



Strengthening European Food Chain Sustainability by Quality and Procurement Policy

Deliverable 10.1: SYNTHESIS OF FINDINGS

November 2019

Contract number	678024
Project acronym	Strength2Food
Dissemination level	Public
Nature	R (Report)
Responsible Partner(s)	Aristotle University of Thessaloniki
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Keywords	Findings, Synthesis, Synthetic Report

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 678024.



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TABLE OF CONTENTS

LIST OF ABBREVIATIONS AND ACRONYMS	4
EXECUTIVE SUMMARY	5
1. INTRODUCTION	8
2. A CONCEPTUAL AND METHODOLOGICAL FRAMEWORK FOR IMPACT ASSESSMENT (WP3) .	9
3. FARMERS ENGAGEMENT IN QUALITY SCHEMES (WP4).....	11
3.1 Main points regarding farmers engagement in quality schemes	11
3.2 Key points regarding the contribution of FQS to the improvement of the price transmission mechanism and the reduction of price volatility	12
3.3 Key findings on the impact of FQS on the internal-external EU trade and quality of product exported to the EU.....	12
4. IMPACT ASSESSMENT (WPS 5 TO 7)	13
4.1. The Economic, Social and Environmental Impacts of EU FQS (WP5).....	13
4.1.1 Findings regarding the contribution of FQS to the production of PGs	14
4.2 Impact of Public Sector Food Procurement Policies (WP6)	14
4.2.1 Categorization of different types of Public Sector Food Procurement in primary schools.....	15
4.2.2 Nutritional outcomes of PSFC models in a school context from the five involved country-cases	16
4.2.3 Key findings regarding the socioeconomic and environmental impacts of PSFP models and recommendations to enhance PSFP impacts on rural territories	17
4.3 Sustainability of Short Food Supply Chains (WP7).....	18
4.3.1 The main drivers of and barriers to the sustainable development of SFSC and the related policy recommendations.....	18
4.3.2 The key findings regarding the quantitative assessment of sustainability of SFSC 20	
5. CONSUMER ANALYSIS (WP8).....	21
5.1 Products and process attributes of relevance in consumers’ food purchase decision	21
5.2 Relevance of labels promoting EU and national FQS for consumers	22
5.3 Consumers’ food practices concerning FQS	23
5.4 The role of attitude, trust, social norms on the choice of products promoted by FQS...	23
5.5 The effect of a policy intervention and commercial strategy to boost FQS sales	24

LIST OF ABBREVIATIONS AND ACRONYMS

CAW	Cultural Adaptation Work
DCE	Discrete Choice Experiment
DoA	Description of Action
DOOR	Database Origin & Registration
CT	Convention Theory
EC	European Community
EU	European Union
FAO	Food and Agricultural Organisation of the United Nations
FFL	Food For Life programme of the UK Soil Association
FQS	Food Quality Schemes
GC	Generation Change
GE	Gender Equality
GI	Geographical Indication
GMO	Genetically Modified Organisms
ICT	Information and Communication Technology
ID	Industrial District
GAS	Solidarity Purchase Groups
LA	Local Authority
LAFS	Localised Agri-Food Systems
LM3	Local Multiplier
LOC	School with an Alternative model of public food procurement
LOW	School with a low cost model of public food procurement
LOC MODEL	A procurement model where the procurement contract encourages local sourcing and/or a proportion of local suppliers is present in the supply chain
LOW MODEL	A procurement model in which contract awards are based heavily, or entirely, on lowest price bids from suppliers
LOC-ORG MODEL	A procurement model where the procurement contract encourages local sourcing, and sourcing of organic produce
MEAT	Most Economically Advantageous Tender
OECD	Organization for Economic Co-operation and Development
ORG MODEL	A procurement model where contracts encourage sourcing of organic produce
PDO	Protected Designation of Origin
PGs	Public Goods
PGI	Protected Geographical Indication
PSFP	Public Sector Food Procurement
SFSC	Short Food Supply Chains
SMEs	Small and Medium Enterprises
SPT	Social Practice Theory
S2F	Strength2Food
TSG	Traditional Speciality Guaranteed
UK	United Kingdom
VS	Virtual supermarket
WP	Work Package
WTP	Willingness to Pay

EXECUTIVE SUMMARY

This report synthesises the main findings of WPs 3 to 8 to produce an integrated analysis of the effects of EU quality and PSFP policies on economic, social and environmental sustainability and the promotion of a healthy diet. Particular emphasis is given to the interactions and crossovers between different FQS, PSFP policies, and SFSC initiatives.

In WPs 3 to 8, six research activities were conducted to identify the factors that determine the success or failure of FQS, PSFP and SFSC initiatives and their economic, environmental and social impacts, including surveys of consumers' perceptions on FQS.

Large-scale datasets were used to analyse food quality schemes. Concerning the spread of, and engagement in, FQS, **the increase in uptake of FQS within the EU over time (2007-2013) was mainly influenced by the entrance of new member states in 2004 and 2007.** The adoption of FQS contributes to a reduction in price volatility along the supply chain, positively affects export unit values and trade flows. Therefore, **EU quality policy behaves as an export promoting device.** At the same time, EU quality policy, by setting high-quality standards, pushes non-EU countries towards price competition by exporting lower quality products at lower prices in the sectors where GIs are present.

For evaluating the sustainability of agri-food chains, a set of indicators was developed to assess the social, environmental and economic impact of FQS, SFSC and different PSFP policies on rural territories. **The assessment of the economic performance relied on the calculation of price premiums, profitability and value-added distribution (gross value-added, gross operating margins, net results), trade and local multipliers. Environmental performance was measured in terms of carbon footprint, water footprint, food miles and food waste. Finally, social performance was measured in relation to social capital, governance and bargaining power, generational change and gender equality. FQS generally perform well in terms of classical economic indicators, compared to non-GI equivalents, except regarding exports, in the majority of the cases.**

Environmentally, FQS, on average, perform well in terms of lower GHG emissions per hectare and lower distance travelled by products, producing, therefore, fewer transport-related emissions. The reduced food miles of FQS are connected with these products being sold, mostly, on the local/national/EU market and not overseas. Moreover, in some cases, technical specifications are responsible for the fewer food miles of FQS products, as – for instance – those for PDO products limit a fairly small geographical area for production and processing, reducing the distances between farms and processors.

However, the carbon footprint of GIs and comparable non-GI equivalent products, expressed in terms of per tonne of product is similar. The results are similar for water pollution by nitrates (grey water footprint). Specifically, the performance of FQS is better on a per hectare basis, but similar to conventional products on a per tonne of output basis. **Overall, no differences emerged between FQS and reference products regarding blue, grey and green water footprints, except for organic products, which record a better performance than equivalent reference goods in terms of their blue water footprint.**

On social aspects, FQS perform better on indicators related to employment and equality of bargaining power across the value chain. The most interesting result is that FQS products provide more employment per tonne of product while ensuring a higher turnover per

working unit. FQS also seem to have an edge on educational attainment and generational renewal, but this is not statistically significant. Finally, FQS and their conventional reference are similar regarding employment of women.

The positive socio-economic impacts of GIs were also evidenced by research conducted to investigate the capacity of FQS to generate spill-over effects, highlighting that GI have contributed to strengthening rural areas and creating job opportunities, whereas organic products have contributed to the generation of environmental PGs.

School meals were chosen for the evaluation of the nutritional, economic, environmental and social impacts of different models of PSFP. **In terms of nutritional impacts, there is no evidence that the nutritional values of menus or levels of plate waste are determined by the type of PSFP model adopted by the school/local authorities.** The factors explaining these differences include the variety of the food served to children and the serving size, the place where the meal is consumed, the lunch duration and the presence of adult supervision and encouragement. Therefore, the recommendations developed to optimise the nutritional intake of the school meal and reduce plate waste concern: *i)* National and Municipal Policies and Practices; *ii)* Staff Resourcing, Roles, Training and Skills; *iii)* School-based Policies and Initiatives; and *iv)* Canteen Environment and Layout.

On environment aspects, the carbon footprints of the PSFP models depended more on the composition of the meals rather than where foods came from, highlighting that the localised models do not contribute to the reduction of carbon emissions. Instead, the local economic multiplier effects of localised models are higher compared to those of their counterparts, mainly due to the higher percentage of the total budget spent with local suppliers. Therefore, the proportion of schools' meals budget that is paid to local catering staff and local food suppliers is a more important determinant of the economic multiplier effect than the absolute number of local suppliers involved in a school meal supply chain. Furthermore, better and stronger relations between supply chain members and between suppliers and schools/local authorities are found in the localized models.

The evaluation of SFSCs draws on both **qualitative and quantitative evidence. The qualitative assessment showed that consumers, producers and retailers/organisers in general gave positive evaluation of SFSC on the economic, social and environmental sustainability dimensions compared to long food supply chains.** Firstly, the economic sustainability of SFSC is, according to the interviewed producers, enhanced because of higher price premia and bargaining power. Regarding consumers, they report that SFSC are often an important means to get high-quality food at affordable prices, while in other instances the price may be perceived too high, hence a major barrier against their participation in specific initiatives.

As far as social sustainability is concerned, results show that several dimensions seem to enhance SFSC development, such as the sociability of markets, closer connections between producers and consumer, co-operation between producers and the strengthening of local identity among both producers and consumers.

Consumers regard SFSCs as more environmentally friendly than distribution through long supply chains. SFSC shoppers also consider them to produce less waste and packaging, and important sales channels for making organic products more easily available.

The quantitative assessment showed that SFSC are beneficial for producers economically. Overall, SFSCs provide higher price premiums since they allow for capturing a larger margin which otherwise would be absorbed by different intermediaries. Furthermore, participation in SFSCs resulted in higher supply chain value added. **SFSCs generate additional employment, especially for women, in logistics and retail activities.** However, SFSCs may generate higher environmental impacts per unit of production, measured in terms of food miles and carbon footprint. On average, food miles for SFSCs appear to be more than three times greater compared with conventional, long chains.

Taste, price and freshness are the major attributes that influence consumers' purchase decisions in foods, while attributes promoted by EU and national FQS are of relative low importance. In addition, locality, buying from the producer and consumers' convenience when they buy foods influences consumers' purchase behaviour. **Where FQS products are evaluated as more expensive or less tasty, consumers typically will buy other products, even if they care about the attributes that are promoted by FQS.**

Overall, **national labels indicating, for example, geographical origin received a considerably higher level of recognition than EU FQS labels.** Recognition of the EU FQS labels is generally low. Among the EU labels, **recognition is higher for the EU organic label than for PDO and PGI, while TSG label has the lowest level of recognition.** The majority of consumers who recognize a label stated that they make use of the label at least sometimes when they purchase food products. However, **consumers are more familiar with supermarkets' logos or specific organic brands than with FQS from assured national and EU schemes.** Consumers are generally confused by PDO, PGI and TSG labels and do not understand what they guarantee.

During the purchase process, consumers are focused on the product's appearance, reputation of the producer or of the brand and nutritional content, rather than looking at a specific FQS. Qualitative research revealed that products with GIs were sometimes part of food practices, but without much emphasis on the certification itself. Generally, consumers are keen to support local producers. A hierarchy is observed in participants' perceptions whereby local foods and SFSC are regarded as most desirable, then organic foods, followed by origin (non-local) and eventually labels such as PDO and PGI.

Well-designed communication campaigns could raise awareness and consumer knowledge about EU FQS, and help to increase the credibility and trust through the provision of information on the control system behind the EU FQS labels. For instance, Strength2Food research revealed that a **small modification of EU organic logo can contribute to raising consumers' understanding and trust in the EU organic labelling scheme.** However, more prominent placement of the logo at the shelf is insufficient to gain consumers' attention and increase purchases of products promoted by the FQS.

REPORT REGARDING THE SYNTHESIS OF FINDINGS

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1. INTRODUCTION

This report synthesizes the main findings of Work Packages (WP) 3 to 8 to produce a coherent analysis of the effects of European Union (EU) quality policy and public sector food procurement policies on economic, social and environmental sustainability and the promotion of a healthy diet. Particular emphasis is given to interactions and crossovers between different Food Quality Schemes (FQS), Public Sector Food Procurement (PSFP) and Short Food Supply Chains (SFSC) initiatives. Thus, the synthesis assesses whether quality initiatives, such as Protected Designation of Origin (PDO), Protected Geographical Indication (PGI), organic, SFSC and better PSFP, are mutually reinforcing and under what circumstances.

In the WPs 3 to 8 six research activities were carried out to identify the factors that determine the success or failure of FQS, PSFP and SFSC initiatives and their economic, environmental and social impacts, including surveys of consumers' perceptions on FQS. More precisely:

- WP 3 focused on the development of the conceptual framework of the project, definition of the methods and indicators for measuring social, environmental and economic impacts of FQS, SFSC and PSFP policies, and verification of indicators for impact measurement on six pilot studies in view of a subsequent application of the method to the activities of WP5, WP6 and WP7;
- WP 4 analysed the farmers' engagement in quality schemes and the impact of quality schemes on the improvement of the price volatility and transmission mechanism for FQS as compared to non-FQS, on the extent and composition of internal-external EU trade, and the quality of exported product to the EU;
- WP 5 focused on the evaluation of the economic, environmental and social impact of EU FQS, the identification of determinants affecting their sustainability and the contribution of FQS to the production of Public Goods (PGs),
- WP 6 evaluated the nutritional, economic, environmental and social impact of different models of PSFP, focusing on school meals,
- WP 7 focused on the identification of drivers and barriers affecting the development of SFSC and evaluated the economic, environmental and social impacts of SFSC on rural territories, and
- WP 8 focused on the evaluation of consumer perceptions and practices towards FQS products and the investigation of potential policy intervention and commercial strategies to boost the sales of FQS products.

This report is organized as follows. The next section presents the conceptual and methodological framework of the project (WP3). The third section offers insights regarding farmers' engagement in quality schemes and the impact of EU quality policy on price transmission mechanisms along food supply chains, internal-external EU trade and the quality of exported products to the EU (WP4). The following section focuses on the main findings of the economic, social and environmental impacts of FQS, PSFP, and SFSC on rural territories, respectively (WP5, WP6, and WP7). The key results regarding consumer perceptions and practices towards FQS products as well as findings from the experimental research aimed at increasing the sale of FQS products are presented in the fifth section (WP8).

2. A CONCEPTUAL AND METHODOLOGICAL FRAMEWORK FOR IMPACT ASSESSMENT (WP3)

The methodological framework draws on conventions and territorial development theory as well as previous empirical research, considering the role of different factors that influence and characterise FQS, such as quality and its perception by the consumer; the territory in its ability to characterise and manage food production; and the food value chain in its ability to deliver value-added to producers.

The territory is the place of production whose specific environmental characteristics are capable of qualitatively characterizing the products; the place that facilitates the provision of the product, lowers transaction costs and contributes to the creation of its reputation; the place of consumption; the place where different supply chain management arrangements generate environmental, social and economic impacts. Taking into account the aforementioned characteristics, the most effective conceptualisation of the place of production is represented by the Localised Agri-Food System (LAFS). The uniqueness of the LAFS resides in recognising the role of the territory to contribute to creating value within the supply chain. LAFSs are the result of a process of cooperation among companies with common interests, located in a given area, which organise and agree on certain production and marketing rules to obtain a competitive advantage over competitors. The latter can be actual or potential, from within or outside the territory, but they do not adhere to those rules characterising the LAFS.

The territory and the development model are complemented by a third component of the identification of an FQS: the characteristics of the value chain. Typically, chains, especially in agri-food sectors, are regarded as a tool for managing production, useful to create an appropriate product quality and develop marketing strategies aimed at creating value for all the actors of the chain. In sum, a dominant model of FQS-value chain does not exist, but several typologies of FQS value chains emerge, according to the combination of their structural and management features. However, the common elements in the FQS supply chains are the compliance with EU Regulations, the presence of a set of rules laid down in a code of practice and the existence of a certification body that guarantees the actors' compliance with the code of practice. Although close relationships between the area of production and food chains for FQS, SFSC and certain forms of PSFP would have been expected, the literature review indicates that this connection is not always explicit. For some domains, the connection with the area of production can be explicit and very strong (i.e., Geographical Indications – GI, organic for the animal sector), strong but not explicit (i.e., SFSC), subjected to the local procurement strategy (i.e., PSFP), or absent (i.e., organic vegetal products). The literature shows that within value chains and LAFSs, organisations (e.g., producer organisations, inter-branch organisations and certification bodies) and local institutions operate for the benefit of all the agents. Indeed, the interaction among

LAFS stakeholders is instrumental in the evolution process of the local system. The possible combinations between food chains and territories lead to different types of agri-food systems:

- a) Closed LAFS: local agricultural outputs are processed by local food industries (mainly SMEs), or purchased by local consumers.
- b) Open LAFS: agricultural outputs are not processed by local food industries or purchased by local consumers.
- c) Mixed Systems: Closed and Open LAFS coexist.

In the Strength2Food (S2F) project, the territory and the food chain are embedded as LAFS.

The LAFS concept provides tools to identify the boundaries of the LAFS area, so that each FQS is subject to a distinctive strategy:

- For GI productions (i.e., PDO, PGI and TSG), the LAFS is represented by the municipalities identified in the official code of practice that is part of the EU Regulation published on the DOOR database;
- For organic products, the LAFS is not officially defined, and the suggested criteria refer to the region where producers carry out their production and commercial activities;
- For SFSC products, in the absence of a legislative reference, the definition of the LAFS refers to the region that includes the production and consumption area, which are contiguous to each other.

In the real world, different FQS can overlap each other, generating a hybrid FQS framework (e.g., Organic-GI; Organic-SFSC, GI-SFSC; Organic-SFSC-GI). In this case, the dominant criterion is the presence of a Designation. When the GI is not considered, the dominant criterion is the SFSC.

In the S2F project, the link between quality schemes and the territory is considered as follows:

- *Closed LAFS*: all the inputs come from the territory and all the output is purchased within the territory in local markets. It is the case of SFSC and Short Food Geographical Indications (SF-GI), in other words SF-PDOs.
- *Mixed LAFS*: i) the inputs–buying process is not confined within the territory, while the downstream stages of the supply chain are bounded by the territory, as is the case of PGIs and organic products and, ii) the inputs-buying process is bounded within the area, whereas the downstream stages of the supply chain are not. In this case, we have PDOs and SFSC. Under this system, most of the output is purchased via local markets but part of it is also sold on “domestic” markets (i.e., where consumers are in different regions but face the same market rules, like the EU).
- *Open LAFS*: neither the upstream nor the downstream stages of the supply chain are bounded, as for PGIs, large-PDOs and organic production. Most of the output is purchased in distant markets, “domestic” or “global” (i.e., where consumers are in different regions with different market rules, like extra-EU).

The level of embeddedness of the value chain with respect to the LAFS creates different categories of markets: local to local (i.e., SFSC and some PSFP); local to domestic (i.e., GI and organic); local to global (i.e., GI), allowing for different public and private strategies and different impacts on the territory.

The same theoretical framework is also useful for analysing PSFP strategies, where three systems can be defined:

- *closed system*: when all the inputs for meal preparation originate from the local production system;
- *mixed system*: where only part of the inputs for meal preparation originate from the local production system;
- *open system*: where all the inputs originate from domestic and global sources (i.e., outside the LAFS boundaries).

3. FARMERS ENGAGEMENT IN QUALITY SCHEMES (WP4)

The EU has regulated the quality schemes for agricultural products, seeking to contribute to the development of disadvantaged areas where geographical constraints increase production costs and weaker price competitiveness. Likewise, it has aimed to communicate the specific characteristics of these products to consumers, allowing producers to offer unique and differentiated products of higher quality at a higher price. Thus, this section is focused on the main findings regarding:

- i. farmers engagement in quality schemes;
- ii. the contribution of FQS to the improvement of price transmission mechanisms and the reduction of price volatility;
- iii. the impact of FQS on internal-external EU trade and the quality of products exported to the EU, in the presence of FQS being produced in the destination market.

3.1 Main points regarding farmers engagement in quality schemes

The spatial analysis of PDO/PGI uptake across the EU revealed that the use of the quality labels is higher in regions that are less productive and are located in Less Favoured Areas, as well as in sparsely populated, more marginalized and remote areas. Additionally, as may be expected, regions with large agricultural production make more use of these labels. However, in regions where small-scale farming is prevalent, the use of the label is low. Where producers use a large part of their production for their own consumption the use of the quality labels is low. In regions where quality labels are absent, the number of tourists is low and the majority of inhabitants are employed in agriculture.

The increase in uptake of PDO/PGI labels in the EU over time (2007-2013) is connected with regional, socio-economic and institutional variables. Among them, regional variables are most significant in explaining the changing uptake of PDO/PGI labels in the EU. Specifically, a transition was observed from the Southern regions towards the Eastern regions of the EU with respect to the uptake of quality labels, reflecting the entrance of New Member States in the EU in 2004 and 2007. In addition, the hectares of the mountainous area and the existing number of PDO and PGI products in a region are among the regional variables that help to explain the adoption of quality schemes in the EU.

Further work considered the case of Italy. Here the uptake of FQS in less-favoured areas is limited, while organic farming prevails in these areas. PDO/PGI, as well as organic FQS uptake, is higher in hilly and mountainous areas. Organic farming is adopted mainly by farms growing arable and permanent crops and breeding livestock, while farms specialised in permanent cultivations (e.g., grapes and apples) prefer participating in PDO/PGI schemes. A regional division in the uptake of PDO/PGI schemes in Italy was also recorded since farmers of Central and Northern Italy are much more likely to be engaged in these quality schemes. Nevertheless, this differentiation was not observed for organic farming. Larger farms are more likely to engage in FQS, both PDO/PGI and organic. However, farmers' age and completion of higher

education emerged as the most important determinants for their engagement in FQS in Italy. Considering external characteristics, the presence of tourism infrastructure is positively correlated with the uptake of PDO/PGI and negatively with the uptake of the organic scheme.

3.2 Key points regarding the contribution of FQS to the improvement of the price transmission mechanism and the reduction of price volatility

The assessment of the extent to which FQS contribute to improving price transmission mechanisms (in the long-run) with reduced asymmetries (in the short-run) was carried out through a comparison of three FQS products (PGI beef, PGI lamb and PDO Parmigiano Reggiano cheese) with their reference products. Weekly prices were recorded at both the farm and retail levels of the food supply chain for each system and cover the period after 2011. Findings regarding price transmission mechanisms compared to conventional chains showed mixed results.

The same case studies were used to identify whether European FQS have proven useful in reducing price volatility along the food supply chain. Findings showed that the magnitude of price volatility is higher in conventional systems than for FQS (beef and cheese products). Also, asymmetric dynamics are more significant in the conventional system, which means that, at least for these case studies, European FQS have proven useful in reducing price volatility between the actors of food supply chains.

3.3 Key findings on the impact of FQS on the internal-external EU trade and quality of product exported to the EU

The impact of FQS on trade flows has been analysed by studying the effects of GI certifications on trade within the EU-15, and between the EU-15 and its main trading partners.

Regarding external EU-trade, a new GI in the EU exporting countries increases trade flows, as well as export unit values. When the destination (non-EU) countries have a GI policy in place, the GI trade effect is smaller, probably because of the higher competition there. However, on the EU import side, the GI policy does not affect the trade unit values of the exporting country.

Regarding the export promoting or trade reducing effect of GIs, the main findings indicate that EU quality policy behaves as an export-promoting device when implemented by exporters, but it incorporates also some trade reducing elements when analysed from the importing country perspective.

As for the quality of agri-food products exported to the EU, it was assessed whether EU GIs lead the non-EU exporting countries to adopt quality or price-based competition strategies. Results showed that non-EU countries, when exporting in categories where EU GIs proliferate, are more likely to opt for a price competition strategy rather than a quality competition strategy. This is justified by the fact that the presence of GIs imposes high-quality standards and non-EU countries to achieve high volumes of exports can decide either to upgrade the quality of their exporting products (thus competing on quality) or to export at a low price. The second choice leads to trading in lower quality products.

Further, we also assessed whether the estimated result was heterogeneous across countries at different stages of (economic) development. The evidence suggests that the negative price-quality effect is particularly relevant for more developed countries (i.e., OECD countries) than for less-developed ones. This reflects the fact that developed countries are more likely to export higher quality products than developing countries. Consequently, to adopt a price competition

strategy, OECD countries have to opt for a sharp decrease in the quality of the exported products, and thus to export lower-quality and lower-price products. In contrast, non-OECD countries are more likely to export low-quality products, and thus, the diffusion of EU GI leads to a slight decrease of the price of the exported products, but not of their quality, as it is already lower than that of richer countries.

Non-EU countries, which recognize EU GI policy and/or produce GI products according to their policy, do not show any significant variation in their quality or price export strategy. Thus, further diffusion of EU GIs does not significantly affect the exporting strategy followed by these non-EU countries. Therefore, it is obvious that EU quality policy, by setting high-quality standards, seems to put downward pressure on the quality of exports from non-EU countries seeking to export in these sectors where GI are present, as they opt for price-based competition rather than to compete on quality. Within this perspective and taking into account the increase of the number of EU GI, European consumers will view the products coming from non-EU countries as cheaper and low-quality alternatives against the high-quality products produced within the EU.

4. IMPACT ASSESSMENT (WPs 5 TO 7)

4.1. The Economic, Social and Environmental Impacts of EU FQS (WP5)

The assessment of the economic, social and environmental impacts of FQS including organic, PDO and PGI products identified the main factors influencing the performance and evolution of FQS and related LAFS. This assessment relied on data from 29 FQS case studies in 14 countries, where each FQS was compared to a reference product in the same country that is not certified or to the national average for the relevant value chain.

The assessment of the economic performance relied on the calculation of price premiums, profitability and value-added distribution (gross value-added, gross operating margins, net results), trade and local multipliers. Environmental performance was measured in terms of the carbon footprint, water footprint, food miles and food waste. Social performance was measured in relation to social capital, governance and bargaining power, generational change and gender equality. FQS in the majority of case perform well in terms of classic economic indicators, compared to non-GI equivalents, except regarding exports.

Environmentally, FQS, on average, perform well in terms of lower GHG emissions per hectare and lower distance travelled by products, producing, therefore, fewer transport-related emissions. The reduced food miles of FQS are connected with these products being sold, mostly, on the local/national/EU market and not internationally. Moreover, in some cases, technical specifications are responsible for the fewer food miles of FQS products, as – for instance – those for PDO products limit a fairly small geographical area for production and processing, reducing the distances between farms and processors.

However, the carbon footprint of GIs and comparable non-GI equivalent products, expressed in terms of per tonne of product is similar. The results are similar for water pollution by nitrates (grey water footprint). Specifically, the performance of FQS is better on a per hectare basis, but similar to conventional products on a per tonne of output basis. **Overall, no differences emerged between FQS and reference products regarding blue, grey and green water footprints, except for organic products which record a better performance than equivalent reference goods in terms of their blue water footprint.**

On social aspects, FQS perform better on indicators related to employment and equality of bargaining power along the value chain. FQS products provide greater employment per tonne of product while ensuring a higher turnover per working unit. FQS also seem to have an edge regarding educational attainment and generational renewal, but this is not statistically significant. Finally, FQS and their conventional equivalents are similar regarding employment of women.

4.1.1 Findings regarding the contribution of FQS to the production of PGs

The linkage between FQS and PGs stems from the “multifunctional” character of FQS, which reflects the ability of food production systems to support the generation of positive and negative externalities within the multiple roles played by agricultural activities. Specifically, GI contribute to the generation of PGs by generating positive externalities for the benefit of value chains and rural areas thanks to their positive impacts on natural resources, and cultural heritage preservation, as well as socio-economic spill over effects.

A gravity model assessed the capacity of GIs to generate spill over effects based on two main socio-economic variables: industry labour productivity and employment. The analysis revealed that:

- ✓ GIs contribute to strengthening rural areas and create job opportunities. The extent of the impact depends on the type of GI product. When a GI product does not require complex processing or a long maturation, as in the fruit and vegetable case, the employment impact is greater in the agricultural sector and lower in the industrial (processing) sector. Conversely, when the GI product requires complex processing or a long maturation, like meat products, the employment impact is larger for the manufacturing industry than for the agricultural sector.
- ✓ The impact on productivity is minor in the short and long term, because of the dominant presence of small farms and Small and Medium-sized Enterprises (SMEs). However, GIs favour employment growth even in firms with low productivity, due to the specific features of GI products, with associated higher consumer WTP and market price. The latter allows even low productivity production units to pay for additional staff.

Regarding the contribution of FQS to the generation of PGs, the evidence is that:

- ✓ Organic FQS products contribute more to the generation of environmental PGs than GI products.
- ✓ GI products contribute more to the generation of socioeconomic PGs than organic ones.
- ✓ Most FQS, however, have limited capability to generate Cultural Heritage PGs. This finding indicates that there is considerable room for improvement in the cultural dimension of these products, for the benefit of producers and consumers.

4.2 Impact of Public Sector Food Procurement Policies (WP6)

School meals constitute a key example of food procurement strategies that may impact on nutrition, food supply chains and local economies. This focus on school meals is driven by the opportunity for innovative food procurement practices to inspire changes in health, knowledge and practices not only amongst children but also to the wider community. Thus, this subsection is focused on the main findings regarding:

- i. the contracting processes for public food procurement across eight partner countries (Croatia, England, France, Germany, Greece, Italy, Scotland and Serbia), with a specific focus on primary school meals;

- ii. the nutritional outcomes of PSFC models in a school context from the five involved country-cases;
- iii. the recommendations stem from the evaluation of nutritional outcomes of PSFC models in a school context from the five involved country-cases;
- iv. key findings regarding the socioeconomic and environmental impacts of PSFP models to rural territories and priority actions.

4.2.1 Categorization of different types of Public Sector Food Procurement in primary schools

Considerable variations in the proportions of schools meals provided to children across the eight participating countries were observed, from those countries where almost 100% of schools provide meals (Croatia-Zagreb, England, France and Scotland), to those where 50-70%, on average, provide meals (Germany-NRW, Italy, Serbia), excepting Greece where the proportion was very low equal to 4% because, traditionally, families are responsible for school meal provision. Significant variations were also noticed in on-site kitchen facilities across the eight countries, except for Greece where schools do not have kitchens. It is also worth mentioning that in France and Italy a higher proportion of a school's meals is prepared outside of school facilities and transported to school premises. It was revealed that 40-60% of pupils participate in school meals, although these percentages vary even between schools in the same country/region.

In terms of cost, France and Italy have the most expensive meals in contrast to Croatia, which has the least expensive. This can be justified by the fact that in France and Italy, as well as in England and Scotland, the meals include the highest number of components since there are specific mandatory requirements regarding the meals provided to schools. State subsidy of meals is common across countries for families at a socio-economic disadvantage.

National ministries of education and health are responsible for setting policies and standards relevant to school meals for the majority of the countries studied. However, in Germany and Italy, policies are more regionally driven, while in Serbia there is a lack of clear institutional ownership for policies related to school food and specific nutrition standards for school meals are only just being introduced. The headline policies for school food target health and nutritional aspects of meals. However, it is worth mentioning that France and Italy also have policies relating to sustainability, which is supported by specific laws to encourage local and organic sourcing, and waste reduction, while in England and Scotland sustainability is promoted more through the encouragement of schools to participate in voluntary codes of practice and programmes, such as Food For Life (FFL).

Regarding the transposition of Directive 2014/24/EU, which targets enhanced flexibility and fairness in public procurement processes in the EU and encourages more sustainable practices, it was observed that, with the exception of Serbia, all countries encourage the splitting of large contracts into smaller lots. In addition, all countries allow reservation of contracts to social enterprises and employers of disadvantaged groups, as well as the specification of particular production processes, certificates and labels in contract award criteria, where these are justifiable given the subject of the tender. On the other hand, no country prohibits cost-only contract awards, but in most cases, national legislation strongly discourages the practice in favour of awards based on the price-quality ratio, Most Economically Advantageous Tender (MEAT), and other approaches which take qualitative and sustainability criteria into account.

4.2.2 Nutritional outcomes of PSFC models in a school context from the five involved country-cases

The research regarding the nutritional impacts of different models of PSFP, including also the role of plate waste, in a primary school context was conducted across five European countries namely Croatia, Greece, Italy, Serbia, and the UK, using pairs of contrasting procurement models. Specifically, for Croatia, Greece, Serbia and the UK, the contrasting procurement models were: (i) a local model (LOC), in which the procurement contract encouraged local sourcing of foods, and/or a proportion of the suppliers were local, and (ii) a low-cost model (LOW), in which the procurement contract made no reference to local sourcing. For Italy, the contrasting procurement models were: (i) a local and organic (LOC-ORG) model, in which the procurement contract specified a minimum amount of food from organic agriculture, integrated production, typical or traditional products (at least 70% of all foods); and (ii) an organic (ORG) model, in which the procurement contract specified that the majority of foods must be organic. The evaluation of the nutritional impacts relied on the comparison between the nutritive values of the meals served by the schools in each PSFP case with the standards recommended either by the relevant national body or World Health Organisation (WHO).

Regarding the nutritional composition, some notable nutritional deficiencies in school menus across all countries and cases were found. Particularly, both Italian cases had the highest rate of alignment to national recommendations in terms of the energy content of planned school lunches, while both Greek case menus had the lowest rate of alignment. Although school menus across all cases met recommendations for carbohydrate and protein content, in some cases, a high proportion of menus provided insufficient fibre (such as in Croatia) or were found to be too high in fat (Greece) or saturated fat (UK). In addition, a large proportion of daily menus across the cases were found to be deficient in key micronutrients, while, across some cases, the salt content of school lunches was found to be very high and certain menus exceeded the total daily sodium recommendations for children. Despite the variations across cases that were revealed by the nutritional analysis, the nutritive values of menus did not appear to be affected by the type of procurement model adopted.

Significant variations were also found concerning plate waste across countries and cases. The lowest rates of plate waste were found in Croatia LOW and Serbia LOC cases, whereas the cases with the highest rates of waste were Greece LOW and LOC, and Italy ORG. The majority of collected waste came from starchy food, vegetables and fruits. The food categories that represented a smaller proportion of waste were desserts, other food, and soups in all countries. However, in the UK and more precisely in the LOW case, only 6% of total waste came from vegetables, because of child refusal to eat vegetables, leading to the reduction of vegetable quantities offered. This highlights the role that service practices play in controlling plate wastes. Overall, PSFP models are not the driving force in the differences observed in collected plate waste between PSFP models. Instead, other factors are more influential, **including portion size, variety and format of food served, canteen environment and layout, length and positioning of lunchtime relative to playtime, and the provision of adult supervision and encouragement.**

The quantities and compositions of waste often translated into considerable nutritional losses compared with the planned intakes. More precisely, for LOC case schools, children were estimated to consume between 63-82% of food served, with energy losses of between 18-35%, protein losses of between 17-35%, carbohydrate losses of 21-37%, total fat losses of 15-38%, saturated fatty acid losses of 15-37% and dietary fibre losses of 22-38%. Consequently, the

actual nutritional value that children intake from lunches often fell below the national/WHO recommendations.

The high levels of plate waste were also found to represent a considerable economic loss for case meal services (as much as 54% of the total supply budget in Greece LOC case), as well as a considerable embodied carbon burden, mainly in cases where the waste disposal method is landfill. Waste reduction is thus a highly desirable goal, not only to minimize nutritional losses, but also financial loss and unnecessary carbon emissions.

4.2.3 Key findings regarding the socioeconomic and environmental impacts of PSFP models and recommendations to enhance PSFP impacts on rural territories

The research regarding the environmental, economic and social impacts of different models of Public Sector Food Procurement (PSFP) was conducted across five countries (Croatia, Greece, Italy, Serbia, UK), using a pair of case studies representing a contrasting model of PSFP. In four countries (Croatia, Greece, Serbia, UK) the paired cases comprised one “LOW” model, where contract awards were made mostly or entirely on the basis of lowest price, and one “LOC” model, where either the contract award criteria referred to local sourcing, or in practice the chain consisted of a proportion of local suppliers. In Italy, the two cases were LOC-ORG (at least 70% of food come from organic agriculture, integrated production or traditional products) and ORG (a model in which the contract primarily referred to organic sourcing).

In terms of environmental impact, it was revealed that LOC (or LOC-ORG) procurement model had a lower carbon footprint than the LOW (or ORG) counterpart. This difference between the cases stemmed from the composition of the meals rather than where the foods came from, as transport emissions comprised only a modest part of total emissions in all cases. In particular, the rate of emissions was affected by the quantities in the average meal of (especially red) meat and other animal products such as hard cheeses, which have a high carbon burden, in comparison with fruits and vegetables, which have a low carbon burden. Similarly, the two organic sourcing cases exhibited the lowest carbon footprints of all cases, not due to the organic sourcing but due to the high proportions of fruit and vegetables they included. It was also revealed that the waste disposal method influences the carbon footprint. Specifically, for cases where landfill was the disposal method, waste contributed substantially to total emissions.

In terms of economic impacts, the local economic multiplier (LM3) effect of meal services was examined and found that in three out of five case pairs (Greece, Serbia and the UK) LOC models had greater LM3 ratios than their counterparts, due to their proportionately higher expenditures on local suppliers. However, in Italy and Croatia, the LOC models gave smaller LM3 ratios than their counterparts due to the low budget spent on local suppliers in the LOC-ORG case. In Croatia, the smaller LM3 ratio in the LOC case was due to a lower proportion of total budget spend on payroll, and also a slightly smaller proportion of locally resident staff. Indeed, the above outcomes relating to economic multiplier effects are probably the most compelling evidence of the positive impacts of localized PSFP models.

In terms of social impacts, no notable employment or training/development differences within the case pairs that could be attributed to the type of procurement model were found. Instead, all notable differences were related to factors such as variations in national/regional context, and/or size of supplier. However, differences were found between the PSFP models in terms of supply chain connectedness, with the greater strength and abundance of social relations to be present in LOC cases. Indeed, this result ranks alongside the local multiplier effect as the most compelling evidence of the positive impact of localised PSFP models. Nevertheless, even

within LOC cases, the research found quite weak relationships between suppliers and schools, and the extent to which PSFP can serve as a vehicle for stimulating rural development activity. The analysis indicates that progress in the latter is dependent on the extent of mixed farming and agri-food processing, and related infrastructures in the region.

4.3 Sustainability of Short Food Supply Chains (WP7)

The work carried out in S2F on SFSCs aimed at evaluating the impacts of SFSC on rural territories and the possibilities for further stimulating the development of SFSC. To achieve these objectives, including the assessment of the social, environmental and economic sustainability of SFSC, research has drawn both on the LAFS concept, emphasising that the distance between producers and consumers is “short”, and on the SFSC emphasis on a minimal number of intermediaries. This subsection focuses on the main findings regarding:

- i. the drivers of and barriers to the sustainable development of SFSC and the related policy recommendations;
- ii. the assessment of the impact of SFSC on rural territories.

4.3.1 The main drivers of and barriers to the sustainable development of SFSC and the related policy recommendations

The analysis of the organisational development of SFSCs in Europe sought to identify the main motivations for participating in SFSCs, according to producers, retailers and consumers. At the same time, the main drivers of, and barriers to the sustainable development for, SFSC were investigated. An assessment of the economic, social and environmental sustainability of SFSC completes the evidence provided. In particular, the first dimension relates to the extent to which SFSC are economically viable for producers and consumers, the second to the role of SFSC for social and territorial cohesion and the third one to the role of SFSC in mitigating climate change, focusing on transportation distances and CO₂ emissions.

To achieve these goals, a comprehensive theoretical and methodological framework was developed on the basis of the Theory of Conventions (CT) and Social Practice Theory (SPT), which informed data collection via customer surveys as well as in-depth interviews with the main actors in SFSC (producers/farmers/fishers, market managers/retailers and consumers). Research investigated twelve SFSC initiatives across six European countries: France, Italy, Hungary, Norway, Poland and the UK.

Based on the data analysis, a typology of cases was developed that emphasises three types of justification worlds:

- The ‘Domestic’ world represented by traditional SFSC markets and outlets that exist across Europe. These markets cater to consumers who may have the habit of visiting local markets to get every day, local products at affordable prices.
- The ‘Civic and Green’ mode representing those SFSC initiatives which emphasise fair relations in the food system, meaning that producers shall gain a fair return on their sales and also that consumers are entitled to access good quality food at affordable prices.
- The ‘Market’ world containing SFSC which aim at creating added value from unique small scale, locally produced / processed (often handcrafted) food. The strategy consists of creating unique spaces to sell the products, such as specialty shops or farmers’ markets, which often attract wealthy and/or highly educated consumers.

These three typologies are used to discuss the main drivers and barriers affecting the development of SFSC, as well as the policy recommendations related to **food distribution and provision, trust and transparency, fair price, community building and transferability of experiences**. More specifically:

One main factor for evaluating the sustainability of SFSC is the effectiveness of the distribution of food from producers and provisioning for consumers. The results of the customer surveys indicate that SFSCs, with some variations between the typologies of SFSC (i.e., domestic, civic, green and market), tend to attract a smaller segment of well-educated, high income and, in many cases, consumers above the age of fifty years old. A challenge many SFSCs thus confront is to attract new and broader segments of consumers. Some of the factors which consumers often mentioned as impediments to participating in SFSC were:

- i) the limited availability of both local products and local markets,
- ii) small product range in contrast to the offer of supermarkets/hypermarkets,
- iii) their location, which is often outside the city, in contrast to large supermarkets being located in residential areas or near residential areas easily reached by car,
- iv) the schedule of opening days and hours, considering that supermarkets are open (almost) every day and for long hours, while SFSC usually have shorter and infrequent opening days that put a strain on the loyalty of the customers,
- v) seasonality which limits the frequency of product supply.

The strengths and weaknesses of food distribution/provisioning for three types of justification worlds are:

Domestic: Consumers' superior knowledge of the products, through familiarity with the place they are produced and sold, so they participate in the SFSC as part of recognizable practices, is among the strengths that enhance SFSC. Moreover, as it turns out, consumers have close contact with the producers/vendors, based on mutual trust, while they experience that products are fresher and often find them safer than in ordinary supermarkets. On the other hand, a crucial barrier is the strong competition by the conventional retail chains, on price and availability. Similarly, a negative point is producers' lack of knowledge and interest in marketing and use of information and communication technologies (ICT), social media and other modern advertising and marketing tools.

Civic and Green: Improved access to local and organic food products at affordable prices, as well as the extended information and communication about the food distribution and the places (farms/fishers) it comes from, are the strengths of this food distribution model. The producers and consumers share the same values of fairness in the food system (food sovereignty) and environmental sustainability. The weaknesses include infrequent delivery and the less convenient pickup places, which may lead to members dropping out, the strong competition with conventional stores as well as the seasonality of the products.

Market: The experience value (sociability) and the quality of products are among the upsides of this type of SFSC. The barriers include the perception that markets may be viewed as expensive and exclusive compared to conventional supermarkets.

The argument of whether SFSCs deliver “fair prices” is complicated and depends on the type of SFSC and whether the issue is investigated from the producer or consumer side. In particular, the main arguments are:

Domestic: The added value for the local producer is often used as an argument for (public) support for small-scale SFSC enterprises because it leads to a fairer price enjoyed by the producer. Producers at traditional farmers markets (such as Hungary and Poland) believe that they have limited bargaining power and this is mentioned as a barrier. Moreover, consumers are price conscious and expect affordable prices also because of the competition with supermarkets.

Civic and Green: The price should reflect the real environmental costs and at the same time ensure the producer makes fair economic return. One goal is also for the consumer to have access to sustainable products at a reasonable price.

Market: A main driver is price premia on products enjoyed by farmers, although they may exclude large groups of consumers.

Different types of SFSC possess varying capabilities for transferring experiences across cases, national and cultural boundaries:

Domestic: SFSC have a significant role in community building, enhancing a local food identity and supporting the local food cultural heritage. However, there are difficulties in transferring “local food identities” from one context to another.

Civic and green: SFSC often rely on innovative practices for cooperation between consumers and producers, as well as more efficient organisational communication models in distribution of food. They have benefitted from active use of new communication technology (i.e., social media, smart-phone applications) which have the potential to spread to other types of SFSC and local contexts. However, the lack of familiarity with modern ICT (i.e., use of social media, smart-phone applications) may stand in the way of transferring experiences across Europe.

Market: another challenge for further SFSC development is directly linked to organizational issues. Several barriers are mentioned regarding the disadvantages faced by producers, retailers and market managers when trying to develop their business or initiatives. Strengthening e-cooperation and organisation at the local level is a key element for further development of SFSC. The development of the SFSC can be aided by larger network organisations (such as the Italian farmers’ market organisation Campagna Amica).

4.3.2 The key findings regarding the quantitative assessment of sustainability of SFSC

The economic, social and environmental sustainability of SFSC was assessed through empirical research in seven countries: France, Hungary, Italy, Norway, Poland, United Kingdom and Vietnam. Data were collected from a sample of 208 businesses, consisting of 186 farms and 22 fishmongers (in Norway and the United Kingdom). In total 486 chains were examined.

Regarding the **economic sustainability** indicators, the results seem to confirm that SFSCs are economically beneficial for farmers, as they may achieve a price premium compared to selling in long chains. This price premium compensates the producers for the time invested in more laborious distribution. However, the economic effects on local economies are less clear-cut as much SFSC activity is small-scale, with farmers typically engaging in more than one type of supply chain.

Concerning the impact of SFSC on **social sustainability**, they generate additional employment, especially for women, in the logistics and retail activities. Moreover, producers perceived that long food supply chains led to weaker bargaining power positions.

As far as **environmental sustainability** is concerned, SFSCs may generate more negative environmental impacts per unit of production, measured in terms of food miles and carbon footprints. On average, food miles for SFSCs were more than three times larger than for long chains, due to the remoteness of markets from both from the place of production and the final destination of the consumers. Improving the efficiency of SFSC distribution is a priority.

5. CONSUMER ANALYSIS (WP8)

FQS are seen as an essential means of communication about food product and process characteristics, reducing information asymmetry on the side of consumers and supporting an informed choice. Such labels, however, can only serve its purpose if they promote attributes of relevance for consumers and if they are recognized, understood and trusted by consumers. This implies that the competitiveness and growth of firms supplying food promoted by FQS labels will depend on a thorough understanding of consumer demand. Based on such insights possible tools for more tailored and effective policy measures or marketing of products with FQS can be identified. Thus, the objective of the consumer part of the S2F project was:

- i. to gain a thorough understanding of consumers' preference for different product attributes and of their knowledge, perception, confidence and valuation of EU/national/regional food quality labels and sustainable food chains;
- ii. to explore consumers' food practices and purchasing behaviour with respect to products promoted by those schemes and the determinants of consumers' willingness to pay for those products;
- iii. to investigate to what extent potential marketing and policy adjustment are effective in generating consumer confidence and purchase behaviour and thus promote sustainable food chains.

The analysis involved different consumer groups, food cultures and geographical settings. More specifically qualitative (ethnographic) and quantitative (online surveys) research was conducted in five EU countries (France, Germany, Hungary, Italy, and UK) and two Non-EU countries (Norway and Serbia). Furthermore, an experiment using a Virtual Supermarket was applied in Germany, Serbia, and the UK.

5.1 Products and process attributes of relevance in consumers' food purchase decision

Attributes promoted by EU and national FQS, such as the production or processing method (e.g. organic, traditional production methods) or the region the product was produced or processed, are generally of relative low importance for consumers. However, the relevance of the attribute differs depending on the product and country investigated. For instance, while region and country of origin prove to be process attributes with a relatively high relevance for consumers in Italy and France when buying food they are of minor importance in most of the other countries. Considerable heterogeneity also exist regarding the attribute GMO free which is one of the most important attribute in consumers' food purchase decision in Serbia while of relative low importance in countries such as the UK or Norway. Animal welfare friendly products play a minor role in Serbia and Hungary but are especially of high relevance in

Germany. Interesting, despite those considerable differences between countries in consumers' preferences at an aggregate level the results obtained in the S2F project also point to the existence of consumer segments across countries that share more similarities than differences.

While attributes promoted by FQS are of relevance for (some) consumers, taste, price and the freshness of food products remain the crucial criteria for the large majority of consumers in their food purchase decisions for all products and in all countries investigated. The ethnographic fieldwork allows for a deeper understanding, pointing to a preference for localness. Convenience is also important in consumers' food purchase decisions although it can, to some extent, be in conflict with the requirements previously named. Overall, the research reveals that to the extent that products promoted by FQS are higher in price or perceived as less tasty, fresh or convenient, consumers will likely select other products even if they care about the attributes promoted by FQS.

5.2 Relevance of labels promoting EU and national FQS for consumers

Labels are an essential means of communicating food quality attributes otherwise not easily detectable for consumers at the point of sale. The findings of the first S2F online consumer survey and the ethnographic fieldwork reveal that recognition of EU FQS labels was low, though higher for the EU organic label than for the PDO and PGI labels. Recognition was by far the lowest for TSG. While recognition of the EU FQS labels is in general low, considerable differences exist depending on the label and country investigated. In many cases, national labels indicating, for example, geographical origin or specific qualities receive a considerably higher level of recognition than EU labels. This even holds for the same kind of label; while most participants recognized the national organic label this did not hold for the EU organic one. The findings of the qualitative study revealed, in addition, that respondents were more familiar with supermarkets' own logos or specific organic brands than with FQS from assured national and EU schemes.

According to the results of the online study, the majority (circa 70%) of those recognizing a label also state that they make use of the label at least sometimes when undertaking grocery shopping. Thus, recognition is a crucial step to use. This indicates the importance of increasing awareness regarding food quality labels for enhancing the market relevance of products promoted by those labels. There are a number of reasons why those recognizing a label do not use it while grocery shopping, but one reason dominates: a lack of attention to product labels while grocery shopping. Other reasons mentioned by a large proportion of respondents are that the products promoted by such labels are too expensive or unavailable at the point of sale, and a lack of trust in labels generally or in the specific label investigated.

National labels receive a better evaluation compared with the EU labels. In particular, the EU organic label is least positively evaluated. Trust is the characteristic of a label perceived by consumers to be most important, however, the findings of the qualitative and quantitative analysis reveals that the level of trust in EU FQS labels is, in general not very high. One particular problem underpinning this is that knowledge is low for the studied labels. PDO, PGI and TSG were difficult to understand for consumers. Perceived knowledge increases to some extent for those recognizing and using the label; however, this does not always correspond to the actual meaning of the label. However, consumers have to know what the label represents to make an informed choice. Accordingly, respondents' low rating of the statement 'this label helps me to make an informed choice' is thus unsurprising.

5.3 Consumers' food practices concerning FQS

Every day practices are an essential part of food consumption and thus a better understanding of whether and how everyday food practices are connected with FQS and sustainable food chains is relevant. This section draws on ethnographic fieldwork.

Routine and habits are central when purchasing food. Furthermore, most participants focused on product appearance as a cue for quality and freshness, the reputation of the producer or of the brand, and nutritional content rather than looking at a specific FQS. They also expressed an aversion to packaging, excessive plastics on food products, and they declared a preference for buying unpackaged food. Moreover, price was mentioned as fundamental for most informants. It appears that, although at a discursive level, most participants would accept the idea of paying more for better quality, in everyday purchase decisions price is definitively a central element of food practices.

Regarding consumers' consumption practices linked to FQS, overall, quality schemes and labels did not affect them much. Consumers mostly relied on their previous experiences, tacit knowledge and recommendations of family members, relatives, friends and other influencers rather than on producers' claims or FQS. Products with a GI label were sometimes part of food practices, but without much emphasis on the certification itself. Several informants selected SFSC products mostly because of the perceived benefits concerning supporting the environment, local economy, animal welfare and personal health, giving them a feeling of doing "the right thing".

There was some evidence that participants are keen on local food and are supportive of local producers. It seems that they select mostly local or regional products because of the name and the quality they know about. When buying local or organic food products, most participants do not pay special attention to the official FQS; retailers' private labels and commercial brands appear to be sufficient. Within this framework, self-production plays an important role in some countries, including Hungary, Serbia, and France and regarded as high quality and extremely valuable.

Broadly, there is a hierarchy in participants' perceptions of FQS and short chains, whereby local foods and SFSC are the most salient and valued, then organic foods and last are origin and eventually labels (i.e., PDO, PGI). However, a number of other factors, such as taste, financial and time constraints as well as food habits influenced the final purchase decisions.

5.4 The role of attitude, trust, social norms on the choice of products promoted by FQS

The relevance of FQS in motivating consumers' purchase decisions was investigated using a Discrete Choice Experiment as is the role of cognitive and affective attitudes, trust, and social norms in influencing the choice of a product promoted by a FQS. The latter is based on an Integrated Choice and Latent Variable model. The respective products and labels investigated were as follows: (semi) hard cheese promoted by a PDO label in France and Italy, sausage promoted by a PGI label in Hungary, apples promoted by the EU organic label in Germany, Norway and the UK and potatoes promoted by national organic labels in Serbia.

The findings confirm the important role of price in consumers' purchase decisions. Divergence between countries exists with respect to consumers' appreciation of EU and national quality schemes. For France and Italy – both surveys investigate the FQS label PDO

for cheese, compared with no label or a combined label “PDO + Bio” in the case of France and “PDO + Mountain label” in the case of Italy. The combined label is most preferred by consumers, though the sole PDO label also receives a higher relative purchase frequency compared with products with no label. For other countries, we see that some FQS labels are not able to raise consumers’ interest in the product. This holds true for the EU organic label in the case of Germany, Norway and the UK and for one of the national organic labels in the case of Serbia. Interestingly, however, it seems not to be organic *per se* that is of little interest to consumers but the specific label. Overall, national organic labels receive not only a much higher level of recognition but are also much better evaluated. Furthermore, the choice experiments that include country of origin as an attribute confirm the findings of the ethnographic studies that locality of products is important; consumers prefer products originating from their own country.

5.5 The effect of a policy intervention and commercial strategy to boost FQS sales

The findings so far indicate that FQS fail to inform consumer behaviour as was intended. In this section, the findings regarding the effectiveness of one policy adjustment and one marketing adjustment on consumer confidence and purchase behaviour is considered.

The policy adjustment investigated relates to the EU organic logo that has been implemented since 2010. Despite the fact that the EU green-leaf logo was launched almost a decade ago, public awareness, knowledge and trust of this label seems limited (see section 5.2). One reason for this may be the design of the EU green-leaf logo, which is far from self-explanatory. Against this background, the effectiveness of a modification of the green-leaf logo in improving consumers’ evaluation of the label was assessed. More specifically the text “ECO” (modification 1) and ECO EU certified (modification 2) was added inside the green-leaf. The findings clearly indicate that the adjusted EU green-leaf logo would lead to a significant improvement in its clarity, trustworthiness and attractiveness as perceived by consumers. This holds for both label modifications to a similar extent.

The marketing adjustment was motivated by the insights that a lack of attention while undertaking grocery shopping is the main reason why those consumers recognizing a label do not use it (see section 5.2). Thus, it was investigated whether highlighting the FQS label at the point of sale could boost consumer interest and purchases. For this purpose, an experimental setup in three European countries (Germany, Serbia, and the UK), focusing on four product categories (fresh milk, apples, cheese, and cured ham) was conducted in a virtual shopping environment, called the Virtual Supermarket (VS). The study examined three of the four EU FQS labels: the EU organic label, the PGI label, and the PDO label. The results reveal that usage, recognition, knowledge and trust with respect to the different labels, in most cases did not differ significantly between participants of the treatment group (those participants who shopped in a VS with a prominent placement of the FQS labels at the shelf) and the control group (those participants who shopped in a VS without such placement). Though the marketing strategy investigated proved unsuccessful, the evaluation of the VS by participants reveals that the VS can be a suitable instrument for testing different marketing strategies with a large number of participants.



The Strength2Food project in a nutshell

Strength2Food is a five-year, €6.9 million project to improve the effectiveness of EU food quality schemes (FQS), public sector food procurement (PSFP) and to stimulate Short Food Supply Chains (SFSC) through research, innovation and demonstration activities. The 30-partner consortium representing 11 EU and four non-EU countries combines academic, communication, SMEs and stakeholder organisations to ensure a multi-actor approach. It will undertake case study-based quantitative research to measure economic, environmental and social impacts of FQS, PSFP and SFSC. The impact of PSFP policies on nutrition in school meals will also be assessed. Primary research will be complemented by econometric analysis of existing datasets to determine impacts of FQS and SFSC participation on farm performance, as well as understand price transmission and trade patterns. Consumer knowledge, confidence in, valuation and use of FQS labels and products will be assessed via survey, ethnographic and virtual supermarket-based research. Lessons from the research will be applied and verified in 6 pilot initiatives which bring together academic and non-academic partners. Impact will be maximised through a knowledge exchange platform, hybrid forums, educational resources and a Massive Open Online Course.

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