used *alongside* the use of conventional manure, while for others, the materials should *replace* the use of conventional manure. A minority of respondents felt, on the other hand, that this route compromises organic production too much. If one is not able to use only organically produced waste materials, then it would be better to limit the organic production and preserve the purity rather than being forced to use conventionally produced waste as fertilizer input. This also applies to the use of conventional manure, which they believe should be phased out completely.

The disagreement among the organic consumers participating in this qualitative study testifies to the difficult decisions ahead which could risk alienating some of the consumers who are currently big advocates of the organic production form. If it is not an option to reduce production capacity and preserve the closed circuit – this analysis works on the premise that this is not an option – then a decision must be made on the extent to which other types of materials can be used as fertilizer inputs on organic fields, either alongside conventional manure or as a replacement for it. Another difficult decision ahead is whether all types of organic, compostable waste materials can be used as fertilizer inputs, or whether it should be limited to those types of materials that intuitively seem the simplest and most understandable for consumers – namely food waste, plant waste and waste materials from breweries, meat processing and dairies.

It can also be recommended that use of materials containing microplastic is carefully considered and possibly (if in any way an option) completely eliminated from this process of recirculating nutrients, as it could potentially alienate consumers who are very mindful about sustainability. By its very nature, plastic is and remains a concern for consumers,<sup>4</sup>

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<sup>4</sup> See among others Danish Agriculture & Food analysis "Fremtidens emballage skal være mere bæredygtig" (in Danish) published May 2020 as well as the report "Globale megatrends 2030" (in Danish) published February 2020. Both analyses can be located on [www.lf.dk/tal-og-analyser/forbrugere-og-trends](http://www.lf.dk/tal-og-analyser/forbrugere-og-trends)

and the organic consumers in this qualitative study do not react any differently than others: the idea that you would consciously send plastic out into nature cause offence and could potentially halt the acceptance of recirculation, both in organic and conventional forms of production. It does not fit well with the organic consumers' ideas and perceptions about sustainability, which form the whole foundation for their acceptance.

### **THE RIGHT FORM OF COMMUNICATION AND CHOICE OF WORDING MAY PROVE IMPORTANT FOR THE FUTURE ACCEPTANCE AMONGST ORGANIC CONSUMERS**

The knowledge that we already use non-organic material in organic production as fertilizer input can potentially alienate organic consumers, but on the other hand, it can also help to pave the way for their acceptance of other waste materials. The information changes most organic consumers' impression of organic production but not necessarily for the worse. Also, it makes it easier for the organic consumer to form an opinion regarding the dilemmas of new types of materials for recirculation and the risks that may relate to these. For some, it even raises their impression of the organic way that effort is put into developing the organic production form in a direction that is (even) more sustainable. This finding seems to suggest, therefore, that communication and specific wording concerning this may prove important, of which one could constitute an entire future quantitative study on its own.

For several, there is a difference between their spontaneous reaction to the topics of the interview and their opinions after being given time to think it over, or after the conversation had dwelled on the topic for some time. This indicates that opinions can mature over time. One possibility is, therefore, that advantages and disadvantages are communicated in several phases, through more than one channel and with more forms of expression.

The specific wording used can also be relevant. Transparency is important, but too many details have the potential to alienate, especially when it comes to waste materials such as manure, biosolids from wastewater, and human urine, where some among the organic consumers in this study expressed a bit of ambivalence and a few even showed emotional discomfort, even though the thought of using of these materials as fertilizer inputs made sense to them rationally. It can prove to be a balancing act between what information should be provided in a potential information campaign to the public, and what information should simply be made available on websites and in reference works. Words like 'nutrients', 'biofertilizer', 'biodegradable', 'compostable', 'natural' and 'organic' appear in this qualitative study to be more navigable than words such as 'household waste', 'industry', 'faeces', and 'slurry', despite this study being too flimsy a foundation to be able to determine which specific words it would be best to use when communicating about this.

Regardless, it will be advantageous to talk about recirculation in a broader context of sustainability, future viability, intelligent use of natural materials and a circular process – a context which is important for the organic consumers and in which they perceive organic production as having a pivotal role to play.

# Appendix: Interview guide

## INTRODUCTION AND BRIEF TALK ABOUT ORGANIC PRODUCTION

(APPROX. 10 MIN)

Thank you for meeting me here today and helping us. We're conducting this project, which this interview is a part of, in collaboration with researchers at the University of Copenhagen. The project is supported by the Ministry of the Environment's fund, GUDP, and this conversation we have here today is part of a larger project, where we're studying Danes' opinions. For example, a bigger survey will also be conducted in the form of a questionnaire being carried out by the university, and research is also being conducted into farming methods, for example, alongside this. The project will run over three years, and this phase of the project that you're taking part in comes at the start and will therefore provide input for further work.

You are one of 20 selected participants whom we've invited to take part. We've done so because we would like to learn a little more about your opinions, and what you think about different things. It's important for me to point out right away that I'm not looking for any specific answers. There are no 'right' or 'wrong' answers today. It's your thoughts and opinions that I'd like to learn a little more about. So, don't be worried that you might, for example, offend the place where I work. Just be honest, otherwise we won't learn anything. And always remember to base your answers on yourself, on what you think – and make it clear to me if you are talking about something that someone else thinks or has said. Then, I won't misunderstand and think that these are your own opinions.

Do you have any questions before we get started? (pause)

You've been invited in part because you answered that you often or always buy organic food and drink. I'd like to hear a little more about that:

- What do you associate with the word 'organic'? (Probe: values, products)
- What are the most important reasons why you buy organically produced food and drink? Are there any considerations that weigh more heavily than others?
- Is there anything you miss about organic production – or anything that makes you wonder?
- Do you believe that there are any weaknesses to organic production? If yes: what are they?
- How do you think organic production can be further developed?

## SUSTAINABILITY AND ORGANIC PRODUCTION – ASSOCIATIONS AND OPINIONS

(APPROX. 10 MIN – TOTAL TIME SPENT 20 MIN)

*Comment: after an introductory discussion about associations on organic food, we continue by looking at perceptions of sustainability as a concept and in relation to organic production. This will form a 'point of reference' for the rest of the interview and the subsequent analysis: what is experienced as sustainable – will recirculation be perceived negatively – and can organic production 'handle' implementing this form of recirculation in organic farming?*

What do you associate with the word 'sustainable'? Probe: Values, associations: what does the word mean to you? What does it include?

On the other hand, what do you think it doesn't include?

When is something sustainable? When is something not sustainable?

If the respondent doesn't mention these conditions themselves, probe into:

- Do factors such as i.e. >xx< play a role in how sustainable something is? If so, how?
  - Land use – the way you farm the land; how much do you get out of it?
  - Environment – impact on one's surroundings
  - Biodiversity – healthy soil, clean water?
  - That everything is grown in Denmark?
  - How you fertilize the fields?

In your opinion, how sustainable is organic production? Is organic production always sustainable?

Can you think of any instances/discussions, where you've been in doubt about the sustainability of something organic?

If yes: what made you doubt it? Are there any dilemmas or paradoxes, in your opinion, in terms of how sustainable an organic product is?

Can something be sustainable if it hasn't been organically produced+ In what way? What has contributed to making it sustainable?

What about the climate in relation to sustainability? Is being climate-friendly the same as being sustainable?

## RECIRKULATION

(APPROX. 15 MIN – TOTAL TIME SPENT 35 MIN)

*Comment: After having asked about associations regarding 'sustainable' and 'organic', the interview then focuses on the potential for recirculation of products from the surrounding community in organic production. The purpose of the interview is to place focus on spontaneous reactions and feelings in the consumers: how 'far' can you go? Could it be used for food? Would the consumer eat it?*

If I say the word 'recirculation', what comes to mind? Is that good or bad? In what way? What could be an advantage of it? On the other hand, is there anything that could be a disadvantage or cause for concern?

Does 'recirculation' fit with your experience of sustainability? How?

Can everything in principle be 'recirculated' or 'used again'? Or are there some things that we should refrain from recycling? What are they? Can you give some examples?

What if we focused now on recirculation in food production? That is, the production of food and drink that we buy in the supermarkets and eat at home at the dinner table... Is there anything that would make an obvious choice for recirculation, in your opinion?

Conversely, is there anything that shouldn't be used in food production?

*Ask for each type:*

What if you recirculated >xx< What could it be used for? In which case would it be good to 'recycle' these types of materials? Any cases where it not be good to use them?

Organic household waste from the city's dustbins?

Ground-up waste that could contain microplastic?

Food waste from large canteens?

Human urine?

Manure from pigs?

Straw used in animal pens and barns?

Waste products from agricultural production, e.g. plant waste, roots

Waste products from industry, e.g. dairies, meat processing, breweries

What if it was used to fertilize the fields where vegetables are grown for people to eat? What would you think about that? Why?

## RECIRCULATION AND ORGANIC PRODUCTION

(APPROX. 15 MIN – TOTAL TIME SPENT 50 MIN)

- In your opinion, would there be a difference between organic and conventional production in relation to what can be recirculated back into the production of food for human consumption?
- What is currently used to fertilize the fields in organic production – do you know?
- If you consider organic production for a moment, specifically, the cultivation of vegetables. Would it be acceptable to fertilise the fields with...
  - Organic household waste from the city's dustbins?

- Ground-up waste that could contain microplastic?
- Food waste from large canteens?
- Human urine?
- Manure from pigs?
- Straw used in animal pens and barns?
- Waste products from agricultural production, e.g. plant waste, roots
- Waste products from industry, e.g. dairies, meat processing, breweries

*If yes, ask: Why is that? How should it be treated in that case?*

*If no, ask: Why not? (spend time exploring why it is not OK)*

- What if I were able to guarantee that there were no health risks involved – that everything would be thoroughly treated so there were no bacteria?
- What if I told you that research has shown that the fields are not ‘harmed’ in any way? That, for example, biodiversity thrives on this type of fertilizer – that there are still insects and worms in the soil, that it provides the right fertilizer input for the plants to thrive, and that there is no risk to the groundwater? Would it then be okay to use this in organic production?
- How would it make you feel about organic production of vegetables and plants, if permission was granted to use these types of fertilizer?
  - Does this make organic food more or less healthy in your eyes?
  - Does this make organic food more or less sustainable in your eyes?
  - Does this make organic food more or less environmentally friendly in your eyes?
  - Does this make organic food more or less climate-friendly in your eyes?
  - Will this have any influence on your desire to buy organic vegetables?

## INFORMED DISCUSSION ABOUT NEW TYPES OF RECIRCULATION IN ORGANIC PRODUCTION

(10 MIN – TOTAL TIME SPENT 60 MIN)

*In collaboration with the University of Copenhagen, material has been prepared beforehand in everyday language that briefly lists the current situation together with the dilemma involved in recirculation in organic production. As the interview is taking place online, the material is shown via the meeting room's option for online sharing.*

Finally, I'd like to show you something and hear your opinion about this...

The interviewer gives the respondent time to read the material.



After reading:

What do you think about what I've just shown you here? What's the first thing that comes to mind? Positive... negative...

Review the specific elements: what do you think about this?

How does this match with your own view of organic production?

Is there anything that surprises you? What?

Is there anything that you're wondering about/not sure about? What?

Does this change your opinion about organic production? Do you have more or less of a desire to buy organic products now that you have this information?

## CLOSING

What do you think about everything we've talked about today? Is there anything that you've found surprising or that has concerned you?

Is there anything that you think we've forgotten to talk about? Anything that you can think of that we should have mentioned?

If you were to give a recommendation as to how you could best further develop organic production in a sustainable direction, what would it be?

Thank you for all your help!

