From Farm to Fork: Policy actions for sustainable and healthy EU diets

The transition to more plant-based diets in the EU is essential for addressing health, environmental, and economic challenges. Current consumption patterns contribute to high levels of non-communicable diseases, biodiversity loss, and greenhouse gas emissions, particularly from livestock production. Yet, demand-side policy interventions remain underutilised across the EU. Research shows that information-based tools, such as food labelling and educational campaigns, show limited standalone impact but can be effective when paired with fiscal and regulatory measures. Nudges, such as food placement and portion adjustments, have demonstrated success in shaping consumer behaviour. Fiscal measures like taxes and subsidies can drive significant change but require careful design to ensure equity and public support. Regulatory tools, including public procurement reforms and marketing restrictions, offer strong potential but remain underutilised.

The Strategic Dialogue on the Future of EU Agriculture proposes a range of actions to facilitate a shift towards more sustainable and healthier diets. Key areas of focus include food labelling, promotion, provision, and pricing, with an emphasis on information instruments and administrative rules related to food provision.

EU-level actions should focus on the following priorities: 1) **Revision of the EU Public Procurement Directive** to prioritise sustainability and health in public food procurement, 2) **Updating EU food labelling legislation** to provide clear, science-based sustainability labels, expanding its scope to out-of-home food providers, such as in restaurants and canteens, and 3) **Developing EU-wide legislation** to regulate marketing to children across all platforms (physical, digital, and TV). Member State should prioritise 1) the development of concrete plans for **providing free school meals** in primary schools, accompanied by educational programs starting from kindergarten to promote sustainability awareness from an early age, and 2) the **implementation of fiscal measures**, such as taxes on less sustainable foods and subsidies for plant-based alternatives.

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Introduction

Unhealthy diets are a leading cause of premature deaths and health conditions in the EU

Food is more than nourishment. It is at the heart of our culture, and identity (Anderson et al, 2016) – sustaining bodies, fostering communities and driving livelihoods. Yet, the very systems that nourish us are a **leading cause of ill health and environmental degradation in Europe**. Unhealthy diets are, after smoking, the leading cause of premature deaths in the EU, due to rising rates of obesity and non-communicable diseases (NCDs), including coronary heart disease, type 2 diabetes, and cancer (European Commission, 2024). This trend is **attributed to diets low in plant-based foods, whole grains, and nuts and high in animal-based and processed foods, saturated fats, sugar, and salt** (e.g. Clemente-Suarez et al, 2023). For instance, while diets vary between European countries and socio-economic groups (Mertens et al, 2019; Alves et al, 2024), recent FAO assessments show that, across the whole of Europe, average meat consumption surpasses recommended levels (FAO, 2023). The FAO (2024) estimates that the global hidden environmental, social, health and economic costs of agrifood systems amounted to approximately $11.6 trillion annually[1]. A staggering 70 percent ($8.1 trillion) are hidden health costs linked to NCDs resulting from unhealthy dietary patterns.

EU food systems drive biodiversity loss, water pollution, soil degradation and contribute to GHG emissions

The impacts of the broader EU food systems on the state of the region's natural resources and greenhouse gas (GHG) emissions are equally profound. Spanning activities from production to waste disposal, **food systems drive biodiversity loss, water and air pollution, and soil degradation** (EEA, 2022), contributing to nearly a third of the EU's GHG emissions (Jensen, 2023). It is estimated that food consumption made up around 49% of the EU's total consumption footprint in 2022, showing an upward trend since 2010 (European Consumption Footprint Platform, 2024). The environmental (as well as social and economic) impacts of our diets are not only felt in the EU but have far-reaching, global effects. According to IPES-Food (2019) more than 30% of the land required to meet EU food demand is located outside Europe.

However, **environmental impacts vary considerably between different types of food**. For example, Eberle and Fels' (2015) assessment of food consumption impacts in Germany found that producing **animal-based foods requires up to eight times more agricultural land** per kilogram compared to plant-based foods intended directly for human consumption. This stems from the feed-to-food conversion losses typically associated with animal protein production. For example, producing 1 kg of plant-based meat alternatives requires approximately 1.3 kg of

[1] The assessment employed true cost accounting (TCA), a methodology that estimates the visible and invisible environmental, social, health and economic impacts and costs of agrifood systems. The study used publicly available data for 154 countries to assess these impacts and drew from an extensive review of existing TCA case studies to estimate their costs. All cost estimates are reported in US dollars, adjusted for purchasing power parity (PPP) in 2020.

arable crops (Kearney, 2020)[2]. In contrast, producing 1 kg of live weight for beef requires 7-10 kg of feed, 4-5 kg for pork, and 2-2.5 kg for poultry (OECD, 2022).Two-thirds of the EU's GHG emissions from agriculture, accounting for around 13% of EU's total net GHG emission (Bognar et al, 2023), derive from livestock production (EEA, 2024)[3].

Shifting to more plant-based diets could reduce negative impacts

Evidence suggests that shifting to more plant-based diets across the EU could significantly reduce these negative impacts of the current food system (e.g. Giosè et al, 2022). An assessment of the effects of lowering meat, dairy and eggs consumption by 25% and 50% in the EU showed substantial reductions in inter alia freshwater and marine pollution, water use, land use, and climate change (Sanye Mengual and Sala, 2023). There is also substantial evidence suggesting that plant-rich diets positively affect bodyweight, and cardiovascular health and might contribute to the prevention of diabetes (Viroli et al, 2023).

Box 1. What do we mean by more 'plant-based' or 'plant-rich' diets?

Plant-based or plant-rich diets feature a high share of whole grains, tubers, legumes, fruits, vegetables, seeds and nuts. They include a moderate consumption of fish, meat, dairy products and their plant-based alternatives (or proteins) that are nutrient-rich and compatible with WHO guidelines on salt, sugar and fat content.

Some replacements are highly processed and may contain high levels of salt and additives; they can be categorised into two groups: classic plant-based proteins and novel protein sources. Classic plant-based proteins are derived from plants, such as legumes, soy, mushrooms, nuts, or jackfruit, and have been available in the market for years in the form of products like seitan, tofu, and tempeh. Novel protein sources, often referred to as "alternative proteins," encompass foods produced using innovative techniques, including precision fermentation and cell cultivation. Examples include proteins derived from insects, animal cells, and plant extracts (Vivideconomics, 2021).

EU policy has underutilised demand-side measures

Consumer studies point towards **a growing number of people reducing their meat consumption** (Smart Protein, 2023) or adopting new dietary behaviours such as flexitarianism (Perez-Cueto et al, 2022) This shift is often driven by **concerns about animal welfare, environmental and climate impacts, or health advice** (Verkuijl et al, 2022). Yet, despite the health and environmental impacts of current consumption patterns, and a growing interest in plant-based diets, the **focus of EU policy has so far been on supply-side solutions** while

[2] These figures are estimates for entirely plan-based meat replacements. The production of 1kg of cultured meat requires around 1.5 kg of soy, peas, maize, and red sugar beets (Kearney, 2020). See Box 1 for an overview of the different categories of meat alternatives.

[3] This figure does not account for the embedded indirect emissions such as feed production.

demand-side policies remain underutilised. The final report of the Strategic Dialogue on the Future of EU Agriculture (2024) acknowledges the essential importance of diets for the transition towards a sustainable agri-food system, for reasons of public health protection, climate, the environment, animal welfare and overall resilience of the agri-food system. It recommends making *"the healthy and sustainable choice the easy one"* and supports the shift from animal-based towards a more plant-based food consumption.

This policy briefly explores the health and environmental benefits associated with a shift towards more sustainable diets in the EU and sets out the wider economic case for the agri-food sector. It provides an evidence-based analysis of the effectiveness of different policy instruments to change dietary behaviours. Against this background, we assess the recommendations from the Strategic Dialogue for facilitating a move towards plant-based diets in the EU.

The benefits of moving to more plant-based diets

International and national dietary guidelines vary, reflecting differing priorities such as environmental protection, nutritional adequacy, and cultural considerations (Tadic, 2024). Despite these variations, guidelines for healthy and sustainable diets converge around the following core principles: ensuring a broad intake of nutrient-rich foods, a minimal amount of processed foods, a high share of whole grains, tubers, legumes, fruits, and vegetables, with a preference for locally sourced options, a moderate consumption of meat, dairy products and alternatives, responsibly sourced fish should be sourced responsibly from certified fisheries, tap water as the primary beverage (Gonzalez Fischer and Garnett, 2016). One example of guidelines for a healthy and environmentally sustainable diet is the Planetary Health Diet (PHD), developed by the EAT-Lancet Commission (2019) (see Table 1)

Table 1. Recommendations of the Planetary Health Diet

Food category	Grams/day
Vegetables	300
Fruit	200
Cereals (Rice, wheat and corn)	232
Starchy vegetables (potatoes and manioc)	50
Dairy	250
Beef, lamb, and pork	14
Poultry	29
Eggs	13
Fish	28
Nuts	50
Legumes	75
Unsaturated fats	40
Saturated fats	11.8
Sugar	31

Dietary patterns in the European Union are characterised by high per capita consumption of animal products, although red meat intake has been gradually declining (OECD-FAO, 2024). In 2023, the average European consumed about 40 kg of pork, beef, and veal annually (OECD, 2024), or around 770 grams per week (Smart Protein, 2023). This significantly exceeds the recommendations of the PHD and most national dietary guidelines, which typically advise limiting red meat consumption to 300–500 grams or up to a maximum of three servings per week. In contrast, 2019 data on daily fruit and vegetable intake in the EU (Eurostat, 2022)[4] indicate that 33% of the population aged 15 and older reported not eating any fruit or vegetables daily, 55% consumed between one and four

[4] Women's daily intake of fruit and vegetables is higher than that of men

portions, and only 12% met the recommended five portions per day.

This pattern reflects significant consumption shifts over the past 50 years. Since 1961, global protein intake from animal products has risen by nearly 30%, while plant protein consumption has declined markedly (Sans and Combris, 2015). As a result, **average global protein consumption now surpasses dietary recommendations in all the world's region**s (Ranganathan et al, 2016). In the EU, current protein intake is approximately 82g per capita per day, with 49g coming from animal sources and 33g from plant-based sources (Simon et al, 2024). The recommended average consumption is 46g of protein per capita per day (EFSA, 2012). Analyses show that diets high in protein are associated with increased cancer risk, liver and renal function disorders, coronary artery disease, and may impact the body's calcium regulation, leading to bone loss and increased risks of fractures (Delimaris, 2013[5]).

The benefits of moving towards more plant-based diets include:

Better health outcomes

Plant-based diets are generally low in saturated fats and dietary cholesterol and rich in fibre, antioxidants, and phytochemicals (WHO 2021; Crimarco et al 2020). A recent review attributes the positive health outcomes observed in studies and trials to these nutritional characteristics. It concludes that evidence suggest a **link between more plant-rich diets and lower rates of cardiovascular disease, reduced cardiovascular mortality, a decreased risk of type 2 diabetes, as well as a lower likelihood of developing cancers** such as prostate, colorectal, breast, and digestive system cancers (Landry and Ward, 2024).

Adopting more plant-based diets could not only improve health outcomes but also significantly reduce public healthcare costs. According to Vandenberghe and Albrecht (2019), the four major NCDs in the EU—cardiovascular disease, cancer, type 2 diabetes, and chronic respiratory disease—account for at least 25% of total health spending. Other estimates suggest an even greater impact, with chronic diseases consuming 70-80% of national healthcare budgets (Kuipers and Quoidbach, 2014). Regardless of these variations, healthcare spending as a share of GDP is expected to rise in the coming years, driven by aging populations, an increase in chronic diseases, and the adoption of advanced diagnostic and therapeutic technologies (EC, 2021).

Finally, reducing the consumption of animal products in diets could further help address concerns regarding the welfare of farmed animals (Guyomard et al, 2021).

Lower environmental and carbon footprints

Reducing meat and dairy consumption, especially beef, and increasing plant-based foods like vegetables and whole grains, **could substantially lower the carbon, water, and land footprints of EU food systems while supporting biodiversity, and decrease water and air pollution** (EEA, 2022). It is estimated that 80% of the nitrogen pollution in European aquatic

[5] Delimaris (2013) reviewed the available evidence on the health risks of prolonged high protein diets to healthy adult men and women; the impacts on children were not covered by the review.

environments and 90% of ammonia emissions[6] from agricultural activities stem from animal production (Peyraud and MacLeod, 2020). One recent analysis concludes that a shift toward the EAT-Lancet's planetary health diet (PHD) in the European Union and the United Kingdom could reduce the EU's blue water use by 4.1 Gm^3 annually, cut GHG emissions by 220 $MtCO_2e$ per year, and enhance carbon sequestration by 17,400 $MtCO_2e$ (Sun et al, 2022). A reduction of livestock production could also free up a large amount of land. Displacing one sixth of meat and dairy with plant-based and novel sources of proteins could result in the release of 21% of domestic farmed area in the EU and 9% of oversees area used for feed imports (Collas and Benton 2024). Since livestock in sustainably managed grazing systems can have substantial benefits including maintaining socio-cultural landscapes and traditions, habitat for biodiversity and contributing to economies in rural areas (Röös et al 2016), these livestock reductions would ideally take place in intensive rearing hotspots to achieve the maximum environmental benefits

A more resilient food system

Research indicates that transitioning to a food system primarily based on plant-based diets **could decrease dependence on imported feed crops**, like soy, thereby **reducing vulnerabilities to global supply chain disruptions** (Hristov et al, 2024). A recent analysis suggests that widespread adoption of the PHD in the EU and the UK could offset disruptions in food production caused by global crises, such as the war in Ukraine (Sun et al, 2022). Moreover, plant-based food systems are more resource-efficient, requiring less land and water than animal-based systems. To illustrate, while livestock takes up most of the world's agricultural land, it only produces 18% of the world's calories and 37% of total protein (UNEP, 2023). This enhanced efficiency could lead to greater self-sufficiency within the EU, reducing reliance on external agricultural inputs, such as animal feed (Albaladejo Román, 2023).

The business case for a shift to more plant-based diets

A business case for a shift to plant rich diets should be built on a broad equation that addresses longer-term commercial and societal benefits and costs. It should address the inherent complexity and undisputable societal importance of agrifood value chains, while acknowledging the threat of unintended consequences from the way we currently produce and consume our food (FAO, 2024). A transition towards more plant-based diets bears the opportunity to **reduce hidden costs that the FAO estimated for Europe at 2.4 trillion PPP US dollars over the year 2020**. Although these hidden costs are inherently complex, these are currently 'paid' by society and often by its most vulnerable actors, such as farmers in rural areas experiencing extreme weather (FAO, 2024). **A shift to plant-rich consumption patterns could avoid future hidden costs** as well, since environmental, social and health challenges are compounding and accelerating over time, driving potential costs for a business-as-usual scenario (Godfray et al., 2010).

As explained above, moving to diets rich in plant-based and low in animal-based foods provides the **opportunity to mitigate and build resilience to a multitude of challenges at once**. A shift to plant-based diets could strengthen health conditions in the EU and prevent premature deaths (Guyomard et al, 2021). It can facilitate to reduce the footprint of European

[6] This figure includes emissions from fertilisers used for feed production.

diets, by reducing environmental impact, saving water during agricultural production, decreasing agricultural land-uptake and carbon footprint, while improving the sector's resilience to climate change effects that already take place (EEA, 2022; Sun et al, 2022). It could decrease the impact on animal welfare and the risk of zoonotic diseases from food production as well (UNEP, 2023).

Besides it's potential to reduce hidden costs, **economic opportunities from plant-based protein diversification** should be explored along agrifood value chains -from farm-level to consumers- to enhance sustainable competitiveness of Europe's agrifood system. Increased demand for plant-based foods could allow European farmers in areas suitable for arable farming to benefit from the opportunity to diversify their business to crop cultivation and break simplified and mono-cultured dominated cropping practices. Crop diversification has substantial economic and ecosystem potential, driven by among others improved yield, soil fertility carbon sequestration, pest control and biodiversity (Ballot et al, 2023). Crop diversification with crops such as legumes can reduce input costs for farmers by lowering reliance on fertilisers (Porto Costa et al, 2023). This will require coordinated efforts by agricultural value chains to overcome barriers caused by lock-ins from major crops and the livestock sector, among others rooted in economies of scale (Revoyron, 2022).

Shifting diets could provide an opportunity for agrifood value chains to **cater to changing consumer needs**. Data suggests a rise in low-meat diets across several European countries, mostly motivated by concerns about animal welfare, environmental and health concerns (Smart Protein, 2023). Recent analyses show that sales from plant-based foods have increased by 6% in 2022, and by 21% since 2020 (GFI, 2023). A study by VividEconomics (2021) estimates that the global market for novel protein products i.e. plant-based, precision fermentation and cellular agriculture) could generate over $740 billion in value by 2040 and up to $1.1 trillion by 2050. Although novel proteins are arguably in an early development stage, they could provide the complementary opportunity to both animal-sourced and plant-based foods as nutritional additive and by upcycling crop by-product inputs for farmers.

An increasing demand for plant-based food could disrupt current livestock farmers and livestock value chains to a certain extent, although livestock is likely to remain part of our food system, among others due to its important role in providing nutrients and utilisation of human in-edible feed (Van Zanten et al., 2023). The key question is how to support farmers and their rural areas to benefit from crop diversification? A first step could be to incentivise the demand for plant-based foods, to **provide farmers with demand for their crop production** and reduce the risk of selling their products to often lower priced animal feed purposes.

Finally, achieving the EU's net zero target by 2050 will require agricultural emissions to drop by an estimated 40–60% by 2040 which can only be achieved by increasing the ambition of the sector's climate actions: emissions are projected to decrease by just 1% with existing measures and 5% with additional actions (compared to 2005 levels) by 2030 according to the EU's 2023 Climate Progress Report. **Stronger policies are therefore likely to be put in place** to accelerate reductions while addressing sustainability challenges like biodiversity loss and soil depletion. Reshaping the Common Agricultural Policy (CAP) to provide more adequate financial rewards to farmers delivering environmental services – as recommended by the Strategic Dialogue on the Future of EU Agriculture - could offer farmers a stable income. Introducing a market mechanism, such as an Emissions Trading System (ETS) for agriculture,

could provide additional funding, making sustainable practices more financially viable. Potentially, these policy changes **could make conventional livestock farming less attractive while incentivising climate-friendly alternatives.**

Demand-side policy measures: Effectiveness, limitations, and implementation challenges

Behavioural change is considered crucial for achieving a sustainable food system, yet the methods to drive such change remain contested. Past efforts to influence food consumption behaviours have often focused on the individual through educational initiatives, such as informational campaigns. However, **food choices are not driven solely by personal preferences** and these assumptions are increasingly criticised for their overly simplistic view of the factors shaping consumption behaviours (Soneryd and Uggla, 2015; Eckhardt and Dobscha, 2019). There is growing recognition among researchers, policymakers, and practitioners that **choices and consumption patterns are significantly influenced by food environments**, which encompass the physical, economic, political, and socio-cultural contexts in which individuals interact with the food system. (e.g. EEA, 2022, FPC, 2022).

Advocates of food environment approaches argue that the context in which food is accessed, marketed, and consumed, needs to be fundamentally restructured to facilitate healthier and more sustainable choices. For policymakers, this involves **creating policies that minimise triggers for unhealthy eating**—such as the marketing of unhealthy foods and oversized portions—while increasing opportunities for healthier, more sustainable dietary behaviors (FPC, 2021). This highlights several **entry points for designing policy interventions**, and the range of information-based, market-based, regulatory, and nudging tools which can be deployed to shape food consumption behaviours (see Figure 1).

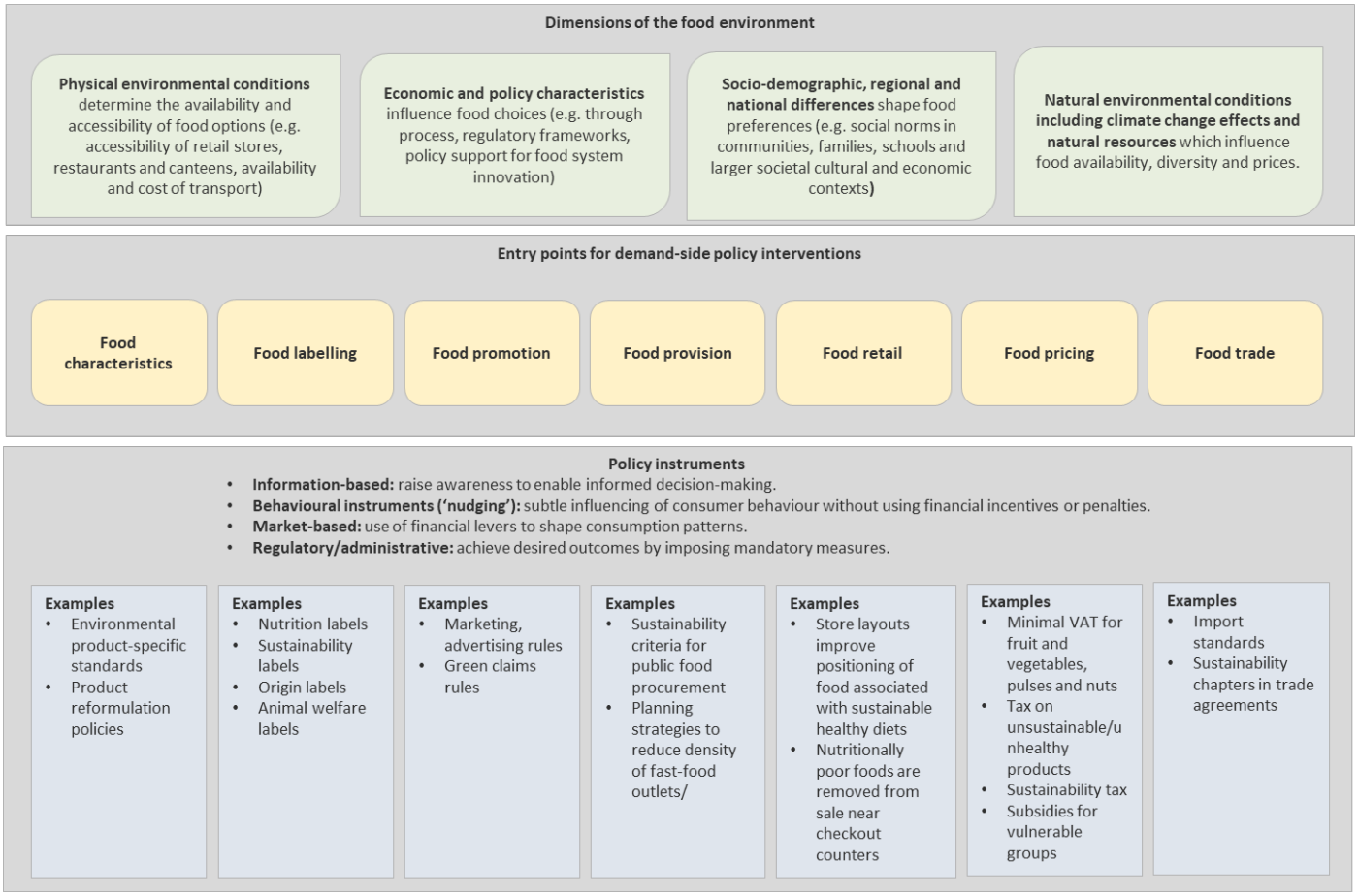
Research suggests that the effectiveness of different types of instruments in promoting sustainable food consumption varies significantly. The following measures are discussed below: information-based instruments, labels, nudging, market-based instruments, and regulatory and administrative instruments.

Studies evaluating **information-based instruments**, such as food labelling and educational **campaigns**, report **mixed results**. Campaigns like "Eat Five Fruits and Vegetables a Day" have modestly increased consumption, whereas others, such as "Meatless Monday," have shown inconsistent long-term effectiveness (Guyomard et al, 2021). Schleicher and Töller (2024) argue that campaigns may need to be repeated and sustained over longer periods to achieve success. These examples also suggest that the type of food product being targeted can influence the effectiveness of information campaigns.

Insights into the **effects of labels are similarly mixed**. Individual studies highlight the potential of labels to influence purchasing behavior, such as increased demand for certified milk (Elofsson et al, 2016) or reduced sales of meat dishes (Slapø and Karevold, 2019). However, these successes are not universal, as consumer knowledge and preexisting attitudes toward sustainability often shape label effectiveness (Grunert et al., 2014). Research indicates that the **impact of labels frequently varies across demographic groups, with women, higher-income consumers, and those with higher education generally responding more positively**. This underscores the risk of exacerbating inequalities if label designs fail to address

differing levels of consumer understanding (Lobstein et al., 2020). Complex or overloaded labels, especially those incorporating multiple dimensions, can confuse consumers (Gadema and Oglethorpe, 2011; Moon et al., 2016). A notable positive side effect, as reported by Russo et al. (2020), is the influence of labeling on industry practices. **Companies often reformulate products to meet labeling requirements**, thereby improving nutritional and environmental outcomes.

Figure 1. Food environment dimensions, entry points for policy action and types of policy instru-



Sources: author's own compilation based on Ammann et al, 2023; FPC, 2022, EEA, 2022.

Nudging approaches aim to influence behaviour through subtle cues or positive reinforcement. Nudges, such as changing food placement or adjusting portion sizes**, have been found to increase healthy food choices in several studies** (Temme et al, 2020). For instance, research assessing the impact of making vegetarian options more visible and accessible in restaurants has been shown to increase their selection (Kurz, 2018). Nudges aimed at promoting sustainable diets, such as encouraging the consumption of meat alternatives, show promise but produce mixed outcomes (Zhou et al, 2019). A systematic evidence review by Blackford (2021) shows that **gender, sensory appeal, attractiveness, and dish type play a crucial role in the effectiveness of these types of interventions**. Developments in digital technologies open new opportunities to tailor these interventions to specific demographics and even individuals. However, these innovations come with various challenges: high implementation costs, ensuring message credibility, and the potential for manipulation (Cadario and Chandon, 2019).

Market-based instruments, such as **taxes and subsidies**, are widely recognised as **effective in influencing consumer behaviour**, especially when targeting products with negative environmental or social externalities. However, their success is c**ontingent on factors such as tax rates, targeted categories, and the broader design of the policy** (Schleicher and Töller (2024)). For instance, in Mexico, a 10% tax on sugary drinks led to a 12% reduction in purchases (Temme et al, 2020). In contrast, the impact of price increases on meat consumption remains less clear. Studies suggest that VAT hikes on animal products, such as the abolition of VAT concessions on meat in Germany, could reduce consumption by up to 6%, potentially leading to a 5.4-Mt CO2eq reduction in GHG emissions. Other studies estimate that meat consumption could decline by 11-12% (Schleicher and Töller, 2024).

In some cases, **taxes have also shown the potential to encourage food reformulation across manufacturers** (Burgaz et al, 2023). Taxation of specific food products, however, tend to have a **stronger effect on price-sensitive groups**. To mitigate such impacts, compensatory measures, such as increasing government transfer payments or offering free school meals, are recommended. Placing non-differentiated taxes on targeted products—such as a uniform price increase across all meats—poses another risk as it can have the counterproductive effects of consumers turning to cheaper, lower-quality meat, undermining any reduction in overall meat consumption. As a result, policies should consider exempting organic meat from tax hikes or offering higher subsidies for more sustainable options (Schleicher and Töller (2024).

Environmental taxes, including those focused on food GHG emissions, **show promise in reducing emissions, with broader tax scopes leading to greater reductions** (Bonnet, 2018; Springmann et al, 2017). One challenge with broader sustainability taxes is their complexity. These taxes require accurate calculations to add a fixed amount to the price of products, and prices need to be regularly adjusted according to overall price developments. If the tax levies are too small, farmers, food processors, and retailers may absorb the cost, or consumers may not notice the price increase Furthermore, if taxes on certain products are not carefully calibrated, they **may push producers to lower prices or pass on the cost to other products** (Schleicher and Töller, 2024).

Subsidies, **particularly for fruits, vegetables, and plant-based foods, have been shown to be effective in improving the accessibility and affordability of healthier foods** (Frelih Larsen et al, 2024). However, the overall dietary impacts of subsidies remain unclear, and subsidies are **most effective when combined with taxation measures**. In some cases, subsidies can lead to perceptions of unfairness, especially if they are restricted to certain products or consumer groups. Furthermore, reductions in VAT for healthier foods, such as fruits and vegetables, **may not always be passed on in full by retailers or could be offset by higher net prices**, reducing the overall impact of the policy (Schleicher and Töller, 2024).

Regulatory and administrative instruments often result in the strongest behavioural impacts (Ammann et al, 2023). Public procurement rules, such as policies in schools and public spaces, aim to increase the availability of healthy foods while reducing unhealthy options. Effective examples include the school lunch programs in Norway, the UK, and England, which have led to reduced intake of sugar, salt, and saturated fats (Temme et al, 2020). In general, **food provision policies are promising approaches to reducing micronutrient deficiencies while addressing issues like obesity** (Burgaz et al, 2023). Denmark's organic public procurement strategy, launched in 2012, shows that healthier and more sustainable meals can

be delivered without increasing operating costs when supported by capacity building, value chain collaboration, and the active involvement of kitchen staff (Holmbeck, 2020), conclusions, that are also evidenced by examples reported by Jones et al (2016). **Marketing regulations, such as advertising bans** on unhealthy food, especially those high in fat, sugar, and salt, have also **proven effective in reducing children's exposure to unhealthy food marketing**. However, comprehensive marketing restrictions are still limited in Europe, and voluntary industry measures tend to be less effective than government regulations (Temme et al, 2020).

Evidence suggests that **policy mixes are more effective than standalone interventions**. For example, pairing taxes on unhealthy or environmentally harmful foods with subsidies for healthier options, like a tax on red meat combined with subsidies for fruits and vegetables, can guide consumption patterns (Tadic, 2024). Adding nudges such as better food placement and simplified labelling enhances effectiveness by increasing consumer awareness and shaping social norms (Temme et al, 2020). Product bans, like sugary beverage bans in schools, coupled with subsidies, can shift food environments and behaviours (Ammann et al, 2023). Information-based tools, such as educational campaigns and labelling, often have limited impact when used alone but are more effective when paired with pricing mechanisms or mandatory measures (Temme et al, 2020).

Finally, as the previous sections demonstrate, changing **food consumption behaviours presents significant challenges due to the complex interplay of social, cultural, and personal factors,** such as education, knowledge of sustainability challenges, and income. Guyomard et al. (2021) further highlight that food choices are deeply tied to identity, making interventions aimed at altering these behaviours politically and socially challenging. Research shows that consumer reactions to policies vary based on the food category (Tadic, 2024) with efforts to affect a reduction in meat facing particular high levels of resistance due to deeply ingrained preferences and habits (e.g. Milford and Kildal, 2019).

Enhancing EU demand-side policies

A 2022 assessment by the EEA concluded that **current EU policies are failing to promote a shift towards sustainable food consumption**. They explain that the (limited) demand-side measures provided under the CAP are cancelled out by a financial support system that continues to favour conventional, high-input agriculture, making sustainably produced food less affordable and accessible. Despite measures like the EU organic label, conventional foods remain cheaper and more widely available.

The **'Farm to Fork' (F2F) strategy announced a broad suite of policies** targeting the entire food value chain, with an emphasis on consumption and waste reduction. This included several **information-based interventions**, such as front-of-pack labelling, certifications, and nutrient profiles, designed to encourage healthier food choices and limit the intake of unhealthy products. These initiatives built upon existing EU regulations concerning food information, traceability, and safety, such as the General Food Law of 2002, and the organic label (EEA, 2022).

The EEA (2022) concluded that, while these kind of information-based instruments are crucial, **there is a recognised need for stronger fiscal policies to support the shift to sustainable food consumption**. A positive change in this regard are the recent **legal changes in the EU's VAT directive**, now allowing the abolition VAT on fruits, vegetables. Another positive recent

development is the **EU Code of Conduct on Responsible Food Business and Marketing Practices**, launched in 2021, with the goal of promoting healthy and sustainable consumption patterns. Both individual companies and EU or national food associations can sign up to the code, and by March 2024, it had 141 signatories (European Commission, 2024). However, the code is broader and less specific than originally envisioned in the F2F strategy and relies on self-regulation and voluntary commitments which is likely to reduce its effectiveness (EEA, 2022).

As it stands, **several of the F2F initiatives remain pending**. A legislative framework for sustainable food systems (FSFS), announced for 2023 never materialised despite a public consultation having taken place in 2022. Similarly, the legislation on nutrient thresholds, initially scheduled for 2022, and minimum criteria for sustainable public procurement of food announced for 2023, have not been put forward. Progress on food labelling initiatives has also stalled. Revised rules on front-of-pack nutrition labelling, origin indications for certain products, and "use by" and "best before" date markings, all announced for 2022, have not been submitted. Likewise, the proposal for sustainability labelling of food products, scheduled for 2024, has yet to be presented (EPRS, 2024).

Actions proposed by the Strategic Dialogue on the Future of EU Agriculture

The recently concluded Strategic Dialogue on the Future of EU Agriculture explicitly states that *"The shift towards balanced diets that are healthier and more sustainable is essential for a successful transition"*. It sets out a broad range of actions, directed to the Commission, Member States and other food system actors. Figure 2 provides an overview of the Strategic Dialogue's recommendations on demand-side actions, organised by the policy entry points described earlier (see Figure 1). Broader strategic recommendations that could influence dietary patterns, such as developing an EU Action Plan for Plant-based Foods and ensuring coherence between agri-food promotion policies and other objectives, such as healthy eating guidelines and sustainability goals, are not discussed further here.

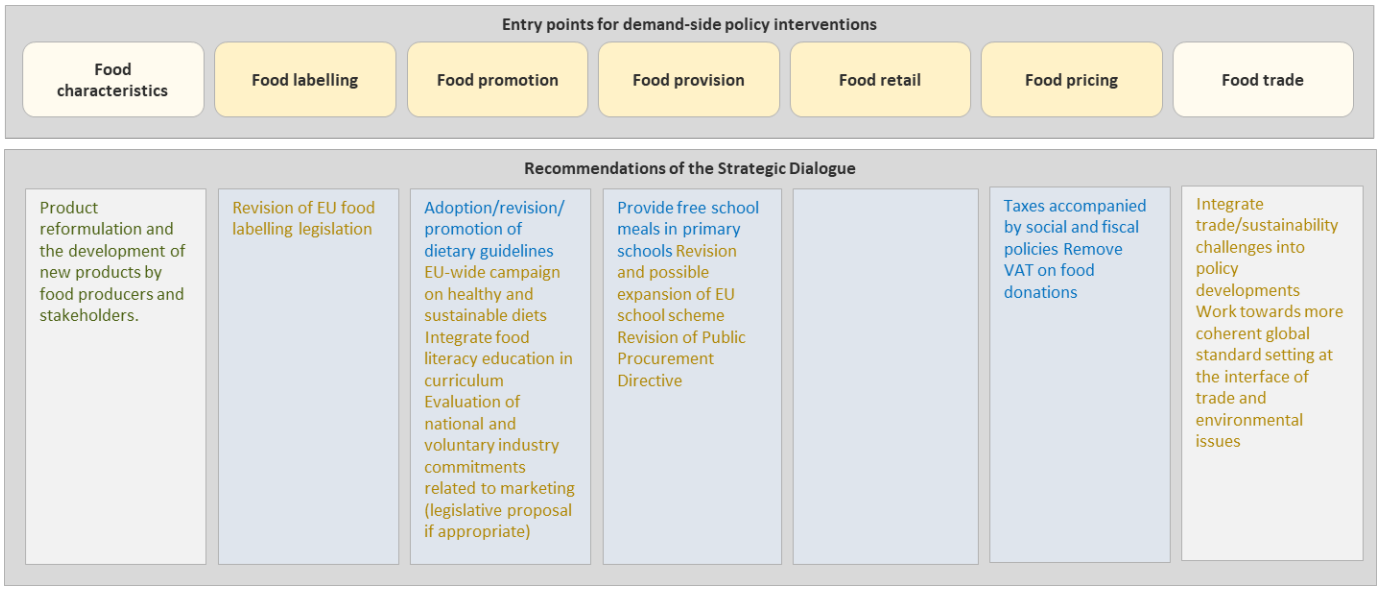
The mapping shows that the **suggested actions primarily focus on food labelling, promotion, provision, and pricing**, with no recommendations targeting the food retail sector. Analysing the proposed actions, it is evident that the EU prioritises areas within its competence, such as public procurement and labelling, by pushing for the creation or revision of legal frameworks. However, in areas such as taxation, where the EU has limited jurisdiction, the proposed actions often lack specificity and depend on Member States for implementation. In such cases, the EU institutions could support Member States through coordinating and aligning efforts, for example through expert platforms, helpdesks or other forms of facilitation.

Areas for further action include the promotion of food online. For instance, EU digital marketing regulations could be revised as proposed by the European Commission's Group of Chief Scientific Advisors (2023). The recommended revision of EU food labelling legislation could expand its scope by developing labelling requirements for out-of-home food consumption, such as restaurants and canteens. The retail sector offers further opportunities for action: the EU might consider encouraging Member States to define targets for the ratio of plant-based

to animal-based products offered by retailers[7], to establish regulations on the placement of food items in retail spaces or propose other nudging strategies to promote sustainable choices.

Finally, it is important to note that while several recommendations directed at the EU level include proposed revisions to legal frameworks, **most actions focus on informational measures** rather than "hard" policy interventions that are likely to have a greater impact. Table 2 outlines. actions designed to enhance the effectiveness of the Strategic Dialogue's recommendations for demand-side interventions.

Figure 2. Recommendations from the Strategic Dialogue on demand-side actions, categorised by policy entry points*



*Colour code: EU-level actions, Member State actions, actions to be taken by other stakeholders, NB: Policy instruments related to food characteristics and food trade were not covered in detail by the analysis in this paper and are therefore not addressed here.

[7] Several retailers have already committed to increasing the share of plant-based proteins in their outlets according to madre brava (2023).

Table 2. Recommendations of Strategic Dialogue and actions proposed to maximise their effectiveness

Recommendations of the Strategic Dialogue	Expected impact*	Recommendations to maximise effectiveness
Provide free school meals in primary schools, accompanied by educational programs starting from kindergartens and schools.	high	Ensure that free school meals prioritise plant-based options. Incorporate hands-on sustainability education into school curricula, such as gardening programs and cooking classes, to create long-term behaviour change. Establish monitoring frameworks to track dietary improvements and environmental impact.
Examine whether the EU school scheme could be expanded to play a more significant role in promoting the transition toward healthier and less resource-intensive diets from an early age.	low	Should be combined with action #1 (above).
Adopt or update (if already existing) food-based dietary guidelines (FBDGs) to integrate sustainability. Develop strategies to encourage consumer adherence to diets aligned with guidelines.	low	Ensure that FBDGs are, tailored to cultural and regional contexts, to enhance public acceptance and adherence. Pilot programs to measure adherence rates and refine FBDGs and communication actions accordingly. Align public procurement rules and plans for provision of free school meals with FBDGs to increase their effectiveness.
Additional actions to motivate consumers toward healthier and more sustainable diets, for instance via a Europe-wide awareness campaign.	low	Moderate long-term behavioural changes possible if tailored to different target audiences with regular activities over a longer timeframe. Prioritise health over sustainability in messaging. Ideally combined with other actions, such as launch of new label or free school meals.
Conduct a comprehensive review and, if necessary, update EU food labelling legislation to provide consumers with trustworthy, comprehensive, EU-wide, science-based, comparable, and transparent food labelling enabling informed choices about key sustainability aspects of food, including animal welfare, while considering the feasibility for operators. The use of digital means could support the provision of voluntary information to consumers.	moderate	Collaborate with consumer groups, industry representatives, and sustainability experts to develop labels that balance clarity, accuracy, and feasibility for food producers/processors. Include menu labelling in the scope of the revised regulation. Combine labels with awareness campaigns to improve consumer knowledge about sustainability. Develop targeted communication strategies to bridge gaps in understanding, particularly for lower-income and less-educated consumers, to avoid exacerbating inequalities. Implement systems to regularly assess the effectiveness of labels in driving sustainable purchasing behaviour and improving product reformulation. Use insights to refine designs and messaging. Encourage industry adoption through incentives, such as subsidies for reformulating products to align with labelling criteria, or by introducing regulations that set minimum sustainability requirements for labelling eligibility.
By 2026, publish a report evaluating the effectiveness of current national measures and industry voluntary commitments related to the marketing of foods high in fat, sugars, and salt to children, both offline and online. Where appropriate, this report should be accompanied by a legislative proposal.	high	Develop EU-wide legislation to regulate marketing to children across all platforms (physical, digital, and TV). Revise the Audiovisual Media Services Directive to address gaps in current marketing regulations.

Recommendations of the Strategic Dialogue	Expected impact*	Recommendations to maximise effectiveness
Provide fiscal tools that promote coherent price signals, such as tax reductions on more sustainable products while, where possible, safeguard food affordability for lower-income consumer segments through social and fiscal policies.	high	EU has no mandate for tax but EU-wide coordination on pricing instruments like VAT changes, meat taxes, or climate labels could enhance effectiveness. Support Member States in implementing fiscal measures by offering technical guidance. Combine fiscal policies with educational campaigns to maximise consumer uptake of sustainable options.
Remove VAT on food donations to encourage donations to food banks and other social organisations that distribute food for free to their beneficiaries.	low	Limit to healthy and sustainable foods to avoid negative health effects on vulnerable population relying on food banks.
Propose a revision of Directive 2014/24/EU on Public Procurement removing the possibility for Member States to use the lowest price criterion alone as the determining factor for awarding tenders in essential services and labour-intensive industries. Enshrine "best value" approach instead, which rewards quality, including the sustainability of the food to be provided. Include a framework for Member States to progressively increase the procurement of sustainable food, based on common standards that cover the environmental, social, animal welfare, nutrition, and economic aspects of the food system. Measures should be accompanied by adequate financial and technical support for public buyers, including training for staff handling and preparing food in public settings, as well as guidance and training for public tender adjudicators.	high	Revised revision should refer to (regularly updated) national dietary guidelines as basis for procurement rules and should set out minimum procurement targets and criteria related to e.g. organic products, climate impacts or animal welfare[8]. Make supporting measures (e.g. on training) a requirement of the revised directive.

*Expected impact as a stand-alone intervention. Effectiveness is likely to increase when combined with complementary measures.

[8] See FPC (2022) for proposed sustainability criteria for public canteens.

Conclusions and recommendations

Urgent action is required to reduce greenhouse gas (GHG) emissions from agriculture, address environmental degradation, and improve unhealthy dietary patterns across the EU. Achieving these goals on a large scale within the coming decades will necessitate aligning changes throughout the food system, from farm to fork. **Shifting toward more plant-based diets offers multifaceted benefits,** including improved public health, reduced environmental impacts, and the creation of new economic opportunities for the agri-food sector, which must adapt to climate change.

Despite these potential benefits, **demand-side policies remain underutilised across the EU**. Research shows that effectiveness of different policy instruments in promoting sustainable food consumption varies, highlighting the importance of a balanced and well-designed policy mix. Information-based instruments and labels, while valuable, have shown mixed results. Nudges, such as adjusting food placement or portion sizes, have proven effective in encouraging healthier and more sustainable food choices. Market-based instruments, including taxes and subsidies, can also play a significant role, particularly when used in combination. However, their success depends on careful policy design to avoid perceptions of unfairness. Regulatory and administrative instruments have demonstrated the potential to drive substantial behavioural change, though their application remains underexplored.

The Strategic Dialogue on the Future of EU Agriculture proposes a range of actions to facilitate a shift towards more sustainable and healthier diets. Key areas of focus include food labelling, promotion, provision, and pricing, with an emphasis on information instruments and administrative rules related to food provision.

EU-level actions should focus on the following priorities:

- **Revision of the EU Public Procurement Directive** to prioritise sustainability in public food procurement.
- **Updating EU food labelling legislation** to provide clear, science-based sustainability labels. This revision should expand labelling requirements to cover out-of-home food consumption, such as in restaurants and canteens.
- **Developing EU-wide legislation** to regulate marketing to children across all platforms (physical, digital, and TV), including revising the Audiovisual Media Services Directive to address gaps in marketing regulations.

At the Member State level, the following immediate actions should be prioritised:

- **Implementing fiscal measures**, such as taxes on less sustainable foods and subsidies for plant-based alternatives.
- **Providing free school meals** in primary schools, accompanied by educational programs starting from kindergarten to promote sustainability awareness from an early age.

For areas outside the EU's direct competence, EU institutions should consider supporting Member States by coordinating and aligning efforts through expert platforms, helpdesks, or other facilitation mechanisms. Such initiatives could play a crucial role in engaging the retail sector in the transition toward sustainable diets.

Finally, while this brief focused on the consumer side, the **necessary dietary shifts will need to be accompanied by changes on the supply side**, particularly in livestock production, **and the development of robust supply and value chains** for plant-based proteins (Manners et al., 2020). Governments play a pivotal role in supporting these changes by setting ambitious targets, e.g. for emission reductions in the agricultural sector or an increase of domestically grown protein crops. and providing financial support to incentivise farmers for example through an emissions trading system for agriculture (Bognar et al, 2023).

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