



# Turning sustainability trade-offs in the food system into opportunities.

## Healthy diets, a sustainable Europe – Key messages from the SUSFANS project

### About SUSFANS:

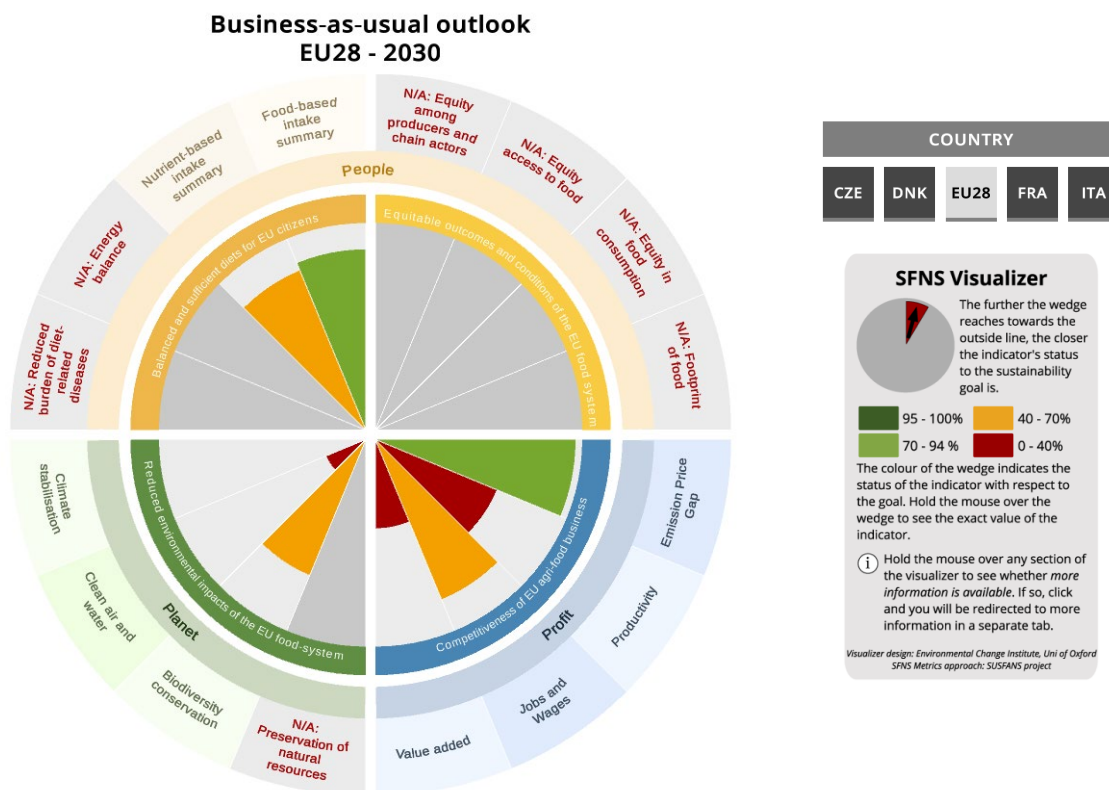
Based on the main findings from the research project SUSFANS, this policy brief presents recommendations for policy reform and innovations that contribute towards solutions for health, the environment, equity and enterprise. This brief has benefited from discussions with stakeholders on March 7, 2019, Brussels.

SUSFANS (Metrics, models and foresight for sustainable food and nutrition security in the EU) has developed tools for assessing the sustainability performance of the EU food system, and created foresight on future diets, food production, and sustainability impact. SUSFANS worked in and with four case study countries that represent the diversity of food systems and diets in the EU: Czech Republic, Denmark, France and Italy.

### SUSFANS major findings:

- An integrated assessment of the sustainability performance of the EU food system includes nutrition & health, and social, economic and environmental sustainability domains.** Sustainability of the EU food system requires: balanced and sufficient diets, reduced environmental impact, equitable outcomes and conditions and viable agri-food business. See figure 1.

**Figure 1. SUSFANS Visualizer – The Sustainability Performance of EU Food Systems**



Source: SUSFANS Foresight report [3]. For documentation on methods & data, <http://susfans.eu>

2. **The sustainability performance of EU food system is qualified as “insufficiently future-proof” (Figure 1).**

Diets in the EU have to become more environmentally and economically sustainable, as well as more healthy and nutritious. The environmental imprint of EU food production systems is too large – although EU ranks high in a global comparison of technical efficiency.

3. **EU food consumption and production compromise nutrition and environment.**

If Europeans would consume 200 kCal less energy from food, it will reduce diet-related disease burdens and possibly 9-10% of global land use and greenhouse gas emissions from the diet. Environmental benefits in the EU are much smaller due to international trade in agriculture and food products.

4. **Economic sustainability and social justice are under pressure in the EU food system.**

For many dimensions of equity and social justice, policy information on the performance of food systems in the EU is missing.

5. **Transformation is due: Agenda 2030 provides opportunities for moving the EU food system from quantity-driven to quality-driven.**

In an ageing and wealthier future Europe, new windows appear for sustainable food. This provides opportunities for a systems transformation involving consumption, distribution, trade and production in the EU.

SUSFANS main policy recommendations:

- Develop an **EU policy protocol to monitor** the health and sustainability impact of food consumption and intake.
- Better **enable market decisions that support a transformation** to sustainable and healthier food supply and consumption
- Employ **intervention strategies which involve experimentation, market intervention and social innovations.** Instruments with impact on consumption and production should be combined and maintained long term.
- **Reconnect different policies,** under an aligned multi-level and multi-dimensional **food policy framework in the EU and Member States** for a sustainable Europe

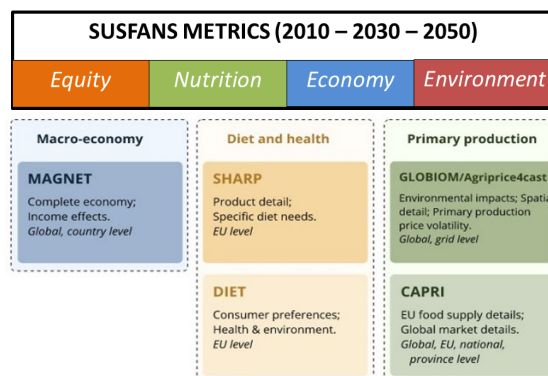
The SUSFANS framework can enable evidence-based decision-making on such integrated food visions and policies, and support the direction of R&I and international collaboration needed to implement such policies.

**About the SUSFANS approach**

**SUSFANS presents a novel approach to deliver quantitative foresight on diet change, policy and production system innovations, and assess the sustainability performance of the EU food system:**

- Include EU-specific nutrition surveillance data (i.e. individual food intake) in a **framework for integrated multi-criteria assessment of the EU and global food system,** benchmarking national data against a reference sustainable, healthy diet for EU.
- **Modelling the entire system,** including post-harvest food handling & distribution, global trade, natural resource use, food loss and waste, and impacts on diets, environment, economy and equity.
- **Exploring instruments and transformative pathways incl. economic sustainability and equity.**

**SUSFANS Modelling toolbox (source [7]):**



## Scientific underpinning of the main results and recommendations

### Unique contribution of SUSFANS:

SUSFANS makes operational how to integrate nutrition, health, environmental sustainability and social justice into a single framework for sustainable food production and consumption.

The food system in the EU emerges from the web of interactions of citizens and consumers with food retail, food services, industry, trade and handling, primary producers, input providers and regulators [1]. Novel entry points for system change can be found when taking

the perspective of citizen-driven and consumer-centric solutions.

Data and modelling tools are assembled to assess the performance of food systems for the EU and member states in a global setting. A stakeholder group endorsed the framework as tool to discuss integrated policies and strategy.

SUSFANS uses this framework to inform how research and innovation can inform multi-level policy coordination between EU and member states – while adhering to the cultural and national sensitivities of food choice and policies that apply to food.

**Table 1. Sixteen indicators on which to assess the sustainability of the EU food system**

Performance Metric	Interpretation
<b>Policy goal: Balanced and Sufficient Diets for EU citizens</b>	
1. Food-based dietary guidelines	How well do Europeans eat compared to recommended diets?
2. Nutrient recommendations	How well are the nutrient recommendations met through what food Europeans eat?
3. Energy Balance	How well do Europeans eat in terms of not consuming too much, avoiding overweight and obesity?
4. Disease burden	What do European diets mean for diseases such as cancer, diabetes and heart failure, which are major causes of illness and death?
<b>Policy goal: Reduced Environmental Impacts of EU food system</b>	
5. Climate Stabilization	Is European food production climate-smart?
6. Clean air, soil and water	Is the food produced in Europe produced without polluting the soils, air, and water?
7. Biodiversity conservation	Can we avoid adding pressure (due to the food we eat) on the genetic and functional diversity of species on our planet?
8. Preservation of natural resources	Is the food system in Europe respecting the scarcity of natural resources such as water, soil fertility and fish stock?
<b>Policy goal: Viable EU agri-food business</b>	
9. Value added and trade	How does agri-business compare to others, in terms of profitability and competitiveness in international trade?
10. Jobs and wages	How does agri-business compare to others, regarding job creation and wages?
11. Productivity and Innovation	How does agri-business compare to others, regarding productivity and innovation capacity?
12. Emission price gap	How far off is the market price because it does not account for carbon emissions?
<b>Policy goal: Equitable outcomes and conditions of EU food systems</b>	
13. Equity amongst food chain actors and producers	How do food choices made in Europe affect people working to produce that food elsewhere?
14. Environment for equitable food access	Are the (legal) rights of people to food, health and wellbeing ensured throughout the food system?
15. Food consumption and nutrition	Are health and nutrition outcomes equitably distributed across the population?
16. Environmental Justice	Is the environmental burden of food produced globally for European citizens distributed equitably?

Source: SUSFANS [6]

## Major findings:

**1 An integrated assessment of the sustainability performance of the EU food system should include nutrition & health, social, economic and environmental sustainability domains. The research indicates that diets in the EU have to become more environmentally and economically sustainable, as well as more healthy and nutritious.**

The EU food system should deliver: **balanced and sufficient diets, reduce environmental impacts, viable business and jobs, and equitable outcomes and conditions** [6]. This is the vision that was developed by a diverse group of stakeholders and SUSFANS researchers throughout the project.

**Different actors** in the food system have **different views** on how to manage the trade-offs in the food system, e.g. between a healthier and more sustainable diet. These **differences can be turned into opportunities and drivers of change.**

For example, the **perspectives from EU citizens on sustainable consumption differ** widely across the SUSFANS study countries **Czech Republic, Denmark, France and Italy.**

**SUSFANS developed a multi-layered index of sustainability metrics for the assessment of the EU food system, food security and dietary habits.** The index is composed of 16 performance metrics, each made up of several underlying indicators. The top level of information in the index is provided in Table 1.

**2 The sustainability performance of EU food system is qualified as "insufficiently future-proof" and policy, research and innovation should focus more on sustainable food systems.**

**From the 16 indicators of sustainability performance developed by SUSFANS, 8 have been quantified for 2030,** compared to a policy target and plotted on a continuous scale between 0 (worst performance) and 100 (performance is on target). **The quantification approach makes use of the SUSFANS toolbox, a suite of advanced global modelling tools and EU-specific foresight scenarios** [3,7], see insert on page 1. Results are shown for a business-as-usual scenario. At

the level of EU28, the metrics in the range of 70-100 are emission per unit price gap (93) – which reflects the very high rank of EU in a global comparison of carbon efficiency per unit – and food based intake (75) which is the gap between food intake and the EU-wide reference for a healthy diet; metrics in the range of 40-70% are nutrient-based intake (69), job creation (69) and biodiversity conservation (49); metrics in the range of 0-40 are productivity (39), value added (17) and clean air & water (3), climate stabilization (0.1). **On the basis of these outcomes, the sustainability performance of the EU food is qualified as insufficiently future-proof.** A further strengthening of performance is required. In a global comparison – not fully applied in SUSFANS – the challenges for improving food systems outcomes in the EU (e.g. reducing emission intensity of production, or diet-related disease burden), may be less dramatic than other regions, yet this warrants further examination.

**3 EU food consumption and production reveals nutrition and environment trade-offs which can be turned into opportunities for change. This would require a systems transformation involving food consumption, distribution, trade and production in the EU.**

The index allows an exploration of performances in more detail, i.e. by **unpacking EU averages at the level of member states and the sustainability dimensions into sub-indicators.**

**Current nutritional patterns are imbalanced, resulting in a substantial but avoidable burden of diet-related diseases** such as heart disease and cancer.

**The nutritional assessment in SUSFANS uses an innovative European-wide approach** to evaluate the healthiness of dietary intake at the national level. Our approach deviates from a reference diet as done in the recent report of the EAT Lancet Commission (Willett et al. 2019). Instead it makes use of common EU-wide food-based dietary guidelines (FBDG) based on the various national FBDG.

**The FBDG is combined with an index metric for three components of a balanced and sufficient diet** at population level: food-based and nutrient-based adequacy, and energy use (BMI). The index has been quantified for the four SUSFANS case study countries (Czech

Republic, Denmark, France and Italy) using national nutrition surveillance data collected between 2003 and 2008. Caveats apply to the interpretation of the data, due to the differences in data collection and the availability of more recent national surveys. (See note at the end of the brief.)

**Overweight rates are problematic across the countries.** Approximately half of the Czech population (52%) was overweight (i.e. BMI of 25 kg/m<sup>2</sup> or more), whereas overweight in Denmark (43%), France (39%) and Italy (36%) was less prevalent. Intakes levels exceed energy requirements in different degrees across these countries.

**In all countries, intakes were low for legumes (< 20 g/day), and nuts and seeds (< 5 g/day), but high for red and processed meat (> 80 g/day).** Mean intake of red and processed meat was generally high in all countries (84–94 g/day), well above the recommended level of 71 g/day. There was more geographical variability for other food groups. Within countries, food intakes also varied by socio-economic factors such as age, gender, and educational level, but less pronounced by overweight status. Several micronutrient deficiencies and shortage of fibre are widespread, and may become more important for B12, calcium, and Zinc, in some countries and subgroups. [8]

**The environmental impact of dietary patterns is large,** yet there are clear opportunities for reducing such impact. Many of these options coincide with consumption shifts required to bring health benefits. Such shifts are related to **reducing the consumption of meat, especially ruminant meat, overconsumption.**

More specifically, **a 200-kcal higher total energy intake was associated with a 9% and a 10% higher daily greenhouse gas emission (GHGE) and land use (LU).** A 5 energy percent (50g/2,00kcal) higher meat intake was associated with a 10% and 14% higher GHGE and LU density, with ruminant meat being the main contributor to environmental footprints. A 10% higher proportion of ruminant meat to total meat was associated with a 5% and a 7% higher GHGE and LU density.

**Food waste in the EU is of concern** but was not explicitly quantified.

We observed a major **gap between macro and micro data:** food availability in the EU (based on FAO balance sheet data) exceeds food intake (from nutrition surveillance data at the individual level) by **about 800 to 1,000 kCal per person per day**, in the four case study countries. This uncertainty in the consumption data requires further study.

#### **4 Economic sustainability and social justice in the EU food system are under pressure.**

**The economic viability of primary agriculture and fisheries and food production is under threat** of more competitive regions in the world and low profit margins [9] Also, a stronger risk of drought and other crises events on food markets is considered to test the resilience of farming activities, although unevenly across regions [10].

**Equity and social justice are under pressure,** with food access not guaranteed across the EU population and unequal diet quality observed in the population, by education levels and gender. A possible equity issue is related to concentration in the value chain, in the face of large buying power from upstream value chain partners. Using an innovative metric, farmer's profit margins were assessed as fluctuating 4-5 times more than the profits of food retail, for selected value chains in France and Italy [11]. Whether this observation warrants intervention is the subject of further research.

An important observation is that **ethics** on equity and social justice are often missing in sustainable food and sustainability assessments. The evidence base for this is limited and needs strengthening [12].

#### **5 Transformation: 2030 Agenda provides opportunities for moving the EU food system from quantity-driven to quality-driven**

A projection of the impact of growth, demography and trade drivers towards 2030 suggests an emerging window of opportunity for aligning EU agriculture with environmental boundaries while remaining globally competitive as sustainable producer [9]. The stabilization of EU population and moderate GDP growth result in a marginal growth in EU food consumption and production. As other regions become increasingly competitive, opportunities for EU farmers to continue expanding production by increasing export shares are limited at the same

time and slight increases in production levels can only be expected in the livestock sector since domestic demand for animal products is still projected to continue to increase.

Despite these economic challenges for EU farmers, some co-benefits for the environment are anticipated. Fertilizer demand and emissions are projected to stabilize or even slightly decline while other natural vegetation area is expected to increase related to the abandonment of agricultural land. Sustained yield growth results in continued decline in agricultural areas with potential co-benefits for biodiversity or climate change mitigation i.e. through afforestation.

These co-benefits could be strengthened under a transformation towards a quality-driven food supply system in the EU. A key requirement is to account for a push towards shared value in food markets. Various drivers of sustainable consumption among EU consumers are in line with health benefits, and have the potential to generate higher value added.

## SUSFANS main policy recommendations:

Based on the research outcomes, SUSFANS concludes that it is possible for the EU to move towards sustainable diets and a sustainable food supply system in a matter of decades, but only with a proper transformation of production, trade, distribution, and consumption of food.

A number of evidence-based recommendations from SUSFANS are made on how to enable this transformation:

### **Recommendation no. 1: Develop an EU policy protocol to monitor the health and sustainability impact of food consumption and intake.**

The added value of a strengthened protocol is to have comparable methodologies across countries and to be able to connect health and sustainability issues. It would create common ground for introducing the cross-border sustainability implications of food into national level food based dietary guidelines (FBDGs). The guidelines themselves should remain in the national policy remit, as they need to consider regional food cultures and challenges.

The existing policy framework for monitoring food intake has obvious limitations: across the EU different survey protocols are in use and comparative analysis is hampered by a shortage

of protocol for data harmonization across EU. Also, the standard limitations of survey-based monitoring apply: it is a low-frequency and expensive monitoring, with limited connections to market data and cross-references to other monitoring tools. **So a better monitoring of consumption and intake is needed in order to steer policies, target campaigns and assess their impact.** For example, there is a need for a better handle on the consumption of meat and (added) sugar.

One key recommendation in this context is to unlock **data on food consumption and food intake** to new users in policy, at national and EU level: such data are of particular interest to users in the area of environmental impact and protection, and resource use: key areas are consumer choice as a climate change mitigation strategy and reducing food waste. These are in the remit of **DG CLIMA, DG Environment; DG SANTE**, now responsible for food waste, could explore how a better food intake and waste monitoring provides opportunities in this regard.

**Health prevention** is partly in the EU policy mandate, for example on labelling, food quality standards, innovation in food industries and reformulation, and regulation of global industry players. The policy information to monitor impact of such policies on the prevention of diet-related disease burden is currently missing.

### **Recommendation 2: Better enable market decisions that support a transformation to sustainable and healthier food supply and consumption**

Scenarios suggest that there is **a shift from quantity to quality**. An opportunity to rethink the food system is offered by the demographic shift towards an ageing and wealthier EU population, while the continued competitiveness as supplier of bulk goods on global markets is eroding.

There is untapped potential to turn sustainability trade-offs in the food system into opportunities for change. For example, there is **a small segment in the consumer population that is motivated to make sustainable food choices** [2] and there is evidence to suggest the segment is expanding; reducing overconsumption and food waste are effective pathways in this regard [3]. Simultaneously, **broader-based progress on sustainable consumption can be achieved with shifts towards more sustainable practices in food production** [4]. A challenge for food companies

is to generate new business models that tap into the diverse consumer motives for sustainable food [5].

**Involving the consumer** in managing the shift, not only by expecting the consumer to **pay a price premium** for higher quality of food, but also by increasing his/her willingness to **consume less**. An example is that higher animal welfare standards require more feed and land inputs per kilogram of protein at production stages, which can be managed partly by a shift towards lower volumes of consumption and a slightly higher price.

A transformation in the EU food system would benefit from a level playing field for **import competition based on sustainability standards**. There is a growth of voluntary standards that organise this at value chain level. For example, certified palm oil, beef free from deforestation impact, etc. Civil society is an important enabler in such initiatives. Trade rules provide another route; the call on food systems to deliver to 2030 agendas strengthens a call for greater product differentiation of products in trade based on production methods.

Climate action in the EU may have an impact on the exports to global markets. Because of the relatively high rank of the EU in global emission intensity, a measure **reducing domestic emissions might lead to a leakage effect**. This needs to be assessed case-by-case.

**A consumer shift towards eating recommended diets according to food-based dietary guidelines (FBDG) has been shown to bring social welfare** benefits in Denmark, France and Italy – and synergies between climate change mitigation and disease prevention dominate over possible trade-offs [13].

Changing the practices in the food system requires feedback in terms of **data and market signals**, for example on **drivers of consumer choice**. An important enabler could be more market intelligence that builds trust that the business cases for quality and sustainability innovations are realistic and bankable.

**Recommendation no. 3: Intervention strategies which involve experimentation, market intervention and social innovations are needed. Instruments with impact on consumption and production should be combined and maintained long term.**

**Food choice in the EU is projected to worsen over the coming decades** in at least two ways: food consumption and intake scenarios suggests that the consumption of vegetables, fruit and nuts is stable at below-recommended levels between 2010 and 2050, while the consumption of meat and sugar – both discouraged food groups – rises. Meat consumption would increase by 5-12 percent in the EU, in volumes. Sugar consumption would expand between 10-20 percent in 2 decades [3].

**Food systems in the EU provide, in general, sufficient and diverse food. However, some groups of consumers do not have access to it**, either due to lack of income or problems in the marketing of food. There is a subset in the EU population that consumes a healthy diet from the current portfolio of food in the EU. Scaling up this healthy diet to the level of the EU population might generate new **constraints in food availability** and create sustainability challenges. For example, the current **harvest from sustainably managed fish stock is insufficient** to serve recommended levels of fish protein.

BCC works and we should continue even if short term impacts are small. **Consumer information** including labelling can be seen as supportive policies for a shift in consumer behaviour but evidence varies on the targeting of health and sustainability information to consumers. All communication instruments have weak effects but they are positive – for which they need to be maintained over a long duration of time because behaviour change takes years and often generations.

**Fiscal policies**, such as the soda tax in France need evaluation. It is possible to quantify the impact of carbon taxes on the consumption volume and to social cost-benefit analysis for health and environment [13]. It was estimated that prices for beef would need to increase by over 250% in total in just three decades in order to adjust consumption consumers towards recommended levels of beef intake in 2050 [3]. The extent of price incentives are excessive however, and the impact on social inequalities requires side-policies in order to make such taxation politically unfeasible.

**Industrial companies’ strategies in food innovation and reformulation and their responses to nutritional policies are potent entry points for healthier consumption.** Food reformulation (decrease in salt, fat, sugar

contents in foods) may have significant effects on public health [14]. But even where the food industry engages in the reformulation of food products, the effects on and consumers' intakes are still modest. Main difficulty is related to **consumer acceptance ('healthy=not tasty intuition')**.

A policy mix aiming to change the demand and the supply side at the same time, is needed. Next to information measures and price-based policies, marketing standards, direct interventions in the physical food environment and range of choices available to consumers need to be considered.

**Recommendation no. 4: Reconnect different policies, under an aligned multi-level and multi-dimensional food policy framework in the EU and Member States into strategy for a food-sustainable Europe**

New perspectives could be developed on how to manage the trade-offs in an innovative way. On the basis of such assessment several **coherent, inclusive strategies for food in a sustainable Europe** should be developed.

A number of possible visions have been identified in the SUSFANS project:

- **"Quality for Europe"** – towards a smaller, high-quality production for EU domestic markets within planetary boundaries and active citizen or consumer involvement (e.g. true pricing).
- **"Safety for the world"** – towards a high-value global food exporter, with food safety and traceability as core assets.
- **"Circular systems"** – towards a resource-efficient food system that uses limited pristine resources and future foods [5,15].
- **"Consumer-centric"** – towards a system based on a standardised primary production and extensive differentiation in consumer markets, supported by food chain brokers.

Public policy-making will provide necessary coordination for visioning and enabling social innovation that achieve (part of) such changes.

**The Common Agricultural Policy (CAP) and Common Fishery Policy (CFP)** Policies should promote sustainability in primary food production in the EU, in particular by supporting a better management of nutrient balances in farming systems, particularly livestock systems,

and the management of fish stock at a maximum sustainable yield.

**EU consumers mostly eat "local food", i.e. food produced in their own country.** By consequence, a more sustainable supply will contribute to some extent to improve the sustainability of the diet of the European consumer.

In the context of open markets and trade (both intra-EU and global trade), **the CAP and CFP instruments have limited direct impact on protein consumption patterns in the EU.** In particular, in model-based assessments of the ex ante effects of measures to improve sustainability of EU protein supply - reduce the herd-size of livestock in the EU and promote open-water fishing at a lower yield than at present – we found limited impact on production and consumption volumes and market prices in the EU. This is mainly explained by a strong suggested increase in imports of meat from the world market.

**Conclusion and outlook**

The project's unique perspective is to take into account the effects related to the changes in scale and structure. It is recommended therefore to complement behavioural experiments at local with modelling tools at higher levels of analysis, in order to create insight into plausible impacts at the system level from transformation in demand and supply.

One lesson learned from the SUSFANS process is that experimentation of practitioners with an involvement of knowledge institutes provides an important way forward for systems transformation. The SUSFANS framework can enable evidence-based decision-making on such integrated food visions and policies, and support the direction of R&I and international collaboration needed to implement such policies.



### Disclaimer on the nutritional analysis

For the assessment of dietary intakes on the national level, individual-level data were obtained from four EU Member States representing the diversity of food habits in the Europe, i.e., Denmark (2005-2008), Czech Republic (2003-2004), Italy (2005-2006), and France (2006-2007). These countries were selected to capture a wide range of food and agricultural commodities that are incorporated in the dietary patterns, not as a representative sample of the EU as a whole [8]. For use in the SUSFANS project, national dietary survey data were standardized for the two days daily and for energy intake (2000 kcal for women and men). Therefore, data presented here may differ from national dietary survey data published elsewhere. In the foresight scenarios for 2020 to 2050, changes in food consumption patterns expressed as a %change for each FoodEx2 food group generated as an output from the MAGNET simulation model. [7]

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The SUSFANS consortium is grateful for funding from the EU research & innovation program Horizon 2020 under grant no. 633692, and additional national funders