TRIGGERS OF SOCIETAL TIPPING POINTS

IN TRANSITIONS TO SUSTAINABLE FOOD CONSUMPTION

Report of the PlantPro Project



PlantPro: Accelerating an efficient green consumer transition | Funded by Innovation Fund Denmark | grant nr 0224-00044B





Department of Management, Society and Communication

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PlantPro project partners were involved in this project task in the way outlined in the project plan. The (co-)WP leaders provided feedback on the procedure in a meeting in October 2021, and reflected on first results in a meeting in January 2022. The Steering Committee members commented on the draft report in March 2022. The analysis and conclusions are the independent work of the research team at CBS, who discussed and reflected on this with the AU and KU team on an internal workshop in March 2022.

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Executive Summary

This report is part of the PlantPro project funded by Innovationsfund Denmark. The project aims to accelerate an efficient green consumer transition. This includes an increase in the consumption of plant-based food and a reduction of food waste. **The report outlines development paths and identifies triggers of societal tipping points in transition processes to sustainable food consumption**. The analysis is **based on seven case studies** which have in common that substantial progress towards sustainable food consumption has already been made: organic food, keyhole label ('nøglehulsmærke'), wholegrain partnership ('fuldkornspartnerskabet'), and food waste reduction in Denmark; as well as the plant-based transition in Sweden, Germany, and the Netherlands. The report concludes with recommendations for fostering the plant-based transition in Denmark.

This report is based on a conceptual framework for the systematic analysis of sustainability transitions. This framework distinguishes between *conditions* that enable sustainable transitions, *measures and actions* that create favourable conditions and trigger tipping points in the transition, relevant groups of *actors* that implement measures and actions (policy, private business, science & research, non-profit entities, consumers), and *amplifiers* that reinforce the effects of measures and actions.

The case studies showed that the following *conditions* foster the transition to sustainable food consumption – the **tipping point in the transition will be reached when each condition has at least partially been met**:

- Availability Sustainable foods and practices should be easily accessible and available for consumers
- Attractiveness Sustainable foods should be highly attractive for consumers in order to reduce perceived sacrifices
- **Competitive & affordable consumer prices** Prices of sustainable foods must be competitive and at the same time should be affordable for the broad population
- Awareness, knowledge & skills Consumers should be aware of sustainable alternatives and know how to implement sustainable practices and prepare sustainable foods
- Social & Cultural Norms Sustainable foods and practices should be perceived as normal and an integral part of Danish society

The case studies further revealed that *measures and actions* in each of the following areas are needed to reach a tipping point:

(1) Communication, Nudging & Education;
 (2) Food Products and Meals;
 (3) Distribution Channels;
 (4) Price & Pricing Strategies.

Further key take-aways from the case studies:

- Reaching the tipping point in the transition to sustainable food consumption requires engagement from all groups of actors business/industry, policy, civil society, consumers.
- Tipping points in the transition to sustainable food consumption are not triggered by single measures or actions. It is the interplay of many measures by many different actors that drive a successful transition.
- Collaborative initiatives and actions are often very impactful, especially if they involve all groups of actors.
- Measures and actions tailored to different consumer segments are most promising.
- The level of policy commitment largely determines the speed of the transition to sustainable food consumption, i.e. whether positive developments in niche segments will scale up.
- Large retail chains play a decisive role in scaling up systemic change. Retailers determine the degree to which sustainable food is widely available and how it is promoted at the point-of-sale. If large retailers are on board, the transition is likely to gain momentum.
- A radical new step towards sustainability by a large food company or retail chain will likely cause positive cascading effects, since competitors will follow and other key actors will implement complementary actions.

So far, the plant-based transition is still in its infancy in Denmark. This report offers a systematic ground for identifying conditions that enable a successful transition, and mapping concrete measures and actions to trigger long-lasting changes in the food consumption patterns of consumers in Denmark.

PlantPro Accelerating an efficient green consumer transition

The project PlantPro contributes to accelerating an efficient green consumer behaviour transition towards more plant-rich diets and reduced food waste. It aims to fill a knowledge gap on factors that drive consumer behaviour change towards more sustainable plant-rich diets and upcycled foods and greater acceptance of sustainable food technologies.

PlantPro is funded by Innovation Fund Denmark. The project runs for three years, from 1 April 2021 to 31 March 2024. The project is a collaboration between the MAPP Centre at the Department of Management at Aarhus University, Department of Food Science at University of Copenhagen, Copenhagen Business School, Plantebranchen, Dansk Vegetarisk Forening, Thinktank OneThird, Simple Feast, Beyond Coffee, Circular Food Technology, Møllerup Brands, Food Innovation House, Orkla, Naturli, Planteslagterne, Upfield, Eachthing, Rema1000 and Fair Trees.

Throughout the project, PlantPro will identify key success factors in industry and societal transitions, map consumer factors that determine acceptance and behaviour across consumer lifestyle groups, assess environmental impact, and measure the effect of nudging, information, and motivation on behavioural change in public and private settings under real-life context. It will deliver a catalogue of marketing and policy actions.

See more at https://mgmt.au.dk/plantpro

The commercial value created consists of market growth for innovative plant-based food and food upcycling businesses. The societal value created consists of the achievement of climate targets and sustainable development goals. The overall goal is to contribute to the development that a greater share of the broader population consumes more plant-rich diets in ways that at the same time reduce food waste in the system.



The work package structure focuses on the industry (WP1), the consumer (WP2), and the interplay of both in the market (WP3). WP1 aims to identify which key success factors shape sustainable industry and societal transitions in the food and other sectors, in Denmark and abroad. WP2 aims to map the consumer factors that determine the acceptance and behaviour across different consumer lifestyle groups, and the respective environmental impact of it. WP3 aims to assess the impact of actions to nudge, inform or motivate behaviour change among consumers in different public and private choice contexts.

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PlantPro

Accelerating an efficient green consumer transition



WP 5: Communication and Implementation, Copenhagen Business School

Aim of the study

Triggers of societal tipping points in transitions to sustainable food consumption an efficient green consumer transition

The aim of WP1.2 of the PlantPro project is to

- outline development paths,
- understand how behaviour change is impacted, and
- identify factors that trigger societal tipping points in transitions to sustainable food consumption.

The report is based on a qualitative analysis of successful societal transitions to sustainable food consumption, using a case study approach. A particular emphasis is placed on promising measures and actions that companies, policy-makers, interest organisations and other stakeholders can implement to foster the consumer transition and trigger societal tipping points.

Methodology & Theoretical Framework What was done and how?

Data & Analysis

Analysis of successful societal transitions in sustainable food consumption

Case studies

- Organic food (DK)
- Keyhole label (DK)
- Wholegrain Partnership (DK)
- Food waste reduction (DK)
- Transition to plant-based food in Sweden The Netherlands
 - Germany

Data

• Review of secondary data, i.e. documents, reports, and scientific publications

Analysis framework

- **Framework for triggering societal tipping points** (adapted from The Food and Land Use Coalition (FOLU) and the Globals Systems Institute at the University of Exeter (2021)
- Framework of relevant environments for new products and practices (adopted from Mylan et al., 2019)

Data analysis

- Iterative approach of thematic analysis
- Cross-checks by several analysts

Theoretical Framework

Framework for triggering societal tipping points in sustainability transitions

The **current food system in Denmark** exceeds the planetary boundaries and needs to shift towards sustainable consumption and production patterns. Overall, the transition towards sustainable food consumption in Denmark is still in its early phase. In selected areas, however, Denmark has made remarkable success, foremost in the areas of organic food consumption, wholegrain intake, and food waste reduction.

The shift towards more plant-based food consumption has started but is still in its infant stage. This report aims to identify promising ways of accelerating the transition towards sustainable food consumption in Denmark, based on the empirical framework of positive tipping points in sustainability transitions.

Societal transitions, i.e. transitions to new practices and/or beliefs, often occur in a non-linear, s-shaped manner. A **Societal Tipping Point** is reached when the system starts to change exponentially. Empirically, societal tipping points often occur once 10-40% of actors have adopted the new practices and/or beliefs. The majority is then likely to follow at a rapid pace. Once the exponential growth phase is reached, the transition occurs almost automatically without the necessity of large interventions.



Crucial questions for sustainability transitions:

- How to accelerate the transition in the first phase to quickly move towards a positive tipping point?
- What measures & actions can trigger a positive tipping point?

Theoretical Framework

Framework for triggering societal tipping points in the transition to sustainable food consumption

Adapted from: The Food and Land Use Coalition (FOLU) and the Globals Systems Institute at the University of Exeter (2021)

	Measures & Actions create favourable conditions and trigger positive tipping points	Amplifiers Factors that amplify the impact of measures & actions and accelerate	Conditions enable the system to move towards a societal tipping point	
State prior to	 Communication, Nudging & 	societal tipping points	 Availability 	Nacirad ctata
transition	Education		- Attractiveness	
Unsustainable	 Food Products and Meals 		Competitive & affordable prices	Sustainadie
consumer behaviour	Distribution Channels		- Awareness, Knowledge, Skills	behaviour
	 Price & Pricing Strategy 		 Social & Cultural Norms 	

Actors

Implement measures for shaping favourable conditions

Sustainability transitions are facilitated through a number of **Conditions** that enable the system to move towards a societal tipping point. The transition can be actively accelerated by different groups of **Actors** who implement **Measures and Actions** that create favourable conditions and help overcome the resilience of the 'unsustainable' system. **Amplifiers** reinforce measures and actions to accelerate a system change.

Please note: A ,sustainability transition' requires radical shifts of the current system, both on the demand as well as the supply side (Köhler et al., 2019). This project report aims to identify how to increase *consumption* of sustainable food products and practices. The report outlines measures, conditions, amplifiers, and actors that can contribute to changing *consumer* behaviour. It is important to recognise that an increasing consumer demand for sustainable food requires an increased supply of sustainable food. This report does not address how to foster behaviour change on the supply side; this question is subject to Task 1.1 of the PlantPro project.

Summary of results

Results in brief - Relevant actors

Relevant actors for the shift to sustainable food consumption





- Different groups of actors actively accelerate the transition to sustainable food consumption.
- By **implementing measures and actions**, these actors can **create favourable conditions** that move the transition towards a **societal tipping point**.
- **Collaboration** between actors is crucial in sustainability transitions.
- In addition to the 'obvious' groups of actors,
 Science and Research has emerged as an arena in the case studies, influencing the decision-making of the other four groups of actors.

Results in brief – Five Conditions

enabling the transition to sustainable food consumption

Awareness, Knowledge & Skills

Consumers are informed, know how to make sustainable choices and are capable of preparing sustainable foods



Consumers

Social & Cultural Norms

Sustainable foods and practices are an integral part of society





Sustainable foods and practices

Availability

Variety of sustainable alternatives available in supermarkets, public kitchens, restaurants, etc.

Attractiveness

High product quality (taste, texture, smell, etc.) reduces perceived sacrifices of sustainable behaviour change

Competitive & affordable consumer prices

Sustainable products are affordable at a competitive price



Evidence from the case studies

- The transition towards sustainable food consumption gains momentum as soon as progress is made regarding these five conditions.
- A positive tipping point in the transition can be reached when all of these conditions are (at least partially) in place.

Results in brief – Measures & Actions

creating favourable conditions for accelerating the transition to sustainable food consumption

Areas of Action	Measures & Actions		
Communication,	Communicate multiple benefits of sustainable food consumption		
Nudging & Education	Clearly defined terminology with common logo and standards		
	Point-of-Sale Promotion & Nudging		CO
	Campaigns and public events		nsur
	Dietary Guidelines		ner
	Education and training		segr
Food Products and Meals	Tasty and attractive food products and meals		nent
	Wide range of products and meals		Ś
Distribution Channels	Outlets where mainstream consumers usually shop		
	Distribution channels for the dedicated consumers		
Price & Pricing Strategy	Pricing instruments		



Evidence from the case studies

- Tipping points in the transition to sustainable food consumption are not triggered by single measures or actions.
- It is the interplay of many measures by many different actors that drive a successful transition.

Results in brief – Amplifiers

Factors amplifying the impact of measures & actions



Results in brief - Key take-aways

Successful transitions to sustainable food consumption



Key actors and system dynamics:

- Sustainability transitions in the food sector can have different starting points: engaged consumers voicing a desire for change, business actors pursuing sustainable solutions, policy-makers setting sustainability agendas, or a combination of the aforementioned. Science and research might play a role in motivating these actors to initiate change. Scaling up requires engagement from all groups of actors.
- The level of **policy commitment** largely **determines the speed of the transition** to sustainable food consumption, i.e. whether positive developments in niche segments will scale up.
- Large retail chains play a decisive role in scaling up systemic change. Retailers largely determine the degree to which sustainable food is widely available and how it is promoted at the point-of-sale. If large retailers are on board, the transition is likely to gain momentum.
- A radical new step towards sustainability by a large food company or retail chain is likely to cause positive cascading effects, since competitors will follow and other key actors are likely to implement complementary actions.

Conditions:

• Five conditions as pre-requisites for reaching the tipping point in the transition: Sustainable foods and practices are widely available, attractive, and competitive in price; consumers are aware and capable of sustainable solutions; and social norms do not work against sustainability but are supportive.

Measures & actions:

- Tipping points in the transition to sustainable consumption are not triggered by single measures or actions but result from an **interplay of many measures** by many different actors.
- **Collaborative** initiatives and actions are often very impactful, especially if they involve all groups of actors.
- Measures and actions tailored to different consumer segments are most promising.

Results in brief - Where are we in the journey?

Transition to (more) plant-based diets in Denmark

depends on consumer segment

depends on

consumer segment

X



Social & Cultural Norms

Sustainable foods and practices are an

integral part of society



Consumers





Attractiveness

High product quality (taste, texture, smell, etc.) reduces perceived sacrifices of reducing consumption of animal foods

depends on consumer segment and type of plantbased foods

Competitive & affordable consumer prices

Sustainable products are affordable at a competitive price

Evidence from the case studies

- The transition towards sustainable food consumption gains momentum as soon as progress is made regarding these five conditions.
- A positive tipping point in the transition can be reached when all of these conditions are (at least partially) in place.



? Small progress

Plant-based foods



Promising next steps – wish list

for accelerating the plant-based transition in Denmark

- Key groups of **actors collaborate** in **multi-actor initiatives** for the plant-based transition.
- Strong **policy** support at all **governmental** levels: Would send an important signal to mainstream consumers and boost the plantbased food business sector.
- **Food companies** in the plant-based sector: Focus on improving sensory characteristics of plant-based foods, and inspiring consumers to prepare plant-rich dishes (beyond exchanging meat with meat substitutes).
- Radical innovative steps by large retailers: Re-think the positioning of plant-based foods relative to animal foods (especially meat), and upgrade plant-based foods in comparison to animal foods in particular regarding
 - Point-of-sale promotion, shelve space, positioning: dedicate more space and attention to plant-based food
 - Price and price promotions: lower the relative price of plant-based foods compared to meat and dairy, stop extensive price promotions for meat
- **NGOs**: Even stronger engagement of NGOs not directly related to food (e.g. environmental, health, sports) would be beneficial.
- **Consumers** open to plant-based foods: Spread the word about good experiences with plant-based foods.

Results in detail What we have learned from the case studies

Case studies on transitions to sustainable food consumption

Brief overview and status quo: Where are we in the transition?

Organic food



- Today, the Ø -label is the best-known and most trusted labelling system in Denmark (Organic Denmark, 2021).
- Organic products are relatively common in public kitchens and takeout venues. The Organic Cuisine Label, introduced in 2009, is recognised by 58% of the population (Food Nation, 2021).
- Organic food has become an integral part of the Danish food culture and has been included in the guiding principles of the New Nordic Cuisine.
- 10% of Danish farmers are organic producers (Food Nation, 2019).
- In 1987, as the first country in the world, the Danish Parliament adopted the Organic Farming Act that laid down standards and principles for organic food and farming and introduced financial support for farmers converting from conventional to organic farming (Aschemann et al., 2007). In 1994, permanent subsidies for organic farming were introduced.



Wholegrain partnership

- The Danish wholegrain partnership was founded by representatives from the food industry, health NGOs, and public authorities in 2008. The initiative targets the whole Danish population, with a special focus on individuals with the lowest wholegrain consumption (Fuldkornspartnerskabet, 2021).
- To achieve their objectives, the collaborating partners have established a fourfold strategy to increase consumer demand and market supply for wholegrain food produce. The strategy aims to increase the availability of wholegrain food products, fosters the development of new wholegrain products, focuses on the promotion of the wholegrain logo, and helps to change food consumption norms for wholegrains (Lourenço et al., 2019).
- The wholegrain intake has increased over the last years. For instance, from 2000–2004 to 2011–2013, the consumption of wholegrain increased by 75% (by 118% for children). In addition, the number of wholegrain products carrying the wholegrain logo increased from 150 in 2009 to 800 in 2018. The success attracted additional partners as such, the number of partners rose from 14 initial partners in 2009 to 31 in 2018 (SAPEA, 2020).



Case studies on transitions to sustainable food consumption

Brief overview and status quo: Where are we in the transition?

Keyhole label



- The aim is to help consumers make healthier food choices by eating less and healthier fat, less sugar, less salt, and more dietary fiber and whole grains.
- Several consumer surveys, conducted since the official launch of the label in Denmark in 2009, have shown increasing awareness for the Keyhole label among Danish consumers. In 2012, 93% stated to know the label, while a study conducted in 2014 found that already 96% of consumers recognized the label. In a study conducted in 2021, 57.7% of consumers stated that the keyhole label influences their food choices (Laasholdt et al., 2021).
- Knowledge about the 'meaning' and the underlying guidelines of the label remains fairly low. In particular, the label encourages consumers to overestimate healthfulness and underestimate environmental impacts of Keyhole-labeled products (Christensen, 2012). A more recent study conducted by Aarhus university showed that there is still high uncertainty among Danish consumers about the health aspects of the label (Laasholdt et al., 2021).

Food Waste reduction



- Among Danish consumers, awareness of food waste is high. According to results from Aarhus University, 85% stated to have heard or seen information about food waste in the past year (Stancu & Lähteenmäki, 2018).
- Danish efforts to reduce food waste led to a reduction of food waste of 25% between 2010 and 2015. With this success, Denmark reached a European record (FUSIONS, 2016a) after starting with food loss figures higher than the EU average (Szulecke, 2019). Between 2011 and 2017 food waste at the household level was reduced by 8% (Ministry of Environment and Food, 2017). A more recent study provided by the Danish Agriculture and Food Council (2020) reveals that four out of ten Danish consumers are wasting food on a weekly basis, while a mere 5% stated to never waste food. However, half of Danish consumers would like to reduce their amount of food wasted.

Case studies on transitions to sustainable food consumption Brief overview of status quo: Where are we in the transition?

Plant-based transition in Sweden



- Meat consumption decreased from 88.4 kg per capita in 2016 to 78.6 kg per capita in 2020 (Swedish Board of Agriculture, 2021; Collier et al., 2021).
- In 2020, only 12% of Swedes stated to never eat vegetarian dishes (Sifo/Axfood, 2020).
- Eating less meat or locally produced meat is perceived beneficial for protecting the environment and guaranteeing animal welfare (Collier et al., 2021).
- Consumption of plant-based proteins has increased over the last years and especially the younger generation is increasingly turning towards a meat-reduced dietary style (Lund Gade et al., 2021).



Plant-based transition in the Netherlands

- The Netherlands is one of the largest and fastest growing national markets for plant-based meat substitutes globally. The total retail turnover of plant-based protein products was estimated at 368 million euros in 2017 (Distrifood, 2017; Tziva et al., 2020; Changing markets foundation, 2018).
- In 2020, Dutch consumers ate 75.9kg meat per capita (WUR, 2021). However, willingness to decrease meat consumption for environmental and health reasons increased among Dutch consumers (Elzerman et al., 2021; Sanchez-Sabate and Sabaté, 2019).
- Younger women tend to be more open to meat alternatives and meat substitutes (Elzerman et al., 2021).



Plant-based transition in Germany

- In 2021, 10% of German consumers followed a vegetarian dietary style, and already 2% did not eat any animal-based products. Reducing the intake of animal-based products is mainly based on curiosity (71%), followed by animal welfare concerns (59%), and benefits for climate and environment (13%) (BMEL Nutrition Report, 2021).
- In 2017-2018, 15 percent of all global new vegan product launches happened in Germany. The German plant-based food market was worth 1.96 billion dollars in 2018 (USDA, 2020).
- Interest in reducing meat intake and substituting meat with alternative protein sources is higher among younger consumers (Jürkenbeck et al., 2021). Moreover, opinion leaders within the younger generation already promote a meat reduced dietary style (Schulze et al., 2021).

Relevant actors

Relevant actors for the shift to sustainable food consumption





- Different groups of actors actively accelerate the transition to sustainable food consumption.
- By **implementing measures and actions**, these actors can **create favourable conditions** that move the transition towards a **societal tipping point**.
- **Collaboration** between actors is crucial in sustainability transitions.
- In addition to the 'obvious' groups of actors,
 Science and Research has emerged as an arena in the case studies, influencing the decision-making of the other four groups of actors.

Five Conditions

enabling the transition to sustainable food consumption

Awareness, Knowledge & Skills

Consumers are informed, know how to make sustainable choices and are capable of preparing sustainable foods



Consumers

Social & Cultural Norms

Sustainable foods and practices are an integral part of society





Sustainable foods and practices

Availability

Variety of sustainable alternatives available in supermarkets, public kitchens, restaurants, etc.

Attractiveness

High product quality (taste, texture, smell, etc.) reduces perceived sacrifices of sustainable behaviour change

Competitive & affordable consumer prices

Sustainable products are affordable at a competitive price

Evidence from the case studies

- The transition towards sustainable food consumption gains momentum as soon as progress is made regarding these five conditions.
- A positive tipping point in the transition can be reached when all of these conditions are (at least partially) in place.

Measures & Actions

creating favourable conditions for accelerating the transition to sustainable food consumption

The following pages outline successful **measures and actions** identified from the case studies as important elements that brought the consumer transition forward.

The measures and actions are organised around four areas of action: (1) Communication, Nudging & Education; (2) Food Products and Meals; (3) Distribution Channels; (4) Price & Pricing Strategies.

The measures and actions contributed to creating favourable conditions that enabled consumers to change their behaviour (see previous page).

The results are based on a **detailed analysis** of each case study, using an iterative approach of thematic analysis, involving several researchers to cross-check the most important themes and issues.

The following pages highlight the most impactful measures and actions from each case study.

Overview of Measures & Actions

creating favourable conditions for accelerating the transition to sustainable food consumption

Areas of Action	Measures & Actions	
Communication,	Communicate multiple benefits of sustainable food consumption	Mea
Nudging & Education	Clearly defined terminology with common logo and standards	asuri
	Point-of-Sale Promotion & Nudging	es &
	Campaigns and public events	act
	Dietary Guidelines	ions mer
	Education and training	tailı seg
Food Products and Meals	Tasty and attractive food products and meals	ored
	Wide range of products and meals	to c
Distribution Channels	Outlets where mainstream consumers usually shop	liffer
	Distribution channels for the dedicated consumers	ent
Price & Pricing Strategy	Pricing instruments	

Evidence from the case studies

- Tipping points in the transition to sustainable food consumption are not triggered by single measures or actions.
- It is the interplay of many measures by many different actors that drive a successful transition.

Communication, Nudging & Education What to communicate?

Highlight multiple benefits of sustainable behaviour change

Reference Cases

Organic food

Many consumers perceive organic food as beneficial in several respects, foremost in terms of the environment, human health, animal welfare, the farmers, and product quality. The organic sector has been successful in communicating the multiple benefits of organic food, and consumer research has shown that consumers buy organic food because they perceive it as beneficial not only for the environment but also in other respects (Aschemann-Witzel & Niebuhr Aagaard, 2014; Ditlevsen et al., 2019)

Plant-based food in Sweden

In 2015, the Swedish government introduced sustainable dietary guidelines that account both for human health as well as the environment (Torstensoon et al., 2021). Since then, plant-based foods have been promoted as beneficial for the environment *and* human health in public and private campaigns. Still, consumers in Sweden feel somewhat uninformed about the environmental impact of meat. To facilitate sustainable dietary choices, even more communication is needed (Collier et al., 2021).

Plant-based food in the Netherlands

In 2011, the Health Council of the Netherlands published "Guidelines for good nutrition, the ecological perspective," concluding that promoting plant-based products, including meat substitutes, will benefit public health, the environment and animal welfare (Tziva et al., 2020).

Condition(s): Awareness, Knowledge & Skills, Attractiveness, Social & Cultural Norms

Highlighting the multiple benefits of sustainable behaviour change addresses consumers' various needs and desires.

Next to demographics, such as age and gender, consumers' values and attitudes play an important role when buying sustainable food products. For instance, health and environmental concern, ethical concern such as animal welfare, and cultural values have an impact on whether a consumer makes a sustainable food choice or not (Katt and Meixner, 2020).

How to facilitate easy recognition of products?

Clearly defined terminology with common logo and underlying standards

Reference Cases

Organic food

In 1990, the organic '0-label' was introduced to guarantee consumers that farmers and companies are certified and comply with the governmental standards for organic production. Denmark was the first country in the world that introduced a governmental logo for organic food. The 0-label is now the best-known and most trusted labelling system in Denmark. Since 1987, the term 'organic' has been a protected term, regulated by the Danish Organic Farming Act laying down the standards and principles for organic food and farming (Padel et al., 1999; Organic Denmark, 2021).

Keyhole label

The Keyhole label is a joint Nordic label that is owned by the Swedish National Food Agency. The label was initially launched in Sweden in 1989 (Swedish Food Agency, 2021). Denmark introduced the label in 2009. The great majority of consumers recognizes the label (96% in 2015). In a study conducted in 2021, 57.7% of consumers stated that the keyhole label influences their food choices (Laasholdt et al., 2021). The label is voluntary and free to use for manufacturers. No individual inspection is required for Keyhole-labeled products. Instead, inspection takes place within the framework of public food inspections. All necessary material for manufacturers is available online, and marketing support is also provided to food companies (Swedish Food Agency, 2021).

Wholegrain partnership

The wholegrain logo was introduced in 2008 to make it easy for consumers to recognize wholegrain products. The logo was initiated by the wholegrain partnership which was founded by representatives from the food industry, health NGOs, and the DVFA (Fuldkornspartnerskabet, 2021). Since then, healthy products containing a high level of whole grain and los level of fat, sugar and salt could carry the logo. The Danish Food Administration legally owns the logo and is responsible for inspections in stores and food manufactories (Greve & Neess, 2014).

Sustainability attributes need to be clearly communicated, e.g., in form of labels, since consumers cannot verify the truthfulness during or after the purchase (Fernqvist and Ekelund, 2014; Maaya et al., 2018; Macready et al., 2020).

A label provides several advantages that need to be considered. First, products carrying a logo are easily recognizable for consumers. Second, a logo provides the possibility for the food industry to differentiate their products which in turn, could initiate further product development. Third, having a common logo would facilitate monitoring and accountability of the market success (Greve and Neess, 2014).

How to make sustainable food the easy and obvious choice?

Point-of-Sale Promotion & Nudging

Reference Cases

Organic food

Conventional food retailers in Denmark support their organic food assortment with increased promotion of organic food, e.g. through shelve stickers, price tags with organic label, and special displays for organic food (SAPEA, 2020). Organic food is often placed in prime spots at eye height of supermarket shelves, and in special displays along the aisles and before the checkout area.

Keyhole label

Food retailers support national campaigns initiated by the Ministry of Food, Agriculture and Fisheries with promotional activities. For instance, during the campaign in 2014, three major retail chains used ceiling signs, posters and flyers, shelf labels, and promotional videos in the fruit/vegetable as well as fish section to increase consumer awareness. In addition to promotional activities, information material, such as recipes and competitions with prizes were used to attract consumers while shopping (Mørk et al., 2017).

Food Waste

Food retailers implemented several actions to avoid food waste. For instance, they placed suboptimal food side-by-side with normal food products or offered suboptimal food products in a designated area. Some food retailers used specific price tags that included information about food waste. Moreover, Rema1000 used food waste related communication at the point-of-sale to promote food waste reduction (Kulikovskaja & Aschemann-Witzel, 2017)

Plant-based food in Sweden, the Netherlands, and Germany

Plant-based food is promoted in many large supermarket chains, e.g., through shelve stickers, special displays, and designated shelves with ceiling signs. These measures increase the salience and visibility of plant-based foods for consumers in general, including meat eaters, and not only for consumers actively searching for it. Many restaurants and canteens offer meat-free dishes and highlight them prominently on their menu.

Condition(s): Awareness, Knowledge & Skills, Attractiveness, Social & Cultural Norms

Food shopping behavior is highly habituated, and thus hard to change. This is especially true for meat consumption. For most consumers, meat is an integral part of their diet (Piazza et al. 2015).

Increased salience and prominent placement of sustainable food have the potential to nudge consumers into choosing sustainable alternatives and changing their food habits; e.g. in supermarkets via shelve stickers, ceiling signs, special product displays, free samples and give-aways, and in restaurants/canteens via free appetizers, prominent placement on the menu card, dish of the day.

Communication, Nudging & Education How to raise awareness and interest?

Campaigns and public events

Reference Cases

Organic food

The second Organic Action Plan (between 2011 and 2020) included several national campaigns and events which successfully increased awareness and interest among consumers, e.g. Organic Day, Why organic? (Organic Denmark 2021; SAPEA, 2020). Also in earlier years, a number of successful campaigns and events were carried out with financial support from the government. In addition, private retailers frequently run campaigns promoting organic food.

Food Waste

Driven by increasing pressure from the non-governmental organization "Stop Wasting Food" (Stop Spild af Mad), retail chains introduced several campaigns to avoid food waste. One famous example is the initiative from Rema1000, which stopped its "buy 3 for 2" marketing campaigns already in 2008 (Aschemann-Witzel et al., 2016; Halloran et al., 2014). In 2020, the Danish government announced to annually celebrate the National Day of Food Waste on September 29th (Ministry of Food, Agriculture and Fisheries of Denmark, 2020).

Kevhole label

The introduction of the keyhole label in Denmark was supported by a national campaign. Since then, the Ministry of Food, Agriculture and Fisheries has run annual national campaigns to increase consumer awareness. Campaigns either targeted the whole population or a specific target group. For instance, the 2014 campaign especially addressed men with a lower level of education (Mørk et al., 2017).

Wholegrain Partnership

The collaborating partners have created and carried out a variety of communication activities. The partners offer seminars, workshops and public events that target the entire Danish population as well as specific target groups. For instance, in 2012 the initiative "Vil du have det hele med?" specifically targeted young women to increase their wholegrain intake (Greve & Neess, 2014). The National Wholegrain Day in January aims to raise awareness of the importance of sufficient wholegrain intake (Lourenco et al., 2019).

Plant-based food in the Netherlands

Since 2018, the Netherlands celebrate the National Week without meat - the result of the private initiative 'Nationale Week Zonder Vlees' (weekzondervless.nl).

Several private actors have contributed to the market growth by marketing campaigns to promote meat substitutes. For instance, already in 2005, Friesland Campina supported the market launch of their new brand for meat replacements (Valess) with a €3 million marketing campaign. Another example is the NGO 'Nature & Environment' that launched a campaign to promote meat substitutes in 2011 (Tziva et al., 2020).

Personalized and emotional campaigns are needed to support the sustainable consumer transition, especially for reaching consumers with low interest in sustainable food choices (Guthrie et al., 2015).

"

The cases analysed show that public actors together with private actors (e.g. food retailers) and/or NGOs have implemented campaigns and public events and successfully increased consumer awareness and interest.

Impact of dietary guidelines on sustainable food consumption

Dietary guidelines are an important component of food policy and serve as a basis for the development of measures and actions intended to reach a sustainable consumer transition (Brink et al., 2019). Originally, dietary guidelines have been introduced to prevent diseases caused by insufficient nutrient supply. Today, they play an important role in promoting healthy and environmental friendly dietary patterns (Brown et al., 2011).

In the Netherlands and Sweden, the clear recommendation to eat less meat was added to the dietary guidelines, which played a crucial role for the plant-based food transition in these countries.

Netherlands Revised in 2016	Sweden Revised in 2015
 General recommendations: Eat lots of fruit and vegetables Consume mainly wholegrain products such as wholegrain bread, wholegrain pasta and brown rice Eat less meat and more plant-based foods, and vary with fish, pulses, nuts, eggs and vegetarian products Consume daily sufficient dairy products such as milk, yoghurt and cheese Eat a handful of unsalted nuts daily Consume soft and liquid spreadable fats and cooking fats Drink sufficient amounts of tap water, tea and coffee Limit or minimise consumption of certain products: Limit consumption of processed meat Minimise consumption of sugar-containing beverages Don 't drink alcohol or no more than one glass daily Limit salt intake to 6 grams daily Nutrient supplements are not needed, except for specific groups for which supplementation applies 	 More vegetables and fruit - Eat lots of fruit, vegetables and berries! Ideally, choose high fibre vegs such as root vegetables, cabbage, cauliflower, broccoli, beans and onions. More seafood - Eat fish and shellfish two to three times a week. Vary your intake of fatty and low-fat varieties, and choose eco-labelled seafood. More exercise - Exercise for at least 30 minutes every day! Take brisk walks, for example, and reduce the amount of time you sit still by taking brief, active breaks. Switch to wholemeal - Choose wholegrain varieties when you eat pasta, bread, grain and rice. Switch to healthier fat - Choose healthy oils when cooking, such as rapeseed oil or liquid fats made from rapeseed oil, and healthy sandwich spreads. Look for the Keyhole symbol. Switch to low-fat dairy products - Choose low-fat, unsweetened products enriched with vitamin D. Less red and processed meat - Eat less red and processed meat, no more than 500 grams a week. Only a small amount of this should be processed meat. Less sugar - Hold back on the sweets, pastries, ice creams and other products containing lots of sugar. Cut back on sweet drinks in particular. Maintain a balance - Try to maintain energy balance by eating just the right amount. The Keyhole - healthy choices made easy - Check for the Keyhole symbol. This is a National Food Agency symbol which can help you to find food containing less sugar and salt, more wholegrain and fibre and healthier or less fat.
for which supplementation applies Condition(s): Awareness, Knowledge & Skills, Social & Cultural N	and fibre and healthier or less fat.

Distory Cuidalines

Communication, Nudging & Education How to increase consumer knowledge and skills?

Education

Reference Cases

Organic food

The organic movement has been supported by several measures aiming to increase knowledge & skills about organic food among different target groups on the demand side. Educational material for schools has been developed. Another important target group on the demand-side is the catering and hospitality sector, including public kitchens. Education and training of chefs and kitchen staff has been a crucial factor to increase the offer of organic food in restaurants and canteens. In addition, events have been carried out to increase consumers' knowledge and skills about (cooking) with organic food.

Keyhole label

The policy support for the Keyhole label also includes the area of health education. Educational material for primary and lower secondary schools has been developed that includes, apart from dietary recommendations, information about the Keyhole label (YouthWiki, 2021).

Wholegrain Partnership

The collaborating partners offer seminars and workshops, host public events, and provide educational material for schools and training of staff in kitchens and service institutions (Lourenco et al., 2019).

Food Waste

In collaboration with the Danish Government, Danish companies and organizations in the food industry, the movement introduced several initiatives, such as a national educational campaign in schools (Kiaer, 2018),

Condition(s): Awareness, Knowledge & Skills, Attractiveness, Social & Cultural Norms

Educational programmes in schools seem promising to facilitate sustainable food choices among children and youth (Evans et al., 2012).

> Training kitchen staff to use organic produce is a crucial component in supporting kitchen conversion to organic. In addition to providing kitchen skills, an important dimension is to change the mind-set of kitchen staff (Daugbierg, 2021).

Food Products and Meals

How to satisfy consumer needs and desires?

Tasty and attractive food products and meals

Reference Cases

Organic food

Over the years, the organic product range has increased dramatically and nowadays caters to the diverse preferences of different consumer segments. In the early days, organic food tended to have particular sensory characteristics (especially taste and texture) and deficiencies (e.g. limited durability, suboptimal look), and selection was limited (e.g. in terms of fat content for milk) (Hughner et al., 2007). These barriers have long been overcome in Denmark. Organic food companies are now successful in positioning their products as high quality, **tasty** products, both in the premium as well as the middle (price) segment. The organic product range has been extended and covers not only 'basics' but also **convenience** products. **Domestic origin** of organic food is highly valued by consumers.

Political support has been focused on encouraging research in innovative organic products. Here a collaborative political approach has been key, aiming to strengthen the dialogue between the organic sector, research institutes, and governmental institutions (Organic Action Plan for Denmark, 2011–2020). As such, the Danish government has supported supply chain collaborations on product development and provided help for small companies to develop new products (Holmbeck, 2020).

Wholegrain Partnership

The collaborating partners have established a fourfold strategy to increase consumer demand and market supply for wholegrain food products. The strategy aims to increase the availability of wholegrain food, fosters the development of new wholegrain products, focuses on the promotion of the wholegrain logo, and helps to change food consumption norms for wholegrain food (Lourenço et al., 2019). The consumption of wholegrain food has increased, indicating that consumers are satisfied with the range of **tasty** and **convenient** wholegrain products, most of the from **domestic** raw materials.

Plant-based food in the Netherlands

Product development was key in the plant-based transition in the Netherlands. Already in the 1990s, the government supported research for the development of meat substitutes (Tziva et al., 2020). Food companies originating from the production of animal-based foods reacted to increasing consumer demand for meat substitutes and invested in innovative product development. For instance, in 2005, the dairy cooperative Friesland Campina introduced a new brand (Valess) and started to sell vegetarian meat alternatives (Tziva et al., 2020).

Plant-based food in Sweden

The Swedish food industry has reacted rapidly to the growing interest in vegetarian and vegan products and started developing innovative meat substitutes to satisfy the growing demand. Among the first plant-based producers, there has been a strong push for learning and experimenting with plant-based alternatives to offer a satisfying plantbased product. For example, Swedish brands such as Anamma, Hälsans Kök, and Risenta began the production shift many years ago.

Plant-based food in Germany

Already in 2012, the major meat processing company 'Rügenwalder Mühle' identified the trend for an increasing interest in meat-reduced dietary styles as an untapped opportunity and started to develop vegetarian substitutes. In 2019, the company's turnover share of vegetarian products was 25% and vegetarian/vegan meat substitutes were among the most popular brands in this product category (Saari et al., 2021).

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For most consumers, taste is the most decisive food quality attribute (Hoek et al., 2017) and expected bad taste leads to avoidance of meat substitutes (Clark et al., 2019). However, perception of taste varies between different consumer groups. For instance, omnivores tend to compare the taste of plant-based alternatives with the taste of meat and are often disappointed. In contrast, some vegans and vegetarians do not like the taste of meat and thus. do not prefer meat substitutes that have similar sensory characteristics (Kerslake et al., 2022). Thus, **improving** sensory characteristics (e.g. taste. texture) targeting different consumer segments is key to facilitate a sustainable consumer transition.

Distribution Channels

Where to sell sustainable food?

Sustainable food choices have to be easily accessible for consumers. This is true for both, mainstream and dedicated consumers.

Distribution channels for the <u>dedicated</u> consumers

Reference Cases

Organic food

Since its establishment 1999, the Danish company 'Arstiderne' used a boxscheme based delivery system to provide organic food products to consumers (Thøgersen, 2002). With this approach, 'Arstiderne' removes barriers for dedicated consumers to chose sustainable food products, e.g. spending time in the supermarket to identify organic products and the cognitive burden to choose between products.

Food Waste

In 2018, 'Eat Grim' was established which is a box-scheme based delivery service, to provide consumers with vegetables that do not fit the norm and would otherwise be wasted (Eat Grim).

Condition(s): Availability, Awareness, Knowledge & Skills, Attractiveness, Normalisation

Offer sustainable solutions in places where <u>mainstream</u> consumers usually shop

Reference Cases

Organic food

In 1993, the largest Danish retailer SuperBrugsen (Coop) began to sell organic food in their 'normal' supermarkets at a large scale, making organic food widely available to 'mainstream' consumers. This step marked a cornerstone and had a high impact on the development of the organic sector in Denmark. Other retailers followed soon after.

In 2016, Coop initiated a new campaign that put organics on the agenda by lowering prices and increasing the organic product range. The discount chain 'Netto' followed and initiated a marketing campaign that aimed to make organics accessible to everyone. Sales of organic food continued to increase, also incentivizing the supply side to further increase the production of organic food (Danish Agriculture & Food Council, 2020).

Policy support focusing on encouraging public kitchens to go organic has lead to an increasing supply of organic food and beverages when eating out. A well-known example is the introduction of the national 'Organic Cuisine Label' that guarantees 30, 60, or 90 percent of organic products in public kitchens as well as in other takeout venues (Holmbeck, 2020). In 2020, already 3.250 cafés, restaurants and public kitchens used the organic cuisine label (Organic Denmark, 2021).

Keyhole label & Wholegrain partnership

Products carrying the **keyhole label** are widely available in Danish supermarktes (Nordic Council of Ministers, 2010). The same is true for foods carrying the **wholegrain logo** (Greeve & Neess, 2014).

Food Waste

The support of Danish food companies was key on the path to make food waste reduction easy for mainstream consumers. For instance, the mobile application "Too Good To Go" provides a platform for restaurants and food stores to sell their unsold food surplus to consumers (Condamine, 2020). Moreover, Danish retailers have introduced point-of-sale measures to encourage customers to purchase items which soon reach the best-before date.

Plant-based food in Sweden, Netherlands and Germany

Retailers in Sweden, the Netherlands and Germany have reacted quickly to increasing consumer interest in plant-based products, and started selling meat and milk substitutes. Nowadays, international producers choose Sweden to test their new plant-based products. For example, McDonald's restaurants have chosen Sweden (and Denmark) as test markets to offer the first vegan burger developed with Beyond Meat (Tjärnemo & Södahl, 2015).

Condition(s): Availability, Awareness, Knowledge & Skills, Attractiveness, Social & Cultural Norms, Competitive & affordable consumer prices

Price and Pricing Strategy

What role does price play?

Due to higher production costs, in most cases, sustainable food products are associated with higher consumer prices. Higher prices are a major barrier for consumers to make sustainable food choices (Aschemann-Witzel and Zielke, 2017).

The lower the perceived sacrifice of the alternative choice (e.g. taste) is, the easier it is to tip the balance to the sustainable alternative under the influence of price measures (Hoek et al., 2017).

Pricing instruments

Reference Cases

Organic food

Food retailers continue to be key actors in the organic movement; they have a large impact on consumer prices and consumers' price perception. Over the years, the organic product range has diversified, not only in terms of product variety but also in terms of price positioning. Coop initiated a price differentiation strategy, focusing on lower prices for organic products. They introduced a new range of 'everyday'-organic products at lower prices, in addition to the established premium range. Several grocery chains followed with similar measures: The discount chain 'Netto' introduced a marketing campaign that aims to make organics accessible to everyone (Danish Agriculture & Food Council, 2020). In addition, the pricing strategy of most retailers also include price discounts for organic food. For instance, SuperBrugsen and Irma offer a certain % discount on organic food on particular days of the week, e.g. 20% off on Tuesdays.

In the context of pricing, it is important to mention the supply-side policy measures that are in place. Certified organic farmers in Denmark have received subsidies since 1994. In addition, farmers converting from conventional to organic farming receive financial support (Aschemann et al., 2007; Lov no. 363, 1987).

Food Waste

Food retailers have implemented several price-related actions to avoid food waste. For instance, a common practice in food retailing is to offer suboptimal food items at lower prices. To increase awareness for such offers, products carry special price tags. In addition, retailers often offer price reductions for products close to the expiry date. Price reductions vary in formats. Some retailers use fixed price reduction levels, while others use percentage reductions (Kulikovskaja & Aschemann-Witzel, 2017). More recently, an innovative solution to facilitate the implementation of predefined routines for checking expiration dates, and thus price reductions, was launched. The supermarket chain Løvbjerg announced to test a system that systematically calculates price reductions on food items in relation to their expiry dates.

Condition(s): Availability, Competitive and affordable consumer prices, Attractiveness

Amplifiers Factors amplifying the impact of measures & actions



Amplifiers

Collaboration

Reference Cases

Organic food

Collaborative actions have been the centrepiece of the organic movement in Denmark since the beginning, and have largely contributed to the success. Since the 1980s, policy-makers have followed a collaborative policy approach that integrated conventional and organic interest associations and all relevant groups of actors. The foundation of the umbrella organisation Organic Denmark marks an important cornerstone, enabling collaboration among all groups of relevant actors.

Keyhole label

Overall, the Keyhole initiative has benefited from the joint initiative of four Nordic countries. The cooperation had positive effects in terms of the communication strategy and legislation and has thus led to positive synergies (Nordic Council of Ministers, 2010). Besides its cross-Nordic nature, the keyhole label is an example of a successful collaboration of different groups of actors: policy, food companies, retailers, health organisations, and civil society organisations.

Wholegrain Partnership

Since the beginning the initiative has been characterized by a strong public-private collaboration with representatives from the food industry, health NGOs, and the Danish Veterinary and Food Administration DVFA (Lourenço et al., 2019). Already in 2008, one year after the first joint meeting of key actors from the wholegrain supply chain, the Wholegrain Partnership was established (Fuldkornspartnerskabet, 2021). Among other positive outcomes, the Wholegrain Partnership has benefited from a strong collaboration with the food industry, especially food retailers. The industry has provided support through several commercial and advertising campaigns (Greve & Neess, 2014). Food retailers have supported the movement by addressing consumers through campaigns to increase awareness of wholegrain products (Danish Cancer Society, 2020). The success story of the wholegrain movement in Denmark has already caught the attention of other European countries. E.g., within the WholEUgrain project, Denmark, Romania, Slovenia, and Bosnia and Herzegovina are collaborating to transfer the Danish success story to other European countries (Fuldkornspartnerskabet, 2021).

Food Waste

The movement to reduce food waste received public support and was backed by politicians as well as Danish chefs already at an early stage (Halloran et al., 2014; Szulecka et al., 2019). In collaboration with the Danish Government and Danish companies and organizations in the food industry, the movement introduced several initiatives (ReeFood), such as a national educational campaign in schools or a certification scheme to encourage food waste reduction in restaurants and hotels (Kjaer, 2018). Moreover, the work of the movement is characterized by collaboration with Danish food retailers (Halloran et al., 2014). Over the years, other society-driven initiatives have joined the fight against food waste. For instance, Rasmus Erichsen founded the non-profit organization "Stop Waste Locally" (Stop Splid Lokalt) in 2016 (Kjaer, 2018). In addition, policy support was characterized by collaboration with the private sector. As such, in 2011 a voluntary network aiming to reduce food waste was founded and supported by stakeholders along the food supply chain. As a result of building a network of key stakeholders, the "Charter of Less Food Waste" was created and signed by ministries, food retailers, restaurants, and hotel chains. Since 2019, the public-private collaboration has been driven by the think tank "One\Third" initiated by the Ministry of Environment and Food. Among others, the think tank works together with food companies, retailers, and producers that aim for a 50% reduction of food waste by 2030 (Danmark mod madspild).

Plant-based food in Sweden

The Swedish government research council for sustainable development established an inter-disciplinary and inter-sectoral research center, PAN Sweden. Researchers from leading institutions in Sweden, in collaboration with business partners and public health organizations, collaborate to provide evidence-based knowledge about how to make plant-based foods the healthy and climate-friendly choice, and the preferred choice for consumers (PAN Sweden, 2021).

Plant-based food in the Netherlands

The plant-based food transition in the Netherlands is characterized by strong collaborations, in the form of networks, formal associations, and innovation hubs. One example is the Green Protein Alliance (GPA) which is a multi-stakeholder platform bringing together plant-based food companies, the Nutrition Center and the NGO Nature and Environment (Tziva et al., 2020). The overall transition has been fueled by the creation of innovation hubs for plant-based protein, connecting plant-based start-ups and food companies from around the world with public and private research institutions, with governmental support e.g. as part of regional economic growth strategies (Tziva et al., 2020).

Amplifiers Lessons learned from the case studies

Broad policy approach Support from many policy areas and levels

Reference Cases

Organic food

The principles of organic farming were integrated into a diverse range of policy areas, such as national strategies for nature restoration, green economic growth, and plans to protect drinking water and reducing pesticide residues in food (Holmbeck, 2020).

Food Waste

There is currently no national plan specifically on food waste reduction. Rather, the subject is included in national strategies. As such, the aim to reduce food waste is included in the Resource Strategy "Denmark without waste" that was published by the Danish government in 2013. Subsequently, the Resource Strategy was also included in the Resource Plan for Waste Management 2013–2018. More recently, the Action Plan for Circular Economy (National Plan for Prevention and Management of Waste 2020–2023) includes initiatives to tackle food waste reduction as well (Ministry of Environment of Denmark, 2021).

Plant-based food in Sweden

The transition to more plant-based diets has been a health policy goal for many years in Sweden. The climate and environmental benefits of plant-based foods have also been recognized and integrated into respective environmental policies. In addition, the Swedish governmental research council for sustainable development established an interdisciplinary and inter-sectoral research center, PAN Sweden, where scientists, business partners and public health organizations collaborate.

Plant-based food in the Netherlands

Increasing the intake of plant-based foods (and reducing the intake of animal proteins) has for may years been part of the Dutch health policy agenda (Gezondheidsraad, 2015). In addition, the transition to increased production and consumption of plant-based foods is included in Dutch environmental policies (Raad voor de leefomgeving en infrastructuur, 2018). Moreover, supporting innovation in the plant-based food sector is part of (local) governmental economic growth policies in the Netherlands (Tziva et al., 2020).

Amplifiers Lessons learned from the case studies

Continuity

Reference Cases

Organic food

Since the beginning, policy-makers in Denmark have followed a collaborative policy approach that integrated conventional and organic interest associations. They have thus built a consensus along the food supply chain that organic farming is an integral part of the Danish food sector. Due to policy support across legislative periods, stakeholders along the supply chain experience continuous assistance and stability – another driver of the organic transition, already in the early years (Schvartzman, 2008).

Wholegrain Partnership and Keyhole label

The Wholegrain Partnership and the keyhole label have been in place for more than 10 years, with continuous support from all stakeholder groups, contributing to the success.

Monitoring & Accountability

Reference Cases

Wholegrain Partnership

The success of the partnership was monitored since the beginning. E.g. data on sales of products carrying the wholegrain label was regularly assessed and, if necessary, the partners' communication strategy was adapted (Greve & Neess, 2014).

Keyhole label

In Denmark, the introduction of the Keyhole label has been supported by national campaigns to increase consumer awareness and knowledge. After implementation, each campaign has been evaluated in terms of success (Mørk et al., 2017).

Social Contagion

Reference Cases

Organic food

Organic food is common in public kitchens and takeout venues. The Organic Cuisine Label was introduced in 2009 to increase the share of organic products in public kitchens, and is nowadays recognised by 58% of the population (Food Nation, 2021).

Plant-based food in the Netherlands

From 1996 through 2006, the livestock supply chain crises raised public concerns over the health and safety aspects of animal-derived foods. The mad cow disease, the dioxin crisis, and the chicken flue outbreaks led to mass media attention and public concern linking meat consumption with health risks. In consequence, Dutch consumers increased the demand for plant-based protein. Retail sales of meat substitutes increased during the crises. The increasing consumer demand led to positive spillover effects for growth and innovation in the plant-based sector (Tziva et al., 2020).

Plant-based food in Germany

The presence, behaviors, and expectations of others affect the adoption of meat reduced dietary styles positively. Opinion leaders have the ability to change the opinions of a critical mass and thus, play a predominant role in societal change towards meat reduced dietary styles. In Germany, opinion leaders in food choices promote a meat-reduced dietary style (especially vegetarian and vegan) and thus, promote the societal transition (Schulze et al., 2021)

Recommendations for the plant-based transition in Denmark

Where are we in the journey?

Transition to (more) plant-based diets in Denmark

depends on consumer segment

Awareness, Knowledge & Skills Consumers are informed and know how

to make sustainable choices and how to prepare plant-based foods



Consumers



Social & Cultural Norms

Sustainable foods and practices are an integral part of society





Attractiveness

High product quality (taste, texture, smell, etc.) reduces perceived sacrifices of reducing consumption of animal foods

depends on consumer segment and type of plantbased foods

Plant-based foods

Competitive & affordable consumer prices

Sustainable products are affordable at a competitive price

Evidence from the case studies

- The transition towards sustainable food consumption gains momentum as soon as progress is made regarding these five conditions.
- A positive tipping point in the transition can be reached when all of these conditions are (at least partially) in place.



? Small progress



Conditions to be met

for accelerating the plant-based transition in Denmark

Once the following conditions are at least partially met, the transition to (more) plant-based diets will accelerate in DK, i.e. a societal tipping point will be reached.

Availability

Wide availability of a variety of plant-based products/meals in Danish supermarkets, public kitchens, restaurants, cafés

Awareness, Knowledge & Skills

Danish consumers are aware of the benefits of plant-based products and know how to prepare plant-based meals as well as how to substitute traditional animal products

Social & Cultural Norms

Plant-based is part of the Danish food industry and the Danish diet

Negative stereotypes about plant-based foods and diets are a niche phenomenon (less masculine, bad taste)

Competitive and affordable consumer prices

Consumer prices for plant-based foods are comparable or lower than prices for traditional animal foods

Attractiveness

High quality products (taste, texture, smell) lead to low perceived sacrifies when reducing the consumption of traditional animal products

Measures & Actions

for accelerating the plant-based transition in Denmark

- Communication, Nudging & Education
- Food Products and Meals
- Distribution Channels
- Price & Pricing Strategy

Measures & actions tailored to different consumer segments

Prospects for the plant-based transition

The younger generation in Sweden, Germany and the Netherlands is increasingly interested in following a meat reduced dietary style. Younger individuals tend to substitute meat with alternative protein sources (Jürkenbeck et al., 2021; Elzerman et al., 2021; Lund Gade et al., 2021).

A similar trend can be observed in Denmark. A recent study conducted by Hielkema et al. (2021) showed that younger individuals in Denmark are more likely to reduce meat consumption.

Other consumer segments are less open to changing their diets. They need to be targeted with different measures.

Recommendations for the plant-based transition in Denmark

What to communicate?	
Message	Condition(s)
The decision to adopt a plant-based diet is based on multiple motives. Personal motives, such as health, and altruistic motives, such as concern about climate change, environmental issues, and animal welfare, are strongly associated with consumers' decision to follow a plant-based diet (Vainio et al., 2016; Janssen et al., 2016).	Awareness, Knowledge 8 Skills Attractiveness Normalisatior
Interestingly, the image of following a plant-based diet has recently changed among younger consumers: A meat- reduced diet is part of their social orientation and associated with trendsetting (Schulze et al., 2021).	Actor(s) involved
 The plant-based transition in Denmark should continue highlighting the multiple benefits of plant-based foods: Altruistic benefits: climate, environment, animal welfare Personal benefits: health, pleasure, trendsetting 	Private food sector, Policy-makers, NGOs

Recommendations for the plant-based transition in Denmark

How to promote plant-based foods?

Terminology & Labelling

Different terminology is currently used to refer to similar types of food (e.g. plant-based, plant-rich, vegan, vegetarian, meat-free). A study conducted by Faber et al. (2020) in 2018 showed that consumers in Denmark were less familiar with the term 'plant-based' than with the terms 'vegan' or 'vegetarian'. Many Danish consumers were undecided when being asked which term ('plant-based', 'vegan' or' vegetarian') they found most appealing. However, the data might be outdated already given the large number of products labeled as 'plant-based' that has come on the market in recent years. Further research is needed to provide evidence which terminology works best for which segment of Danish consumers, and to what extent there is consumer confusion.

In addition, the actors involved in the plant-based transition should discuss whether a common logo for plant-based foods would be beneficial for consumers and the plant-based transition. The organic, keyhole and wholegrain case studies showed the potential benefits of creating a common logo based on clearly defined standards and criteria, either governed by a multi-stakeholder initiative including a government agency (keyhole, wholegrain) or a governmental scheme (organic). First, products carrying a common logo are easily recognizable for consumers. Second, a logo provides the possibility for the plant-based food industry to clearly differentiate their products, which in turn could initiate further product development. Third, consumers in Denmark have high confidence in labelling schemes supported by a government agency. Fourth, a common logo could facilitate monitoring and accountability of the market success. These potential benefits need to be carefully weighed against possible disadvantages (e.g. administrative burden, need for common standards and criteria).

Point-of-sale Promotion and Nudging

Food shopping behavior is highly habitual and thus hard to change. This is especially true for meat consumption. For most consumers meat is an integral part of their diet (Piazza et al. 2015). Increased salience of plant-based foods in supermarkets (via prominent shelve positioning, shelve stickers, free samples, give-aways in online stores, etc.) and restaurants and canteens (free appetizers, etc.) have the potential to nudge consumers into choosing plant-based alternatives and facilitate to break with traditional food habits.

Similar promotional activities were successfully used to promote organic foods (SAPEA, 2020), increase sales of products carrying the keyhole label (Mørk et al., 2017), and motivate food waste reduction (Kulikovskaja & Aschemann-Witzel, 2017). See also p. 48 'radical steps'.

Condition(s) Awareness, Knowledge & Skills Attractiveness Normalisation Actor(s) involved Private food sector Policy-makers Science & Research

Condition(s)

Availability Awareness, Knowledge & Skills Social & Cultural Norms **Actor(s) involved** Private food sector, Policy-makers, NGOs

Recommendations for the plant-based transition in Denmark

How to raise awareness and increase knowledge?

Campaigns and Events

In each of the case studies analysed, private actors (e.g. food retailers) and/or public authorities have implemented campaigns and events to increase consumer awareness and provide information. Research has shown that information provision has the potential to impact consumer behaviour. However, consumers react differently to different kinds of information. For instance, to successfully convince meat eaters to follow are plant-based dietary style, information about taste and habits are more important than information about negative health impacts (De Boer et al., 2017; Vainio, 2019). Thus, to effectively reach consumers, implementing campaigns and events targeting sub-populations is beneficial. The keyhole and wholegrain initiatives have successfully launched campaigns targeting a specific sub-group (Mørk et al., 2017). To accelerate the plant-based transition in Denmark a national plant-based week or national plant-based day of the year could be implemented.

Dietary Guidelines

Denmark's official Dietary Guidelines (revised in January 2022) guide Danes to eat plant-rich and consume less meat (Ministry of Food, Agriculture and Fisheries of Denmark, 2021; FAO, 2022). This is an important step in the right direction. If the development in Denmark will be similar to that in other countries, the revision of the dietary guidelines will lead to a decrease in meat consumption in the next years.

Education & Knowledge

Higher objective knowledge about healthy diets is associated with higher intake of healthy foods (Dickson-Spillmann & Siegrist, 2011). Thus, to accelerate the plant-based transition in Denmark, improving knowledge and skills about plant-based foods seems promising. According to the case studies analysed, the following measures seem beneficial to promote plant-rich diets in Denmark:

- Education in schools: knowledge about benefits of plant-based foods, and skills in plant-based food preparation
- Chefs and kitchen workers (public kitchens, private restaurants): Improved knowledge and skills in plant-based meal preparation
- General population: Skills about plant-based food preparation, and knowledge about benefits of a plant-based foods (health, sustainability)

Condition(s)

Awareness, Knowledge & Skills, Attractiveness, Normalisation **Actor(s) involved** Private food sector, Policy-makers, NGOs

Condition(s)

Awareness, Knowledge & Skills Social & Cultural Norms **Actor(s) involved** Policy-makers

Condition(s)

Awareness, Knowledge & Skills Social & Cultural Norms **Actor(s) involved** Policy-makers NGOs Science & Research

Food Products and Meals

Recommendations for the plant-based transition in Denmark

Tasty and attractive plant-based foods tailored to different consumer segments

Many Danish companies have already launched innovative plant-based products and brands (e.g. Naturli, Planteslagterne). Also food companies from Condition(s) the 'traditional' meat sector (e.g. Danish Crown) and dairy sector (e.g. Arla) have entered the market and launched plant-based product lines. The Awareness, Knowledge & Skills, Attractiveness. increasing diversity of companies on the supply side is promising since different companies cater for different consumer segments.

Overall, it is important to highlight that there are large differences among different categories of plant-based foods (Dansk Vegetarisk Forening, 2021). Plant-based 'milk' is the most successful product category when it comes to plant-based substitutes, and sales are still increasing. Meat substitutes are currently in a phase of stagnation. Plant-based cheese is relatively unpopular due to dissatisfying sensory properties.

For most consumers, **taste** is the most decisive food quality attribute (Hoek et al., 2017; Reipurth et al., 2019), and for some consumers expected bad taste leads to avoidance of meat substitutes (Clark et al., 2019) and other plant-based food. Perceptions of taste vary between different consumer groups. For instance, omnivores tend to compare the taste of plant-based alternatives with the taste of meat and are often disappointed. In contrast, some vegans and vegetarians do not like the taste of meat and therefore do not like meat substitutes that have similar sensory characteristics (Kerslake et al., 2022). Thus, each plant-based product should be developed with a clear target group in mind (in particular regarding taste and texture).

Domestic origin of food is important to many consumers. In Denmark, most animal foods are from domestic production. Consumers have similar expectations towards plant-based foods, which is a challenge because of the still limited production of domestic plant proteins (Dansk Vegetarisk Forening, 2021).

Other important aspects are **convenience** and **ease of food preparation**. Ready-made products like plant-based sausages and nuggets cater for this desire. With less processed or unprocessed protein foods, mainstream consumers might need even more recipe inspirations and clear food preparation instructions.

Normalisation, Social & Cultural Norms

Actor(s) involved

Private food sector. Policy-makers, Science & Research

Distribution

Recommendations for the plant-based transition in Denmark

Reach out to mainstream consumers

Increased offer

It is important to make it easy for mainstream consumers to choose plant-based food in *all* environments; i.e. supermarkets, canteens, restaurants and public kitchens need to increase their offer of plant-based alternatives.

Radical innovative actions

Food retailers link producers and consumers and are considered as 'gatekeepers' in the supply chain. With their decision to market sustainable products, they make alternative products accessible to the mass market and thus, have a huge impact on driving the market of sustainable food products. Radical innovative actions towards sustainability that question the incumbent system have in the past proven to have pull effects on other market actors, horizontal and vertical (e.g. SuperBrugsen's decision to list organic products as the first large supermarket chain in Denmark in the 1990s; Rema1000's decision to abandon 'buy 3 for 2' deals). Competitors follow the pioneers, so that it eventually pays off to be the frontrunner. To benefit from implementing radical actions, retailers should communicate them as a strategic step.

Radical innovative steps for retailers:

Re-thinking the positioning of plant-based foods *relative to animal foods*, especially meat, and **upgrading plant-based foods** in comparison to animal foods - regarding

- point-of-sale promotion, shelve space, positioning (see previous pages);
- price and price promotions (see next page);
- communication campaigns, etc.: .
- strategic position within the whole company (e.g. company-internal incentive structure)

Condition(s) Availability Awareness, Knowledge & Skills. Attractiveness, Social & Cultural Norms Actor(s) involved Private food sector. Policy-makers. NGOs

Develop distribution channels for the dedicated consumers

Condition(s)

The popularity of meal boxes has increased during recent years (e.g. Arstiderne, Simple Feast, Eat Grim), Plant-based meal boxes are a promising approach to facilitate a shift towards a plant-based dietary style for dedicated consumers. The Danish company 'Simple Feast' is a role model.

Availability Awareness. Knowledge & Skills, Attractiveness. Social & Cultural Norms Actor(s) involved Private food sector

Price & Pricing Strategy Recommendations for the plant-based transition in Denmark

Beyond a premium price strategy - use full spectrum of pricing instruments

Higher prices are a major barrier for consumers to make sustainable food choices (Aschemann-Witzel and Zielke. 2017). Currently, consumer prices for plant-based alternatives are relatively high compared to meat and dairy products. Moreover, large retail chains frequently offer price discounts on meat. Overall, meat and dairy products have much lower price margins than plant-based alternatives.

To facilitate the plant-based transition, economic incentives for consumers could be beneficial, i.e. lowering the relative price of plantbased foods compared to meat and dairy. Radical price-related actions for accelerating the plant-based transition could be:

- Plant-based day of the week e.g. 20% price discount on plant-based foods (similar to SuperBrugsen's organic days)
- Strategic decision to stop price promotions for meat (similar to REMA1000's abandonment of 'buy 3 for 2' deals)

In addition, relevant **policy interventions** should be considered (e.g. **lowering the VAT on plant-based foods**, including legumes, fresh vegetables and fruit).

Although this report focuses on the demand side, it is worth highlighting that the analysis of the case studies revealed relevant insights about financial incentives for the supply side. In the Netherlands, the government has introduced financial incentives for meat companies and farmers to reduce or shut down their animal production and move into plant protein production. Similar steps could be interesting for Denmark. The organic case study revealed the importance of economic incentives for farmers in the form of subsidies for organic production. Similar policy measures could be considered for plant-based foods (e.g. subsidies for farmers producing protein crops).

Condition(s) Competitive & affordable consumer prices Social & Cultural Norms

> Actor(s) involved Private food sector Policy-makers Science & Research

Amplifiers For the plant-based transition in Denmark



Promising next steps – wish list

for accelerating the plant-based transition in Denmark

- Key groups of **actors collaborate** in **multi-actor initiatives** for the plant-based transition.
- Strong policy support at all governmental levels: Would send an important signal to mainstream consumers and boost the plantbased food business sector.
- **Food companies** in the plant-based sector: Focus on improving sensory characteristics of plant-based foods, and inspiring consumers to prepare plant-rich dishes (beyond exchanging meat with meat substitutes).
- Radical innovative steps by large retailers: Re-think the positioning of plant-based foods relative to animal foods (especially meat), and upgrade plant-based foods in comparison to animal foods in particular regarding
 - Point-of-sale promotion, shelve space, positioning: dedicate more space and attention to plant-based food
 - Price and price promotions: lower the relative price of plant-based foods compared to meat and dairy, stop extensive price promotions for meat
- **NGOs**: Even stronger engagement of NGOs not directly related to food (e.g. environmental, health, sports) would be beneficial.
- **Consumers** open to plant-based foods: Spread the word about good experiences with plant-based foods.

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