# POLICY RECOMMENDATIONS FOR AN ALTERNATIVE PROTEIN TRANSFORMATION IN GERMANY

By

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## 1. EXECUTIVE SUMMARY

Accelerating the Protein Transformation[1] offers outstanding environmental impact and economic benefits to Germany[2]. The current policy landscape has begun to recognize this opportunity in recent years[3,4]. However, a **national strategy** is needed to fully leverage its benefits.

This document offers actionable policy proposals for the German government to fully embrace the potential of the protein transformation in four key areas:

1. **Fostering innovation and scale-up**, establishing Germany as a technological leader
    - Funding open-source academic research incl. plant breeding
    - Supporting access to capital for scaling up production
2. Supporting agriculture to **produce more human-edible protein crops** in Germany, decreasing dependence on imports
3. **Levelling the playing field** at consumer-level
    - Reduced or 0% VAT for healthy, climate-friendly alternative proteins
    - Introducing clear labelling highlighting environmental impacts, for all foods
4. **Acting as a role model** by leveraging the alternative protein impact opportunity in government purchasing

This document further outlines how Germany could support the protein transformation on EU level, such as through:

- Including agriculture in EU **emission trading scheme**
- Ensuring **efficiency** in Novel Food and other **regulatory processes**
- Building an **informed opinion on NBTs** (New Plant Breeding Techniques)

[1] The Protein Transformation describes the shift from animal-based proteins to alternative proteins, such as plant-based proteins or proteins based on microorganisms or animal cells (definition taken from [2]).

[2] Food for Thought: The Protein Transformation (2021), published by Boston Consulting Group and Blue Horizon

[3] Coalition agreement 2021 between SPD, Bündnis 90/Die Grüne and FDP, p. 46

[4] Beans, Peas & Co. - The Federal Ministry of Food and Agriculture's Protein Crop Strategy for promoting the cultivation of pulses in Germany (2021)

## 2. Background

**Accelerating the protein transformation offers great impact and economic opportunities for Germany**

Animal agriculture accounts for around 15% of global greenhouse gas (GHG) emissions, roughly matching GHG emissions of the whole transportation sector[5]. In Germany alone, meat consumption causes emissions of around 43 million tons of $CO_2$ per year[6]. Yet, mitigating emissions from the food system has historically been deprioritized compared to decarbonizing sectors like Energy and Transport, as the technology to effect meaningful change was simply not available. In recent years, however, such technology has begun to develop, now enabling the rise of a nascent industry of alternative proteins such as plant-based products, or products based on microorganisms or animal cells (See box "What are alternative proteins?").

Being historically underinvested in usually positions a sector for meaningful change once investment becomes available. Indeed, research by Boston Consulting Group and Blue Horizon (BH) confirms that investing into alternative proteins can generate 10x more Impact on Capital Employed (IoCE™) compared to investments into decarbonizing, for instance, transportation. Here IoCE is calculated by valuing the avoided emissions using carbon prices, relative to the investment needed[5].

Therefore, increasing the production and consumption of alternative proteins should be considered as a low-hanging fruit to reduce GHG emissions. This shift is referred to as the 'Protein Transformation'[7].

Around 70% of German consumers have heard of alternative protein products, and 55% have already tried them. An encouraging 30% of Germans incorporated alternative protein products into their regular diet[5]. This signals that the Protein Transformation is already making strong headway in Germany.

**What are alternative proteins?**

Alternative protein products offer an alternative to animal-derived meat, dairy or egg. They can be classified into three types:

- **Plant-based** products, including for example burger patties based on beans or lentils, or soy or oat milk
- **Fermentation-enabled** products, such as nut-based cheese or yoghurt, or dairy or egg proteins produced by precision fermentation
- **Animal cell-based** products such as cultivated meat, which are still in very early stages of development.

Plant-based products are the prominent product type on the German market, including or sausages. Several products are produced and sold by German start-up or scale-ups such as *LikeMeat*, a BH portfolio company, or manufactured as part of established meat companies such as Rügenwalder Mühle. In total, over 129 companies are currently working on plant-based alternatives in Germany[8].

In 2021 alone, almost 100,000 tonnes of plant-based meat products were produced by German manufacturers, valuing to around EUR 460 million[9]. Notably, this compares to around 3.5 million tonnes of meat produced in German slaughterhouses in 2022[10], highlighting ample headroom for further impact.

[5] The Untapped Climate Opportunity in Alternative Proteins (2022), published by BCG and Blue Horizon

[6] Sustainability in meat industry report by IFFA

[7] Food for Thought: The Protein Transformation (2021), published by BCG and Blue Horizon

[8] GFI Europe: Alternative Proteine in Deutschland (*https://gfieurope.org/de/deutschland/)*

[9] Deutsches Statistisches Bundesamt (Destatis), Press release No. N 025, 9th of May, 2022

[10] Deutsches Statistisches Bundesamt (Destatis), Press release No. 332, 5th of August, 2022

Plant-based products with enhanced taste and texture through components produced by precision fermentation are currently developed. One example is *Motif*'s plant heme protein, which adds colour and taste to plant-based burger patties. Soon to be expected are mycoproteins, which are whole foods based on fungi proteins produced by fermentation. In several years, cultivated meat products based on cultured animal cells might be on the market, such as cultivated beef developed by Dutch *Mosa Meat*.

**Alternative proteins could secure Germany's position as technological leader and create domestic jobs**

The Protein Transformation offers a unique macroeconomic opportunity for Germany. According to a recent study commissioned by federal agencies of the United Kingdom[11], the alternative protein field could create around 10,000 new factory jobs, and secure around 6,500 jobs in agriculture in the UK. Given that the UK's GDP is 25% smaller ($3 trillion) than Germany's ($4 trillion), Germany might expect greater macroeconomic opportunities.

Additionally, the Protein Transformation offers an opportunity for Germany to achieve economic independence and self-sufficiency on food. The production of alternative proteins efficiently provides food by directly using plants, in comparison to the production of animal feed, which is converted into human-edible food at rates of, e.g., 1.5 – 9 kg of feed for one kg of food[12]. Therefore, the Protein Transformation can decrease Germany's dependence on imports, an important consideration in times of global supply chain instabilities through war and pandemics.

**The current German policy landscape recognizes the opportunities presented in the Protein Transformation**

Alternative proteins were specifically mentioned in Germany's most recent coalition agreement (2021)[13], where goals were set to strengthen plant-based alternatives and support approval of innovative alternative proteins in the European Union. Therefore, several policy updates can be expected soon:

- **Update on the DGE (German Nutrition Society) guidelines**

According to the coalition agreement, the DGE recommendations are currently being updated, and will be published by the end of 2022. The new recommendations may include environmental and social factors, as well as animal welfare considerations. They will act as guidelines for federal and communal kitchens and cafeterias in schools or hospitals[14].

- **Updates on regulation of animal agriculture intensity**

The German ministry for agriculture commenced discussions on regulations defining the maximum number of animals based on available land[15] as defined in the coalition agreement (Flächengebundene Tierhaltung).

- **Implementation of the EU CAP**

The 'German strategy plan'[16] for the novel EU common agricultural policy (CAP 2023-2027[17]) will be implemented by German regulations by January 2023, offering a substantial opportunity for investment volumes of around EUR 30 billion for 5 years. Seven EU member states have already incorporated the CAP as a trial run, including Denmark, which defined the Protein Transformation as part of its implementation.

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[11] 'National Food Strategy' report funded by the UK's Foreign, Commonwealth & Development Office and the ClimateWorks Foundation (2021)

[12] Life cycle analysis (LCA) of Cultivated Meat and Traditional Animal Proteins, CE Delft (*https://cedelft.eu/wp-content/uploads/sites/2/2021/04/CE_Delft_190107_LCA_of_cultivated_meat_Def.pdf*)

[13] Koalitionsvertrag (2021): *https://www.bundesregierung.de/breg-de/service/gesetzesvorhaben/koalitionsvertrag-2021-1990800*

[14] Overview of DGE quality standards: *https://www.dge.de/gv/dge-qualitaetsstandards/?L=0*

[15] Nutztierstrategie (2019), by Bundesministerium für Ernährung und Landwirtschaft (BMEL)

[16] The German CAP strategy plan can be found here: *https://www.bmel.de/DE/themen/landwirtschaft/eu-agrarpolitik-und-foerderung/gap/gap-strategieplan.html.* It will need to be approved by the European Commission. The strategy plan was improved from its original draft to put more focus on sustainability and independence from protein crop imports following recommendations from the EU.

[17] The EU CAP 2023-2027: *https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/new-cap-2023-27_en*

**The German policy landscape needs updating to leverage and accelerate the Protein Transformation**

To establish Germany as a technological leader in alternative proteins, policies need to encourage development, drive innovation, and unlock sales opportunities. In this report, we focus on Germany's policy landscape and briefly highlight key issues at the EU level. In the following chapter, four key policy recommendations are presented, to leverage and accelerate the German Protein Transformation.

## 3. Key policy recommendations

There is an urgent need for a Germany to develop a **national alternative protein strategy**, where mid-to-long term initiatives are established. National policy strategies are already present in neighbouring countries; Netherlands and Denmark, who may serve as role models.

Importantly, the German national alternative protein strategy must cover the whole supply chain of alternative proteins, from fostering research for innovative, healthy, and natural products, providing support towards the creation of a sustainable agricultural system, to improving acceptance and facilitating informed purchasing decisions among consumers.

While the implementation of some regulations in Germany, e.g., agricultural regulation, occur at the state level, a national strategy would allow the development of clear roadmaps, which then could be aligned to regional characteristics of federal states. A recent example of an established national strategy is the U.S. national bioeconomy and biomanufacturing initiative (NBBI), which touches on the U.S. food system in many places.

The following four key policy recommendations are proposed for discussion by the German government:

1. The government needs to foster innovation and scale-up in Germany
2. The government needs to support agriculture in transition
3. The government needs to level the playing field on the protein market
4. The government needs to take the lead on the German protein transformation

## I. The government needs to foster innovation and scale-up in Germany

*Aim: To establish Germany as a technological leader in alternative proteins.*

The development of sustainable, healthy protein alternatives needs to be accelerated in Germany in order to be economically competitive in the next 5 to 10 years.

- **Accelerate alternative protein research and development**

Governmental financial support is needed to establish and support alternative protein research. Following similar programs from Israel or Singapore, the German Federal Ministry of Food and Agriculture published a first call for research on alternative proteins for small and medium-sized companies.

Promoting knowledge creation and open knowledge sharing at German universities will up-skill valuable researchers and workers, thus accelerating innovation. These funds should go towards establishing dedicated alternative protein departments within universities to tackle the priority areas in the alternative proteins space, setting up grant programmes for researchers and departments and modernising university labs. As an example, the Danish government has earmarked significant funding for research of plant-based (EUR 90 million), and fermentation-based and animal cell-based proteins (EUR 35 million)[18].

Research funding could take the form of a German excellence cluster for alternative protein research, integrating research on production technologies such as fermentation with research on human health implications[19]. Such excellence clusters have been announced recently in the United States, with a $10 million NIH-funded institute for cellular agriculture located at Tuft's University, or the Green Protein Excellence Cluster (GPEC) in Steenbergen and Breda, The Netherlands.

***Case Study 1:*** *An innovation hub for innovative food crops*

There is an urgent need to accelerate plant breeding research programs, to enable transition from classical feed crops to protein-rich, human-edible food crops. Rice, wheat and corn are dominant, globally grown crops, often unable to withstand drought and disease. Protein-rich food crops, including 'dismissed' European crops such as lupine[20] or alfalfa are more tolerant to the effects of climate change and could ensure food provision in the upcoming decades. However, breeding programs are required to elevate taste, e.g., by removing bitter off-tastes. This is similar to previous breeding enhancements of squash, corn or soy[21].

Studies have shown that in order for new food crops to establish themselves on the market, ecosystems need to be created[22]. Governmental funding or financial support is required to foster the necessary ecosystems. As an example, businesses working on novel food crops only become investable once there is a certain base level of supply of products available. Financial support from the German government could help get production over this initial 'threshold' by accelerating the development of both breeding techniques and planting methods, or by supporting access to capital for scaling up of production.

- **Support scale-ups and alternative protein producers with infrastructure financing**

The cost of building commercial-scale food production facilities can be enormous, usually between EUR 10 to 100 million. Traditional food producers usually finance such facilities via bank debt, one of the cheapest capital sources available. Due to the innovative nature of some alternative protein production processes (e.g., precision fermentation), this source of capital is often unavailable to start-ups for their first facility.

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[18] A detailed article by GFI Europe can be found under *https://gfieurope.org/blog/denmark-plant-based-investment-in-climate-agreement/*

[19] A recent example for research on health implications is the SWAP-MEAT study by Prof. Gardner and colleagues (doi: 10.1093/ajcn/nqaa203) which indicated health benefits through a plant-based diet.

[20] Further information is provided in an extensive article by *European Seed* who interviewed public and private seed producers and agricultural institutes: *https://european-seed.com/2021/11/move-over-soybeans-lupin-is-here-to-stay/* (2021)

[21] Enhancing the Flavor of Food through Plant Breeding (2017), published by the U.S. Department of Agriculture

[22] The future of lupin as a protein crop in Europe (2015), a collaborative study by European researchers *(https://doi.org/10.3389/fpls.2015.00705)*

However, off-takers usually demand that construction of the first facility is at least started before signing meaningful contracts with a company. The Venture Capitalists (VCs) who usually finance such start-ups rarely have enough capital available to finance infrastructure. Access to low-cost capital for innovative, commercial infrastructure has thus become a key bottleneck in scaling, not just for alternative proteins, but the whole bioeconomy[23].

Providing German alternative protein start-ups with access to low-cost capital for innovative infrastructure thus offers a tremendous opportunity to enable the national and federal alternative protein industry to deliver sustainable, healthy, tasty food alongside employment opportunities and industry creation. Financing could be implemented via governmental bank guarantees, targeted grants, or governmental loans. Targeted financial support for innovative, sustainable alternative protein infrastructure could be included in infrastructure packages to support economically disadvantaged regions.

[23] Forthcoming publication by Blue Horizon, Synbiobeta, Synonym, and Planetary.

## II. The government needs to support agriculture in transition

*Aim: To facilitate the Protein Transition in Germany on an agricultural level.*

The National Protein Crop Strategy of the German Federal Ministry of Food and Agriculture supports the 'green protein transition', aiming to grow protein crops such as broad beans, lupins or alfalfa on 10% of Germany's land area. The strategy was set into motion in 2021 with a budget of approximately EUR 5 million[24] and the objective of promoting protein crops as feed for organic farming. It is advisable for federal states to expand this program in light of sustainability targets, but also for food security concerns, especially as only 22% of German agricultural area is used to produce food for human consumption, with the rest dedicated to feed (60%), or energy production (14%)[25].

- **Strengthen the 'green protein transition' on governmental level**

A transition from an animal feed-crop based agriculture to an agriculture focussed on providing food crops for human is necessary to advance food security in Germany and Europe. The federal government should ensure that our limited resources are used efficiently in the in the development of a European protein crop strategy and the upcoming revision of the German protein crop strategy and, for example by introducing spatial planning laws (see *Case Study 2*).

***Case Study 2:*** *Spatial planning laws of the Renewable Energy Act*

In the Onshore Wind Power Act, as part of Germany's Renewable Energy Act[26], the government introduced changes to laws on spatial planning and construction, including 2% of Germany's surface area to be reserved for onshore wind power. This accounts for more than twice the area currently designated for land-based wind turbines, which contributed to around 15% of Germany's overall power production [27].

Similar laws could be introduced for areas used for human-consumption food crops to accelerate the transition from animal feed crops. Depending on each state and its unique properties, a certain percentage could be designated to food crops, including repurposing of land currently used for growth of feed crops. Since protein food crops such as pulses need less fertilisers and therefore contribute substantially to soil health, the current soil health of each state could be incorporated into decisions on spatial planning laws. Notably, the Protein Transformation would allow a reduction of Germany's total agricultural area[28].

- **Support farmers through targeted funding as part of the CAP**

The upcoming German 2023 implementation of the EU's CAP provides a rare opportunity to promote cultivation of human food crops. For instance, an area premium could be higher for human-edible, high-calorie, and protein-rich food crops. For instance, Denmark now requires growers to submit purchasing agreements and undergo random checks to receive bonuses as part of a program to promote growth of crops for human consumption [29]

[24] Beans, Peas & Co. - The Federal Ministry of Food and Agriculture's Protein Crop Strategy for promoting the cultivation of pulses in Germany (2021)

[25] Summarised in 'Ernährungssicherheit und Tierhaltung' of the Wissenschaftlicher Dienst des Deutschen Bundestags (2022), document WD 5-3000-068/22, based on data from Statistisches Bundesamt

[26] Summarised in an article by Clean Energy Wire: *https://www.cleanenergywire.org/factsheets/germanys-2022-renewables-and-energy-reforms*

[27] Fraunhofer ISE 2021, 'Installed net power generation capacity in Germany 2002-2021'.

[28] The Intergovernmental Panel on Climate Change's (IPCC) 2022 report 'Impacts, Adaptation and Vulnerability'.

[29] Denmark's funding scheme for plant-based products summarised in an article by the GFI (2021): *https://gfieurope.org/blog/denmark-plant-based-investment-in-climate-agreement/*

**Case study 3:** *Funding program for the 'green energy transition' of farmers*

In 2016, the German government launched a program to support farmers in becoming carbon-neutral[30]. Farmers receive financial support for consultation with experts and subsidies of up to 40% to purchase systems designed to reduce farm emissions, including solar systems. This program runs until 2023 with a total budget of around EUR 160 million.

Similar 'green protein transition' programs could be established to support farmers in transitioning towards growing climate and pathogen-resistant, healthy protein crops for human consumption. Following the advancement of protein crops as discussed in *Case study 1*, financial support needs to be in place to drive change away from classical feed crops to novel food crops possible for farmers. Financial support may take the form of consultation, where farmers are advised on their transition from feed to food crops, or from animal-based to plant-based agriculture. Financial support may also involve subsidies for purchasing of machinery or facility construction.

[30] The 'Bundesprogramm zur Steigerung der Energieeffizienz und CO2-Einsparung in Landwirtschaft und Gartenbau' was established in 2016 by the Bundesministeriums für Ernährung und Landwirtschaft (BMEL).

## III. The government needs to level the playing field on the protein market

*Aim: To facilitate a fair market for both animal-based and alternative products.*

- **Support a level-playing-field and lower cost of healthy, sustainable living through adjustments in taxation**

In Germany, animal-based products such as cow milk are currently subjected to a staple food-specific value added tax (VAT) of 7%, while plant-based milk is taxed at 19%, placing it into a similar taxation range as clothes or furniture.

Decreasing VAT to 7%, or even 0% for alternative protein products, similar to taxation models in other European countries such as Belgium, France, Ireland or Portugal, would support lower costs of living during times of high inflation. Additionally, it would send a clear message to consumers proving accessibility of environmentally conscious food, even during times of economic challenge.

- **Continue to promote clear, consumer-friendly labelling of alternative proteins**

Clear labelling is key to ensuring consumer safety and convenience. In adhering to EU regulations, Germany leads a good example in preventing further restrictions on the labelling of alternative proteins. This labelling is key for driving consumer adoption of alternative proteins, as consumers better understand which part of a meal the products can be used in. It should be noted that alternative protein companies do not intend to deceive consumers – clear labelling as "plant-based" or similar is usually to the producer's advantage as they cater to health- and environmentally-conscious consumers. Maintaining clear and transparent labelling is thus a crucial part of boosting consumer trial and adoption and required for establishing Germany as a leader in alternative protein innovation and production.

- **Mandate environmental impact labelling**

56% of surveyed German consumers stated environmental impact as the top motivator to consume alternative proteins, and a major positive impact on global warming would be the main reason for 26% of the surveyed consumers to completely switch their diet to alternative proteins[31].

Incorporating climate impact into product labels would therefore act as a means to guide consumer behaviour towards more sustainable purchasing. Evaluation of this idea is already ongoing at EU level: The new food sustainability initiative[32] encourages open public discussion on sustainability labelling. Its results will be published in 2023, and depending on its outcome, the EU will define rules on sustainability labelling of food products.

Germany needs to play a key role in this discussion and ensure a transparent and fair labelling process is developed. Importantly, standards need to be kept comparable across different food items, e.g., between animal products and non-animal products of same category, such as steaks or sausages.

[31] The Untapped Climate Opportunity in Alternative Proteins (2022), published by BCG and Blue Horizon

[32] The Sustainable EU Food System Initiative can be found here: *https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13174-Sustainable-EU-food-system-new-initiative_en*

## IV. The government needs to take the lead on the German protein transformation

*Aim: To ensure government agencies' procurement becomes a role model for sustainability.*

- **Align government purchasing with political priorities**

Governmental purchasing provides a tool for consumers to try new, environmentally conscious food in a trustworthy environment, such as at work or in school canteens, and enhances visibility of products on the market. Additionally, making a healthy, plant-based meal the default option on the menu can foster public health and wellbeing Lastly, a shift to plant-based food in federal and state canteens would accelerate progress in reaching the net zero targets of the federal agencies as part of the Bundes-Klimaschutzgesetz[33].

***Case study 4:*** *Governmental purchasing as part of the U.S. National Biotechnology and Biomanufacturing Initiative (NBBI)*

An example of government purchasing as a tool to foster sustainability is the BioPreferred Program of the U.S. government, which drives procurement of bio-based products by U.S. governmental agencies. Recently being endorsed by the National Biotechnology and Biomanufacturing Initiative (NBBI)[34], it also supports training and support for contracting officers, and provides directions to industry about gaps in biobased product options to leverage the market.

In a similar way, the German government could implement the Protein Transformation into its governmental purchasing regulations, to increase mandatory purchasing of alternative protein products by federal agencies.

[33] 'Auf dem Weg zur klimaneutralen Bundesverwaltung 2030', published by the Bundesministerium für Umwelt, Naturschutz, nukleare Sicherheit und Verbraucherschutz (2020): *https://www.bmuv.de/pressemitteilung/auf-dem-weg-zur-klimaneutralen-bundesverwaltung-2030*

[34] Blue Horizon recently published a report on the impact of the NBBI on the sustainable food system industry: *https://bluehorizon.com/insight/how-the-u-s-national-biotechnology-and-biomanufacturing-initiative-nbbi-accelerates-the-creation-of-a-new-sustainable-food-system/*

## 4. Additional policy recommendations at EU level

The Czech Republic, holding presidency of the Council of the European Union until end of 2022, drove sustainable agricultural practices[35] and urged for the execution of the European Green Deal, even in a situation of political and economic challenge[36]. Sweden, who will follow the Czech Republic in 2023, offers an emerging alternative protein landscape including established plant-based companies such as *Oumph!*, part of BH's Live Kindly Collective, and spear-heads agricultural policies[37].

To accelerate the Protein Transformation in Europe, Germany needs to commit to influence regulations at EU level. Germany could strive for a leading role together with aligned European partners, and drive progress on key issues at EU level.

**EU matter 1: Include agriculture in the EU Emissions Trading Scheme**

The Emissions Trading Scheme (ETS) is one of the EU's main tools to reduce GHG emissions, covering around 40% of the EU's emissions including the energy-intensive industry, aviation, and electricity generation[38]. Carbon farming, which describes net carbon removals by sustainable land management[39], could be leveraged by adoption of the ETS, providing growers an additional, sustainable income source. As a following step, animal-based products, accounting for 15% of global GHG emissions, should be included in the EU's carbon market. Extending the ETS to agriculture could provide farmers who are cultivating sustainable, healthy human food crops with additional income, thus fostering a fair and market-driven transformation towards a sustainable food system.

**EU matter 2: Drive progress in 2023 on NBT decisions**

The EU commission is currently reviewing the EU's rules on new plant breeding techniques (NBTs)[40] following a study exploring the novel techniques conducted in 2021[41].

NBTs, used for example by BH's portfolio company *Tropic*, offer substantial benefits for food security and sustainability, while mitigating many of the concerns around older "GMO" (genetically modified organism) technology.

A legislative proposal on NBTs is expected in the second quarter of 2023. It is therefore crucial that the German government formulates an informed and differentiated opinion on NBTs.

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[35] Press release on the meeting of EU agricultural Ministers in Prague in September 2022: *https://czech-presidency.consilium.europa.eu/en/news/agriculture-ministers-in-prague-eu-must-strengthen-food-security-improve-sustainability-of-agriculture-and-promote-the-use-of-modern-techniques-in-agriculture/*

[36] Media article published by Euractiv reporting on a press briefing of the Czech Republic's Agriculture Minister before taking over EU Council presidency in May 2022: *https://www.euractiv.com/section/agriculture-food/news/green-deal-is-not-dead-czech-agri-minister-states-ahead-of-eu-presidency/*

[37] Swedish regulations on NBTs are summarised in a publication by researchers from Universities Bayreuth and Wageningen, two leading institutions on alternative protein research: *https://doi.org/10.1002/aepp.13084* (2020) and has further been analysed by the U.S. Department of Agriculture in their report 'Agricultural Biotechnology Report - Sweden' (2020)

[38] The EU Emissions Trading Scheme: *https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets_en*

[39] Carbon farming as a business model described by the European Council (2021): *https://climate.ec.europa.eu/system/files/2021-12/com_2021_800_en_0.pdf*

[40] Public consultation on the NBT initiative has closed, and a decision is expected in the 2nd quarter of 2023: *https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13119-Legislation-for-plants-produced-by-certain-new-genomic-techniques_en*

[41] European Commission study on new plant breeding techniques: *https://food.ec.europa.eu/plants/genetically-modified-organisms/new-techniques-biotechnology/ec-study-new-genomic-techniques_en*

**<u>EU matter 3:</u> Increase efficiency of regulatory processes to unlock sustainability and health benefits of new products faster**

The EU regulations on novel foods extend to food which has not been consumed prior to May 1997, including (1) agricultural products from third countries, (2) newly developed, innovative food, or (3) food produced using novel techniques. The approval process includes a thorough and evidence-based assessment of safety and nutritional value. The process usually takes at least 18 months but can take up to 36 months or even longer. Once the regulatory authorities approve a novel food product, it can be sold across all 27 EU countries.

Manufacturers of innovative plant-based, fermentation-enhanced products are about to apply for approval under the Novel Food Regulation or are already in the process. One example being products containing protein derived by precision fermentation, used for example in the production of animal-free dairy[42]. While these products are approved and available on the market in e.g., the United States, they await approval in the EU.

In light of the climate crisis, the German government should urge efficiency on the approval processes of food products which offer a substantial impact on reaching net zero. Alternative protein products which are classified as healthy, safe and sustainable must reach the European market without undue delay. Options to ensure a safe and efficient review of all necessary documentation are a rolling review, or parallel review. Rolling reviews are for instance already performed in the United Kingdom.

Increasing the efficiency of regulatory processes could shorten time to market, and thus time to impact, without sacrificing any of the thoroughness that supports the population's trust in the safety of their food. Examples could include a regulatory framework which allows for pre-application consultations between companies and scientific evaluation bodies of regulatory authorities, to avoid procedural delays, or defined timelines for every stage of review to make the process more predictable.

[42] A study exploring the consumer perception of animal-free dairy based on precision fermentation: *https://pubmed.ncbi.nlm.nih.gov/36263302/*, conducted by researchers of one of BH's portfolio companies, Formo in 2022.

About Blue Horizon: Blue Horizon is accelerating the transition to a Sustainable Food System that delivers outstanding returns for investors and the planet. The company is a global pioneer of the Future of Food. As a pure play impact investor, Blue Horizon has shaped the growth of the alternative protein and food tech market. The company invests at the intersection of biology, agriculture and technology with the aim to transform the global food industry. Blue Horizon was founded in 2016 and is headquartered in Zurich, Switzerland. To date, the company has invested in more than 70 companies. Its business model offers an attractive opportunity to invest in the evolution of the global food system while contributing to a healthy and sustainable world. www.bluehorizon.com

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