



# Danish Action Plan for Plant-based Foods





# Table of contents

<b>1.0</b>	<b>Preface</b> .....	<b>5</b>
<b>2.0</b>	<b>Introduction</b> .....	<b>7</b>
<b>3.0</b>	<b>Strengthening plant-based foods</b> .....	<b>9</b>
<b>4.0</b>	<b>A strong plant-based value chain</b> .....	<b>11</b>
	The Plant-based Food Grant .....	11
	Network for plant-based foods.....	12
	Help for plant-based start-ups.....	12
<b>5.0</b>	<b>Healthy, tasty plant-based foods for all</b> .....	<b>15</b>
	Greener Public Food Agreement.....	15
	The Official Dietary Guidelines – Good for Health and Climate .....	15
	Funds available for switching to organic produce .....	16
	EU school scheme for fruit and vegetables .....	16
	Plants on the syllabus .....	16
<b>6.0</b>	<b>Export and internationalisation efforts</b> .....	<b>21</b>
	General efforts.....	22
	Innovation Centre Denmark .....	23
	Invest in Denmark .....	23
	Analysis and knowledge needs .....	23
	EU Promotion Policy and plant-based foods .....	23
<b>7.0</b>	<b>Production and processing efforts</b> .....	<b>27</b>
	Ingredient strategy.....	27
	Biosolutions .....	28
	Production and processing aid under the EU's CAP (2023-27).....	28
<b>8.0</b>	<b>A good food base</b> .....	<b>31</b>
	Eco-scheme varied plant production.....	31
	Eco-scheme organic land support.....	31
	Grass as a plant-based protein source .....	32
	Strategy for agricultural plant-genetic resources.....	32
	The development of commercial seaweed production .....	32
	Variety development and mapping .....	33
<b>9.0</b>	<b>Research, innovation and development</b> .....	<b>35</b>
	GUDP .....	35
	Agricultural funds .....	35
	The Innovation Fund and AgriFoodTure .....	35
	National knowledge and business clusters .....	36
	Approved Technological Service Institutes .....	36
	The research-based government service .....	37
	Nutritional research on plant-rich diets for the sick and elderly.....	37
	Interdisciplinary research centres promoting plant-based foods.....	37
	The research reserve .....	37



# 1.0

## Preface

Plant-based foods are the future. If we want to reduce the climate footprint within the agricultural sector, then we all have to eat more plant-based foods - as according to the Official Dietary Guidelines. When the agreement on a green transition of the agricultural sector of 4 October 2021 (the Agricultural Agreement) was signed between the former government (the Social Democratic Party), the Liberal Party of Denmark, the Danish People's Party, the Green Left, the Danish Social Liberal Party, the Red-Green Alliance, the Conservative People's Party, the New Right, the Liberal Alliance and the Christian Democrats, a decision was made to draw up a Danish Action Plan for Plant-based Foods.

Denmark – and the rest of the world – has faced several major crises in recent years that have affected our health, environment, climate and food supply. The population continues to grow on a planet where climate change is putting pressure on our society. Food demand is huge, especially in times of crisis, as the war in Ukraine has shown us. There is competition for land use as it must serve multiple functions: it must provide a clean aquatic environment, develop renewable energy, increase nature and biodiversity, provide crops for food and feed, and deliver a significant reduction in greenhouse gas emissions. And then there's the impact of poor dietary habits on nutrition and health. Increasing the production and consumption of plant-based foods will help solve these challenges.

Denmark is in a unique position to address the challenges we face regarding climate, environment and nutrition and has the opportunity to lead a rapidly growing global market, and thus serve as an example for the rest of the world. Denmark has the right climate and strong technical, economic and social preconditions for agricultural production, as well as a long history of adapting to changing circumstances.

The Danish Government wants to strengthen the Danish plant-based food sector. We will achieve this through a number of initiatives that support the value chain. This action plan should inspire everyone who works in our food systems and who influences our daily food choices; from the farmer and food producer to the retailer, the canteen provider and the export markets – and of course the consumer on their daily trip to the supermarket.

Happy reading!

**Jacob Jensen**  
**Minister for Food,**  
**Agriculture and Fisheries**





# 2.0

## Introduction

Plant-based foods are to be understood in a broader context. The term plant-based foods covers all foods derived from plants, as well as edible fungi, algae and nutritious microorganisms. Plant-based foods can also be combined with enzymes and other non-animal ingredients as long as they are suitable for human consumption. In other words: Plant-based foods include everything from grains and carrots to plant paté and seaweed.

According to recent projections from the OECD, FAO and the European Commission, demand for plant-based products is set to rise. This trend is also evident in Denmark, where sales of plant-based meat alternatives have increased tenfold since 2010, sales of plant drinks have quadrupled, and sales of legumes have almost doubled. Danish society must continue to follow this trend— and, more importantly, help drive it forward.

Both the latest IPCC report from 2023 and the new Nordic nutrient recommendations highlight plant-based foods as a crucial part of a balanced diet that can counteract climate change. The 2022 Climate Programme further points out that a behavioural change towards a more plant-based diet has a highCO<sub>2</sub>e reduction potential. This action plan attempts to provide part of the answer as to we in Denmark can do to get there.

The action plan is the result of discussions with stakeholders as well as the existing knowledge base, including the AgriFoodTure partnership on research and innovation. In addition, Aalborg University and the University of Copenhagen have jointly conducted an [analysis of the plant-based food sector in Denmark](#), including case studies of state plant-based measures in selected countries.

The University of Copenhagen has also conducted a [market projection of the plant-based food sector](#).

The analyses show that many companies in the sector are currently facing obstacles in areas ranging from market access and food regulation to the launch of new products. There is a strong desire in the sector to be able to use Danish crops and ingredients in production, but prices, quality and quantity, as well as availability of Danish crops and ingredients, means that these are not used to the extent that is demanded today. The plant-based food sector consists mainly of start-ups, and as such there is no unifying link across the value chain. The market projection from the University of Copenhagen concludes that the protein-rich plant-based food sector can expect growth of between four and eleven per cent annually until 2030 in Denmark and in local markets, while fruit and vegetable production will be steadily increasing. According to AgriFoodTure, Denmark only needs a small share of the growing global market, amounting to between one and three per cent, to would correspond to a market value of between DKK 4.5 and 13.5 billion and the creation of up to 27,000 jobs in the sector.

This action plan has a number of other initiatives planned, also stemming from the Agricultural Agreement. These must be viewed in relation to each other: Strategy for green proteins for animals and humans, Strategy for organic farming, Strategy for technical reduction potentials, Strategy for green jobs in agriculture and related sectors, the Danish Bioeconomy Panel and a Task Force for vertical agriculture. As a whole, all initiatives serve the common purpose of strengthening the green transition of the agri-food sector and reducing the sector's greenhouse gas emissions.



## 3.0

# Strengthening plant-based foods

According to a market projection from the University of Copenhagen, there are 15 plant-based protein crops that are suitable for cultivation in Denmark. As such, there is ample opportunity for Denmark to contribute to the necessary global transition of agriculture to a more plant-based food basis. The Danish Government wants Denmark to actively participate in this transition, and for Danish agricultural production, agricultural exports and the dietary habits of the Danish population to inspire the rest of the world to a green transformation of the global food system. Promoting healthy, climate-friendly and environmentally friendly plant-based foods is particularly important here.

With this action plan, the government sets out the following objectives for the Danish plant-based food sector:

- The Danish plant-based value chain must be strengthened and the coherence of the individual value chain links increased.
- We need to sell more plant-based foods. In 2021, approximately DKK 32 billion worth of plant-based foods were sold in Danish retail. The government aims to boost plant-based food sales.
- Export operations for plant-based foods should support the sector's further development. In 2023 and 2024, the branding of the Danish plant-based food sector will be strengthened by means of the public-private partnership (PPP) Food Nation with support from the Danish embassies.
- Danish plant-based produce is to be strengthened through subsidies and development efforts.
- Research and innovation are to be strengthened through public-private partnerships. The government will set up strategic research collaborations between the State and stakeholders in agriculture, including possibly one or more actors (e.g. companies, private foundations or other countries). Such collaborations would help support Danish food companies to become leaders in plant-based food production.

The government believes that the plant-based food sector should be promoted through a combination of measures on both the supply and demand side. With the Agricultural Agreement, this action plan proposes a number of initiatives that focus on one or more links in the plant-based value chain.



# 4.0

## A strong plant-based value chain



A good food base



Production and processing efforts



Healthy, plant-based foods for all



Export and internationalisation efforts



Research, innovation and development

The plant-based value chain is facing several challenges. The retail sector, where competition for shelf space is fierce, is perceived as a bottleneck by the majority of plant-based producers and processors. Supply in both retail, food service and food wholesalers has a certain bearing on the food that ends up on an individual's plate.

Market penetration can be a challenge – both as a start-up and as a company or farmer looking to convert part or all of its production of meat- and/or dairy. It takes time to build enough credit to transform existing production or to start new production, and it requires risk-taking and the availability of long-term contracts. As such, more networking and consulting is required to achieve cohesion within the value chain. According to the analysis from Aalborg University and the University of Copenhagen, it is the first link in the chain in particular, as in the link from agriculture to processing that is considered the weakest.

Supporting both existing and new crop cultivation and production is key to the green transition. Therefore, the government is supporting the Danish plant-based food sector with initiatives aimed at all parts of the value chain, from farm to fork.

### The government's plan to strengthen the plant-based value chain

#### The Plant-based Food Grant

Based on the Agricultural Agreement, the Plant-based Food Grant (The Plant Grant) aims to develop the plant-based food sector. This purpose applies to the entire value chain and at least half of the funds are to be given to organic, plant-based projects.

For the Danish plant-based food sector to become a true showcase for the rest of the world, food companies, research institutions and organisations require opportunities and resources. The Plant Grant can provide grants for plant breeding and cultivation, processing, sales promotion, education and knowledge dissemination. The grants board develops objectives, strategies and annual action plans for how best to support the development of the sector.

Based on the Agricultural Agreement, a total of DKK 675 million has been allocated for the period of 2023-2030, corresponding to approximately DKK 84 million annually.

With the aim of launching initiatives from the agreement, the former Danish Government and coalition parties decided that DKK 25 million of the 2023 grant to the Plant Grant would be given through the Fund for Organic Farming through a reserved fund for organic, plant-based foods.

#### **Network for plant-based foods**

There are already several well-established networks for plant-based foods in Denmark, including Plantebranchen, Planteværket, Netværk for Fremtidens Plante proteiner, Tangnetværket and Planteindustrien (all in Danish).

Therefore, there is ample opportunity for interdisciplinary collaboration, knowledge sharing and consulting for companies throughout the plant-based value chain.

The government is calling for the networks to consider the possibility of creating a joint Plant Hub, similar to that of the Dutch Foodvalley, which is a hub for companies and knowledge institutions. The hub networks and collaborates on the common challenges facing the plant sector: bottlenecks, regulatory barriers, coherence in the value chain, market entry of start-ups and the development of tasty, healthy foods. A plant hub such as this one could help identify the actions needed to address the above challenges.

#### **Help for plant-based start-ups**

Help is available for plant-based start-ups. Innobooster, under the Innovation Fund, invests in knowledge-based development projects in small and medium-sized Danish companies, as well as entrepreneurial companies. They support three politically determined themes, one of which is green technology development and innovation. Innobooster has already helped finance companies that have gone on to develop new types of vegan food and edible seaweed.

EIFO (Danish Export and Investment Fund) helps, among other things, first-time farmers establish themselves. Their target audience is healthy businesses that need long-term, risk-free financing to bring their plans to fruition. Innovation Centre Denmark also helps Danish start-ups gain access to both capital and partners and helps them test and adapt their solution and business model in an international context. The current ingredient strategy within the Danish Veterinary and Food Administration also supports smaller companies and start-ups that need guidance to get approval for new types of food. In addition to state funds and government initiatives, the government is planning an entrepreneurship strategy to strengthen entrepreneurship throughout Denmark.

#### **How the government will strengthen the entire value chain from farm to fork**

- In March 2023, the parties behind the agreement on a green transition of the agricultural sector set up the Plant-based Food Grant. DKK 675 million has been allocated for the period of 2023-30, equivalent to approximately DKK 84 million annually, which the fund can translate into plant-based projects in all parts of the value chain.
- The government is preparing an entrepreneurship strategy to strengthen Danish entrepreneurs.
- The government will continue to work closely with the industry through relevant forums such as the Danish Food Partnership for Health and Climate.

#### **The government calls on businesses and other operators to:**

- Apply for funds from the Plant-based Food Grant.
- Leverage the well-established networks for plant-based foods that already exist. Inspiration can be drawn for a Plant Hub from Foodvalley in the Netherlands.
- Make use of the public funds and other investment and guidance initiatives targeted start-ups.





A good food base

Production and  
processing effortsHealthy, plant-based  
foods for allExport and  
internationalisation  
effortsResearch, innovation  
and development

# 5.0

## Healthy, tasty plant-based foods for all



Plant-based foods should have a much greater presence on supermarket shelves, dining tables and at restaurants throughout Denmark. For Danes to eat more plant-based food, sales of plant-based foods in professional kitchens and the foodservice sector should increase significantly, as well as in private households.

It takes time to develop a food culture. Our dietary habits are governed by much more than the conscious choices we each make in everyday life. Habits and preferences are ingrained, and many of them we carry with us from childhood. So changing people's dietary habits must also be supported through increased enlightenment and nudging. We need to learn how to use new plant-based foods, as well as how to make healthy, tasty and filling dishes with even more of the plant-based foods we are already familiar with. Employees in public and private kitchens must obtain the necessary professional knowledge and skillset to cook with plant-based ingredients and increase the focus on healthy and plant-based eating in primary and higher education.

### The government's plan to promote the use of plant-based foods nationally

#### Greener Public Food Agreement

In January 2023, Statens- og Kommunernes Indkøbsservices (SKI) announced a new and greener food agreement. Sustainability has been incorporated in all parts of the agreement, from production and delivery to procurement and use. The agreement covers a wide range of organic foods, as well as a larger assortment of legumes and other

plant-based foods. The agreement also sets a number of requirements for i.e. seasonal products, information about climate impact, sustainability and certified palm oil. The agreement is out to tender and is expected to enter into force in March 2024.

In December 2022, the Danish Veterinary and Food Administration delivered a study on always having the option to choose a 100 percent plant-based meal in public kitchens. The study concluded, among other things, that kitchen professionals require new techniques and training if they are to prepare tasty, nutritious, plant-based meals. The new SKI agreement includes the provision of a series of free courses for anyone covered by the agreement, some of which are designed to enhance plant-based food cooking skills for kitchen staff. The Danish Veterinary and Food Administration can provide assistance for the courses in nutrition, health and climate. The current 2021 Budget Guide also states that the government's canteen suppliers must be able to provide, for example, one or more weekly meat-free days, beef or lamb no more than one day a week, and dishes with legumes, vegetables and whole grains daily, if requested locally.

#### The Official Dietary Guidelines – Good for Health and Climate

The Official Dietary Guidelines were launched in January 2021 and now show us not only healthy eating habits, but also how we can eat more climate-friendly foods. A plant-based diet is good for both our health and climate. We must – in short – turn down meat in favour of legumes such as beans, lentils and chickpeas. Research also shows that there is a strong correlation between what we need to eat to stay healthy and prevent disease, and what we need to eat to take care of the climate and our planet.

### **Dietary Advice for Meals for professional kitchens**

Dietary Advice for Meals is dietary advice aimed at professional kitchens and has been developed based on the Official Dietary Guidelines – Good for Health and Climate. The advice is designed to make it easier for kitchens to serve healthy and climate-friendly meals.

The potential is huge. Public kitchens alone serve approximately 650,000 meals a day, and this obviously doesn't include meals cooked in private kitchens. The professional kitchens therefore play a crucial role in inspiring and introducing tasty, healthy and climate-friendly food to Danes, thus nudging the population's diets in a more plant-based direction.

### **Climate labelling foods and database**

Studies show that consumers have a strong desire to eat food that is climate-friendly, but that they lack guidance. Meanwhile, industry and consumer organisations have expressed interest in a national climate label. So a voluntary Danish state-controlled climate label for food is currently under development. The government is also supporting the European Commission's study of the option to have a common European sustainability label.

According to calculations by the Climate Council and the Department of Food and Resource Economics at the University of Copenhagen, if Danes were to eat according to climate-friendly dietary guidelines, they would gain more healthy years of life, the country would see a saving of DKK 12 billion in health costs and reduce its climate footprint by 31-45 per cent.

The government will continue to expand knowledge and implement the dietary advice through public-private collaborations, communication efforts and initiatives, for example in professional kitchens. The government will also look at the need to adjust the dietary guidelines in light of the New Nordic Nutrient recommendations, which were launched in June 2023.

### **Funds available for switching to organic produce**

DKK 54 million has been allocated in funds for professional kitchens to switch to organic produce, which will be implemented through the Fund for Organic Farming in the period 2021-24. The funds will go towards developing the skills of kitchen staff and associated employees in sustainable meal production, dietary advice, food waste and the use of seasonal goods. The switch to organic produce in public kitchens where no additional funds are provided for the procurement of crops and ingredients, generally results in more plant-rich meals, as organic meat and dairy are often more expensive than organic plant-based foods.

The funds are expected to push food consumption in the professional kitchens in a more sustainable and plant-rich direction, with higher organic shares and a reduced climate impact. The funds contribute to training professional kitchen staff to provide healthier and more plant-rich dishes.

### **EU school scheme for fruit and vegetables**

The government will promote healthy diets and strengthen access to plant-based foods in primary schools by making better use of the Danish allocation on the EU school scheme for fruit and vegetables. There is the potential to increase the amount of fruit and vegetables consumed by Danish pupils by up to 30 per cent under the grant scheme. The government will also examine whether there is a basis for providing support for plant drinks under the EU school scheme for fruit and vegetables.

### **Plants on the syllabus**

With the development of a plant-based sector comes the need for new skills. Some existing skills

are of course still relevant in the plant-rich kitchen, while others need to be shared and developed. In Denmark, we are skilled at developing new plant-based products and bio-based food ingredients, but there is still work to be done when it comes to learning how to use them.

The analysis conducted by Aalborg University and the University of Copenhagen shows that most companies' needs for skills in product development are already sufficiently covered. For example, a dairy farmer can use his experience in the production of plant-based drinks without needing major retraining. This is due, among other things, to the fact that companies in the Danish plant-based food sector have been able to gain experience and develop skills through experiments, participation in projects, etc.

However, it takes continuing education to change the ingrained culture that centres most of its dishes around animal-based ingredients (such as a piece of meat or fish). And further training is required in technical skills within biotechnology, taste, structure and more advanced fermentation processes.

#### **Plants in vocational workplace training and education**

Vocational training is anchored in professional committees, which are made up of representatives from labour organisations. The committees must follow developments and trends in the work force and set up, develop, adapt or close down training courses. As a result of new or changing skills needs in the labour market, there is an ongoing trend towards green skills in vocational education and training. In some food training courses, the need for new skills is reflected in the increased focus on plant-based foods. The Ministry of Children and Education is in the process of considering a request from the professional committee for gastronomic education to make vegetarian chefs a specialized chef's education. Furthermore, training courses to become a nutritional assistant, dairy farmer or farmer have been continuously adjusted to include subjects and skill objectives that support sustainability and plant-based diets. In 2023, the government also allocated DKK 2 million to the professional committee for gastronomic education to help push chef training in a greener direction.

The labour market education system (AMU) offers publicly-funded courses that allow both unskilled and skilled workers to expand their skills

in line with demand in the Danish labour market. AMU are short courses of usually one to six weeks. People involved in the labour market develop course content through industry-specific further education committees, and the Ministry of Children and Education approves them. Within the food craft courses, there are currently eight different courses on plant-based foods, including fermentation and preparation of legumes and plant-based dishes. There are also AMU courses aimed at kitchen professionals that cover plant-based diets. One such example is the course titled Sustainability in large kitchens. So thanks to AMU, companies already have good opportunities available to them to boost their employees' skills in the plant-based field.

In April 2022, DKK 0.5 million was pledged to strengthen AMU courses focusing on plant-based food to the Further Education Committee for the Kitchen, Hotel, Bakery, Confectionary and Meat industry. The Committee subsequently developed four of the eight new courses in the plant-based field. The Committee also runs workshops and training for teachers at vocational schools, publishes leaflets on courses in plant-based foods, including virtual courses, and organises conferences on plant-based nutrition.

#### **Plants in higher food education**

The plant-rich diet is also a theme included in programmes in higher education, including subjects and modules on plant-rich diets. A number of initiatives have been launched to support this. For example, the Finance Act 2022 allocated DKK 2 million to develop a diploma training module on plant-based diets for nutrition professionals. The module has been developed during the course of 2023 for the purpose of supporting the food professions to create tasteful and varied plant-rich diets. There has also been increased focus on increasing teaching skills and knowledge around plant-based diets among lecturers within nutrition education. The experience and results gained from these efforts is to be circulated to relevant stakeholders.

In 2021, Absalon University College received DKK 1.08 million under the auspices of the VEU Working Group's development programme for the Green project for transforming the food industry. The project aims to develop a practice-oriented and flexible training programme that matches labour market demands for a green transition in food businesses and food production. The project will be completed in early 2024.

### **How the government will boost the consumption of plant-based foods in Denmark**

- The government will reduce the climate footprint of public procurement, which is expected to result in an increase in public procurement of plant-based foods.
- The state and the municipalities have signed a new procurement agreement for food, which includes larger requirements for organic and plant-based foods in professional kitchens, and offers free training courses to improve the skills of relevant employees.
- The government will continue to circulate the Official Dietary Guidelines - Good for Health and Climate through public-private collaborations, communication initiatives and initiatives in professional kitchens.
- The government will also adjust the dietary guidelines in light of the New Nordic Nutrient recommendations, which were launched in June 2023.
- The government will revise the 'Recommendations for the Danish diet in nurseries and child-care facilities', which will also include recommendations for a plant-based diet. The recommendations are expected to be published in 2024.
- DKK 54 million has been allocated through the Fund for Organic Farming to cover the period 2021-24 to support the transition to more organic produce in professional kitchens.
- The government aims to promote healthy diets and strengthen access to plant-based foods in primary schools by making better use of the Danish allocation on the EU school scheme for fruit and vegetables.
- In 2023, the government also allocated DKK 2 million for the professional committee for gastronomic education to help push chef training in a greener direction.
- The government continues to support close communication with stakeholders in the hotel and hospitality industry, to address challenges and information requirements, including how to meet future industry demand.
- The government will continue to support higher education to integrate relevant information about plant-based foods into education.

### **The government calls on businesses and other operators to:**

- Apply for funds through the Plant-based Food Grant to strengthen

The University of Copenhagen has developed a specialisation in plant-based foods on their English-language Master's programme, the MSc in Food Science and Technology. The specialisation will be offered for the first time in September 2023. The University of Copenhagen has also received approval to offer a two-year Master's programme in biosolutions in 2024, which for example will combine expertise in food science and biotechnology.

In 2022, the Ministry for Higher Education and Science carried out a survey about how much of the green transition was covered in upper secondary education. The survey showed that 11 per cent of higher education providers have learning outcomes about agriculture and food production. As part of the survey, an inspiration catalogue was prepared with examples of educational programmes that have incorporated the green transition into their educational content.





A good food base

Production and  
processing effortsHealthy, plant-based  
foods for all**Export and  
internationalisation  
efforts**Research, innovation  
and development

# 6.0

## Export and internationalisation efforts



The increased focus on global plant-based food production brings new opportunities for more innovation and production for export markets, as well as opportunities to work with international operators. The area is in rapid development, with demand shifting from the export of traditional and well-established plant products such as crisps and beer to the increasing inclusion of new plant-based foods, which are marketed as alternatives to animal-based products.

The potential is great, but the competition is fierce. So work must be done to identify new export opportunities and to stimulate demand in the market, which in turn would enable Danish companies to market the goods.

According to figures from Statistics Denmark, exports of plant-based foods have been growing for a number of years. From 2010 to 2022, exports rose from DKK 23.5 billion to DKK 44.5 billion.

The rise corresponds to an increase in the share of total Danish food exports of 7 percentage points, from 16 percent in 2010 to 23 per cent in 2022 (2022 figures). The largest product groups in the export of plant-based foods are additives and enzymes (28.3 percent) and beverages (20.5 per cent). Additives in particular (enzymes, yeast, etc.) has been a growing area, which has gone from exports of DKK 6.4 billion in 2010 to DKK 12.6 billion in 2022. Exports of fruits, nuts and vegetables amounted to approximately DKK 5.0 billion in 2022, and exports of oats amounted to DKK 130 million. Legumes exports in particular have increased significantly over the past years. From 2017 to 2022, exports of legumes grew from approximately DKK 122 million to DKK 510 million, more than a fourfold increase.

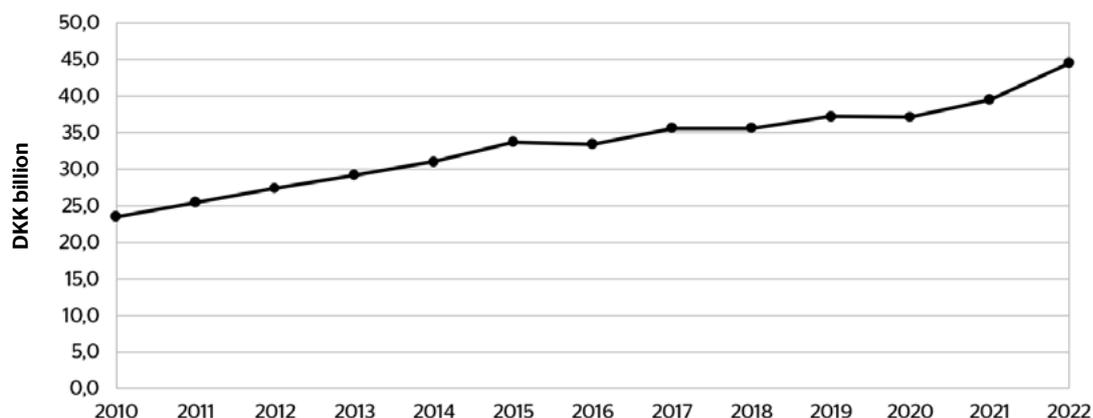
The figure below shows the development of plant-based food exports measured in DKK billion from 2010 to 2022.

<sup>1</sup>Export figures are only available in a number of predetermined categories, so reservations are made for any crops and ingredients added to animal-based products such as lactose. The figures are calculated in fixed prices.

**Figure 1**  
**Trends in exports of**  
**plant-based foods**  
**2010-22**

Note: The calculations are based on the definition of plant-based foods as per the action plan.

Source: Statistics of Denmark.



### Recommendations from the Industry task force on strengthening the Export of Plant-based Foods

The task force was set up in 2022 to identify measures that could promote Danish plant-based foods exports. They came up with recommendations under the following headings:

1. Expanding the knowledge base on export potential
2. Continuation of public-private cooperation on export promotion
3. Insight into regulatory and market barriers in selected export markets
4. A strengthened branding effort
5. Consolidated professional presence in priority markets

The task force consists of representatives from the Danish Food and Agriculture Council, DAKOFO, Danish Food and Drink Federation, Danish Vegetarian Association, Food Nation, Food & Bio Cluster, Danish Brewers' Association, the Danish Plantbased Business Association, Organic Denmark, the Ministry of Foreign Affairs and the Ministry of Food, Agriculture and Fisheries.

## How the government will strengthen exports and internationalisation.

### General efforts

The former government's Export Action Plan for the Danish Food Cluster was launched on 9 September 2022. The action plan set out the framework for government initiatives in support of the Danish food cluster's exports till 2023, including cooperation with the industry. The action plan highlights the great growth potential of plant-based food, which goes hand in hand with goals for the green transition.

As such, the Danish Government is supporting the businesses of the food cluster by creating and maintaining market access and identifying customers and partners in priority markets. Among other activities, the Ministry of Food, Agriculture and Fisheries is supporting companies' access to exports by negotiating new and expanded market access with third countries and certifying actual exports. Under the auspices of The Trade Council, representatives from the Ministry of Foreign Affairs help companies with market-oriented export promotion so that they can export their products and support overall export growth.

In the Forum for Exports of the Danish Food Cluster, the Danish Government will continue to focus on export opportunities for plant-based foods. The partnership includes representatives from the food cluster, the Ministry of Food, Agriculture and Fisheries and the Ministry of Foreign Affairs. Under the auspices of the partnership, a task force on Enhanced Export of Plant-based Foods has been set up. The task force has come up with a total of nine recommendations to boost exports of plant-based foods. Several initiatives have already been launched or are expected to launch throughout 2023.

Export opportunities for plant-based foods are also being promoted through Food Nation, which endeavours to increase the knowledge of Denmark's strengths and conducts branding, visits for foreign stakeholders, participation in export promotion, conferences, etc.

It is expected that the Plant-based Food Grant will further support companies to promote plant-based foods, as set out in the section on page 7 of this action plan.

### **Innovation Centre Denmark**

Innovation Centre Denmark (ICDK) currently has innovation centres in South Korea, India, China, Israel, Germany and the United States. The ICDK is funded through an annual administrative appropriation in the Finance Act. DKK 38.2 million was allocated for 2023 and DKK 71.4 million annually for 2024-25. The innovation centres provide Danish knowledge institutions and companies with access to technology, partners and funding in the countries where the centres are located. They also help implement Denmark's bilateral cooperation on research, technology and innovation. Meanwhile, the innovation centres are responsible for repatriation and publicising knowledge and best practices that help ensure that Denmark is on the forefront of the latest technological trends and that Danish companies can provide the products and solutions that are in demand globally.

Several of the innovation centres perform specific activities in the plant-based field: In the US, alternative proteins are being worked on as part of the country's efforts in the field of biosolutions. In Israel, discussions are underway with AgriFoodTure on climate and environmentally friendly food production, and in South Korea, a collaboration has been established between Danish and Korean researchers on the development and possible uses of seaweed.

### **Invest in Denmark**

Invest in Denmark is an organisation that attracts foreign companies and investments in plant-based foods for the purpose of bringing new knowledge, innovation and technology to Denmark. Foreign companies can help ensure that Denmark becomes a leader in the development of future sustainable technologies and plant-based products, thus contributing to the Danish economy and exports.

### **Analysis and knowledge needs**

In order to expand the knowledge required to export plant-based foods, the task force recommends conducting several analyses. By working with the industry, the government will explore the

options for analysing export capacity for plant-based foods, identifying positions of strength where current and future production capacity is held up against domestic demand, including which areas the industry needs to scale up.

### **EU Promotion Policy and plant-based foods**

The EU Promotion Policy provides co-financing for information campaigns and promotion of agricultural products and the methods by which they are produced. The scheme aims to strengthen the competitiveness of the agricultural sector in the EU by raising awareness of the properties and quality of EU agricultural products, including production methods such as organic production, sustainability measures and plant-based products. The government therefore calls on the plant-based food sector to select specific priority markets that would benefit from long-term strategic efforts, so that the industry can apply for funding from the EU's promotion scheme for plant-based food campaigns.

### **How the government will strengthen Danish plant-based exports**

- The government will continue to focus on export opportunities for plant-based foods through Forum for Exports of the Danish Food Cluster.
- The government will promote and brand the Danish food cluster, including the plant-based food and agricultural sector through Food Nation.
- In 2023 DKK 38.2 million has been allocated to Innovation Centre Denmark which is promoting research and development in plant-based foods through international collaborations in e.g. the US, Israel and South Korea. The grant is set to increase to DKK 71.4 million annually in 2024-25.
- The government will continue to focus on attracting foreign companies and investments in the plant-based food and agriculture sector through the national investment promotion organisation Invest in Denmark.

### **Analyses and knowledge needs**

The government will explore the possibility of conducting the following analyses together with the business community:

- An analysis of the export capacity of plant-based foods, including strong positions and scaling potential in Denmark.
- Brief and operational market analyses on the potential for exports of plant-based foods to local markets.

### **The government is calling on businesses to:**

- Make use of Trade Council's export programmes targeting small and medium-sized enterprises.
- Prioritise and select specific markets in order to strengthen export and internationalisation efforts through longer-term and more strategic pathways. Here, the Trade Council will be able to assist with identifying and providing access to relevant key decision-makers and local partners.
- To use Innovation Centre Denmark's local presence and network for research and innovation collaborations.
- To apply for funds for info campaigns and the promotion of plant-based foods in the EU promotion scheme.
- To apply for funds for international promotion activities through the Plant-based Food Grant.





A good food base

**Production and processing efforts**

Healthy, plant-based foods for all

Export and internationalisation efforts

Research, innovation and development

## 7.0

# Production and processing efforts



Production and processing are a large and important part of producing tasty, healthy and nutritious plant-based foods. The analysis by the Universities of Aalborg and Copenhagen points to the need for more storage facilities for farmers and food-safety-approved facilities for processing crops and ingredients (drying, peeling, grinding and dry fractionation). This applies to both pilot and full-scale facilities, and could seriously accelerate the production process in the value chain.

But the need for production and processing facilities is not the only challenge. Getting approval for new food types is also proving problematic. The term novel food is used to refer to new foods that have not been put on the market in the EU before 15 May 1997 and which therefore need EU approval. For example, chia seeds have been through a novel food approval process. In order to increase the production and processing of plant-based foods, it is vital that we have a responsive authorisation system without compromising food safety.

The EU's Common Agricultural Policy (CAP) offers a number of options that support the switch to plant-based foods. The principles of the support options have been agreed in the Agricultural Agreement.

## The government's plan to strengthen Danish production and processing efforts

### Ingredient strategy

Ingredients are an essential part of developing plant-based foods with a better taste, texture and other desirable properties (e.g. that a plant-based cheese product can be cut, grated, melted etc.). The Danish ingredients industry is also actively working to develop new alternative plant-based crops and ingredients for food production. This could be, for example, the development of various plant-based proteins, including by fermentation of microalgae or side streams from food production.

The ingredients sector is currently supported by a strategy aimed at ensuring growth for the development and innovation of more sustainable food ingredients. The Danish Veterinary and Food Administration provides support and guidance for companies on novel food regulations. As well as developing ingredients for plant-based food production, the ingredients strategy is also about increasing collaboration with the industry, strengthening guidance on key legislation in the field, minimising regulatory barriers to innovation and developing more sustainable ingredients. The strategy has targeted smaller companies and start-ups in particular.

### Forum for the Ingredients of the Future

In order to gain insight into the key problems facing the industry, further and closer communication with industry associations, companies and research institutions is essential. With this in mind, in 2019 the previous government set up a discussion forum – Forum for Ingredients of the Future (FFI). The themes addressed at the forum's meetings provide the government with the necessary insight into where we can best intervene in terms of reducing barriers to innovation, advocating for regulatory changes in the EU and allowing for the development of new crops and ingredients.

It is particularly the production and processing side that needs to both speed and scale up, but also the taste, nutritional value and texture of the plant-based foods requires attention.

### Lighthouse Zealand

Biosolutions have great potential to ensure more sustainable, green foods. Approximately DKK 98 million has been allocated for 2022-25 for the public-private business consortium Lighthouse Zealand that is created to help solve global and local climate and environmental challenges while at the same time stimulating growth and creating jobs in Zealand and the islands.

Lighthouse Zealand will e.g. support the transition to developing plant-based foods and increase sales on export markets. Lighthouse Zealand has launched a number of initiatives to help companies convert to more sustainable ingredients or products and more energy-saving processes. One example is the establishment of the Baltic Plant Solution test facility on Lolland, where companies can test, adjust and refine food production of new plant-based crops, such as faba beans.

The time it takes from the moment an application is submitted until a product is approved as a novel food must be reduced without compromising human health and the environment. In support of this strategy, the Danish Veterinary and Food Administration provides companies with specific guidance aimed at facilitating the understanding of the overall legislation on novel food, including authorisation procedures. Meanwhile, efforts are being made throughout the EU to raise awareness of the inappropriately long approval processes and to promote faster approval processes for novel foods.

### Biosolutions

Biosolutions is an interdisciplinary field based on research into understanding and utilising biological systems. Biosolutions include enzymes, proteins and bacteria that are manufactured on an industrial scale. In Denmark, biosolutions are particularly widespread in advanced foods, where we already have strong positions in bio-based ingredients and fermentation technology – such as for producing plant-based yogurt and cheese.

Biosolutions have the potential to improve the taste, quality, nutrition of plant-based foods, and extend their shelf life. Biosolutions also have the potential to lower both climate and environmental impact of food production. It is a growing area that has gained increased awareness. As such it has the potential to really drive the global green transition forward. Therefore, the government wants to develop the area further, and will do so under the auspices of Lighthouse Zealand, a business consortium for biosolutions. For example, the government will push for innovation-friendly regulation, both nationally and in the EU, to strengthen the sector's development but without compromising nature, the environment, health and food safety.

### Production and processing aid under the EU's CAP (2023-27)

The EU's CAP consists of direct agricultural subsidies, market organisations and rural support. Based on the Agricultural Agreement, four support options have been introduced to support an increased plant-based agri-food production.

The common market scheme is part of the EU's CAP where producers in the fruit and vegetable sector (fruit, vegetables, nuts and mushrooms) can apply for support. Support is offered for operational programmes aimed at e.g. increasing the commercial value of products, improving quality and promoting integrated production or other environ-

mentally friendly production methods, which are expected to contribute to an increase in plant-based agri-food production. A total of DKK 285 million has been allocated for the period 2023-27.

The agri-environment-climate measures are designed to contribute to the reduction of environmental and climate impacts of primary agricultural production. The support is granted for physical investments. The Agricultural Agreement, includes the expectation that integrated aid will be sought to support e.g. technology for producing and processing plant-based foods. To this end, the scheme is expected to strengthen the plant-based crops and ingredients. DKK 560 million has been allocated for 2023-2027 for the agri-environment-climate measures where operators in horticulture, plant cultivation and fruit and vegetable production can apply for support for agri-environment-climate investments.

### **How the government will strengthen Denmark's production and processing of plant-based foods**

- Through the ingredients strategy, the development and innovation of more sustainable foods is strengthened.
- The government will continue dialogue the industry about ingredients, devoting particular attention to the production and processing side of the plant-based value chain.
- DKK 97.8 million has been allocated for 2022-25 for the public-private business consortium Lighthouse Zealand, which contributes to the refining of plant-based food ingredients on a large scale.
- The government will push for innovation-friendly regulation in Denmark and the EU with respect for nature, the environment, health and food safety.
- Through the EU's CAP (for the period 2023-27) substantial resources have been allocated for plant-based food production and processing:
  - DKK 285 million has been allocated to the CMO, which includes support for producers in the fruit, vegetables, nuts and mushrooms sectors.
  - DKK 560 million has been allocated to agri-environment climate measures, which can also support plant-based production and processing technology.
- The government will push to promote plant-based foods internationally, including in the EU.

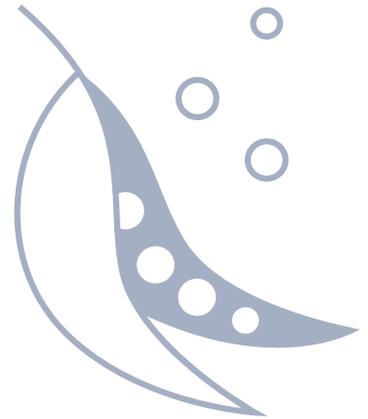
### **The government is calling on businesses to:**

- Apply for support for operational programmes under the EU's fruit and vegetable market management scheme.



# 8.0

## A good food base



Denmark is an agricultural country. The agricultural area comprises cultivated fields, fallow and grassland and accounts for about 60 per cent of Denmark's total land area. Today, about 18 per cent of Danish farmland is used for growing plant-based foods.

Danish operators want Danish companies that produce and sell plant-based products to predominantly obtain their crops from Danish farmers. So if we are to boost Danish plant-based food production and exports, we need look at a transformation of Danish farmland.

Transforming Danish farmland to support plant-based food production means tackling a number of obstacles. It is essential we have sufficient nutrient sources to grow more plant-based foods. In particular, organic plant production involves substitution with alternative sources approved under the EU organic regulation. This issue will be addressed in greater detail in the government's Strategy for Organic Farming.

Furthermore, through targeted breeding and refining, we need to find the most climate-friendly food varieties that are best suited to Danish conditions and that have optimised yield, taste, nutritional value and functionality. Practically all plants grown in the fields today are the result of long, targeted breeding processes. The government sees exciting potential in new genomic techniques such as so-called targeted mutagenesis and cisgenesis. The challenge is to come up with legislation that allows us to promote new genomic techniques for plants that benefit the climate and society without exposing nature, humans and animals to health and environmental risks. The government welcomed that the European Commission put forward two proposals for a new plant regulation in July 2023: 1)

Proposal for revised regulation on production and marketing of seeds and propagating material and forest propagating material (PRM and FRM) and 2) Proposal for new regulation for plants produced by certain new genomic techniques (NGT).

### The government's plan to strengthen the Danish food base

In the period 2023-27, a greater proportion of funds for agriculture will be earmarked for eco-schemes that benefit the climate, environment and biodiversity on agricultural land. The eco-schemes are voluntary and allow farmers to receive additional subsidies for an area if they implement a green initiative. In Denmark, there are a number of subsidy schemes and other initiatives available to promote plant-based food production.

#### Eco-scheme varied plant production

We need to produce more plant-based crops and ingredients. The former government and the coalition parties behind the Agricultural Agreement have allocated a total of DKK 578.5 million for the eco-schemes for varied crop production under the Danish CAP plan for 2023-27. The eco-schemes support farms that use increased crop diversification and grow a minimum of specific rotation crops such as fruit and berries, vegetables, oilseeds (excluding winter and spring rapeseed), leguminous seeds of large-seeded species of the pea family, root vegetables, flax and hemp and potatoes. This supports both environmental impact and a larger and crop diversification.

#### Eco-scheme organic land support

The former government and the coalition parties behind the Agricultural Agreement have alloca-

### **Plant-based protein crops for growth in Denmark**

According to the market analysis from the University of Copenhagen, there are fifteen protein crops that have optimal growing conditions in Denmark. These are chickpeas, peas, beans, lentils, a variety of nuts, mushrooms, quinoa, faba beans, buckwheat, amaranth, hemp, soy, lupine, rapeseed and grass protein.

### **Plant genetics as a Nordic collaboration**

NordGen is the joint Nordic gene bank funded by the Nordic Council of Ministers, and works alongside the national efforts on plant-genetic resources. NordGen manages the conservation and sustainable use of Nordic genetic resources, including responsibility for the seed gene bank, which the five Nordic countries would otherwise be obliged to handle themselves.

### **Land-based seaweed cultivation in Denmark**

In April 2022, Aarhus University submitted an advisory note to the Danish Fisheries Agency concerning land-based seaweed cultivation. The aim was to provide clarity about Danish seaweed production and sales in 2022, as well as future prospects. The note highlighted the favourable environment in Denmark for the development of seaweed production and listed which barriers need to be overcome in order to scale up sustainable seaweed production.

ted a total of DKK 3.6 billion for the organic land grant scheme from 2023-30. The organic land support is an eco-scheme that aims to help maintain and expand organic land in order to achieve the government's goal of doubling it by 2030. This also supports organic, plant-based agriculture.

### **Grass as a plant-based protein source**

The government and the coalition parties behind the Agricultural Agreement have allocated DKK 260 million for green biorefining, which covers methods for exploiting protein from Danish pasture and clover fields (green biomass). In the short term, efforts can promote the development of sustainable feed and thereby reduce dependence on soya imports. This will be given significant focus in the Strategy for Green Proteins for Animals and Humans. In the longer term, supporting the technology could also promote the development of green proteins for food.

### **Strategy for agricultural plant-genetic resources**

The government has allocated DKK 1 million annually and launched a new strategy for agricultural plant genetic resources, which shall apply from 2023-27. The strategy must ensure the long-term and binding work on the conservation of plant-genetic resources. The aim is to be able to use a diverse plant genetic material to develop and adapt food and food ingredients.

### **The development of commercial seaweed production**

The demand for more sustainable and plant-rich foods does not just apply to vegetables and legumes. Researchers at e.g. The Technical University of Denmark and Aarhus University have highlighted great potential in plant-based marine foods such as seaweed and algae. Seaweed has a low climate footprint and can be grown both in sea-based and land-based facilities, where conditions in the latter are more controlled and thus have the opportunity for a wider scale of production. In the Marine, Fisheries and Aquaculture Programme 2021-27 (EHFAF), in addition to the Strategy for a Sustainable Aquaculture Sector 2021-27, a total of DKK 5.1 million has been allocated for 2021-23 to develop Danish commercial seaweed production, so that seaweed can become part of a Danish plant-based and sustainable food base.

The government is therefore delighted that on 15 November 2022, the European Commission adopted the paper "Towards a strong and sustainable algae sector in the EU". The paper proposes 23 measures to create opportunities for the algae industry

to grow into a robust and sustainable sector. The government hopes that the measures envisaged will generate innovation and new opportunities for the sector, while meeting the growing demand in the EU for e.g. alternatives/supplements to existing (animal) protein sources.

#### **Variety development and mapping**

Developing both new crops and varieties within known crops is absolutely essential to increase plant-based food production. New varieties are to be tested and developed for use in food and Danish growing conditions, including crops with a high protein content. It is relevant to develop varieties for conventional and organic cultivation using both traditional and new genomic techniques. This topic will also form part of the government's Strategy for Green Proteins for Animals and Humans.

#### **Funds for varietal development projects**

Funding for varietal development and growing is available through the Plant-based Food Grant, several of the Danish agricultural funds, as well as the Nordic public-private partnership for pre-plant breeding (PPP). GUDP also supports several projects dealing with varietal development (e.g. potatoes and spinach) and projects developing varieties for subsequent processing before consumption (e.g. peas and beans for protein supplements).

#### **How the government will strengthen Denmark's food base Under the Danish CAP plan**

- A total of DKK 578.5 million has been allocated for the diversified crop production eco-scheme from 2023-27. The aim is to support a more diversified crop production.
- A total of DKK 3.6 billion has been allocated for 2023-30 for the organic land support eco-scheme.
- DKK 260 million has been allocated for green biorefining, which in the long term can support the development of green proteins for food.

#### **Additional measures**

- In 2021-23, a total of DKK 5.1 million was allocated to developing Danish commercial seaweed production to strengthen Danish plant-based aquaculture.
- A strategy for agricultural plant genetic resources has been launched from 2023-27 to ensure the conservation of plant genetic resources. The government has allocated DKK 1 million annually for the work.
- In 2023, DKK 2.5 million was allocated for the joint Nordic Public-Private Partnership concerning the pre-breeding of plants for plant-based foods.
- The government will continue to support varietal development and mapping of plant crops for the purpose of optimising yield, texture, taste and nutritional value of plant-based crops and ingredients.
- The government wants to revise EU legislation for the use of new genomic techniques on plants.

#### **The government is calling on businesses to:**

- Apply for funds for varietal development and plant breeding through relevant funds and partnerships, e.g. PPP.



A good food base

Production and  
processing effortsHealthy, plant-based  
foods for allExport and  
internationalisation  
effortsResearch, innovation  
and development

# 9.0

## Research, innovation and development



Turning Denmark into a world leader in plant-based foods will require ambitious research into the plant-based value chain, and to translate such research into concrete solutions in Danish companies. A strengthened plant-based research, innovation and development sector in Denmark will both fill relevant knowledge gaps and contribute to the creation of jobs.

We need more information on how to optimise taste, nutritional value and texture of plant-based foods. We need to increase cooperation with the best research and innovation environments in the world, including the EU's Horizon Europe partnerships. We need to learn more about how to best use plant-based marine resources. We need to understand patterns of behaviour and consumption when switching to a more plant-based diet. We need to do even more research into the circular economy and the use of side streams for plant-based food production.

We need to strengthen our overall research and investment efforts in the green transition of agriculture, including research and investment in plant-based food production. This also includes inspiration from other countries' positions of strength when it comes to plant-based foods.

### The government's plan to support research, innovation and development

#### GUDP

Green Development and Demonstration Programme (GUDP) is a programme under the Ministry of Food, Agriculture and Fisheries. Its aim is to support innovative projects that promote green and economically sustainable development throughout the food and non-food sectors. Within plant-based

foods, GUDP supports a wide range of projects that, among other things, develop new methods for processing legumes in Denmark and recycling side streams to reduce food waste. Projects include developing new technologies and methods to produce plant-based foods and food ingredients, such as faba beans, hemp, oyster mushrooms and seaweed.

#### Agricultural funds

The agricultural funds consist of a total of 13 funds, six of which support projects related to crop production. The funds Promilleafgiftsfonden for landbrug, Promilleafgiftsfonden for frugtavl og gartnerbruget and the Fund for Organic Farming all have fixed appropriations under the Finance Act, while the Potato Tax Fund, the Sugar Beet Tax Fund and the Production Tax Fund for Fruit and Horticultural Products are financed via collected taxes. The funds support research, advice, disease prevention and marketing promotion with the aim of contributing to the sectors' development and improving Danish competitiveness. The Fund for Organic Farming has funds allocated exclusively for organic plant-based foods.

#### The Innovation Fund and AgriFoodTure

The Innovation Fund aims to provide grants for research, knowledge-based innovation and entrepreneurship to strengthen research areas and develop technology and innovative solutions for the benefit of growth and employment throughout Denmark. In April 2022, the Innovation Fund granted DKK 201 million to the research and innovation partnership AgriFoodTure in the field of climate- and environmentally friendly agriculture and food production, which is one of four green missions. In 2022 and 2023, an additional DKK 295 million and DKK 300.3 million were allocated respectively to the four missions, which are to be implemented through the Innovation Fund.

AgriFoodTure is a broad partnership between 41 universities, knowledge and innovation institutions, as well as companies and business organisations who all want Denmark to achieve a world-leading position in the green transition of the agrifood sector. The investment in the partnership will contribute to Denmark meeting its climate target of a 70 per cent reduction in carbon emissions by 2030, and climate neutrality by 2045.

In 2022, AgriFoodTure launched 11 projects, several of which are dedicated to plant-based food production. The REPLANTED project deals with the development of processes and cultures for the production of plant-based dairy alternatives based on peas, oats and potatoes. The AgriFood project concerns the development of relevant varieties of oats, peas and faba beans for plant-based food production. The latter project runs in three phases, of which the first phase addresses how we develop high-quality and high-yield crops. Relevant varieties are therefore selected and cultivated with the aim of providing farmers with access to the most suitable varieties to meet the demands of plant-based food producers.

#### **National knowledge and business clusters**

DKK 160 million has been allocated annually in the period 2021-24 to national knowledge and business clusters to strengthen the power of innovation in Denmark's strongest and most promising business and technology areas. Cluster efforts are rooted in private cluster organisations that, based on the needs of companies, promote innovation through partnerships between relevant operators, including research and knowledge institutions. Food & Bio Cluster Denmark is the nationwide cluster within food and bio-resources, which also has a strong focus on plant-based foods.

#### **Approved Technological Service Institutes**

Approved Technological Service Institutes (GTS) are private non-profit institutions whose purpose is to build and circulate technological skills to Danish business. Approximately DKK 1.3 billion has been allocated for the period of 2023-26 for the institutes to implement initiatives in the areas of sustainable food, an industrial bio-economy, and climate and environmentally efficient agriculture. For example, the activity descriptions for 2023 have set targets for building skills in plant-based protein sources, the development of biotechnological processes for food production and the establishment of a laboratory for plant breeding.

#### **PlantPro**

PlantPro is a research project funded by the Innovation Fund. Its purpose is to examine how we drive consumer behaviour towards more sustainable, plant-rich diets, less food waste and greater acceptance of sustainable technologies. The result is expected to be a catalogue of market and consumption insights, as well as recommendations for specific policies, including the expected effect on consumer behaviour. DKK 13.1 million has been allocated for the project, which runs from 2021-24.

### **The research-based government service**

The research-based government service is a collective term for a range of services (analyses, advice and response programmes) provided by universities for ministries, government agencies and other public administrations. For the service agreements with Aarhus University, the Technical University of Denmark and the University of Copenhagen, a total of DKK 280.7 million has been allocated for the period 2022-25, part of which is expected to go to government services concerning plant-based foods. For example, there is already an agreement on research-based advice for a transition to increased Danish plant production and the mapping of consumer behaviour and preferences in support of the dietary guidelines.

### **Nutritional research on plant-rich diets for the sick and elderly**

A relatively high proportion of meals from public kitchens are served in hospitals and care homes. This means specialised dietary requirements so that the meals are sufficiently healthy and nutritious and meets specific nutritional needs. Studies show that animal protein is better for building muscle mass than vegetable protein. We must therefore investigate how and to what extent the protein requirements of those with small appetites can be met with a higher proportion of plant-based protein rather than animal protein. This also applies to the development of plant-based nutritional drinks and fortification products. Negotiations on the research reserve for 2024 will examine whether funding can be allocated for nutrition studies to uncover the importance of a more plant-based diet for citizens in hospitals and care homes.

### **Interdisciplinary research centres promoting plant-based foods**

Knowledge sharing and coordination between research efforts is essential to promoting the plant-based agenda in Denmark. In June 2022, Aarhus University and the University of Copenhagen announced the establishment of the Pioneer Center for Landscape Research in Sustainable Agricultural Futures (LAND-Craft), which aims to develop basic research-based solutions for the green transition of the agricultural sector. The research centre is co-funded by the Danish National Research Foundation and a number of private research funds and is expected to have a positive impact on research on how to transition to more plant-based agriculture. In 2021, the University of Copenhagen also set up the Green Solutions Centre with the aim

of collaborating on research-based green solutions across the university's faculties. One of the centre's focus areas is to facilitate a shift to a more plant-based food system.

There is also the newly established research collaboration Plant2Food, which is an open platform within plant-based food development. Aarhus University, the University of Copenhagen, the Technical University of Denmark, Wageningen University & Research in the Netherlands and Food & Bio Cluster Denmark are part of the platform, which has been supported by DKK 200 million over the next five years by the Novo Nordisk Foundation.

### **The research reserve**

With the Agreement on the distribution of the research reserve, etc. approximately DKK 321 million will be allocated in 2023 for broader thematic publications in the fields of green research, technology development and innovation in seven areas. Several of these are expected to support plant-based food development: agriculture and food production, the environment and the circular economy, as well as sustainable behaviour and societal impacts. The three aforementioned areas include research and development of bio-based ingredients and fermentation technology, plant growth and the development of new sustainable plant-based foods and ingredients. The government will also launch measures to identify environmental and climate impacts of crops in 2024, and these will be crucial for plant-based food production in Denmark, including the production of peas, faba beans and potatoes.

**How the government will boost plant-based food research and development**

- The government wants to work towards setting up public-private development and research collaborations between the state and relevant stakeholders within plant-based food- and agricultural production.
- The government will continue to support plant-based food projects through e.g. the Plant Grant and GUDP.
- The government continues to support the AgriFoodTure research and innovation partnership, which in 2022 launched several projects addressing plant-based foods. DKK 201 million has previously been allocated to the partnership.
- With agreements on the allocation of the research reserve, etc., the government has further allocated DKK 295 million in 2022 and DKK 300.3 million in 2023 for distribution between four green missions, including climate and environment-friendly agriculture and food production, which also includes AgriFoodTure.
- DKK 160 million has been allocated annually for the period 2021-24 for the national knowledge and business clusters, including the Food & Bio Cluster, which is also dedicated to plant-based foods.
- The government has allocated DKK 1.3 billion for the period 2023-26 towards Approved Technological Service Institutes, which will e.g. strengthen technological skills to develop plant-based foods.
- The Innovation Fund has allocated DKK 131 million to the research project PlantPro, which researches how we drive plant-based consumer behaviour forward. The project is expected to be published in 2024.
- The government will work towards launching analyses regarding the shift to increased plant production, mapping of consumer behaviour and preferences in support of the dietary guidelines, and nutrition research for the sick and elderly. The analyses can be carried out either within the research-based authority service or through the research reserve.
- The government will continue to focus on research in low-trophic aquaculture with a view to strengthening commercial cultivation of seaweed for human consumption.
- The government has allocated approximately DKK 321 million in 2023 for green research, technology development and innovation in seven areas. These areas are expected to support e.g. the development of plant-based foods and related technologies.

**The government calls on businesses and other operators to:**

- Engage in interdisciplinary research programmes with a plant-based focus, such as Land-CRAFT under Aarhus and Copenhagen Universities and the newly started collaboration project Plant2Food.
- To be part of the European research and innovation programme Horizon



