Strengthening European Food Chain Sustainability by Quality and Procurement Policy

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REPORT EVALUATING THE PILOT ACTIONS ON REGIONAL FOOD LABELLING AND PRODUCER CO-OPERATION

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EXECUTIVE SUMMARY

In the frame of the Task 9.5. 'Pilot action on stimulating producer co-operation and regional food labelling' of the Strength2Food project we conducted three different, but interrelated pilot actions which delivered added value beyond the pure academic methods of the S2F project. Two pilot actions were conducted in several locations of Serbia and the third van was realized in Szekszárd, Hungary, on expanding co-operation and regional food labelling to improve returns to local producers.

1st pilot action (Sub-Task 9.5.1.) has undertaken research and demonstration activities in Serbia to improve the effectiveness of food quality schemes and public sector food procurement and to stimulate short food supply chains. This pilot has sought to bring higher quality (organic) food into primary schools in Serbia through public procurement involving local food suppliers. Using the action research method, the project linked together supply and demand within fragmented and challenging policy frame. The action research has necessitated engagement with a number of actors in various settings (central and local policymakers; school directors, administrators, catering staff; actual and potential suppliers; nutritionists, experts in public procurement). It has also drawn on the insights of other S2F Work Packages/Work Tasks to understand the views of parents and children and ascertain the impacts of shortening primary school food supply chains. This has enabled the project to consider the considerable range of strain points and potential fail points for an initiative such as this, and thereby engage relevant stakeholders in the research process.

This includes a current situation analysis in Serbia of the policy and market environment for food procurement by primary schools. It also summarises the findings from discussions with the stakeholders that it has brought together, the progress made in aligning the interests and incentives of these different stakeholders, the creative solution that has been constructed in Vojvodina (in the northern part of Serbia) in response to these issues, and the practical-level issues that have provided potential obstacles to the action research proposition and its sustainability.

The 9.5.1. work defines critical success factors. It notes the hard work and skilled interventions necessary to secure the gains required for sustainable solutions. Gathering motivated stakeholders, willing enablers, and energetic leadership is a difficult but essential task in building the momentum for change. Without this, there is little chance that change can be brought to bear on these issues.

2nd pilot action, Sub-Task 9.5.2. aimed to: (1) enable in-depth analysis of main problems that raspberry producers are faced with in Serbia, and (2) facilitate fresh fruit supply with the aim to improve farmers' income. This sub-task focused on the fresh raspberry supply chain in Serbia, based in Arilje, the largest raspberry growing region in Serbia, the world's second largest raspberry producer. Particular attention is paid to the introduction of new varieties and the development of the organic raspberry production in the Municipality of Arilje in order to promote well balanced cash flow and farm income.

The main challenges farmers face are identified in two broader areas: (1) Market structure and position of small family farmers (lack of horizontal and vertical integration, extremely strong position of large traders, volatile prices); (2) Inadequacy of policy measures and support to farmers (the measures do not address the main issues and do not help farmers in solving the different problems they are exposed to). According to stakeholders' perspectives gathered through qualitative research, better response to the contemporary challenges must be based on: (1) Technology improvement and introduction of new varieties with possibility to develop both

fresh food markets using the high quality schemes in labelling and development of processed food products for domestic and foreign markets; (2) Establishment of better connections among food chain stakeholders.

Following the focus groups, we conducted producer surveys in the Arilje region with the aim to better understand the food chain organization at the local level. The results revealed that trade cooperatives can bring additional value to the chain, despite this model of cooperation is highly distrusted by farmers for historical reasons. We also found that the region, as a whole, suffers from intensive use of chemicals in raspberry production. Therefore, it is extremely important to establish efficient control of different inputs use, particularly those which might significantly influence the development of the organic production. Therefore, our case study focused on the conversion to organic and on the introduction of new varieties in two small farms.

The demonstration activities within the 9.5.2 are important in the context of promotion of changes in agricultural practices in Serbia, which can hopefully give additional economic benefits to producers. The activities conducted in this subtask generated important conclusions regarding diversification strategies that might be applied on the farms. Moreover, the 9.5.2 activities are strongly connected with 9.5.1 (in the context of a new cooperative establishment) and 9.5.3 (in the context of traditional food labelling and promotion). The key recommendations of the subtask 9.5.2 can be summarized as follows:

Key recommendations for farmers and other food chain stakeholders

(1) Implementation of market strategies that involve higher added value production and product diversification within the raspberry food chain; (2) Invest resources on younger farmers, who are ready to change their own business practices in order to achieve higher earnings and are usually early adopters of new strategies, such as digital farming; (3) The fragmented structure of the raspberry sector best suits the interests of big players at the B2B market. There is an urgent need for introduction of new cooperatives based on collaboration between small, family-owned businesses; (4) Marketing strategies should be based on the reorientation from product-driven to customer-driven activities (instead of trying to sell what they produce, farmers should change their point of view in producing what is required in the market); (5) When possible, farmers should opt for organic production which is better valorised at the world market. Product labelling and branding are becoming increasingly important as food demand is generally shifting towards more sustainable products.

Key recommendations for policy makers

(1) There is an urgent need for restructuring the state incentive system, which should better support quality connections between primary and processing sectors within the raspberry food chain; (2) Unfair trade-practices must be stopped; (3) Due to fragmented structure and limited access of farmers to capital and information, there is a need for common branding by introducing the "umbrella name" for high quality products; (4) The government has done a lot in the context of digitalization by introducing the digital agricultural concept in the practice, but the state extension service is not improved at all. (5) Farmers argue about an urgent need to establish a quality and safety standards control system to support export-oriented practices.

Lastly, the results of the subtask 9.5.2 are useful in the context of facilitation of direct connections among different stakeholders. The pilot action has facilitated the identification of the most important problems in the Serbian raspberry value chain, as well as the creation of an innovative environment for problems solving using a bottom-up approach.

3rd pilot action, Sub-Task 9.5.3. aimed to evaluate the experience of place based, co-operative labelling of high value added food for local and regional markets with the purpose of producing

and evaluating a toolkit for such initiatives. The basis of this pilot action was the existing local food system operated by Eco-Sensus, a local non-profit private organisation in Szekszárd, Hungary.

Consumer survey results and lessons learned

With the aim of exploring local food preferences and identifying potential explanatory factors, a comprehensive consumer survey on local foods was conducted in 2019. The survey represented the target population of Szekszárd and examined local food purchasing habits and consumer preferences through a random sample of 250 people, Besides examining perception towards local food in the Szekszárd area, we analysed sources of local food product supply and also perception of local trademarks with a special focus on the "Quality local food – Szekszárd and region" certification mark. Results were compared with a previous survey (carried out in 2011) in order to identify changes over time.

We examined how important are several factors in determining purchase choices, such as seasonal, fresh, healthy, cheap, quality food, discounts, special offers, and big-size packaging. Moreover, local food recognition along food categories were analysed related to the geographical location of Tolna county (including Szekszárd). We found that, although consumers' perception of local food has increased in the past few years, it may still be regarded as low. Analysing the perception of local food marks, we found that in 70% of the responses the concept of trade mark was misinterpreted, hence consumers' awareness of trademarks seems to be insufficient.

These insights were complemented with an analysis of retailers' promotional material in Serbia. This confirmed that, that in order to develop an effective and sustainable local food system, it is of paramount importance to explore and analyse consumers' preferences for local products. The methodology we developed proved to be applicable for the analysis of the demand (consumer) side of local food initiatives and makes possible to measure the effectiveness and efficiency of different policies by comparisons of different time periods.

Local food supply interviews results and lessons learned

Producer interviews, made in the Szekszárd area in 2019, generated deeper insights into the nature of local production, about its state and future prospects. Out of the 30 interviewed producers, 6 were label users and 24 non-users. Most (67%) of the producers deem the existing local food label proper for common marketing purposes and to represent local food economy values. Of course, the proportion of willing-to-participate producers would be effectively less in practice, but still it is a very promising development. The key conclusion concerning local certification label is that, although consumer awareness is still low, the maintenance of existing label systems is a promising tool for producers.

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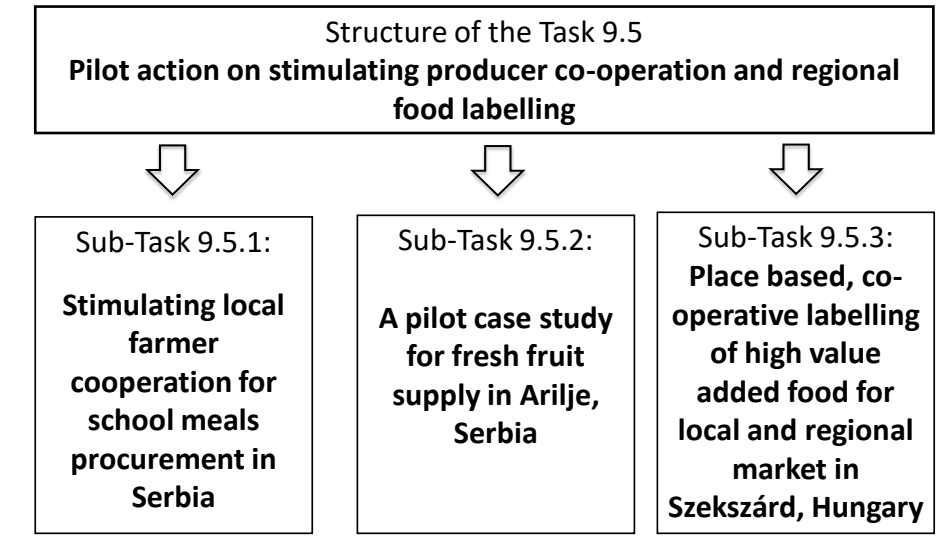
LIST OF ABBREVIATIONS AND ACRONYMS

FQS	Food Quality Schemes
PSFP	Public sector food procurement
PCP	Public-co-operative-partnership
SFSC	Short food supply chain
EAFRD	European Agricultural Fund for Rural Development
PCPs	Public-Co-operatives-Partnerships

INTRODUCTION

The "Task 9.5 Pilot action on stimulating producer co-operation and regional food labelling (M1-M58)" has been focused on expanding co-operation and regional food labelling to improve returns to local producers in Hungary and Serbia, drawing on expertise of academic and stakeholder partners the practitioner expertise of ECO-SENSUS and lessons on importance of consumer preferences for food quality schemes (FQS) products and short food supply chains SFSC feeding in from WP7 and WP8.

The pilot action has concentrated on stimulating opportunities for farmers to produce for local, regional and international consumers, based on three Sub-Tasks, as follows:



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1. SUB-TASK 9.5.1: STIMULATING LOCAL FARMER COOPERATION FOR SCHOOL MEALS PROCUREMENT IN SERBIA

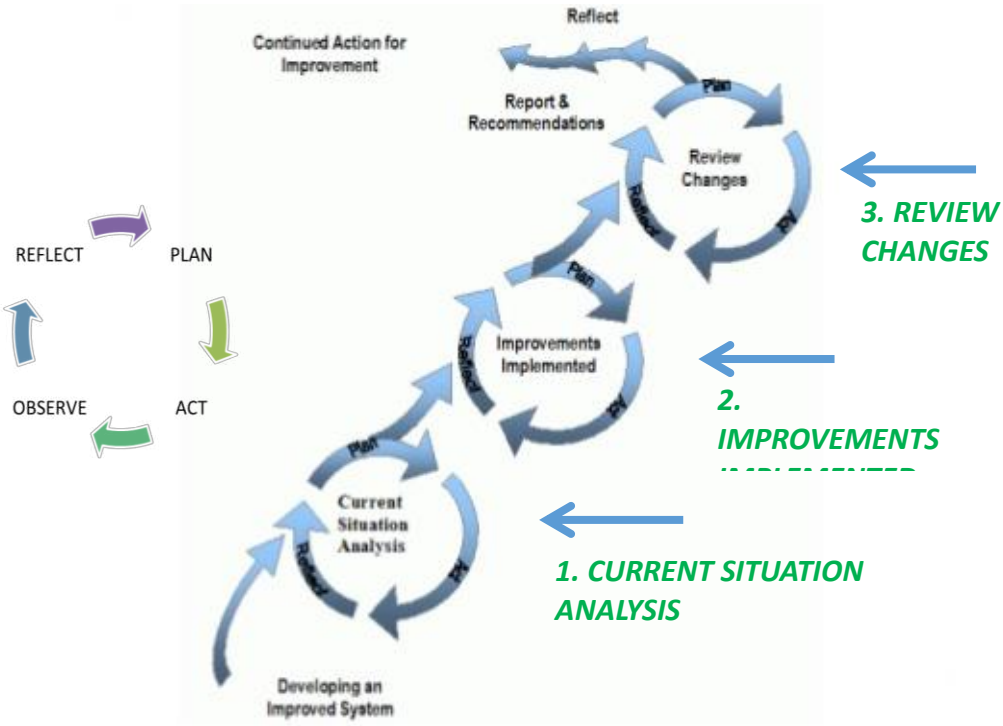
1.1. Introduction

This report concerns the action research activities in WP9.5.1[2]. Action research provides an opportunity to engage with research subjects in a collaborative project to facilitate and bring about changes which have been agreed upon by all parties. It has the dual aim of increasing knowledge and changing some aspect of the world at the same time. The classic action research proposition is Plan, Act, Observe, Reflect (Lewin, 1946), often represented as a circular process, or 'spiral' (Figure 1, below). It is less a methodology, more an orientation towards research (Reason & McArdle, 2004). By its nature, action research involves *strategic action*: a deliberate and planned intent to solve a problem (or set of problems), but this is not a linear process: it is much more complex. In response, flexibility is key (whilst maintaining rigour) - even where interventions are based on a sound rationale, there may be surprises and unintended consequences along the way that need to be taken into account. With this constantly evolving backdrop, many factors impinging on the research process and outcomes are often outside the researchers' direct control. With this in mind, seeking to implement changes without paying due attention to existing knowledge is difficult to justify on either research or ethical grounds. This has required extensive preliminary fieldwork, with emergent action propositions being explored through extensive stakeholder engagement and collective discussions in order to identify the direction of and barriers to change. These propositions have been continually kept under review, with flexibility to adjust in accordance with emerging evidence/feedback.

Given this complexity, Meyer (2000: 179) suggests that: *'Success should not be judged solely in terms of the size of change achieved or the immediate implementation of solutions. Instead success can often be viewed in relation to what has been learned from the experience of undertaking the work'*. However, our ability as researchers to affect people's lives underpins a key responsibility to act in the best interest of all. Hence, action research has an intentional, direct impact on people's lives – which may be positive or negative. As Hilsen (2006: 33) points out, this: *'places an even higher ethical demand on researchers to take responsibility for the social consequences of the research and make it explicit both in our practice and our communications about that practice'.* This has required careful thought about where we are going at each stage, weighing the transformative potential against the risks (e.g. *of intervening in supply-chain dynamics; of leaving schools in a worse position; and (ultimately) of children not being fed!).* We have remained mindful throughout of the need to create win-wins for all in our approach.

[2] This Sub-Task is integrated with the 'demand' side of school meals procurement in Sub-Task 9.1.1, to provide the 'supply' side of the equation. However, the objective of Sub-Task 9.5.1 was to provide opportunities for growers to develop stability of supply to open up new SFSC markets in general, so the benefits of this sub-task for producers extend beyond school meals procurement opportunities to equip them with increased competitiveness to capture other markets. The focus for this Sub-Task were the same local communities and regions as those covered in Sub-Task 9.5.1. Thus, work in the 10 localities where we have primary schools keen to trial more nutritious meals (including Arilje municipality) will concentrate on mapping by BEL and BSN of socio-economic characteristics of local production and supply chains. Once initial mapping in these localities of socio-economic characteristics has been completed to identify potential school meals providers (year 2), and lessons learnt from existing Serbian success stories in school meal provision, together with recommendations coming from WPs 6 and 7, BEL and BSN will work with those small-scale producers (fieldwork, questionnaires, targeted training and workshops) to lay the ground work for setting up producer associations or cooperatives in the future. Establishing suitable governance structures is an essential precondition for these collective efforts to succeed.

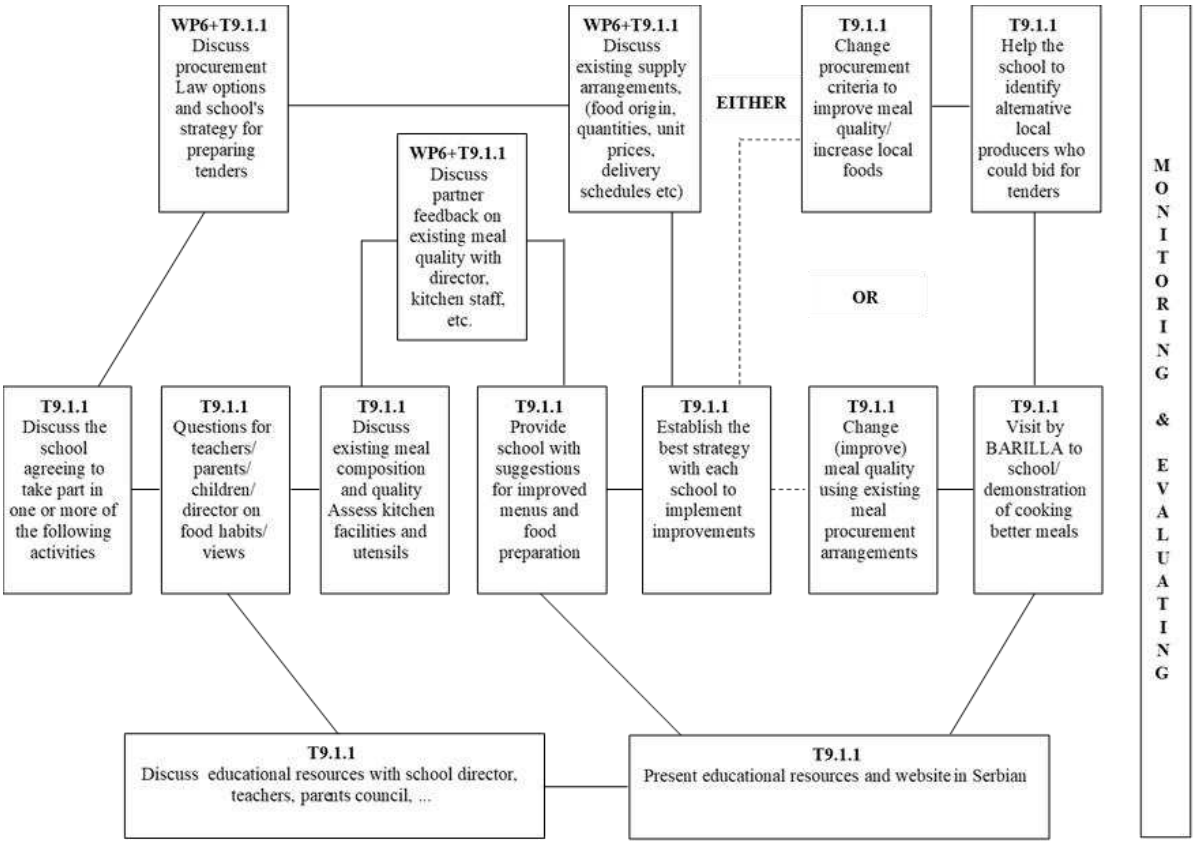
Figure 1. Key elements of Action Research



Improving the Quality of Primary School Meals

This report examines action research with primary schools in Serbia, aimed at improving the quality of school meals through the use of local suppliers for public sector procurement. It details the progress that has been made in linking together supply and demand within a policy frame that is fragmented and challenging. The action research has necessitated engagement with a number of actors in various settings (central and local policymakers; school directors, administrators, catering staff; actual and potential suppliers; nutritionists, experts in public procurement). It has also drawn on the insights of other S2F Work Packages/Work Tasks to understand the views of parents and children and ascertain the impacts of shortening primary school food supply chains (see Figure 2). This has enabled the project to consider the considerable range of strain points and potential fail points for an initiative such as this, and thereby engage relevant stakeholders in the research process.

Figure 2. Links to other S2F WPs and tasks



In many respects, there has been a good degree of synergy between the above activities within different WPs and tasks, with knowledge shared and learning taken relatively quickly into the thinking for WP9.5.1. However, in terms of S2F activities, WP9.5.1 itself has been explicitly discussed at the following stakeholder meetings:

- 104 meetings with school directors and S2F school coordinators from Belgrade, Novi Sad, Valjevo and Arilje areas (see Figure 5)
- 2 joint meetings with Novi Sad school directors/representatives
- 9 meetings with representatives from Ministries (Education, Agriculture); 16 meetings with local government representatives in Novi Sad, Belgrade, Valjevo and Arilje
- 4 meetings with Vojvodina Chamber of Commerce, and public company 'Market Place', Novi Sad
- 10 meetings with agricultural extension and advisory services
- 10 meetings with existing agricultural co-operatives and associations
- 3 meetings with large existing commercial supplier of food to schools
- 24 meetings, 10 Skype meetings and 2 presentations with/for producers from Vojvodina and around Belgrade, Valjevo and Arilje
- Food fair discussions with organic growers in Belgrade and Novi Sad
- 7 meetings with representatives of USAID, Nordic embassies, NGO working with organic producers Terras in Subotica, experts for public procurement, nutrition, restaurant using organic food.

- 2 Hybrid Forums, including: “Opportunities for supplying primary schools with organic fruits and vegetables”, 14th November 2019 in a Novi Sad school

First, this report provides some background about the intentions of the project with regard to establishing short food supply chains through public sector food procurement. Next, the report provides an overview of the action research process. This includes a current situation analysis in Serbia of the policy and market environment for food procurement by primary schools. It also summarises the findings from discussions with the stakeholders that it has brought together, the progress made in aligning the interests and incentives of these different stakeholders, the creative solution that has been constructed in Vojvodina (in the northern part of Serbia) in response to these issues, and the practical-level issues that have provided potential obstacles to the action research proposition and its sustainability.

The report concludes by drawing attention to the definition of critical success factors. It notes the hard work and skilled interventions necessary to secure the gains required for sustainable solutions. In particular, the report notes that gathering motivated stakeholders, willing enablers, and energetic leadership is a difficult but essential task in building the momentum for change. Without this, there is little chance that change can be brought to bear on these issues.

1.2. Action research to stimulate short food supply chains

1.2.1. Background/Context

Serbia is a country in the Western Balkans in Central and Southeast Europe, bordering the EU countries Croatia, Hungary, Romania and Bulgaria, with a population of about 7.2 million. The territorial organisation of Serbia includes five regions (Belgrade region, Vojvodina region, Šumadija and western Serbia region, eastern and southern Serbia region and Kosovo-Metohija region). It has 30 administrative areas, 24 cities, 30 urban municipalities, 150 municipalities, 6,158 villages and 193 urban settlements. There are approximately 1200 state primary schools, many of which include a number of satellite schools, although not all of them provide meals prepared in their own premises (33%).

Strength2Food project has various key goals: to examine carbon footprints and food waste, and food quality schemes such as organic and PDO, as well as public procurement and short food supply chain issues. These goals have been brought together in the action research work package of the project. WP9.5.1 has sought to bring higher quality (organic) food into primary schools in Serbia through public procurement involving local food suppliers.

Serbia is not a member of the EU, and thus it does not have an obligation to implement standardized school food quality policies in accordance with EU standards. Until September 2018, meal provision in Serbian primary schools was regulated only by the general policies governing the area of public procurement and food safety (Law on Food Safety, Law on Public Procurement, Law on Public Health, Law on Health Care, Law on Sanitary Surveillance). These mainly pertain to requirements of sanitary regulation of food procurement and transportation; obtaining the needed quality standards (for example, HACCP); the administrative procedure while applying for publicly declared tenders, etc.

Traditionally, then, the roles of different stakeholders in meal provision have not been clearly defined. While various projects (led by external entities and international organizations such as UNICEF) have aimed to partially and indirectly address these issues, no policy institution has taken particular responsibility for their resolution.

Given Serbia's stated intention to become part of the EU in the future, this issue has recently received some attention. In September 2018, the Ministry of Education, Science and Technological Development introduced its first regulations specifically targeting meal provision in primary schools (MPNTR, 2018 *"On Miscellaneous Conditions for Organising, Exercising and Monitoring the Nutrition of Pupils in a Primary School"*). This was accompanied by *Guidelines and Recommendations on Organising, Exercising and Monitoring the Nutrition of Pupils in a Primary School*, together with nutritional advice on the preparation of school meals, and foods to avoid. This Rulebook advises on, and provides recommendations for, the preparation and organization of Serbian primary school meals. The Rulebook includes food-based and nutrient recommendations and normatives for school meals, and advises that school menus should be developed by a nutritionist/dietician or by school staff. The development and adoption of the Rulebook for the organization, delivery and monitoring of primary school food is a significant step forward in Serbian public policy. Nevertheless, previous experiences demonstrate that consistent monitoring and control of the application of the rules will be vital.

1.2.2. Public Sector Food Procurement

Meals offered by Serbian primary schools are either a snack or breakfast or lunch or various combinations of those three meals. The average price of the school lunch for parents is around 143 RSD (1.21 EUR, range 0.33-2.28 EUR) (Strength2Food survey, 2017, WP9.1.1). Individual school directors may charge whatever amount they decide for school meals, provided this is approved by the school's parents council. Ministry regulations state that the amount charged to parents should be only sufficient to cover either the cost of the meal ingredients (no kitchen staff or other running costs may be charged to parents). In reality most schools do not have a good idea of how much it costs to prepare each meal, so that some schools charge too much to parents, whilst others sometimes end up subsidising the cost of meal ingredients (for example, many schools in Novi Sad, where the municipality sets a cap on meal charges to parents).

Procurement of all products and services related to school meal provision must be carried out in accordance with national public procurement law. The food procurement process is not centralized, which makes schools responsible for their own procurement. In consequence, to minimise the administrative load for food procurements, documentation is usually "copy-pasted" from previous years' documentation.

Schools can vary the numbers of lots from one (a single supplier for all foods) to at least nine (given the average size of contracts, this could mean potentially nine different suppliers bidding for lots worth maybe no more than 250 EUR). Our analysis of procurement documentation shows that the most frequent number of lots used by schools for food procurement is *one*. This means around a quarter of all schools buying food for their own meals use general food distributors to deliver everything, again reducing the school's administrative load. Even where schools may divide food procurement into more than one lot, for example according to fruit and vegetables, meat, dairy, frozen food and other foods, typically general food distributors will bid for and win several lots. Food suppliers can vary from small companies, with a local catchment area (such as Market Padina doo); other bidders are major national food suppliers (such as Univerexport, based in Novi Sad).

Although the Law permits it, *joint procurement by several schools does not occur*. For this reason, food quality criteria and contract eligibility criteria differ from one school to the next. Only a few schools use the services of an external agency to organise their procurements, as

they have to pay for this out of their own budget. Complicated tendering procedures and the lack of competence for their preparation are big issues for schools. We have suggested that it might be useful in future to find better ways for schools to work together to reduce this burden. This may include work to standardise elements of the tendering procedures to simplify the process in general.

Most importantly, however, the current legal provisions define 'lowest economic price' as the key selection criterion in procurement decision making, and the cost of school meals is payable by parents. Both schools and companies supplying them agree about the *harmful impact of making the lowest price the essential contract award criterion*. Schools argue that it is difficult to find reliable business partners if they cannot pay to them a competitive market price. Similarly, because school contracts are generally of relatively small value for many companies (only 0.25% to 2.5% the value of all annual public sector food contracts for the large food companies, Table 1), primary schools are often given a low priority when it comes to scheduling delivery times, so food is occasionally delivered too late to prepare lunch, for example. To win contracts, bidders will sometimes ignore food quality criteria to put in a low bid. For this reason, many schools will have preferred companies that they are happy to award contracts to and others that they will reject because of previous bad experiences.

Table 1. Value of annual procurement contracts with Serbian primary schools*

Supplier name	Supplier location	Type of supplier	Annual public procurement contract value (million RSD)	Number of public procurement contracts	Number of public procurement contracts with OŠ schools	Total OŠ school contract value (million RSD)	Total OŠ school contract value % total value	Average OŠ school annual % total contract value
Avala Merkur	Beograd	General	36.93	16	3	2.74	7.42	2.47
Big Trade doo	Novi Sad	Meats	83.86	26	3	3.72	4.44	1.48
Božilović Luxor doo	Svilajnac	General	107.46	90	13	14.03	13.10	1.00
Illi Group doo	Novi Sad	General	595.11	28	2	8.22	1.38	0.69
Ila Promet doo	Čačak	General	153.77	71	12	8.76	5.70	0.47
Komercservis-produkt	Novi Sad	General	248.17	71	15	9.70	3.91	0.26
Mlekobel doo	Novo Miloševo	Dairy	65.02	21	2	1.70	2.61	1.31
Štrand doo	Novi Sad	Meats	8.83	10	3	3.83	43.36	14.45
Univerexport doo	Novi Sad	General	162.98	79	5	15.08	9.26	1.85
ZZ PKB Povrtar	Beograd	Vegetables	206.08	35	1	0.53	0.26	0.26

*for 10 food suppliers for 12 months during 2016-2017.

Against this backdrop, we have engaged in the action research process (see Figure 1). This heuristic has four broad stages: 1) current situation analysis, 2) improvements implemented, 3) review changes, 4) continued action for improvement.

1.3. Action research stage 1: 'Current situation analysis'

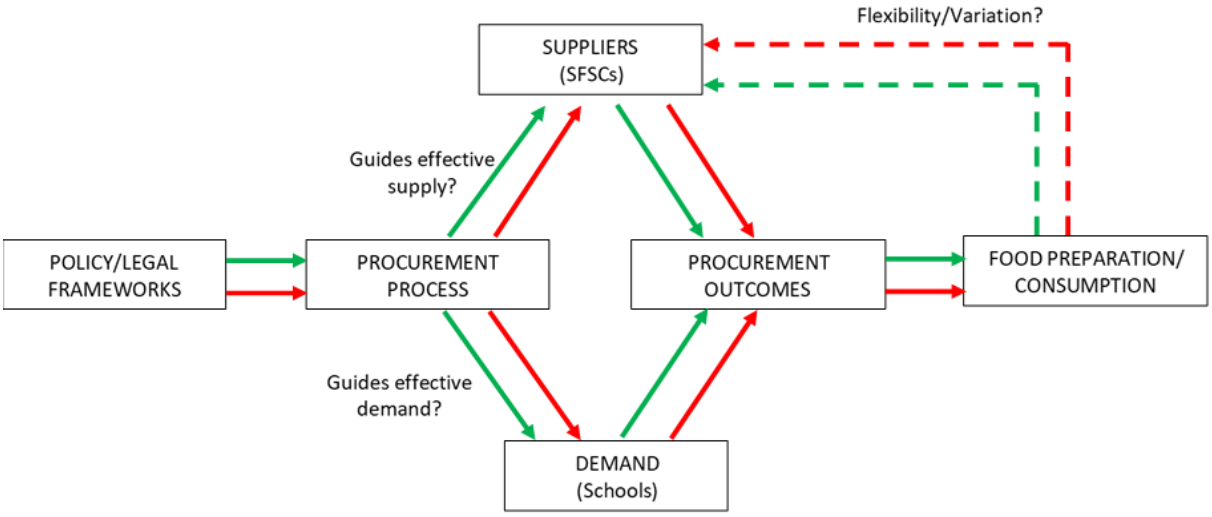
The 'current situation analysis' in WP9.5.1 has included detailed analysis of procurement documentation from the public database, an examination of agricultural census data, and more than 100 outreach visits and discussions on the ground with different stakeholder groups (whilst also taking into account primary data collected through surveys with schools, parents and children, carbon footprint and plate waste analyses from other S2F WPs: WP6.2, 6.3). In sum, our initial *analysis shows that public procurement tends to generate sub-optimal effects for food quality and quantity (food content, freshness), and there is little or no attention to food origin (with impacts for SFSCs, carbon footprint, and local economic development)*. The current situation analysis has also explored a range of options for how SFSCs may be organised within

the current framework of PSFP. This has helped to identify scope for improvement in various elements of the procurement system (Figure 3, below).

More explicitly, Figure 3 identifies the following strain points:

- *The procurement process does not always encourage strategic planning of procurement needs*
- *The procurement process does not always encourage the formation of an effective market*
- *Inadequate specification of demand often affects supply-side outcomes (e.g. food quality)*
- *Inadequate specification of demand often affects demand-side outcomes (e.g. excessive contract variation)*
- *End user dissatisfaction (food preparation chefs, consumers (parents, children)*

Figure 3. Some key elements of the procurement system



Thus, moving left to right, key strain points in Figure 3 come from an enabling environment that is not fully fit for purpose, a procurement process that does not encourage strategic planning of procurement needs, a procurement process that does not encourage the formation of an effective market, and/or an inadequate specification of demand, which affects procurement outcomes (e.g. food quality), leading to end user dissatisfaction (from those responsible for both food preparation and consumption). A new Procurement Law which came into force in July 2020 has done little to address these points, though it will take a few more schools with low food procurement values out of the formal PSFP system - the threshold for requiring PSFP procedures has been doubled from around 4,250 EUR to 8,500 EUR per year. In addition, the reality of operating the everyday supply chain relationship results in *excessive demand-side variation, so that schools often request 'emergency' deliveries at short notice and supplier must respond within the terms of the contract*. This, of course, adds to transaction costs and is not popular with suppliers. The above analysis points to structural issues affecting public procurement issues from a systemic demand-side perspective, considering how the system does not always generate the desired results. These are important issues, as they affect the ability and willingness of potential suppliers to enter into and/or maintain their presence in public food procurement markets. WP9.5.1 has worked with the relevant authorities in Serbia to address some of these strain points. This includes work with local municipalities to identify ways to

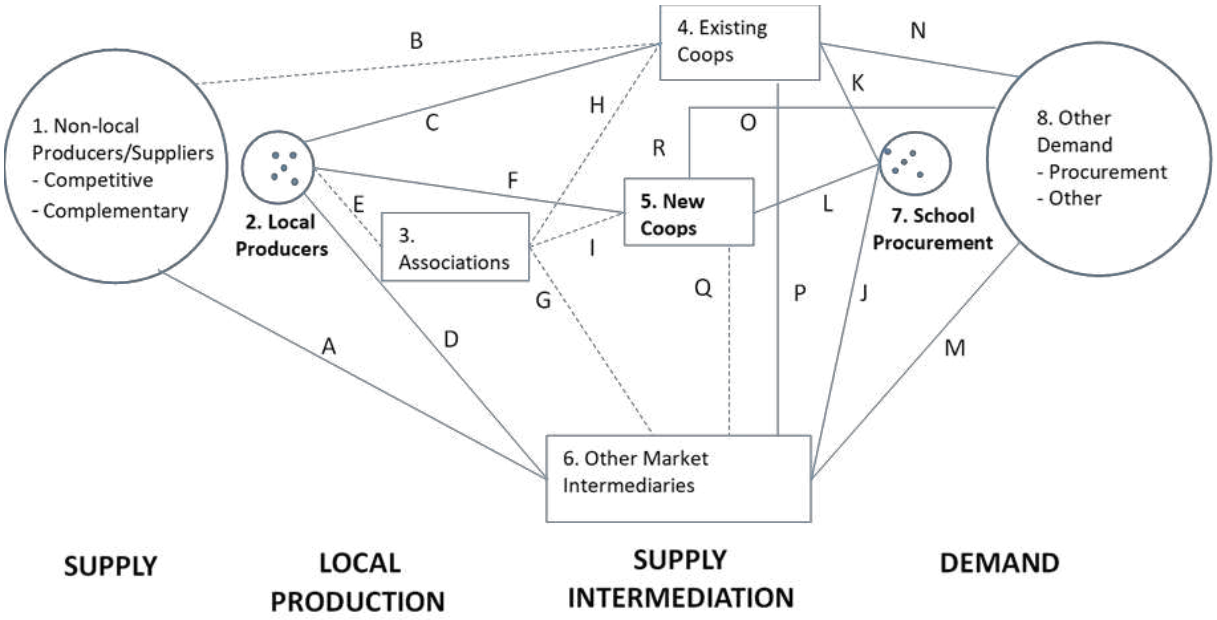
link 'good' producers of food (specifically fruit and vegetables) with the schools in their jurisdictions.

1.3.1. Mapping the possibilities for SFSCs in PSFP for primary schools in Serbia

It is important to address the above systemic demand-side issues. However, it is also important to assess the situation from a systemic supply-side perspective; even if action was to be taken to improve the situation on the demand-side, it would be important to ascertain whether there would be capacity on the supply-side to respond. Figure 4 maps the key supply possibilities for primary school PSFP, including opportunities for local producers to engage in the supply chain.

Figure 4 consists of eight sets of actors (labelled 1-8) and eighteen relationships (labelled A-R), which are explained below, and these create a number of supply chain possibilities that we capture in three supply-chain patterns (see below). The current situation analysis in WP9.5.1 spent time considering each of these actors, relationships and chains to provide a picture of the supply-side situation.

Figure 4. Mapping the possibilities for SFSCs in PSFP for primary schools in Serbia



It should be noted that in Figure 4 the hard lines represent direct supply possibilities, even though some are more likely than others. The dotted lines describe important relationships that need to be included here, but that are unlikely to lead to direct supply possibilities for various reasons detailed below.

1.3.2. Actors

1. Non-local producers/suppliers: These were identified through an analysis of the labels on foods received by the primary schools in the study as part of WP9.1.1. For certain products (e.g. oranges, bananas, various ambient goods), it is clear that there is no local supply alternative. The provision of these items is therefore complementary to any local offer. However, for various other products, including fresh vegetables, there are good local alternatives, so that non-local or imported products are in competition with them, at least when they are in season in Serbia. This analysis provided a basis for considering where we could seek to establish SFSCs for PSFP in the primary schools.

2. Local producers: In addition to the food label analysis, current procurement documentation was examined as part of WP9.1.1 to see the extent to which local producers were already represented in the supply chain for primary school food procurement. While there was evidence that some products were produced locally, and that some contracts had been awarded to supply intermediaries such as co-operatives of local producers, this was piecemeal and unpredictable rather than the subject of any deliberate strategy. Examination of municipality vegetable and fruit productions in the agricultural census (2012) suggested that there were opportunities in principle for local producers to become more involved. Contact with local producers to consider these possibilities with them directly, collectively and individually, was therefore made through associations, extension services, agricultural advisory services, agriculture departments in local government and local markets/food fairs.

3. Associations/Clusters: In mapping the possibilities for the inclusion of local producers, associations and 'clusters' representing their interests are often an effective means of aggregation, from which supply intermediation relationships can subsequently be built. Contact with relevant associations and clusters were made in WP9.5.1 through academic contacts, extension services, agricultural advisory services, and agriculture departments in local government.

4. Existing Co-operatives: Existing co-operatives provide an obvious opportunity for supply intermediation involving local producers. Agricultural co-operatives are formed in the interests of their members, who are generally drawn from the local areas in which they are based. Whilst there were few examples of existing co-operatives involved directly in PSFP, we spoke with the two we were able to identify through our analysis of current procurement documentation; one in Belgrade, and one in Žitište in Vojvodina. We also spoke with a number of further existing co-operatives to establish their willingness and ability to diversify their activities into PSFP with primary schools.

5. New Co-operatives: New co-operatives represented a theoretical supply intermediation category at this point of the action research. All other options were to be examined before we would consider returning to this alternative for establishing SFSCs for PSFP in the primary schools.

6. Other Market Intermediaries: These were identified through an analysis of the current procurement documentation examined as part of WP9.1.1. There are numerous intermediaries involved in PSFP, although a much more limited number in supplying primary schools due to the size and scope of these tenders. We identified some key commercial intermediaries (such as Univerexport and Illi Group) from this documentation and spoke with them with regard to the extent to which they currently involve local producers in the supply chain, and the extent to which they were seeking to do so in the future. While some intermediaries used local food producers, availability and price/quality class were the main drivers for sourcing foods. Other market intermediaries were usually large distributors of all foods, so these were the inevitable bidders for schools putting all PSFP items in a single lot (around a quarter of all schools).

7. School Procurement: WP9.5.1 worked with a sample of around *30 target schools* to consider their current procurement arrangements and potential for changes to incorporate SFSCs. The sample was derived from the results of a school questionnaire in WP9.1.1, which indicated the size of the school, whether or not the school had a kitchen to prepare meals for the children, and the total number of children receiving school meals each day. We met with school directors, administrators and chefs to understand in detail the issues they faced in relation to food procurement, and gauge their interest in and willingness to consider local supply alternatives.

8. Other Demand: Finally, we considered the other markets (including other PSFP markets, such as hospitals, student homes, etc) with whom local producers might seek to engage. It seemed there was little to be gained from seeking to establish SFSCs in primary school food procurement if local producers were more interested in pursuing other, more rewarding market opportunities, especially where certification was not required by the buyer - a major consideration for school food procurement.

1.3.3. Relationships

A. Non-local Producers/Suppliers to Other Market Intermediaries

This is a key relationship, allowing market intermediaries to flexibly access supplies from any available source in order to meet demand. This is appropriate in most PSFP contracts, where a broad range of supplies is likely to be required that exceeds the ability of local producers/suppliers to deliver. However, the availability of non-local products that compete directly with those of local producers have implications for SFSCs that are not always considered by intermediaries, whose priorities are often driven by other economic concerns.

B. Non-local Producers/Suppliers to Existing Co-ops

Where existing co-ops are unable to source products locally from their members in order to fulfil supply contracts, they may supplement their locally-produced product range with complementary products sourced from non-local producers. For example, an organic fruit and vegetable co-operative may need to guarantee the supply fruit and vegetables that are not grown or that are out-of-season locally by importing fruit and vegetables from non-local certified organic producers.

C. Local Producers to Associations/Clusters

Local producers may lack the scale or expertise to operate effectively in presenting their offer via market intermediaries. By grouping together in associations or clusters, they can organise and co-ordinate more effectively, using the association to represent their interests and provide shared services.

D. Local Producers to Other Market Intermediaries, potentially brokered by Associations (G)

Local producers may individually lack the scale or expertise to operate effectively in PSFP markets. The opportunity to sell their products to other market intermediaries represents a key and sometimes the only way of bringing their products to anything other than local spot markets. In this classic middle-man relationship, the financial value that local producers are able to achieve for their products is constrained by the effects of the middle-man's costs/margins on the price they are willing to pay. Loyalty tends to be low and short-termism high on both sides in this relationship, with each party often willing to abandon the relationship in the face of a more financially-advantageous offer. Local considerations do not often figure highly in these calculations, so that SFSCs are not considered valuable in their own right.

E. Local Producers to Existing Co-ops, potentially brokered by Associations (H)

Co-operatives provide an alternative to commercial middle-men, generally providing market intermediation on a cost-plus-expenses model that in principle retains as much value as possible for their producer-members. How successfully co-operatives are able to provide a better deal for their members depends on the price they are able to achieve for their members in the market, and the level of expenses they charge their members for the provision of this service. For example, low market power may mean they cannot achieve high prices; poor governance and management may result in a high level of expenses being charged. Trust is required that the co-

operative will act in the best interests of the members to generate a better return than would be possible from the use of other intermediaries. Where this trust is rewarded, loyalty tends to be high and long-term relationships common. Commitment to local considerations is also likely to be seen by co-operative members as beneficial to their long-term interests – indeed, one of the co-operative principles laid down by the International Co-operative Alliance is ‘concern for community‘.

F. Local Producers to New Co-ops, potentially brokered by Associations (I)

Where no existing co-operative is available that is able/willing to act as an intermediary for local producers in PSFP markets, local producers have the option to set up a new co-operative. Whilst registering a new co-operative is not in itself particularly difficult, establishing the basis of trust and motivation between prospective members, and ensuring that the co-operative has the necessary skills, expertise, certifications and commitment to engage successfully in market intermediation on local producers' behalf can be challenging issues, often requiring a steep learning curve. There are further issues regarding the ability of any new entity to win contracts in PSFP markets, given their lack of track record. Without support, this can result in new co-operatives falling into, and failing to escape, well-known 'valley of death' start-up scenarios.

J. Other Market Intermediaries to School Procurement

This is the dominant relationship in PSFP. Other market intermediaries generally have the scale, capacity and market power to compete successfully for and deliver PSFP contracts. They are generally able to satisfy any preconditions in tenders and spread costs to achieve economies of scale that are unavailable to alternative suppliers. This provides a general level of reassurance for contracting authorities (such as primary schools in Serbia) that the contract will be fulfilled. While most schools are willing to (and frequently do) change their food suppliers from year to year, according to the lowest offer, other schools have formed reliable relationships with a specific market intermediary (perhaps through prior negotiation to ensure their offers are favourable, or through word getting around to other potential bidders that the school already has a favoured supplier), so these schools are often reluctant to consider new entrants into their PSFP.

K. Existing Co-ops to School Procurement

Existing co-ops provide an alternative form of intermediation. Provided they are able to offer similar levels of reassurance with regard to supply guarantees, there should be no particular difference for contracting authorities in choosing between an investor-owned or co-operative business as a supplier for PSFP.

L. New Co-ops to School Procurement

As with existing co-ops, provided they are able to offer similar levels of reassurance with regard to supply guarantees, there should be no particular difference for contracting authorities in choosing between them and an investor-owned business as a supplier. However, this is a significant proviso, and one that many new co-operatives are often not well-placed to meet.

M. Other Market Intermediaries to Other Demand

This relationship is out of scope for the S2F study in all respects *other than* the way it affects market intermediaries' calculations about the relative value to them of primary school food contracts - as shown above, a single food contract for a primary school is typically worth only around 1% of all PSFP for a large food company. Such calculations affect the ability of a market to form for PSFP for schools, and if it does, the relative level of product quality and responsiveness provided by intermediaries for the prices offered by the contracting authorities.

N/O. Existing/New Co-ops to Other Demand

These relationships are also out of scope for the S2F study in all respects *other than* the way they affect co-operatives' calculations about the relative value to them of PSFP contracts. This creates similar issues to (M) regarding the ability of a market to form and the relative level of product quality and responsiveness provided in PSFP contracts. However, co-operatives' calculations may be skewed more favourably towards primary school food procurement by a genuine desire and commitment to making a contribution to their community.

P/Q. Existing/New Co-ops to Other Market Intermediaries

These relationships may be important in certain circumstances, whereby a co-operative is unable/unwilling to engage directly in supply intermediation for PSFP. This may be the case where all food procurement is placed in a single lot, or where other complexities mean that specialist skills, expertise or resources are required that the co-operative does not possess, whereby the only opportunity to be involved in supply is to join forces with other market intermediaries. Thus, we had one school that wanted organic vegetables to be supplied from local growers through the school's regular market intermediary supplier, rather than adding a separate lot for organic vegetables to be supplied directly to the school, because the school trusted its usual supplier. However, this extension of the supply chain adds the margins of a further middle-man to the final cost, which may either make tenders uncompetitive, or unrewarding for local producers. Neither is helpful for the development of sustainable SFSCs.

R. Local Producer to School Procurement

Given the small size of primary schools‘ food procurement contracts, a single local producer may feasibly have sufficient capacity, capability and certification to directly supply what a school requires in particular lots for PSFP. The risk for schools in this arrangement would be the effect on supply guarantees from the creation of a potential ‘single point of failure‘, which would make such an arrangement unusual, and require careful examination of the contingencies necessary to reassure contracting authorities on such issues.

1.3.4. Supply-chain patterns

Finally, the above analysis of actors and relationships results in several possible supply chains for primary school procurement, of which some are more important than others. These are broken down here into three broad patterns:

a. Non-local producers/suppliers (1) and/or local producers (2) deliver to other market intermediaries (6) which bid for school procurement (7)

> This is the dominant supply-chain pattern for school procurement. The ability to stimulate SFSCs is limited here to the (greater or lesser) extent to which local producers are able to trade effectively with other market intermediaries. Intermediaries' incentives to protect their margins mean that low prices may be offered to local producers (who

must compete on price with non-local producers). In turn this may mitigate against the stability of SFSCs under these arrangements.

b. Non-local producers/suppliers (1) and/or local producers (2) deliver to existing co-operatives (4) or new co-operatives (5) which bid for school procurement (7)

This is a less-common but perfectly feasible supply-chain pattern, as demonstrated by at least two existing co-operatives in Serbia. Non-local producers are potentially less important in these arrangements than in (a) above as they tend to complement, rather than compete with, an existing co-operative's product range from local producers. This adds to the potential of co-operatives for establishing/maintaining SFSCs, particularly for procurement lots in which contracting authorities are seeking the provision of items that predominately are in ready local supply.

c. Non-local producers/suppliers (1) and/or local producers (2) deliver to existing co-operatives (4) or new co-operatives (5) which deliver to other market intermediaries (6) which bid for school procurement (7)

Whilst feasible, this supply-chain pattern would be unusual due to the addition of a second intermediary relationship. As noted above, this would mitigate against both acceptable margins for different actors in the chain, and/or competitive bids for PSFP contracts.

In sum, an assessment of the above supply-chain patterns identified various key possibilities for the promotion of SFSCs:

1. A more enlightened and strategic approach from 'other market intermediaries' to the use of local products in the supply chain for PSFP.
2. The use of single local producers to provide products that fit with the requirements for primary school food procurement.

3a. The use of existing co-operatives whose product range provides a good fit with the requirements for primary school food procurement, and in which trade with local producers is prioritised (for whom PSFP represents *market diversification*)

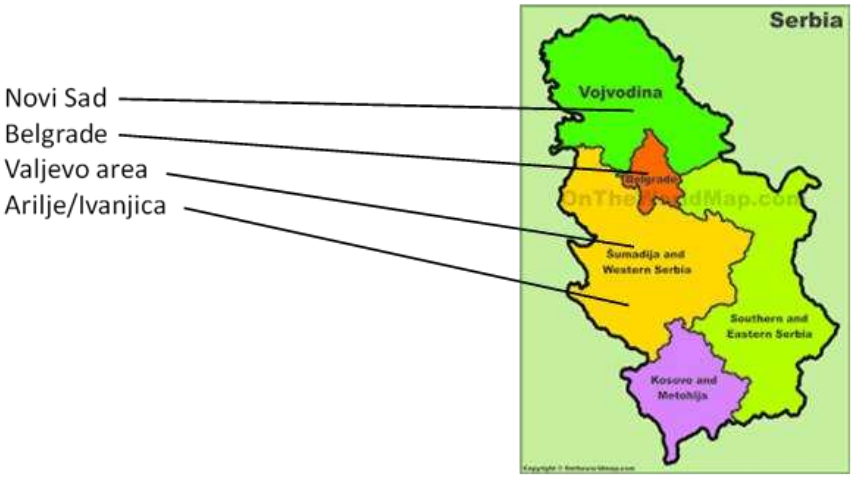
3b. The use of existing co-operatives whose product range could be extended to provide a good fit with the requirements for primary school food procurement, and in which trade with local producers is prioritised (for whom PSFP represents *product and market diversification*).

4. The development of new co-operatives of local producers to provide products that fit with the requirements for primary school food procurement.

1.3.5. Current situation analysis

Mapping the above possibilities allowed us to sensitise ourselves to the data to collect in order to conduct the current situation analysis for primary school food procurement in Serbia. Market conditions vary across the country. WP9.5.1 undertook an analysis of demand and supply arrangements in c. 30 schools across 4 areas in and around the urban centres of Novi Sad, Belgrade, Valjevo and Arilje/Ivanica (see Figure 5):

Figure 5. Study areas in Serbia



NOVI SAD

Around Novi Sad there are various agricultural producers, producer organisations and wholesale/retail suppliers. Some school meal tenders receive several bids, but the small scale of the tenders gives schools very little market power. Bidders therefore tend to be able to work out amongst themselves what quality they are prepared to offer at a particular price to make the supply arrangement (including delivery) worth their while. The end result tends to be downward pressure on food quality, whilst schools pay close to retail prices for the food they procure – only some of which is produced locally. There is therefore considerable interest from school directors and procurement staff for finding suitable new supply arrangements if these can be put in place.

Visits to various Novi Sad schools demonstrated that they generally play their hand as well as they can with the resources available. They realise that they have little market power, and therefore seek to cultivate the best relationships they can with the limited pool of potential suppliers who are willing to bid for their contracts, none of which are local co-operatives. They are aware of the issues this raises for food quality, and many of them support the agenda of improving the nutritional quality of school meals and the S2F proposition for doing so. They balance this support 'in principle' with the pragmatism resulting from the apparent lack of alternatives within the current supplier network. This creates risks in breaking their current supply arrangements in favour of any 'unknown quantity' (in the form of 'new entrant' local suppliers). Security of supply is essential, and in some cases there has been considerable investment over time in the relational 'goodwill' aspects of contracting with particular suppliers - which would be lost if the relationship was terminated. This provided a considerable ethical challenge to the objective to see if SFSCs between local producers and schools could be brokered. It would not be ethical to suggest or recommend any supply relationship where there was any risk of detriment to the school, or its parents and children.

Armed with this knowledge and yet determined to explore the potential for shortening food supply chains, we conducted an analysis of supply possibilities. Our first approach was to speak with existing major market intermediaries. While there was some level of supply-chain trading with local producers, there was no direct strategy for this. Price and quality were the main criteria, so that if local producers could not compete with non-local producers, they were not favoured. In principle, there was interest in building supply relationships with local producers, but only if the price was right. The relative market power of intermediaries meant that local producers in these contract relationships were often in a relatively disadvantaged and precarious

position (local producers themselves were often resentful about the prices they were paid, the delays in payments and the cancellation of contracts at short notice due to market conditions - which left them with surpluses of perishable products they could not sell). Interestingly, however, in conversations with these market intermediaries regarding PSFP, it became clear that there was less interest in supplying highly perishable fresh produce (e.g. fruit, vegetables) due to the effect on their margins of the logistics and wastage costs involved. The inclusion of separate lots for these items was therefore seen as potentially both beneficial to these general suppliers, and an opportunity for more specialist supply organisations.

Next, we approached existing co-operatives of local producers to see if they were able and/or willing to supply to primary schools through PSFP. However, these co-operatives were generally too big, having been set up or evolved to supply larger markets, such as major retailers. Whilst they were interested in the prices that schools were paying, this interest halted when they looked at the size of the contracts and frequency of deliveries required. As part of this analysis, we approached another existing co-operative in Žitište in the east of Vojvodina, which was supplying the local primary school with ready-made meals cooked in the community restaurant that was built and operated by the co-operative. The school provision was seen as a further successful contribution to community life and the contract was operated on a break-even basis. While this co-operative was too far away from Novi Sad to be able to participate more fully in the S2F project, it provided an interesting model by which 'public-co-operative partnerships' might be built. In the far north of Vojvodina (Subotica) we spoke with an organic co-operative that had recently been created (Panonia). However, as well as also being too distant from any of our schools to supply vegetables regularly, its business model was focused on exports of organic produce – a sufficient challenge on its own for a small, newly-started co-operative without dividing its attention between these markets and primary school procurement. We approached a further existing agriculture co-operative closer to Novi Sad (but trading mainly in arable crops rather than vegetables and fruit). The co-operative gave careful consideration to the opportunity to diversify their product offer to include vegetables for PSFP, but calculated that the up-front investments required to do so made the proposition unviable for them. Behind these calculations also lay concerns about the possibility of corruption in the award of contracts, meaning that this investment would be unrewarded. However, in the schools we have worked with in the S2F project, we have seen little evidence that corruption is a significant factor in the award of contracts.

Having established that there was no existing organisation formed from local producers that could be persuaded to come forward to supply the primary schools, the next step was to investigate whether there were any individual agricultural producers/family farms with whom direct supply arrangements would be possible. However, alongside concerns that such arrangements could introduce a 'single-point-of failure' to primary school supply chains, it was anyway not possible to find any such producer of the right size – many producers were too small to be able to guarantee sufficient supply or to hold the appropriate registrations and certification. Others were larger, but often both tied in by their existing supply relationships and unwilling/unable to engage in the competitive tendering process for small-scale public procurement contracts

Nevertheless, given the numbers of producers of different scales and, importantly, the levels of organisation in clusters and associations in this area, we then began to examine the possibilities for the development of a new supply co-operative. At this stage, our engagement with local extension services, agricultural advisors and organic agriculture clusters gave reasons for cautious optimism that it might be possible to identify producers who might combine within a

new co-operative to target particular procurement lots in the provision of food for primary schools.

BELGRADE

The situation in Belgrade schools is broadly similar to that in Novi Sad. While a large proportion of Belgrade schools use caterers to supply school meals, there are still a few that use their own kitchens to prepare meals on the school premises. Moreover, despite a larger number of potential market intermediaries, there is still a significant level of dissatisfaction with the outcomes from the existing 'lowest economic price' procurement arrangements and a willingness to explore different possibilities for the provision of 'healthy food'. These intermediaries are no more likely to engage with local producers than those in Novi Sad.

One existing local fruit and vegetable co-operative was already supplying one of these schools, as well as other public institutions (including some in Novi Sad). Indeed, PSFP accounted for 85% of this co-operative's total business, and they had a 35% success rate in bidding for contracts. The co-operative is 50 years old and has around 15-20 producers in membership, as well as 'lots of verbal agreements' with other producers. Produce is imported out of season, but around 65% of the produce sold (excluding citrus fruits) is from Serbia - with producers in Čačak, Arilje and Leskovac as well as in and around Belgrade. 70% of this produce is produced within 25km of the co-operative. However, the co-operative does not tend to bid for procurement contracts of less than 500,000 dinars, which ruled out many of the primary schools we are working with in the S2F project. Nevertheless, this co-operative provided a further example of how 'public-co-operative partnerships' might be built using PSFP.

Moreover, the relative proximity of Novi Sad to Belgrade and the fact that many local producers were selling to markets in both cities, led to discussion of whether it would be feasible to create a new co-operative to supply schools in both cities. This possibility provided further impetus to the attention given in WP9.5.1 to this option.

VALJEVO

Valjevo was a convenient centre for S2F activities, being readily accessible to the team. However, none of the schools in the city of Valjevo prepares its own meals, but instead either buys foods from the local kindergarten or does not serve lunches at all. Although there are only 2 small rural schools near Valjevo itself that use their own kitchens to prepare school meals, we also included primary schools making their own meals in several nearby municipalities: Mionica, Osečina, Bajina Bašta and Loznica. So, although demand for fresh vegetables and fruits would be low from primary schools in Valjevo, we were also working with eight schools in the area that were buying vegetables.

Around Valjevo there are numerous agricultural producers, but very few producer organisations and only a limited number of other market intermediaries (wholesale/retail suppliers). School meal tenders therefore often attract a very low number of bids. The small scale of the tenders also gives schools very little market power. Bidders are able to work out what quality they are prepared to offer for the price offered in order to make the supply arrangement (including delivery) worthwhile - which adds considerable potential for downward pressure on food quality. Agricultural producers themselves are often small-scale and unorganised. Thus, there are no existing agricultural co-operatives in the area with the capacity to supply primary schools through PSFP. This level of scale and organisation may be possible if they are able to find ways to work in co-operation with one another. We had converstaions with a number of producers in the area, none of whom were against the idea of forming a co-operative with other good producers in principle. However, the scale of the task is greater in this area than in Novi Sad

due to the lack of any form of local clusters or associations within which mutual trust has already been established. Furthermore, our discussions found that local extension services are not well funded, and unable to effectively support co-operative development. So, despite producers‘ interest in doing so, the development from scratch of a small-scale supply co-operative would not be possible within the existing local resources. Primary schools in the area also fall under different municipal jurisdictions. Discussions with local government officials suggested that co-ordination across municipal boundaries would be required to build this form of co-operation and that this would not be considered a high priority without some form of additional incentive. It was therefore established that it would prove challenging to create a new supply co-operative from existing local producers in this environment, where co-operation needs to be built from a very low base.

Visits to Valjevo area schools suggest that they again play their hand as well as they can with the resources available. In terms of improving the nutritional quality of school meals, they are also keen to see what S2F can do for them. However, there is a lack of alternatives within the current supplier network where they would be dealing directly with agricultural producers and cutting out the wholesaler ‘middle-man’. The current situation analysis suggests that it would be difficult to establish a sufficiently robust supply structure for direct supply arrangements between producers and schools to be achieved. The lack of other supply intermediaries also greatly increases the risk associated with breaking any of their current supply arrangements to try something different; where there is sometimes only a choice of two suppliers to go to, it does not make sense to burn bridges with either of them (unless any new supply arrangements are sufficiently convincing).

Similarly, there are also no single local producers with sufficient scale and diversity of production to guarantee supply and to hold the appropriate registrations and certification. However, another potential solution that has been explored involves using the local Agricultural College (or ‘Middle School‘) to supply the primary schools. The agricultural Middle School in Valjevo has a considerable amount of land and production facilities (including polytunnels). A wide range of produce is available, and this could be tailored according to demand. Whilst there was interest in principle in establishing a student co-operative to participate in primary school food procurement markets, and it seems clear that this would provide a viable and interesting proposition for S2F, we were informed at this stage of the project that the law currently restricts the sale of produce from the School in the market. In practice, it would therefore not be possible to pursue this option.

ARILJE/IVANICA

Around Arilje and Ivanica there are numerous agricultural producers, and various associations and producer organisations. These tend to be quite specialist, however: Arilje is known for its production of soft fruits, particularly raspberries; Ivanica is a major producer of potatoes. Currently, there is only a limited number of other market intermediaries (wholesale/retail suppliers) that supply schools through PSFP. School meal tenders again tend to attract a low number of bids, and the small scale of the tenders again tends to give schools very little market power to improve quality at the prices offered, despite their keenness to do so.

In discussions with associations and existing co-operatives in Arilje, there was an openness to diversifying production to grow a wider range of produce for the purposes of supplying local schools. Despite the value of the land in Arilje for soft fruit production, the fluctuations in prices for soft fruits and an ability to use certain pockets of land that are unsuitable for soft fruit production to instead grow vegetables meant that producers could see potential value for them in this small-scale diversification. For one co-operative in particular, there was also a strong

interest in pursuing this initiative as a contribution to the local community. Conversations with producers in Ivanica also suggested that capacity could be built to diversify their production to supply other vegetables as well as potatoes.

Further progression of this initiative was hampered by the physical distances involved in supporting its development (i.e. travel from the research team's base in Belgrade to Arilje and Ivanica involves considerable time and cost). Many of the same constraints encountered in other areas were also in evidence here, few of which could be overcome remotely, requiring effective action on the ground:

- the building of new co-operation between producers in Arilje and Ivanica, even within the structure of an existing co-operative
- the understandable reticence of local schools to break their fragile relationships with the few available supply intermediaries, requiring trust-building activity
- the lack of resources available to local extension services to support new co-operative development

This meant that a lot of S2F resources would have been needed to support this initiative. While it was acknowledged that there was promising potential in the proposal to combine producers within the structure of the existing co-operative, a decision was therefore made to focus the limited resources available on supporting actions elsewhere in Serbia, from which the learning could potentially be subsequently applied in this area.

SUMMARY

In sum, the food procurement environment is challenging for Serbian primary schools wanting to make their own meals. (nb. Circumstances are not so challenging for schools using external caterers to provide their meals, as local bakeries and restaurants are readily available to service the schools' needs, and this is no doubt a persuasive reason for the majority of schools in Serbia using caterers although the implications of this for food quality remain open to question). In different parts of the country, schools that make their own meals face different issues and problems with food procurement. Whilst they appear to be meeting them relatively astutely and creatively (within the constraints of both the procurement regulations and the market conditions), the current arrangements are often suboptimal in meeting the schools' aspirations (and the stated goals of the S2F project) for healthy eating/improved nutrition and the use of short supply chains. The 'rigidity' of the current procurement system, disaggregated demand and lack of willing suppliers has important effects on the quality and quantity of food (as well as important related concerns over carbon footprint).

We found a lack of incentive for other market intermediaries to invest in any greater commitment to or strategy for the development of SFSCs; if such an incentive were to be put in place it could make a difference to local producers' participation in lower supply-chain relationships. However, in our discussions with the Ministries of Education and Agriculture, there were no plans to allocate limited central resources to incentivise this form of activity with regard to PSFP.

We also found a general mis-match in the scale and scope of existing co-operatives to supply primary schools in Novi Sad and Belgrade (although an openness in principle to doing so in Arilje). Furthermore, we found no existing single local producers of sufficient scale and scope to engage effectively in primary school food procurement.

In this situation, with the other options for SFSCs in PSFP appearing to be limited in the current Serbian context, we concluded that the most promising alternative to serve the needs of primary school food procurement was new co-operative development. We were aware that this was

potentially also one of the most challenging alternatives, and many stakeholders we consulted were generally sceptical about the chances of overcoming those challenges. In particular, doubts about the ability of small-scale farmers to organise and scale up their activities effectively lay behind a widely-held sense that it was not really these farmers' place to participate directly in these supply markets, and that they should restrict their ambitions to lower supply-chain relationships. Indeed, one highly-respected agricultural expert in Serbia, friendly to the S2F project, advised that the suggestion of developing a new co-operative to supply in these markets would be like 'building the space shuttle' to these producers. Producers themselves were sceptical of their chances of success in a previously-unconsidered market to them. Nevertheless, with other options for sustainable SFSCs looking even less promising, a decision was made by the research team to look further into these challenges. In particular, it was decided to draw on some of the connections we had made with local producers of quality produce in Vojvodina, and with schools in the cities of Novi Sad and Belgrade. Constantly wary of ethical concerns to maintain transparency, integrity and to 'do no harm', we set out to research the possibility of developing win-wins with all stakeholders through this initiative.

1.4. Action research stage 2: 'Implementing improvements'

1.4.1. New possibilities for local supply? Stimulating short food supply chains

As noted above, in the face of problems with existing food procurement arrangements and the fact that there was no existing large farm or co-operative that was able or willing to enter this market, the remaining alternative for SFSCs was to gather local, 'quality' producers into a new organisation that meets regulatory requirements. The project team has worked to do this with a group of organic vegetable and fruit producers in Vojvodina to serve schools in the Novi Sad and Belgrade areas.

Agricultural production in many parts of Serbia suffers from the problems of small scale, lack of intensive production, lack of co-ordination and poor security of demand. The City of Novi Sad has sought to support the development of organic production with some farmers in their jurisdiction to help overcome some of these issues, making practical advice and other resources available through the publicly-funded extension services. This has led to the development of a number of high-quality but small-scale growers. Despite the assistance from municipal government, however, these producers have largely been unable to secure a stable position in the market. They form part of a loose network, with a (weak) shared identity with other members of a cluster of organic producers in Vojvodina - the *Vojvodjanski Klaster Organske Poljoprivrede.*

When we approached these producers, they were interested in selling organic food to schools. This was about more than the financial proposition of gaining access to a new market; it was seen as in keeping with their philosophy to make a contribution to their local community by improving the quality of the school meals served to primary school children.

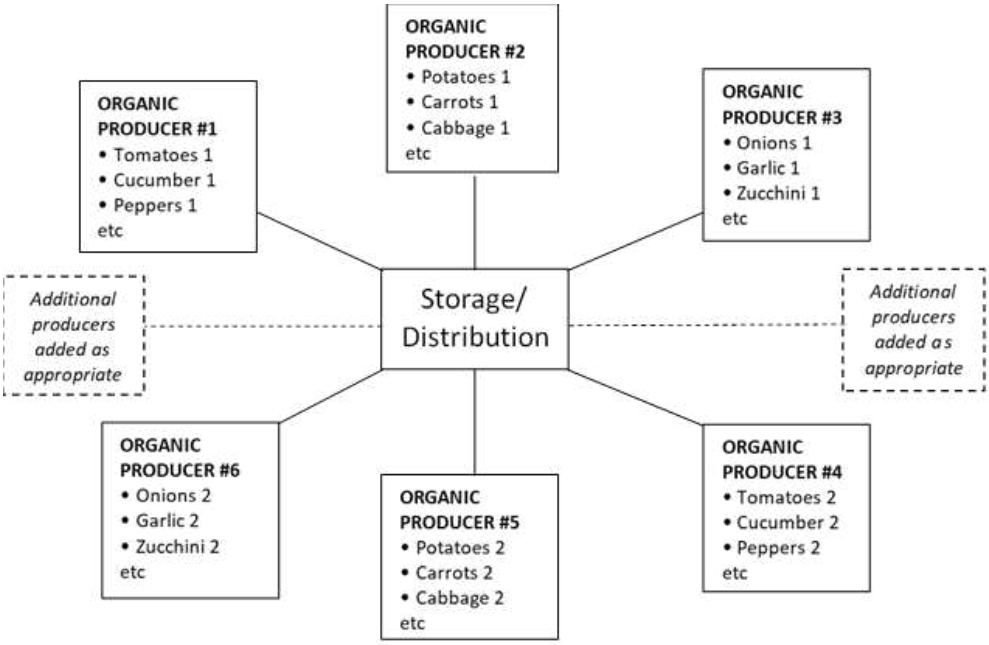
We first met individually with various producers on their own farms, to build a picture of their capacity and capability to sell to schools. We were encouraged by their commitment to high-quality production and the diversity of their offer, particularly with regard to vegetables. We next convened an initial meeting of producers at a local school, where we engaged them in detailed discussion about the options for establishing a supply co-operative. There was an excellent turn-out for this meeting and it is fair to say that discussion was robust, with some seeing considerable potential and others seeing various problems. We listened carefully to their key issues (see below), and maintained contact individually with them in the subsequent few

months while we made enquiries about these concerns through our interactions with other stakeholders, including schools, parents, procurement specialists, local government and Ministry officials. Some of the more proactive producers remained very open to further contact during this period, but importantly even those who were more sceptical appeared to appreciate the transparency and openness of our approach. Thus, very few of them rejected the possibility out-of-hand. Steadily, we were able to assemble various reassurances with regards to their concerns, and a further meeting was arranged at a trde fair in Novi Sad. This meeting was very positive, with a core group of 6 organic producers from the Vojvodina region emerging as the most promising for supplying the schools on S2F project, as they:

- produced vegetables that schools already buy
- had certificates of organic production and food safety that guarantee quality
- together produced sufficient quantities for several schools
- already supplied big retailers and had their own vehicles
- provided fresh vegetables with fair prices
- were enthusiastic towards helping schools improve meal quality

As a group, these producers were therefore able to help the Strength2Food project in a number of ways. First, the group met the criterion for improving the quality of school meals, through the introduction of fresh, organic vegetables. (*NB. It was decided not to include organic fruit at this stage, as the price differences between organic and non-organic were too high for schools to afford organic fruit, even when buying directly*). Second, the group built on the existing interests of the municipality in Novi Sad, who were already invested. Third, it built on the nascent motivations of these producers to work together - and to do something positive in their community. Fourth, there appeared to be sufficient capacity of production within the group to fulfil supply contracts with schools. (*NB. Figure 6 shows how in principle a network of producers might be built. In practice the actual producer network is a little more messy than this, but it has nonetheless been built to ensure that supply guarantees can be met, and that appropriate additional capacity can be added as the new producer organization adds scale*). Fifth, school directors and parents were very positive about the prospects of buying directly from local organic producers, especially having been reassured that the extra cost of organic vegetables would add no more than around 5-6% to the school's annual food budgets (see Figure 6, below).

Figure 6. Ideal-typical producer network to avoid single points of supply-chain failure/guarantee supply



This has provided a good foundation upon which to build, but there are a number of key challenges for producers. The first is that the school year lasts for around only 40 weeks of the year, so that there is no demand for around 3 months in the summer (June-August). The second is that maintaining year-round supply may be difficult, especially during the April-June "hungry gap", requiring additional consideration of the benefits and costs of solutions such as polytunnels and cold storage to extend the season and variety. The third is the time, knowledge and skills required to engage with the tendering process, and the preparation of bid documentation. The fourth is putting in place appropriate arrangements for distribution and deliveries (in terms of buildings, transportation and staffing), bearing in mind that most of our interested organic vegetable growers are widely dispersed around Vojvodina. The fifth is forming a new legal entity in which they are all members, and organising the governance and incentive structures to ensure good co-operation. On top of this, there is the problem of the small size of procurement contracts for the primary schools, the expected frequency of deliveries, and the fact that PSFP is an open competition with no guarantee that our new group of organic vegetable producers would offer the lowest bid to schools.

Figure 7. Visits to the farms of individual organic producers

1.4.2. Challenges to be addressed

CHALLENGE 1: LENGTH OF SCHOOL YEAR

To overcome this challenge and establish a viable business model for SFSC arrangements, an innovative scheme has been proposed and discussed with all stakeholders that combines public procurement and an organic box scheme for parents. The box scheme involves selling organic vegetables directly to parents, using the school as a neighbourhood collection point. It is necessary to add the box scheme for entirely 'pragmatic' reasons – it provides the level of scale required to make the overall supply arrangements viable, notwithstanding the length of the school year. However, there are additional benefits in 'principle' for the objectives of Strength2Food, in the ability to extend the reach of the project beyond the school gates and into the homes of primary schoolchildren.

Box schemes are generally relatively easy and low-cost to start-up, and easy to scale as demand increases and new market opportunities emerge. The main advantages for producers of the combined public procurement and box scheme arrangements are in:

* *Opening new markets:* It is an advantage for producers to co-operate for marketing direct to consumers. Box schemes can open new markets and increase income.

* *Maximising margins:* By operating the supply chain themselves, producers retain margins that would normally go to the wholesaler or commercial buyer.

* *Stability and predictability:* Once producers have established a stable customer base, income and cash flow are more predictable.

* *Spreading investment and risk:* Box schemes spread risk over a larger number of customers. Investment risks can also be spread collectively (for example, investments in shared storage to optimise supply capability).

* *Rationalisation:* There is increased potential for producers to tailor their crop programme to fill veg boxes, rather than growing speculatively for different markets.

* *Flexibility:* Apart from a few staple vegetables, box schemes allow producers to deliver what they have available at any particular time, rather than having to satisfy demands for defined quantities of specific vegetables.

* *Direct connection:* The scheme puts producers directly in touch with their customers, whose starting point is typically an enthusiasm about fresh, local food. Producers can add to this relationship with such things as printed recipes for the week's vegetables, and offering farm walks, where customers (e.g. schools, families) are encouraged to visit their farms as part of their marketing and distribution plan.

CHALLENGE 2: MAINTAINING YEAR-ROUND SUPPLY

Maintaining year-round supply of all vegetables required by the schools provides considerable challenges relating to the seasonality of production and bridging of the 'hungry gap'. Several interventions have been helpful here: first, detailed work with producers to establish the months of the year that they are able to supply particular produce, and in what quantities; second, the introduction of new standardised menus in the schools using the Excel Meal Planner developed in WP9.1.1, which focuses on the use of seasonal vegetables that are generally in good local supply at particular times of the year; third, the establishment of a framework agreement for procurement that recognises that some organic vegetables will be unavailable out of season; and fourth, existing investments by some of the larger organic producers (often with general agricultural grant funding) in polytunnels and cold storage to extend the season and variety.

CHALLENGE 3: ENGAGING WITH THE PROCUREMENT PROCESS

Small producers often emphasize that they have difficulties with preparation of the excessive tendering documentation and the requirement to have references from participation on previous tenders, which is especially challenging for newly established companies. Both of these issues increase entry barriers for new firms and negatively affect their possibilities to become involved in tender procurement. In WP9.5.1 we have been able to provide technical support for local producers in relation to the first of these issues, helping them to understand what is required in responding to invitations to tender. The process of putting bids together for procurement contracts requires particular skills and knowledge. Many of the small-scale producers already had experience of trading under supply contracts, for example with major retailers, but it has been necessary for the S2F team to work with them to ensure they have access to the relevant expertise to respond to primary schools' procurement tenders. This has been a relatively minor challenge to overcome, and a task in which producers are quickly becoming adept.

However, in relation to the second issue, we have encountered entirely-understandable hesitance from schools in dealing with a producer organization as a new-entrant to the supply chain. Therefore, we have worked with schools interested in buying organic vegetables as well as experts in procurement documentation to ensure that no unnecessary eligibility criteria are included that would prevent a new group of organic producers from bidding (such as criteria on minimum number of employees, number of delivery drivers, or storage capacity). As an unknown quantity, there is no track-record upon which to build, so trust relationships need to

be built. In WP9.5.1 we were able to broker meetings of producers and School Directors, administrators and chefs, including sampling of the produce. This was helpful in building relational links and providing reassurances over product quality. However, the need to address potential supply-guarantee risks remained an important barrier. Failure to deliver would mean children going hungry. We have therefore worked with schools and procurement legal specialists to establish framework agreements for both organic vegetables from the new-entrant producer organization, and conventional vegetables from alternative suppliers in separate procurement lots, thereby reducing/removing supply-guarantee risks for the schools.

CHALLENGE 4: ARRANGEMENTS FOR DISTRIBUTION AND DELIVERIES

The initial arrangements necessary for collecting together the produce from different local producers ready for delivery to the schools can be achieved within producers' existing resources. Each has at least a small amount of on-farm storage, and vehicles for distribution, and negotiation of delivery dates and times with schools allows producers to schedule deliveries to fit in with existing customer arrangements as far as possible.

As the operation moves to scale, there is likely to be a need for a more centralised storage and distribution facility to be established. Figure 8 shows an ideal-typical storage and distribution centre, which given the rapid turnover of deliveries in and out does not need to be very large. We have discussed these potential storage requirements with public company 'Market Place' in Novi Sad, who are keen to support this initiative and provide suitable storage at reasonable cost when required by the producers.

Figure 8. Ideal-typical storage/distribution centre

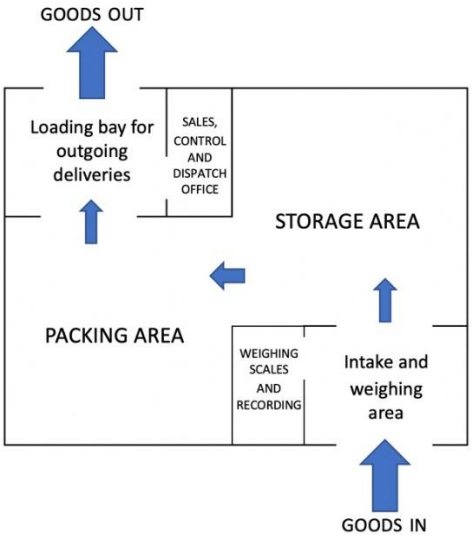


Figure 9. Investigating storage options offered by public company 'Market Place'

CHALLENGE 5: FORMING A NEW LEGAL ENTITY: THE NEW CO-OPERATIVE

Meetings with the producers have raised a lot of important issues and questions. Some of them had held initial discussions about the possibilities of forming a co-operative, predominantly to serve export markets, but these had not progressed far and had been assessed as unrealistic at their level of scale. Building a platform within niche domestic supply markets was seen as eminently more achievable. Nevertheless, initially there was a mixture of enthusiasm and scepticism within the group. However, as they have collectively worked through their issues and questions, and witnessed the interest and in-principle support from other stakeholders, a strong commitment has developed to doing everything possible, with support from the S2F team, to make the scheme work.

S2F provided advice on different types of agricultural co-operatives (and organic box schemes) and how they work. In response, an agreement on the establishment of a new co-operative, 'BioLogika', was signed by 5 producers on 5th February 2020 in Novi Sad, Serbia, and officially registered by the Serbian Business Registers Agency on 11th March 2020.

Figure 10. Registration of the new co-operative: BioLogika

Registration was an important step, but a lot of arrangements have needed to be put in place around organising production, distribution, tendering and working more formally together. Detailed drafts of a mission statement, and financial, operations, governance and marketing

plans have been drawn up in order to work through these arrangements, and an ongoing series of online meetings held to discuss key issues. The following extract from the mission statement sets out the vision, mission and objectives for the new co-operative (available in English and Serbian):

1. Vision and Mission

1.1 Vision: *"Through good food and commitment to our shared environment, to enhance the lives of our colleagues, members, customers, and the communities we serve"*

1.2 Mission: *"To sustainably meet the needs of our members by producing high-quality organic food and selling it directly to satisfied end-customers"*

2. Objectives

2.1 Sustainably Meeting the Needs of Members:

By working together:

OBJECTIVE 1: To develop regular, sustainable sources of income that exceed what is achievable by each individual member working on their own.

OBJECTIVE 2: To grow our business sustainably through shared agreement on investment.

OBJECTIVE 3: To share information and resources as appropriate to maximise sustainable opportunities to increase income and/or reduce costs.

2.2 Producing high-quality organic food:

OBJECTIVE 4: To develop agreement on shared standards of production to guarantee food quality.

OBJECTIVE 5: To produce high-quality organic food in sufficient quantities to guarantee supply for the period of public procurement contracts.

OBJECTIVE 6: To develop effective systems for storing, packing and transporting organic food to ensure it is delivered in good condition to customers.

2.3 Selling Directly to Satisfied End-Customers:

OBJECTIVE 7: To bid for selected public procurement contracts that guarantee demand for a defined period.

OBJECTIVE 8: To use an organic 'box scheme' to sell directly to selected individual end-consumers.

OBJECTIVE 9: To ensure 'on-time' delivery of high-quality organic food at a fair price to all customers.

CHALLENGE 6: SIZE OF PROCUREMENT CONTRACTS

A further key challenge to making improvements involves the viability of the procurement arrangements. This involves a cost-benefit calculation by the producers with regard to the small size of many primary school contracts, the extent of the necessary paperwork and certification, and the conditions regarding the expected frequency of deliveries and other variation requests within the contract. In other words, producers have been keen to establish the viability of contracts that might involve regular deliveries of relatively small quantities, and further transaction costs associated with variable demand (e.g. managing school vacation periods). Some of the key issues are summarised in Figure 11.

Figure 11. Supply- and demand-side concerns

Demand-Side Requirements:

- Security of supply
  - Agreed prices
  - Agreed quality criteria
  - Agreed quantities
  - Frequency of deliveries
- Food safety certification
- Contract management mechanisms
  - Relationship management
  - Variation requests
- Controlled/systematised list of products
  - Standardised menus
  - Joint procurement?
- Risk analysis
- Cost-benefit analysis

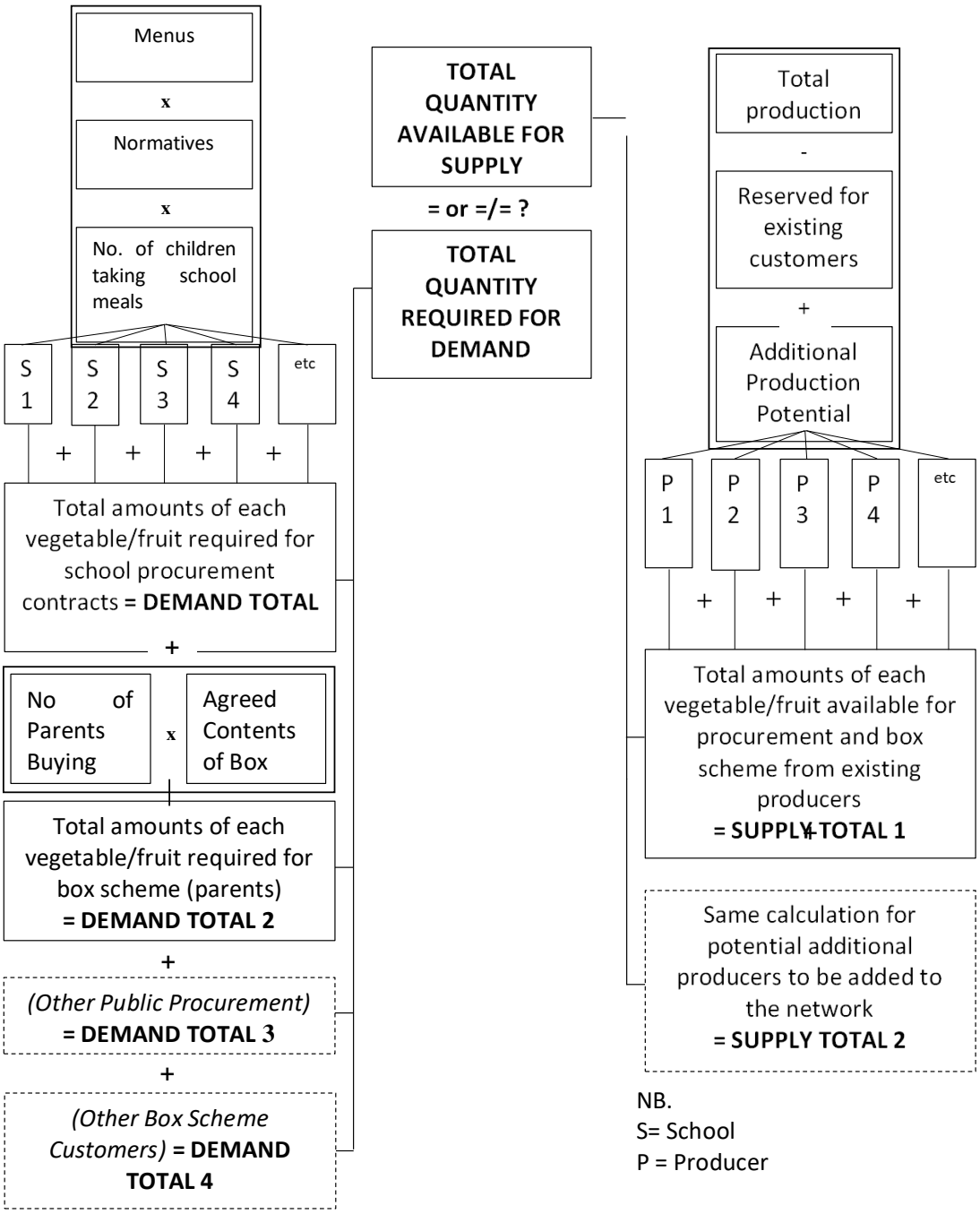
Supply-Side Requirements:

- Security of demand
  - Agreed prices
  - Agreed quality criteria
  - Agreed quantities
  - Frequency of deliveries
- Food safety certification
- Contract management mechanisms
  - Relationship management
  - Variation requests
- Controlled/systematised list of products
  - Strategic planning (planting, growing, distribution)
- Risk analysis
- Cost-benefit analysis
- Funding availability (start-up costs)

Many of these issues are, of course, shared concerns on both sides of the supply-demand relationship. Schools are interested in security of supply in terms of price, quality and quantity guarantees. Producers are interested in security of demand in terms of these guarantees. The basis for trust therefore needs to build on both sides. The S2F project has been able to work with each of these stakeholders to understand their needs in detail. For example, Figure 12 shows the way in which calculations have been made to help provide reassurances on both sides regarding supply and demand guarantees.

Beyond supply and demand guarantees, and once the price is agreed, one of the schools' main concerns is the reliability with which deliveries will be made by the producers. In the absence of a track record of supplying schools, it has been necessary to work with producers to establish their ability to supply, based on the quantities and frequency of deliveries required. By contrast, once the price is agreed, one of the producers' main concerns is whether and how often they will get paid. In the absence of published information on this, it has been necessary to work with schools to understand and demonstrate how regularly and reliably they make payments. While the above challenges provide a considerable list of potential obstacles for the producers, they have remained positive about overcoming them and are meeting regularly (with input from the S2F team) to discuss the path ahead.

Figure 12. Visual representation of supply and demand calculations



Other stakeholders are also positive about the scheme. Again, there was an initial mix of enthusiasm tempered by healthy scepticism from schools about the ability of the S2F project to make a difference to existing procurement outcomes. Many of them felt they had been diligent in scanning the market and in seeking to build potential supplier relationships. Despite some of the sub-optimal outcomes that they themselves recognised, it was therefore a challenge to persuade schools that their current arrangements could be improved through their association with the project. One key issue was a concern about their obligation in the tendering legislation to accept the lowest tender, which they felt would rule out any possibility of purchasing higher quality (and particularly organic) produce. Another key issue concerned the credentials of local producers to meet their contractual obligations under the law. This included all aspects of necessary registration and certification. However, regular and transparent communication with

the schools about the progress of the project, both individually and collectively, has again helped them to work through their issues and questions, and many school directors are enthusiastic, provided the organic producers can be relied upon to meet regulatory requirements and supply guarantees, and that the price is not excessive.

As a support to this process, Strength2Food has analysed the overall school budgets for procurement and prices provided by producers in WP9.5.1 to show that, despite the relatively high prices commanded by organic vegetables in Serbia compared with EU countries, by buying direct from certified local organic growers, organic fresh vegetables would increase schools' annual food budgets by around only 5-6% (see Table 2).

Table 2. Increase in schools' annual food budgets required to include organic vegetables (RSD)

Location	School	Total annual contract including VAT	Conventional vegetables including VAT	Organic vegetables excluding VAT*	Annual contract increase for organic veg	% Annual contract increase for organic veg
Novi Sad	Kosta Trifković	4,943,780	172,018	579,215	407,197	8.24
Novi Sad	Ivo Lola Ribar	2,796,781	179,011	256,710	77,699	2.78
Novi Sad	Djordje Natošević	5,596,271	283,140	416,385	133,245	2.38
Novi Sad	Djura Daničić	2,194,758	134,257	231,275	97,018	4.42
Novi Sad	Petefi Šandor	6,969,305	349,217	736,265	387,048	5.55
Belgrade	Drinka Pavlović	4,909,833	219,120	379,779	160,659	3.27
Belgrade	Dositej Obradović	1,862,630	153,549	284,984	131,435	7.06
Novi Sad	Dositej Obradović	4,986,957	194,073	511,229	317,156	6.36
		* Co-operative sales too small for school contracts to incur VAT.				
1 EUR = 117,57 RSD (Serbian Dinar), at 11.April,2021.						

Work to develop capacity amongst local producers has therefore been matched by important ongoing work on the demand side. In addition to helping to address some of schools' key shared concerns, we also spent a long time in many meetings seeking to understand schools' problems and to help them streamline demand in ways that might attract more local bidders (including procurement lots for organic vegetables).

One of the schools' key concerns related to the administrative burden of procurement paperwork, which felt onerous and led to considerable reluctance to add new details. For example, in order to facilitate SFSCs, we enquired about the possibility for new lots to be created within the procurement documentation that might stimulate local suppliers. Schools' willingness to use the tender specifications to specify supply criteria more clearly and creatively within the law to encourage SFSCs (for example, dividing single contracts into a series of specific lots to encourage new entrants, specifying food quality criteria in greater detail) was therefore identified as a key success factor. Even though this task was not in itself difficult to achieve, a lack of expertise in writing procurement texts and the burden of other competing administrative responsibilities made this a considerable hurdle. In WP9.5.1 we therefore worked with procurement legal specialists trusted by local schools to devise 'model wording' for this, including the text for a separate procurement lot for organic vegetables. This text has helped to reduce the administrative burden on school administrators, and therefore removed a simple but key barrier to the introduction of SFSCs through PSFP.

Two further practical developments in schools are also possible and could be influential. First, the development of new standardised menus for lunches with winter and summer seasons for the schools using the Excel Meal Planner developed in WP9.1 could be an important tool for systemising demand across a number of schools. Second, we have further discussed with schools about the possibilities to aggregate demand through 'joint procurement', for example, by setting up joint framework agreements. This could help them overcome the considerable disincentives for current bidders of small-scale, low-value contracts and disproportionate distribution/delivery costs, which create transaction costs that have to be priced in to any bid. In helping to ensure supply guarantees, this level of standardisation/harmonisation has a significant benefit for local producers, allowing them to forward-plan their planting and growing regimes accordingly.

We are making progress with the standardised menus. The Ministry of Education has taken a strong interest in the **Meal Planner tool**, and presentations to the school directors have also been very positive, with firm interest emerging. We have also worked with members of the working party on the new procurement law implemented in 2020 to ensure that joint procurement is a straightforward possibility for schools. Our discussions with school directors on this issue during the project have also been positive on the possibility for this development in due course. Once these developments are in place, the meal planning tool can be used to calculate the quantities of vegetables required each week by each school, and this can be used to inform producers' advance planning. For now, we will continue to calculate these quantities from schools' publicly-available historical procurement data, though we recognise that the current Covid-19 upheaval of school meal provision in Serbia may result in significant changes in food procurement quantities.

In this way, we have worked extensively to develop flexibility and understanding on both sides of the contract. This has primarily been supported and sustained by the commitment on both sides to the common goal of improving the quality of the school meals served to primary school children, although issues of carbon footprint and local economic development through SFSCs, also demonstrated through the S2F project, have been important secondary considerations.

In sum, however, S2F action research interventions have been required throughout the procurement system in Figure 3, whether in terms of the enabling environment (where the project has advised members of the Working Group on the new public procurement law and engaged central and local government representatives); the demand-side (where the project continues to work with nearly 30 schools); and the supply-side (building firm relationships with and between local producers) to see how the potential for new arrangements to stimulate SFSCs might be improved.

This has also linked the findings on the right hand side of Figure 3 above, in terms of food preparation and consumption. We have thus listened carefully to the views and opinions of school chefs. It is unusual for these (generally low-paid) staff to be included in research discussions, but their input has been invaluable in helping the team to understand the practical issues that underpin the patterns of demand (quantities, delivery times, kitchen storage facilities, etc), the implications of contract variations, and the ways in which new arrangements could be made to fit with the daily contingencies they face. Similarly, in compiling the Meal Planner tool, from which in turn PSFP outcomes might be improved, we have drawn on the evidence from surveys of parents and children as consumers about their aspirations for nutritional and 'healthy' food and the kinds of meals they like to eat.

Much of our work has been conducted in small-scale or individual meetings with different stakeholders; carefully and iteratively listening to their contributions, sense-checking scenarios,

and piecing together a picture. We have deliberately sought to be open and transparent and to build trust in each of these interactions, to build research actions around a collectively-agreed common purpose, and therefore to meet our ethical obligations to the research and its participants. On several occasions, however, we have brought stakeholders together for collective discussion. Sometimes this has been in single-stakeholder groups (e.g. school directors in Novi Sad, local producers in Vojvodina). In the Hybrid Forums we have conducted in WP2.4, this has involved multi-stakeholder groups, where we have brought different actors and voices into the same room to hear and understand each others' views. This has been particularly valuable in bringing together different stakeholders and brokering knowledge exchanges between them that would have been highly unlikely to happen in everyday experience. For example, Ministry officials have found themselves sharing conversations with (and being impressed by) school cooks; local producers have had opportunities to speak directly with (and impress) school directors. These forums have provided additional momentum at key points of the project, consolidating the network of actors involved and helping to incentivise 'win-wins' between them. In each case, this has helped stakeholders to take ownership of various actions and build credible shared commitments on the basis of perceived win-wins.

In this way, the S2F team has provided analysis of the step-by-step arrangements required for the development of SFSCs, and exploration of the incentives that can be put in place to ensure win-wins across the board. Team actions have generally focused on *brokerage* (e.g. ministries, local and regional government, schools, producers; procurement working group), *set-up support*: (e.g. public procurement support, operational planning, legal identity and governance/model rules for the new co-operative, advice on available grants and support to assist with set-up costs and activities), and *other support* (e.g. exchange of knowledge from other WPs/Tasks in the S2F project). If people have not wished to go further with us at any stage of the implementation of changes, we have immediately stepped aside. However, very few people have ever given us an outright 'no'. This has allowed us to provide evidence with regard to certain assumptions and root causes underpinning their initial scepticism, to the point where a critical mass of stakeholders have moved from asking 'why would you do this?', to asking 'why wouldn't you do this?'. People have therefore started to own a change process that is currently facilitated by the S2F team, but that we hope will be genuinely sustainable beyond the life of the project.

1.5. Action research stage 3: 'Review changes'

The first primary school in Serbia to submit procurement documents using the standard text produced by procurement legal experts for fresh organic vegetables (OŠ Kralj Petar I, a school in the centre of Belgrade) uploaded these documents to the procurement web portal in July, 2020. The new co-operative, **BioLogika**, submitted its bid correctly by the deadline, and *won the contract* in late August by offering the lowest bid. The cooperative is now organising the weekly logistics for its high-quality organic vegetables to reach the school by arrangement with the school cook, with whom a good relationship has already been cultivated. Some of the organic vegetables delivered to the school are shown below (Figure 13). With advice and support from the research team, a pattern for reliable delivery arrangements has quickly become established. The school is now in its fifth month of using organic vegetables for school lunches and satisfaction is high. We are now working with the new co-operative to support them to establish the 'box scheme' in the school and sell directly to parents.

Figure 13. Examples of organic vegetables delivered to Kralj Petar I school in Belgrade

Further developments have been delayed by the Covid-19 pandemic restrictions since March 2020 that have meant that some schools have shortened the working day and/or ceased to provide school meals, or changed meal numbers. Once the schools are working again and accepting visitors, meetings with other school directors will be brokered by the research team to support them in their objective to procure high-quality, locally-grown, fresh organic vegetables for their children. Using the experience of the first school with the new co-operative to support our case, we have good prospects to persuade another 1-2 schools to commit to an extra lot for organic vegetables before the end of the project. However, the timing of annual PSFP for most of our schools means that the Covid-19 pandemic will prevent our action research to improve school meal quality through increased uptake of SFSCs from achieving its full potential. Nevertheless, the new co-operative is now establishing a track record of supply in the PSFP market, which adds considerably to its chances of bidding successfully for further contracts, with or without the support of Strength2Food.

There is considerable reason to feel that an important basis for change has been put in place. We have explored the different possibilities for developing SFSCs and, for different evidence-based reasons, arrived at a particular alternative in the Novi Sad and Belgrade areas. The establishment of a new co-operative, formed from high-quality small-scale local producers to supply primary schools through PSFP, has provided a demonstration of what can be achieved with a level of network brokerage and creative stakeholder engagement.

Reviewing these changes, we have achieved the following:

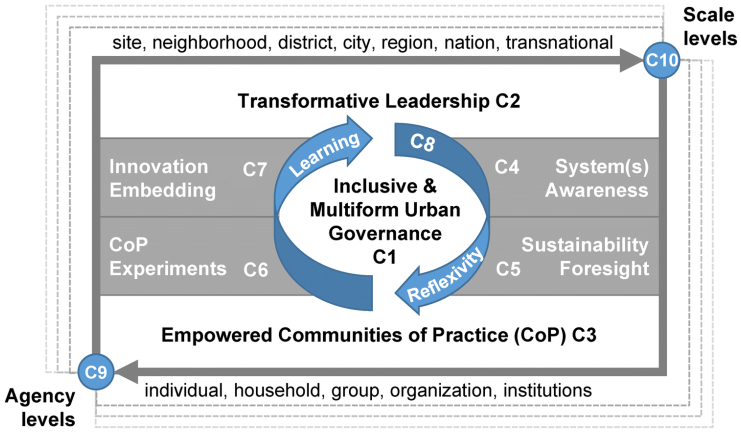
- Gathered local suppliers of quality produce
- Established a viable business model for SFSC supply arrangements
- Supported the development of an appropriate legal entity to participate in public procurement
- Facilitated the identification of schools to target for public procurement (based on demand quantities, delivery schedules, etc)
- Supported the division/combination of 'lots' within tenders (esp. organic vegetables) to encourage SFSCs
- Assessed the planning of logistics in co-ordinating deliveries in the most efficient way
- Supported development of necessary infrastructure - supplier liaison, storage arrangements, client liaison/ordering, delivery arrangements
- Supported the administrative journey through the public procurement process
- Supported the management of supply relationships - how to cope with contract variations, fluctuating demand (school vacations, etc).

In doing this we have provided the new co-operative with a bridge across the well-known 'valley of death' confronting many start-ups. The project has provided a lot of upfront investment in activities to help scope the market, develop a plausible working business model, and overcome some of the key practical, administrative and logistical challenges that the local producers would have been unable to fund themselves. They have added to this with creative use of their own existing resources (vehicles, storage, etc) to keep their operational costs low as they move to scale. Moreover, other stakeholders have been willing to help provide support in line with the shared goal of improving the quality of school meals served to primary school children. Already, other organic growers are coming forward, interested in joining the new co-operative, as they recognise its aims to supply organic food to schools serve valuable societal and health functions.

1.5.1. Conceptualising change

In framing the process we have followed in Serbia, Wolfram's (2016) 'Transformative Capacity Framework' captures different levels of insight of the process through which we have found new ways to address the problems our stakeholders faced (see Figure 14). We have thus sought to explore SFSCs through the lens of a *more inclusive and multi-form urban governance* that has allowed public-co-operative partnerships to emerge between contracting authorities, and local producers/suppliers that were not previously engaged (or enabled to be engaged) in public procurement supply chains.

Figure 14. Wolfram's (2016) 'Transformative Capacity Framework'



The engagement in this process of different levels of *leadership* has been transformative in galvanising the interest, belief, support and normalisation of an innovation that no stakeholder had initially thought possible: the provision of fresh, locally-produced, certified organic vegetables for use in primary school meals, the first example in Serbia, facilitated through Strength2Food. In doing so, we have *empowered two important communities of practice* in the supply of school meals that have previously been given little voice in the procurement process: local producers and school chefs.

We have carefully researched the current systems of supply and reflected on these with all stakeholders, both individually and together. This has allowed us to build a firm *foresight* platform, to arrive together at a set of potentially *sustainable* action research propositions. We have then worked with our communities of practice to set up *low-cost, low-risk actions*, from which the *learning* is now *embedding* the above innovation in the normal working/business practices of the producers, the procurement regimes of primary schools, and the policy positions

of local and central government. It is worth noting that an early question that arose in the project was whether improving the quality of schools meals was enough, if the children did not also eat well at home. Whilst beyond the initial scope of the project, this was nonetheless taken into account in terms of data collection and creative thinking applied to potential supply solutions to extend the provision of good local food into the home. In response, an additional development, involving direct sales of the same fresh, locally-produced, certified organic vegetables to parents (via an organic 'box' scheme), has been proposed. This has the dual advantages of both guaranteeing the sustainability of the innovation (through opportunities to achieve scale), and extending the reach of the project beyond the school as an organization, to the realm of individual households (enhancing project/societal goals of improving the quality of food eaten by primary school children).

This framework provides a helpful heuristic for understanding the process of change. In practice, however, as with most action research projects, this has not been a linear process but something much more iterative and complex. Despite unanimous agreement on the common goal of improving the quality of the school meals served to primary school children, various stakeholders involved in the action research project have had very different and, at times, conflicting agendas. We have been clear throughout that our 'good intentions' as researchers would be insufficient on their own to inspire change, and anyway that we have had an ethical responsibility to engage as openly and objectively as possible with the various imperatives that have emerged in the field. Thus, even where proposed interventions have been based on a sound empirical rationale, there have been surprises and unintended consequences along the way that have needed to be taken into account. Our commitment to flexibility and shared approaches to problem solving (whilst maintaining rigour through the presentation of appropriate empirical evidence) has therefore been key.

1.6. Action research stage 4: 'Continued action for improvement'

In what remains to be done, the following steps and tools have been developed for implementation, and now need to be extended further:

- Support from the Meal Planning tool for the harmonisation of school menus - getting chefs to standardise menus in order to quantify necessary ingredients
- Support for aggregating demand - getting schools to consider buying together
- Support for producer planning: planting, growing
- Pursuit of grant funding to help the new co-operative to scale up: currently, existing premises and vehicles are used, so initial outlay has been low. However, as the co-operative grows its business it will need to make further investments.
- Market expansion: meetings with school directors and parents councils to lay the ground work for further schools in Belgrade and Novi Sad to add a procurement lot for organic vegetables.
- Market testing: meetings with parents in schools to present samples/test demand for the Box Scheme.

Other tasks that rest with other stakeholders to achieve beyond the life of the project include:

- Better guidance to schools on best practice in food procurement (Ministry of Education)
- Harmonising tendering periods to support collective buying (Ministry of Education)
- Continuing to build partnerships, alliances and networks with other actors as appropriate (All Stakeholders)

For the longer term, discussions have also taken place on how the producers could seek to serve an increasing number of customers in public sector food procurement markets. For example, PSFP contracts are available for a wide range of other public sector organisations (e.g. kindergartens, hospitals, prisons, universities). In doing so, there is an ongoing attempt to consider how an ever-broadening base of local organic producers can be included in this initiative as it scales.

Replication of these arrangements in other parts of Serbia, but also in other parts of Europe, may also be possible. It would be possible for public sector actors, perhaps from local economic development departments, to develop a role in analysis and local capacity building to promote this type of activity. Moreover, we are keen to return to the idea of a student co-operative based at the Agricultural Middle School serving as a supplier for local primary schools in the Valjevo area. Our understanding from the Ministry of Education is that this should now be possible within the law, and this will be explored with relevant stakeholders before the close of the project.

1.6.1. Towards a 'Public co-operative partnership'?

One important concept emerging from the above account may be described as that of 'public-co-operative partnership'. This involves a commitment to 'relational partnering' on all sides to ensure the success of the scheme, based on a recognition that each is mutually dependent on the others in delivering valued win-wins. It is an example of 'vertical mutuality' (Simmons, 2020), in which policy stakeholders retain an interest and engagement, rather than simply delegating responsibility to lower levels of co-ordination, and where suppliers accept a degree of 'relative' rather than full autonomy to deliver on these relational contracts (Simmons, 2003; 2004; 2008).

Success in addressing these issues continues to be largely dependent on building the network and incentivising 'win-wins' between different stakeholders. It is clear that everybody has a part to play in creating the conditions for success (see Figure 15).

Recognising the inter-connectedness of different stakeholders and knowledges in making these ideas come to life, the project will thus seek to put in place structures and processes to enable stakeholders to continue as appropriate to build on the partnerships, alliances and networks developed during the project. This requires pre-planning, transparency and ongoing communication between partners. The project has helped to build many trust relationships; it is important that these are now confirmed in taking these new partnerships forward.

Figure 15. Stakeholder inter-relationships and mutual contributions

FROM-TO	Policy-makers	Procurement	Schools	Local producers	End users
Policy-makers		Legal frameworks	Promotion of healthy eating; Guidance on effective procurement	Level playing field; Appropriate regulation	Public information; 'tools of government'
Procurement	Identify perverse incentives		Ability to specify contracts to achieve desired outcomes	Clarity of expectations in contract arrangements	Responsiveness to end user dissatisfaction
Schools	Information on desired demand-side outcomes	Identify perverse demand-side outcomes		Security of demand; Meeting contract obligations	Responsiveness to end user information
Local producers	Information on desired supply-side outcomes	Identify perverse supply-side outcomes	Security of supply; Meeting contract obligations		Diversity and quality of supplied goods; Responsiveness to variation requests from schools
End users	Information on desired end-user outcomes	Identify perverse end-user outcomes	Identify perverse end-user outcomes	Responsiveness to variation requests from producers	

1.7. Conclusions

This research intervention has sought to overcome some of the difficulties involved in improving the quality of primary school meals in Serbia, through the construction of innovative partnership and collaborative working arrangements that align the incentives throughout the system. As detailed above, this has required action research interventions in (i) the policy and enabling environment, on both (ii) demand and (iii) supply sides, and (iv) in relation to contract/relationship management. The research has revealed the need to develop potential new supply arrangements, through both strengthening supply chain co-operation and organising local producers to supply. This report has discussed the progress of this empirical work, described the arrangements that have been tested and identified their key success factors.

Often what emerges from the melding in action research of knowledge, expertise and extensive stakeholder engagement can look quite straightforward *in principle*, or on paper. As many who have attempted it will testify, however, bringing meaningful and ethical change about *in practice* is often a very different research proposition. As can be seen in the above account, we have spoken with children, parents, teachers, school administrators, school chefs, school directors, chambers of commerce, agricultural advisors, producers, current supplier organisations, representative organisations, umbrella bodies, municipal government departments and central government ministries - a very comprehensive stakeholder list. We have worked carefully to understand what a 'win' (or a 'lose') looks like for each of them. We

believe the outcome from WP9.5.1 has created wins for all of them. The Ministry of Education has been happy to see the development of the new co-operative and for it to win its first contract. Ministry of Agriculture, regional (Vojvodina) and local (Novi Sad) government representatives attended the Hybrid Forum in November 2019 and spoke warmly of their support for these developments. This was also the case with the national association of organic producers and NGOs that support rural communities in Vojvodina. We have had further support from the Vojvodina Chamber of Commerce and, in finding alternatives to current arrangements, we have also created a win for those 'other market intermediaries' who have expressed a preference to withdraw from the supply of fresh produce in PSFP contracts, should separate procurement lots be created to allow them to do this. Local producers have grasped the potential of this initiative and taken ownership of it, and positive supply relationships with both schools and parents are being established.

However, most of these stakeholders were sceptical at the beginning, and it has taken careful listening, brokerage, facilitation, and a lot of 'back-and-forth' to capture and help work-around their concerns in enabling the thinking/planning that has developed. Thus it has been challenging to achieve ground-up SFSC development, along with the national and local level institutional change to support it, from a standing start, where everybody was initially facing in quite different directions. Meeting these challenges has taken determination, patience and real faith of purpose, to mobilise and maintain momentum with all of the above stakeholders with no more to motivate them to participate in the research than the shared goal of improving the quality of the school meals served to primary school children, and some ideas for a potential solution.

Crucially, however, as noted above, when we have asked people if they would lend their support to a collective change effort, very few people have ever given us an outright 'no'. We have taken this throughout as an opportunity to keep gathering new evidence in relation to their concerns and returning to them to keep them 'in the ring'. The Hybrid Forum in November 2019 was the first time we had all the key stakeholder constituencies in the room at the same time. However, as the foundations had been laid in our many previous interactions with them, it had become no more than a small step for each of them to commit their support to the proposed solution. Without this considerable prior effort to build shared understanding and co-operation, it certainly would not have been possible to have even got them all in the same room. Instead, it was clear that we had reached a point where people would have been disappointed if the proposed change did not happen. This is a clear advantage for having a 5-year project. If this had been a shorter project it would not have been easy (and perhaps not possible at all?) to have turned around the initial scepticism and inertia with regard to these issues, to the point now where the above win-wins have been created.

The research team gave careful thought from the beginning about whether a new co-operative, with all its accompanying challenges, was the best solution for the SFSC problem. All other options were explored first and, for different evidence-based reasons, rejected. In the end, what has been created is a bespoke solution to a particular problem. From our conversations with stakeholders, this appears to have exceeded anyone's expectations in terms of bringing high-quality, locally-grown organic produce into the school kitchen - with an additional potential positive outcome of substantially increasing the incomes of smallholder farmers. There is still a lot of work to be done to consolidate this progress and inevitable hurdles await. But there is good reason to believe that this will be a sustainable initiative that will survive and grow beyond the life of the project.

More broadly, in working to facilitate the networks and collaborative arrangements that have enabled the development of the new supply co-operative, it is clear that creative solutions to

SFSC problems can be found and facilitated if stakeholders know where to look. For example, despite the fact that the organic producers in this S2F initiative were well known to local government, and there was clear collective capacity for them to engage in PSFP markets, this engagement had never been envisaged – and even when it was proposed, there was little faith that it could be made to work. Much of what has been achieved in the action research has been a progressive change through sustained engagement of stakeholders' mindsets (combined with careful assessment and presentation of available evidence), from 'why would you do this?' to 'why wouldn't you do this?'. Starting instead from the latter mindset would seem more likely to lead to innovations in which local capacities might be combined more creatively. Thus, while it may have seemed that individually each of the organic producers in this project would not be able to service PSFP markets, it has been possible for them to do so in combination. There may be many more examples of how local private sector capacities might be creatively combined in new structures to supply services required by the the public sector, in ways that are unavailable to contracting authorities through the existing structures of supply.

This report therefore presents the novel notion of 'public-co-operative-partnerships' (PCPs) as a way to renegotiate boundaries in agri-food governance, through mutuality in short-food-supply-chains (SFSCs) and public sector food procurement (PFSP). Importantly, this includes the alignment of incentives towards sustainable direct co-operation and 'relational partnering' between the public sector (policy makers and service providers) and agricultural producers. The building of trust and credible commitments in avoiding opportunism and encouraging a 'co-operative learning system' are central to this endeavour. There is no cause, however, for this to be seen as somehow anti-competitive - for at least two reasons. First, if no market has previously been able to form in relation to the required supply of goods or services, then there is *de facto* no competition to be concerned about. Indeed, the bringing together of novel supply solutions may be influential in stimulating *new competition* for these contracts/markets. Second, it is possible to put in place benchmarks against alternatives to any proposed PCP arrangements. For example, it has been possible in S2F to consider the relative cost and quality of the proposed solution (local, organic) with that of the next-best solution (non-local, non-organic) through the current situation analysis. If such costs are comparable, as we have shown them to be (the Meal Planner tool of WP9.1.1 has demonstrated that meal quality can be improved while lowering meal price), then there is no detriment for the contracting authority. It is also possible to assess the relative cost and quality of the specific goods and services provided within the PCP with the cost of those goods and services in other markets. For example, we have been able to show how the costs of buying organic vegetables directly from the producers (thus eliminating the costs of intermediaries), has enabled contracting authorities to access these goods at much lower prices than would be possible if they were to attempt to purchase the same goods elsewhere. In short, the action research undertaken within the S2F project has therefore helped to:

- Enhance the quality of food served to primary school children
- Enhance farmer co-operation through clearly-defined, shared goals (whilst also raising farmers' incomes and acknowledging the dignity in their labour)
- Build stronger partnerships between municipalities and their communities

As these improvements have been implemented and reviewed, the research has sought to provide a good practice example that has a wider and longer-term significance. This report therefore suggests an opportunity for more detailed conceptual and theoretical development around the notion of 'public-co-operative-partnerships', drawing broadly on theories of vertical mutuality, theories of human co-operation that inform the alignment of mutual incentives, and theories of relational contracting and relational partnering. This represents an attempt to examine a distinctive approach to food policy and institutions and how this helps to integrate

food-related concerns across sectors and levels. Thus, on a practical level, there is almost certainly potential (with more strategic and joined-up thinking) to build a broader network of 'trusted' producers in various locations, who are together capable of building appropriate supply structures to encourage all the social, economic and environmental benefits of SFSCs. This provides opportunities for strategic growth of this initiative in various ways. It is hoped and intended to continue to engage both scholars and policy makers in these discussions.

2. SUB-TASK 9.5.2: A PILOT CASE STUDY FOR FRESH FRUIT SUPPLY

2.1 Introduction

Agriculture and the Food and Drink Sector have always been considered as Serbia's greatest economic potential. Tthe greatest traditional comparative advantage of Serbia lies in its favourable climate conditions and rich and fertile land; however, this advantage has not been transferred to the market yet. Throughout history, farmers from Serbia were known as producers and exporters of agricultural and food products - especially cereals, meat and fruits. The agricultural sector still plays an important role in the Serbian economy and society, mainly from economic, social, and strategic point of view. Agriculture accounts for around 7% of GDP (it is also a sign of less developed economy). Along with Food and Drink Industry, the agricultural sector formally employs 120.000 of employees (informally over 600.000 within small family-owned farmsm where workers are not officially recognized as formally employed). Additionally, resilience is an important characteristic of the agricultural sector in Serbia, proved during the past 30 years (staring from the 1990s crisis to the current COVID19 crisis). The agricultural sector plays an important role in regional development and supports living standards for the rural population. Finally, a wider strategic and national significance of the agricultural sector must be considered in the context of "food safety" approach as an indispensable part of any sustainable development strategy. The agricultural activities on the farm and around agriculture activities, in cooperation with other stakeholders in the rural regions, can provide rural households with a relatively high income per unit of work.

In this report we investigate the raspberry sector. Respberry is the product within the fruit and vegetable sector that has the most important strategic economic (> EUR 250 million) and social significance (> 80,000 farms). Authors of different reports on the fruit and vegetable sector development in Serbia (Radosavljevic, 2008, Blagojevic, 2012, Djurkovic, 2012, Grivins et al, 2016, Kljajić et al, 2013, Lukač et al, 2013, Nikolić, 2013, Stojanovic et al, 2019) have emphasized a wide range of problems (shortcomings) such as:

- Inadequate technology to support food quality and safety standards;
- Underdeveloped logistic support;
- High fragmentation of farms;
- Lack of diversification in the sector.

The subtask 9.5.2 explores the main reasons behing these identified problems, and suggests "the way out" for different stakeholders with the main aim – to enable raspberry producers to improve their position in the market (in the light of the overall name of the project, this subtask can be considered as "S2RS", meaning Strength to the Raspberry Sector).

The analysis is focused on raspberry producers in Serbia. Other chains of raspberries (fresh, dried, juices and jams) have not been developed. Domestic market covers 10% of total production, while 90% of raspberry produce has been exported, mostly in the frozen form (bulk). While the study covers all Serbian production, it is particularly oriented towards producers located in the leading region – the Sumadija and Western Serbia (Figure 16). This is a well known region of raspberry production, traditional both in positive and negative aspects. From a positive perspective, the region contributed to the development of the export oriented

raspberry sector and to the transformation of comparative into competitive advantages in the past (this particularly refers to the Municipality of Valjevo, the Municipality of Arilje and the Municipality of Ivanjica). However, from a negative perspective, if we consider the introduction of new varieties and technology improvement, most producers from this region can be considered as bearers of a traditional approach to production, which is wary of innovation.

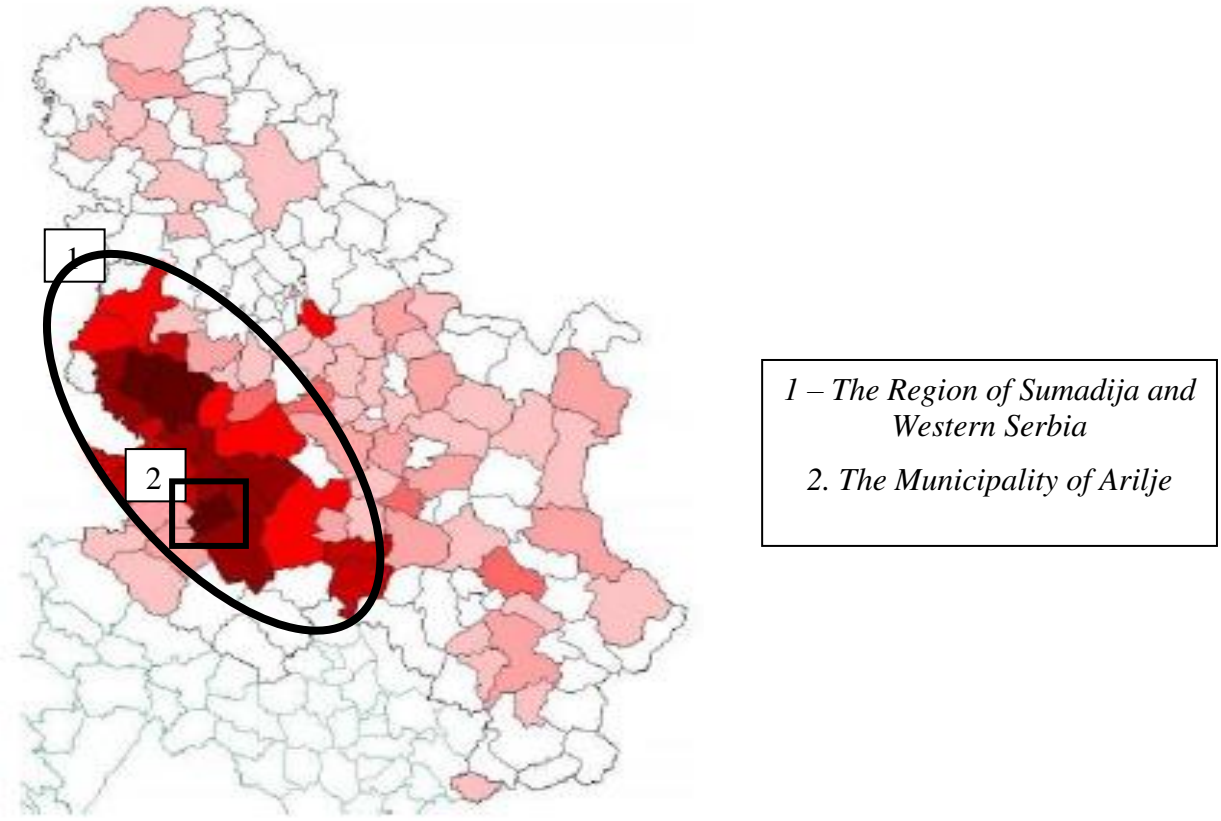


Figure 16. Production of raspberry in Serbia, NUTS-4 level

(Note: More intensive colour indicates higher quantities produced)

The structure of the observed sector stakeholders is extremely complex and includes:

- **Input suppliers** – producers and traders in technology (machinery, equipment and refrigeration capacities), planting material, plant nutrition, plant protection, irrigation plant, greenhouses etc.

- **Raspberry producers** - micro (0.2 ha) farms and small (around 0.5ha) farms in the Western Serbia, large (up to 3 ha) farms in Serbia, larger farms in the Northern part of Serbia and new plantations in the Southern Serbia.

- **Intermediaries** – traders (wholesalers and retailers), distributors, industrial and retail packaging, small specialized refrigeration facilities, local buyers (small traders), farm refrigeration capacities (local, mostly located in the Municipality of Arilje and the

Municipality of Ivanjica), large refrigeration facilities (both privatized former trade socially owned companies and companies which are part of multinational systems), cooperatives etc.

- **Other industries (Processors and HoReCa)** – hotels, restaurants, confectionary sector, mill and bakery sector, milk sector etc.
- **Services suppliers** – certification, quality standards, hygiene standards, food safety standards, packaging and design, marketing, financial services, insurance companies etc.
- **Knowledge services providers (mostly public institutions)** – scientific institutes and other scientific research organizations, Extension Service, traffic and energy infrastructure, innovation and development.
- **Control** – the Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia - inspection and independent certification bodies.
- **Other stakeholders** – the Arilje Municipality Government, regional development agencies and NGOs.

In the CEVES Integrated Report on Performance and Value Chain Analysis of Selected Sectors within Manufacturing Industry (CEVES, 2017) it is stated that there are different possibilities "to improve (or at least sustain) the compromised competitiveness of the entire traditional raspberry food chain, but it is also possible to develop new "modern" chains – related to deeper processing, fresh segment, retail-ready segment and organic production." The related possibilities should be based on strong evidence of different solutions. The evidence includes observations of the main elements of costs in raspberry growing and the price determination.

The focus of demonstration activities within the WP9.5.2 has been twofold: (1) to enable in-depth analysis of the main problems that raspberry producers face in Serbia, and (2) to facilitate fresh fruit supply with the aim to improve farmers income.

Particular attention is paid to the introduction of new varieties and the development of the organic raspberry production in the Municipality of Arilje in order to promote well balanced cash flow and farm income. Investigations put emphasis on the production standards that can be met by farmers, initiatives to improve organic inputs supply, implementation of big data in order to improve control of plant diseases, faciliation of productivity growth in the initial phase of organic production development, improvement of packaging and local market supply, and selection of specific procedures in marketing logistics development. Touching upon all these issues, the subtask 9.5.2 addresses the main problems related to the Serbian raspberry food chain.

2.2 The methodology applied

The Faculty of Economics, University of Belgrade (BEL), along with the Arilje Centre for Agriculture, took the resposibility to identify the main problems in the sector and to prepare a list of local growers interested in changing and improving their practices through Focus Groups Discussions. BEL team visited organic producers and discussed the main challenges that they

have faced in the certification and quality controls. Specific analysis was performed in order to assess LFC capacity not only in organic, but also in traditional Arilje raspberry production (product with geographical identification). The analysis helped mapping the specific requests/questions of organic and traditional Arilje raspberry producers.

Subsequently, BEL and ARILJE conducted producer surveys in Arilje region during January 2018 (n=100), with the aim to better understand food chain organization at the local level. The results revealed that trade cooperatives (their members can be raspberry producers with small storage capacities) can bring additional value to the chain. It is important to work with small storage capacities (which are also producers in the region) in order to influence changes in growers' practices. It is essentially a different approach compared to most of the activities that have been carried out in the sector so far. Previous initiatives tended to focus on producers' interactions and integration, while this pilot initiative focuses on the small storage capacities in the region. The latter currently operate as legally independent entities, and there is a solid basis for their engagement through a new trade union/cooperative.

The conducted activities also put emphasis on the establishment of closer relations between advisers/advisory service and producers. In this context, two meetings with an IT facilitator – BioSense Institute from Novi Sad, were organized during the early stage of the project. BioSense is a hybrid public/private organization which offers IT services for agricultural producers in Serbia. The services for small family producers are often free of charge (such as Digital Agriculture). They expressed willingness to cooperate with producers, producers' organizations and the Civil Society Organisations (CSO) in the Arilje region to establish an efficient control of production (input use, production efficiency, yields control, etc.).

Based on qualitative research conducted within this pilot action (focus group discussions, as explained above), it was found that the region, as a whole, suffers from intensive use of chemicals in raspberry production. Therefore, it is extremely important to establish efficient control of different inputs use, particularly those which might significantly influence the development of the organic production. The establishment of small meteo-stations in the area of Arilje Municipality (the cost of one meteo-station is around 250 Euros) and the introduction of specific relations among raspberry producers, e.g. BioSense Institute and Extension Service, can create a better agri-business environment.

Additionally, in the context of fresh fruit supply development, an experimental production based on the Polana variety was organized on a typical small family farm. The study also covers different aspects of financial analysis related to conversion to organic production of raspberries. Different varieties could bring better market solutions for farmers due to seasonality and improved market returns. Table 3 offer an overview of the main activities and research methods applied in the subtask 9.5.2.

Table 3. The main activities and research methods applied in 9.5.2

1st phase A	Screening of the previous practice applied in the observed sector	*Literature review* [Note: Detailed literature review and relevant indicators' investigation on raspberry sector in Serbia (with specific emphasis on organic production) was performed within WP3] Literature review is based on different reports, scientific papers, statistical databases and media articles.	The main focus: • Sector structure; • preparation of detailed list of stakeholders; • exloration of the market position of farmers based on secondary sources; • list of previously indentified problems in the raspberry food chain; • understanding of development trends or possibilities for the future development.
1st phase B	Screening of the current situation in the observed sector	*Qualitative research* Focus group discussions with local stakeholders (the municipality of Arilje) *Field trip* Visit to the organic raspberry farm in Arilje	Aiming at: • Understanding different problems such as how standards of production can be met by producers, initiatives to improve legal framework for organic inputs supply, implementation of big data analysis in the practice to control diseases and productivity growth in the initial phase of organic production development, packaging and local market supply, selection of specific procedures in marketing logistics development, as well as understanding of the local food chain organization.
1st phase C	Elaboration of the main problems regarding the organization of the observed sector	*Quantitative research* Producers survey in Arilje region (n=100)	Aiming at: • Exploratory analysis of the main connections among stakeholders at the market; • Elaboration of overall connections quality among stakeholders; • Identification of the main sector strategies for development

2nd phase A	Demonstration activities – services	*Expert interviews* with providers of advisory services on digital agriculture	The main focus: • To introduce common understanding between farmers and IT service providers; • To modernize farm; • To create environment for full implementation of research in the practice; • To introduce specific relations with The BioSense Institute and Extension Service, with the aim to create a better agri-business environment.
2nd phase B	Identification of main strategies and supportiing activities	*Policy recommendations*	The main focus is derived from the local government request to modernize raspberry production and to create the adequate supporting mechanisms at the local level.
3rd phase C	Demonstration activities on the farm	*The experimental action / two pilot Case Studies* • *New variety introduction* • *Organic raspberry production* [Note*:* Related to WP5 - verification of sustainability indicators in a changing environment]	Aiming at clear demonstration of the main advantages of the new variety introduction and organic production. Particular attention is paid to financial aspects of doing business and profit analysis.

2.3 Results and Discussion

2.3.1 The 1st phase – Screening and in-depth analysis of the main problems in raspberry production

2.3.1.1 Focus group discussions

The qualitative research focused on the main problems in the raspberry production in the Arilje Municipality. Two focus groups were conducted in May-June 2017. In the Focus Group Discussions (FGD), raspberry producers from the Arilje Municipality, traders and local community representatives took place in interviewing. Small traders with storage capacities (cold storages) were included as well. In total, 10 stakeholders took participation in the discussions. The interviews were held in the premises of the Municipality of Arilje and lasted about 2 hours for each FGD. The interviews were recorded in the audio format.

Table 4. The list of Focus Groups participants

Organisation	Subgroup	Status
1st FGD		
Organic farm owner	Producer	Participated
Large family farmer	Producer	Participated
Farmer	Producer	Participated
Producer with small storage capacity	Producer/trader	Participated
Small family producer	Producer	Participated
Family farm owner	Producer	Participated
2nd FGD		
Farmer and small cold storage owner	Producer/trader/	Invited to participate
Processor/Trader	Manufacturer/Trader	Participated
Trader	Trader	Participated
Member of the Local council for agriculture in Arilje	Local policy maker	Participated
Former president of the Local council for agriculture in Arilje	Local policy maker	Participated

Raspberry production is extremely important for the agricultural sector development in the Region of Sumadija and Western Serbia. The Serbian National Tourism Organization organised a promotional campaign to attract foreign tourists using the following advert message: "Welcome to Serbia, the capital of the RED GOLD" / were the red-gold refers to raspberries. However, the sector, nominated as one of the most important for agricultural and rural development in Serbia, is faced with numerous problems in practice.

Figure 17. Focus Groups Discussions in the Arilje Municipality

During the discussion, two main problems were identified, and they are listed as follows:

- **Problem 1. Market structure and position of small family farmers**

  Lack of horizontal and vertical integration exists due to the extremely strong position of large traders which can have even monopolistic power - the privatization process from a planned economy fragmented the supply chain and individual producers establish direct connections with traders.

  The prices are particularly volatile and producers are not provided with adequate financial instruments to deal with it – producers report the uncertainty of price at the beginning or during the production.

- **Problem 2: Policy measures and support for farmers**

  New procedures are more complicated, particularly for older farmers who are not familiar with e-forms and applications.

  Financial issues are mainly related to insurances against risks: currently, either insurance is not well designed to the specific conditions of production or producers are not sufficiently informed about the importance of insurance. Producers are particularly concerned about a major issue - unfavourable weather conditions (climate change and natural risks such as floods or droughts).

  Land is a constraining factor for increasing farms size and exploiting economies of scales (a particular problem is connected with land leasing procedure based on short time period).

Producers are dependent on subsidies for farm restructuring and technology improvements. However, lack of innovation is also an issue – in spite of the fact that there are different opportunities for introduction of new varieties or implementation of digital agriculture/precision farming techniques, farmers are extremely reluctant to changes in their practices (typical strategy of doing business as usual is applied).

Problem 1: Raspberry market structure, market power and position of farmers in the raspberry food chain

The raspberry market in Serbia is export-oriented. The exported good nominated as “red gold” are actually raspberries in a frozen form. The market is extremely fragmented as it is dominated by a large number of small suppliers / family farmers, while exports are ultimately realized by an extremely small number of large trading companies.

Our respondents shed light on a particular problem related to the food chain structure. The large trade companies dominate and other stakeholders are put in the position of price takers. Despite the fact that raspberry prices on the world market were not significantly changed during the last period, internal market price was strongly volatile. There are a few export companies in the region of Arilje (5-6 larger companies). All other cold storages (medium and small) "work for large exporters" (they are not acting as contractors or integrated companies, but they rely on export companies in their business). Farmers are at the bottom of the chain, holding a very subordinate position.

During the last five years, the small storage capacities were built at many farms in the region. Farmers wanted to be better-off by introducing a new environment in which they wouldn’t be forced to sell their products right after harvest when the price is at the lowest. Wholesalers and exporters took the strategy to sell their own stockpile from the previous year and to import the raspberries from the region (Bosnia and Herzegovina and Kosovo), letting local farmers with storage capacities even in worse position (they had to pay the extremely high cost of electricity for storage capacities, and they let them without any payments during the year).

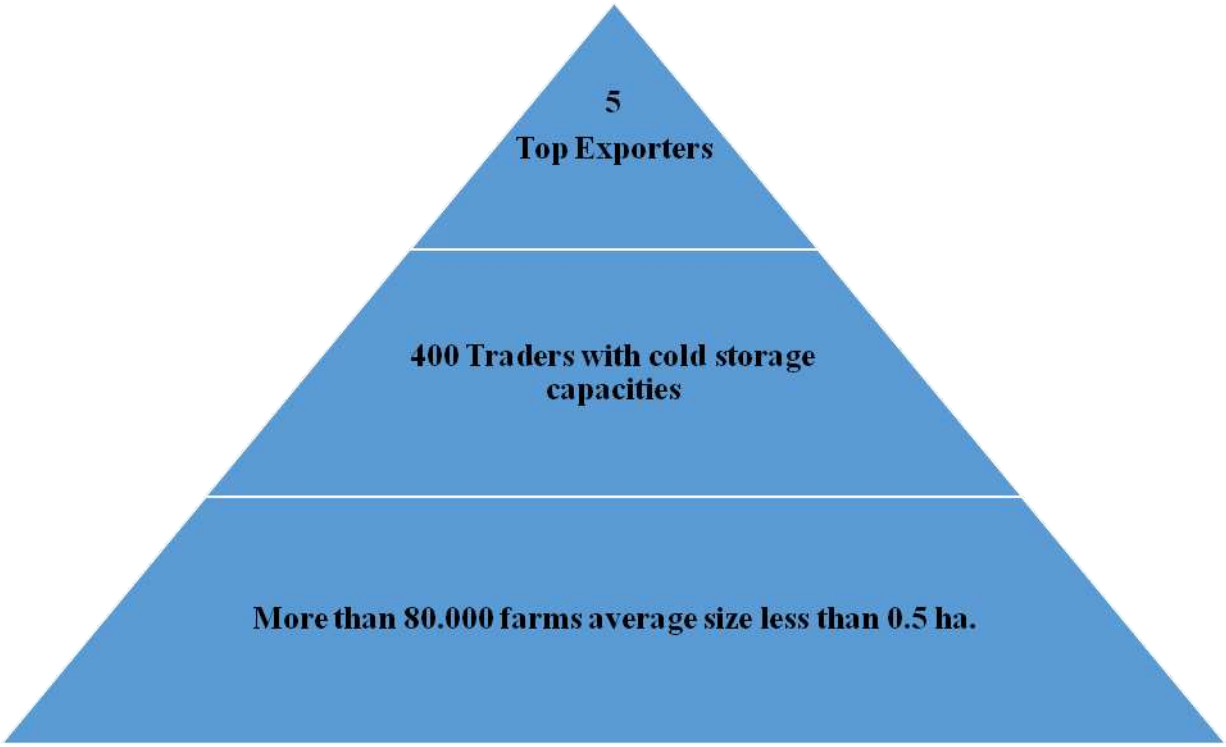


Figure 18. The raspberry food chain structure in Serbia

This has significantly burdened the functioning of the sector. Only in the Arilje municipality around 250 small cold storages operate today. They are in most cases located at small farms and jointly managed by wider communities based on family ties.

The particular problems related to selling products in advance, fair-negotiation on price and other issues related to financial arrangements are evident too. Raspberry farmers are simply put in unfavourable position which will influence their capacity to produce in the long run.

Some selected statements:

"Large exporters are at the first place, they are the most important. I can just sell my products to the large traders, and it will end at the foreign markets most probably. We all work for big exporters." (Trader)

"If price of raspberries goes down, small producers suffer the most. There is no policy defined in the long-run, situation is changing year by year, season by season... We can't count on strategic planning at all." (Farmer)

"Our Ministry and local government should protect small farmers. They have to create better conditions for production. They have to control market situation and certainly we do really expect from them to punish those traders who take advantage over the small stakeholders using illicit actions in the market. But nobody take care about position of small stakeholders at all." (Farmer)

"Let me explain the current position – we have to take significantly higher obligations in our relations with traders, while traders are not obliged to guarantee the price for our raspberries at all. We have to accomplish high standards in production, we have to deliver the signed quantity, but they have to do nothing. Even more, they offer their products to farmers using

these arrangements as the pre-payment. If I have to buy chemicals, I can do it simply in the trader shop. Again, when I have to buy products for everyday life for my family, I can do it in the trader shop without payment. At the end, trader simply reduces the bills and I have to accept the given price." (Farmer)

"We have to establish safety net for farmers by introducing the minimal price." (Local Policy maker)

The producers lament highly unpredictable prices and lack of efficient price control instruments. These problems can be noticed particularly prior or during harvest. This can be further attributed to the underdeveloped system of connections among stakeholders. Institutional arrangements simply depend on price determinate by cold storages (traders). Furthermore, price cannot be negotiated in advance. All stated above regarding the price is related to conventional production for export (frozen raspberries). Higher prices are obtained in organic production (more than twice in comparison with conventional counterpart).

Growing production of raspberries, in neighbouring regions both in Serbia and in broader regions out of the country, has influenced price change against farmers. Farmers in other regions in Serbia – Vojvodina and Kopaonik, Kosovo, Bosnia and Herzegovina are newcomers in the raspberry business. The Arilje raspberry producers took participation in several cross-border cooperation projects and have helped other farmers in the region to establish new plantations. The yields from these fields are still far away from yields in Serbia, and raspberries are of lower quality. However, Serbian traders imported significant amount of raspberries from the region and put the domestic market in the stage of overproduction. This situation is not unique. In 2017, the Serbian market faced a similar problem. The local cold storages capacities were overbooked due to higher stocks from the previous year, while the interest of foreign buyers for Serbian raspberry was lower due to Poland producers' competitiveness. Poland had a record-breaking year in 2016, while the export decreased due to the fact that Serbian exporters mixed the raspberry of lower quality with the top quality sorts like Willamette and Miker and foreign buyers returned entire contingents back. Our respondents argue that the exporters made a decision to mix quantities of top quality from Arilje with imported quantities of lower quality from the region.

Some selected statements:

"There is a lot of raspberry import from Bosnia, Kosovo, Albania and Macedonia, and it is sold as "Serbian". The quality of imported raspberries is highly questionable." (Local Policy Maker)

"This year all storage capacities are fully loaded - what will happen if they face with barriers in selling current stock at the foreign markets?" (Farmer)

"Just a few years ago, our neighbours from Bosnia and Herzegovina were engaged in berry picking at our farms during the season. Now they have their own production." (Farmer)

"The price has significantly changed, year by year; It might be 120 RSD per kg, or even up to 350 RSD per kg." (Farmer)

"Polka variety production is less demanding. It requires less investment, it is less exposed to different risks (such as plant disease), it requires no special technology, and finally, the price is competitive." (Local Policy Maker)

"The assortment must be changed. It would be good if we could export fresh commodity" (Trader)

Raspberry producers usually don't have contract price for their product. Furthermore, they are forced to buy inputs using unusual forward agreements. It is a sort of barter arrangement - there is no statement about raspberry price, but it is set that producers can take whatever they need for current production (different chemicals, inputs etc) in traders shops. This is not followed by immediate payment, but producers have to pay in quantity of raspberries offered to trader at the end of season. Producers pay their obligations with the commodity.

Problem 2: Policy measures and support for farmers

The Serbian government strives to adequately support agricultural producers, aiming at designing a system that will improve market conditions for farmers and competitiveness of farmers. Using the pre-described framework for policy measures at the national level, the local government (at the Arilje Municipality level) also defines sets of measures addressing the additional, specific issues at the local level.

During the qualitative research the following issues were identified:

1. Older farmers are not familiar with the new application procedures for the government support. Younger farmers use the same mechanism adequately in order to improve their own businesses.

The policy measures, applied both at national and local level, have significant impact on farm income in the fruit sector in Serbia. Generally, our respondents positively evaluate government measures. However, the attention of discussants was geared towards particular problems related to non-transparent procedures for budget allocation. Additionally, these procedures are more adjusted to younger farmers (older farmers are still facing a wide range of problems related to application as they have to do it using different portals and e-forms). Younger farmers from the Arilje region have started a new business in the raspberry sector recently and they are more oriented towards the new technologies implementation. This is seen as “the problem” from the older farmers’ point of view, but in general, it might foster the transition of the agricultural sector with younger farmers as the main drivers of change in the new era of digitalization in agriculture.

2. The local stakeholders initiated the working group for negotiations with the national government to better address the problems of the local community.

This idea is not unique. It dates back in the collective practice during the socialist era when direct negotiation mechanism for resolution of economic problems was applied. The working group usually consists of important stakeholders from the local level. This group is formed with the particular aim to access the effects of applied agricultural measures and maximize benefits for producers and other stakeholders in the raspberry food chain. In the new world of the market economy, this group can be considered as the lobby group. The local stakeholders obviously consider the raspberry sector as one of the highest national priorities and expect a specific response from the policy level.

Problem 3. Financial issues as the consequence of adverse climatic conditions and inadequate insurance schemes applied in the practice.

Farmers in Serbia are particularly risk averse. They do not appreciate borrowing money and if they can, they will do all their businesses only with their savings. The state program for the agricultural investment support as it is currently functioning was established in 2010. It is based on the interest rate subsidies. The loans can be given to eligible producers registered in the

Agricultural Holdings Register governed by the Ministry of Finance of the Republic of Serbia. The interest rates are significantly lower in comparison with the regular market conditions. The government defines the main orientations of the investments eligible for the public support (building and purchasing of irrigation systems and equipment, purchasing of agricultural machinery, establishing new plantations, establishing production in greenhouses etc).

Serbia has faced different problems related to weather disasters (such as drought and floods). If the insurance schemes are not applied properly, it creates a lot of problems – producers cannot withstand the costs associated with the new production cycle, while the pressure on the government to intervene is constantly increasing. Farmers constantly deliver strong requests to government for direct compensation of losses.

In the raspberry sector in Serbia, agricultural insurance is not obligatory. Larger players use insurance individually, while small family farms usually insure their business through the specific arrangements with the trade companies (cold storages). According to our respondents, there are high expectations from the national and local governments to help agricultural producers in the case of weather disaster. Farmers constantly complain about inconsistent insurance procedures. For example, insurance companies changed conditions and put producers in less favourable position in situation of early frost which occurs more and more often. Having in mind the overall importance of the insurance in agriculture, the Serbian government subsidizes insurance premiums. Additionally, each municipality takes care about protection form hails. However, smaller producers, as a rule, have limited access to these resources. Very often they are in less favourable position because they purchase all inputs through the "blind agreements" that have already been discussed. It recalls to some earlier systems of exchange with parities that were defined against the primary producers.

Some selected statements:

"Farmers can make a 50% return on investment on the farm from the budget. I have a particular problem with procedures for application – somebody must help me to apply, to fill-in forms, to document investment etc. I can't do it by myself." (Farmer)

"I remember haw it was in the past. Many farmers did a lot of investments in machinery and other equipment, generally in the fixed assets. The procedures were simple, today it is more complex and everything is set in favour of younger farmers" (Local Policy Maker).

"Young people belong to a new generation, they don't want to be employed in the public sector, they want to develop their own businesses. They know a lot, they are very well informed, they are familiar with IT. They only suffer from lack of the experience." (Trader)

"We have to stop further depopulation in rural areas. We have to support young farmers with the specific loans for business development. It might influence more massive return to the village, but we need modern villages with a good infrastructure as well." (Farmer)

"Compensation from insurance companies is inadequate. The assessment of damage is often performed with a delay; producers are left without adequate compensations." (Local Policy Maker)

"Whenever insurance companies have to pay for damages appeared in the Arilje Municipality, in the following year conditions for insurance are more restrictive (higher premiums etc)." (Producer)

"Traders work with larger number of farmers and for the insurance companies it is better to pay traders to attract more producers for insurance". (Trader)

"The local government supports the system for protection against hails on the territory of our municipality. However, the results of protection depend also on the organization of protection against hails in the neighbouring municipalities as well." (Local Policy Maker)

Problem 4. The state land leasing is available for the short period of time, which is not adequate for the fruit production.

The Regulation on State Land Leasing was adopted in December 2017. The regulation determines the fees and procedure for state land leasing to private owners. The eligibility criteria for the land leasing for a longer period of time (up to 30 years which is important in fruit production) are defined as follows: the farm must be registered in the State Registry of Agricultural Holdings; farmer has to submit investment plan which includes investment in agriculture or food processing industry with the focus on innovations, or they can simply expanding the existing business or diversify the existing production lines.

The general criteria for assessing the quality of investment plans are: (1) the investment must be in fixed assets, and this is not limited only to crop growing (storage capacities are included as well); (2) the investment should be at least 3,000 EUR per hectare of land, out of which at least 500 EUR per hectare should be invested in processing capacities (which means that farmers who produce only agricultural products without any processing can not apply for land leasing; (3) the total investment, over the three year period starting with the day when the investment has been made, should be at least 500,000 EUR (meaning that only large players can lease the state land); (4) in the first year, at least 30% of the amount should be invested (which influence the less developed rural regions). Additionally, the Law on Agricultural Land specifies that up to 30% of the state-owned agricultural land at the local level can be leased. Using mentioned criteria, most of family farms will not be eligible. This situation limits particular interests of organic raspberry growers in the Arilje Municipality. Most of the parcels that are under the state leasing procedure are located in the places with bad infrastructure and, very often, under the forest or in the land classified as neglected. This determines an extremely unfavourable position for farmers who cannot invest in fixed assets if they cannot count on a longer period of their use.

Some selected statements:

"There is state land which can be leased in our municipality (the Municipality of Arilje). It counts around 800 hectares. Under the current procedure it is leased for one year only. Producers don't want to accept risk for not be successful for particular parcel leasing in the next year, which is reasonable." (Farmer)

"I am very dissatisfied with the procedure. This is state land that should be leased for at least 10-20 years in our case." (Farmer)

Problem 5. The lack of innovation

Development of fresh produce requires constant change in the technology, including the introduction of new varieties. Two varieties - Willamette and Miker, dominate in the fields and they are usually sold in the form of frozen product at a lower price in comparison to fresh produce. Development of fresh raspberry market requires specific system of packaging and logistics (transport and retail) and it cannot be developed in short-run. However, the first steps

should be taken in the introduction of new varieties which are more suitable for the fresh market development.

The system of the new varieties introduction should be supported with information and knowledge dissemination. The huge problem was identified in the field of cooperation between farmers and extension service provider. The main provider is the state with the publically available agricultural extension service. Farmers argue that the agricultural advisers simply act as "input traders". They just want to sell particular chemicals as much as they can, as they work for input suppliers in parallel. They heavily encourage farmers to buy fertilizers, different chemicals for plant protection or specific machinery. They do not work their main job – advice for farmers regarding what they should do in a changing environment regarding technology improvement. Some respondents simply stated that they went for innovations by themselves using experimental production of new varieties (Polka/Polana).

There was a huge discussion among our focus group discussants related to the quality of imported planting materials. It was connected with development of the new plantations with greater capacity to produce fresh raspberries in the future. Unfortunately, the imported plant material was massively infected by a fungus Phytophthora fragariae var.rubi. The aggravating circumstance was that the planting material was procured through the action of renewing stem plantations supported by the Ministry of Agriculture, Forestry and Water management of Republic of Serbia. The poor standards in import procedures and lack of the internal control mechanisms within the Ministry have contributed to this negative development.

The establishment of laboratories for testing the presence of heavy metals and pesticides in fruits is of extremely importance. The Directorate of National Reference Laboratory was established by Article 18 of Food Safety Law ("Official Gazette RS", No. 41/09). As an administrative body within the Ministry of Agriculture, Forestry and Water Management, the Directorate performs tasks within the field of food safety, animal health, plant health, agricultural and decorative plants, residues, milk and plant gene bank, and carries out other activities in this area. The Directorate manages the following activities: (a) collaborates with national laboratories of other countries; (2) establishes uniform criteria and methods as well as implements standards for certified laboratories activities; (3) organizes the necessary comparative tests between the official national laboratories and conducts appropriate follow-up of such comparative testing; (4) exchanges information obtained from national laboratories of other countries, the Ministry and authorized laboratories; (5) provides professional and technical assistance to the Ministry for the implementation of coordinated control plans; (6) implements and develops test methods in accordance with international standards and mandatory validation; (7) establishes the system of quality control not only for its own use but also for certified laboratories; (8) confirms certificates of analysis and expert analysis if relevant to interests of certified laboratories; (9) provides and implements statistical process control through certified laboratories and monitoring of results; (10) organizes comparative tests for certified laboratories for the equal application of applied methods; (11) provides services to certified laboratories in the field of statistics and information systems; (12) conducts training of staff in certified laboratories; (13) prepares national guidelines for sampling and sample handling in order to implement reliable diagnosis; (14) prepares, maintains and distributes reference material; (15) participates in international comparison tests.[3] Public procurement of equipment for laboratories is financed by international funds, but these laboratories do not function yet. All this causes several challenges for producers who produce in line with good agricultural practice.

[3] Source: http://www.dnrl.minpolj.gov.rs/

Some selected statements:

"Half of the new plantings in Serbia are either of the "Polka" or "Polana" variety. It seems that they are adequate for plantations located in our area, with our weather conditions, products are with the longer durability and with more suitable quality for fresh market. But our producers would probably say that the Willamette variety is the best in the world" (Local Policy Maker)

"We produce our own planting materials. Therefore, our yields are lower than it was expected in general." (Farmer)

"We can't achieve the higher yields with low quality of the planting materials". (Farmer)

"Most of the municipality residents earn their income from raspberries, but how do we think to continue if there are so many plant diseases? And we do nothing to prevent such situations." (Farmer)

"We are going in extensive growth, producers use more hectors and produce less. Is it a good way for the sector development? I don't think so. Everybody thinks that it is easy to produce raspberries, and the extension service doesn't do their job properly." (Farmer)

"We lost the direct connection between producers and scientific research. It was a case 30 years ago. I remember, professors from the agricultural faculties were in the fields, worked together with farmers and helped adoption of the new technologies. Unfortunately, it isn't case anymore." (Farmer)

"We have an important problem with input lobbies. Their goal is to sell as many inputs as possible (pesticides, herbicides, fertilizers). They do not care about production standards and environment at all." (Farmer)

"We have faced with problems in export. Input traders are not good advisers. Listen only experts, advisers from the referent institutions in the country concerning the input use!" (Local Policy Maker)

"Unfortunately, all traders, processors and cold storages have included agricultural pharmacies in their businesses; they offer inputs for farmers in exchange for the final goods, so they will agitate for the chemicals any way." (Farmer)

"If someone needs medicals he has to show prescription from a doctor in the pharmacy. When farmers buys the agricultural chemical inputs (poison in fact), he can do it without any instructions as much as he wants." (Trader)

The WAY OUT

Our qualitative research confirmed previous findings about the overall importance of the sector for the Serbian agriculture and economy. Raspberry production is particularly important for the local communities' development in the Region of Sumadija and Western Serbia. It becomes more and more important as product for other regions in Serbia as well. In the Arilje Municipality it is even more important. The industry located in this municipality was devastated during the transition period - many factories were shut-down. The only opportunity to ensure fair living standards for a family was to use local knowledge and tradition (local milieu evidently present in the cultivation of raspberry). The system still does not work properly, and

it is characterised by numerous barriers, but there are also opportunities and solutions for better response to contemporary challenges. Our respondents pointed out the following options:

- Technological improvement and introduction of new varieties with possibility to develop both fresh food markets using the high quality schemes in labelling and development of processed food products for domestic and foreign markets;
- Establishment of better connections among food chain stakeholders is urgently requested.

Additionally, Food Quality Schemes (FQS) become increasingly important. FQS create conditions for better recognition of products both in domestic and international markets. They create also an environment for promotion of diversity among nations. Protecting autochthonous products of each country means protecting a particular rural area and encouraging rural settlements to produce their unique products with parallel establishment of international food safety standards. The quality of food products is also a strategic requirement in the context of international integration. As far as raspberry is concerned, our interviewees put attention on labels such as Made in Serbia, PDO (Ariljska malina) and Organic (Organska malina).

The label Made in Serbia is important due to the fact that other producers from the region have already started to produce raspberry (it wasn't their alternative in the past) and there is a need to capitalize on tradition and to mark strategic product that is recognized at the international level. On the other hand, producers should also think about the regional capacity to cover world demand for this specific product. It is also evident that the frozen raspberries are sold in packages that are defined by final customer without any sign of geographical origin.

The list of nine agricultural products (wines and alcoholic beverages are excluded) with a geographical indication of origin is confirmed by the Ministry of Agriculture, Forestry and Water Management in 2020 (Table 5). Ariljska malina (Raspberry from Arilje) is the first product on the list.

Table 5. Products with identification of origin or geographical designation of origin in Serbia (wine and alcoholic beverages are excluded from the list)

No.	Product with geographical designation of origin	Label	Producer/Producers organization
1.	Ariljska malina (Raspbrry from Arilje)	Name of origin	PO „Ariljska malina“, Arilje
2.	Đerdapski med (Honey from Djerdap)	Designation of origin	Bee Society "Golubački grad", Golubac
3.	Leskovački domaći ajvar (Domestic ajvar from Leskovac)	Name of origin	PO „Leskovački ajvar“, Leskovac
4.	Oblačinka iz Oblačine (Oblačina from Oblačina)	Name of origin	PO „Oblačinska višnja“, Merošina
5.	Pirotski kačkavalj od kravljeg mleka (Pirot cheese made from cow's milk)	Name of origin	High School "Dr Obren Perić", Pirot
6.	Sremski kulen (Kulen from Srem)	Name of origin	„BUT&CO“, Lašarak, Sremsa Mitrovica
7.	Fruškogorski lipov med (Linden honey from Futog)	Name of origin	Bee Society „Jovan Živanović“, Novi Sad
8.	Futoški sveži I kiseli kupus (Fresh and sour cabbage from Futog)	Name of origin	Futog cabbage producers and processors organization „Futoški kupus“, Futog
9.	Homoljski med (Honey from Homolje)	Name of origin	Bee Society „Homoljski med“, Žagubica

Source: http://www.minpolj.gov.rs

Identified products are closely linked to their specific regions and they are very well recognized as high quality products at the national level. Additionally, the importance of organic raspberry production is constantly growing. This alternative is widely supported by different public programs and growing market demand. Our interviewees have received several requests by trade companies to offer organic raspberries. They are also asked to offer mixed berries (raspberries, blueberries, blackberries, strawberries etc).

As Serbian producers of raspberries export this product as the raw material, in bulk, there are other alternatives to add value to the product by processing. Producers are not supported with adequate market logistics to be able to offer fresh raspberries particularly for foreign markets. Furthermore, they have to invest in technology improvement and new varieties to be able to offer new types of raspberries that are more suitable for fresh consumption. Raspberries can be also processed – industry of jams, marmalades, dried, powder, liofilisated fruit and juices.

Our participants from both groups agreed on the importance of cooperation among stakeholders in the food chain. This cooperation starts with education, where producers can take a position of "knowledge transfer" users (in technology, marketing, standards implementation etc). The highest level of cooperation is realized throughout cooperatives or producers groups. The history of cooperatives development in Serbia dates back to 1846. There were several cooperatives that played an important role in export of raspberries from Serbia during the XX century.

The cooperative movement in Serbia is overwhelmed with different problems related to our past, when cooperative model was applied as the model of agrarian problem-solving in the former Yugoslavia (it was the third model, in comparison with Soviet collectivization and Chinese commune in the socialist world). Unfortunately, cooperatives were heavily abused in the practice and agricultural producers keep in their minds the connection between cooperatives and socialist era in a negative context. They often say that our peasants were members of co-operatives when the majority of the world didn't know anything about this form of economic organization. The Kingdom of Serbia was one of the twelve countries founders of the International Cooperative Alliance (ICA – 1895). Today, farmers have lost confidence in the cooperative model in general. They don't believe that cooperatives can solve the problems related to production and product realization in the market. Cooperatives are often seen as the pure trade companies with two forms of membership. On one hand, "the real membership" with producers who have formed the cooperative organization (essentially considered a closed society where it is not possible to increase the number of members in this category); on the other hand, the positions of a large number of so-called "subcontractors" (kooperanti in Serbian) - those producers who cooperate in their businesses with the cooperative without recognition of the so-called "real membership". Cooperatives practically function as organizations that take care of their own well-being, and therefore fully ignore the goals of a large number of agricultural producers they cooperate with. During the 1970s, cooperatives from Arilje played an important role in the agricultural sector transformation and diversification of raspberry plantations. Today, there is a strong need for cooperative movement revitalization, without any appeal to the connection with former socialist organizations.

Bearing in mind the local milieu and the identified characteristics of the the food chains structure in the Arilje Municipality, it is also clear that small storage capacities could form a new cooperative that could help solving the accumulated problems in the raspberry sector in the region.

An emblematic statement: *"The small storage capacities, family owned, should cooperate even formally by creation of a new trade co-op. Each of small storage capacities cannot influence market price by themselves individually. The large traders play very smoothly and they are even prone to import the requested quantities from the region and to declare it as "Ariljska malina" for foreign buyers. It would probably make a lot of problems for agricultural producers and the region in general due to trust violation. Therefore we should do something by ourselves. I am aware of the fact that it will not be an easy job to do, but it is obviously the only way out at the moment."* (Producer with small family storage capacity)

2.3.1.2 The exploratory research based on farms survey

About the questionnaire

The exploratory raspberry producers' survey was conducted in the Arilje Municipality and supported by the local municipality office. It had the purpose of analysing the quality of connections among raspberry food chain stakeholders in the Arilje Municipality. The interviews were conducted in January 2018. The interviews lasted on average 20 minutes and were conducted using the face-to-face method. The structured questionnaire was provided by the Faculty of Economics, University of Belgrade (Annex 1). Training of the interviewer was also organized prior to survey realization.

The list of primary producers was provided by the Arilje Municipality and respondents' selection was done using stratified sample procedure. The farm size was used as the stratification criteria. The total sample size is 100, but the final sample is composed of 92 completed answers (during the primary check 8 interviews were excluded due to inconsistency in answering, e.g. very low understanding of questions by farmers marked in the questionnaire).

Table 6. Sample stratification by farm size of fruit/berry farms in the Arilje Municipality

Holding dimension	Number of holdings in SWS by farm size	Proportion of holdings by farm size (weight of strata)	Sample of holdings by farm size
Less or equal than 1 ha	1821	40.24%	34
More than 1 ha	2704	59.76&	58
Total	**4525**	**100,00**	**92**

Source: BEL calculation on Agricultural Census 2012. data

As the largest quantity of raspberries is produced in the area of the Arilje Municipality, the results obtained during the survey might be considered as important for the national level (more than half of raspberry producers in Serbia are located in the observed area). The analysis is focused on family farm size up to and above 1 ha.

The main characteristics of our farms in the sample are presented in Figure 19. Based on the total area of raspberries farms, number of farms above 1 ha is 58 in our sample. Farmers aged less than 40 years old are represented by 18 out of 92 farmers interviewed. Around a half of interviewed farmers belongs to the group above 50 years old. Traditional gender structure is evident as male owners dominate in our structure of interviewed farmers, while only a third of our respondents are college or university educated.

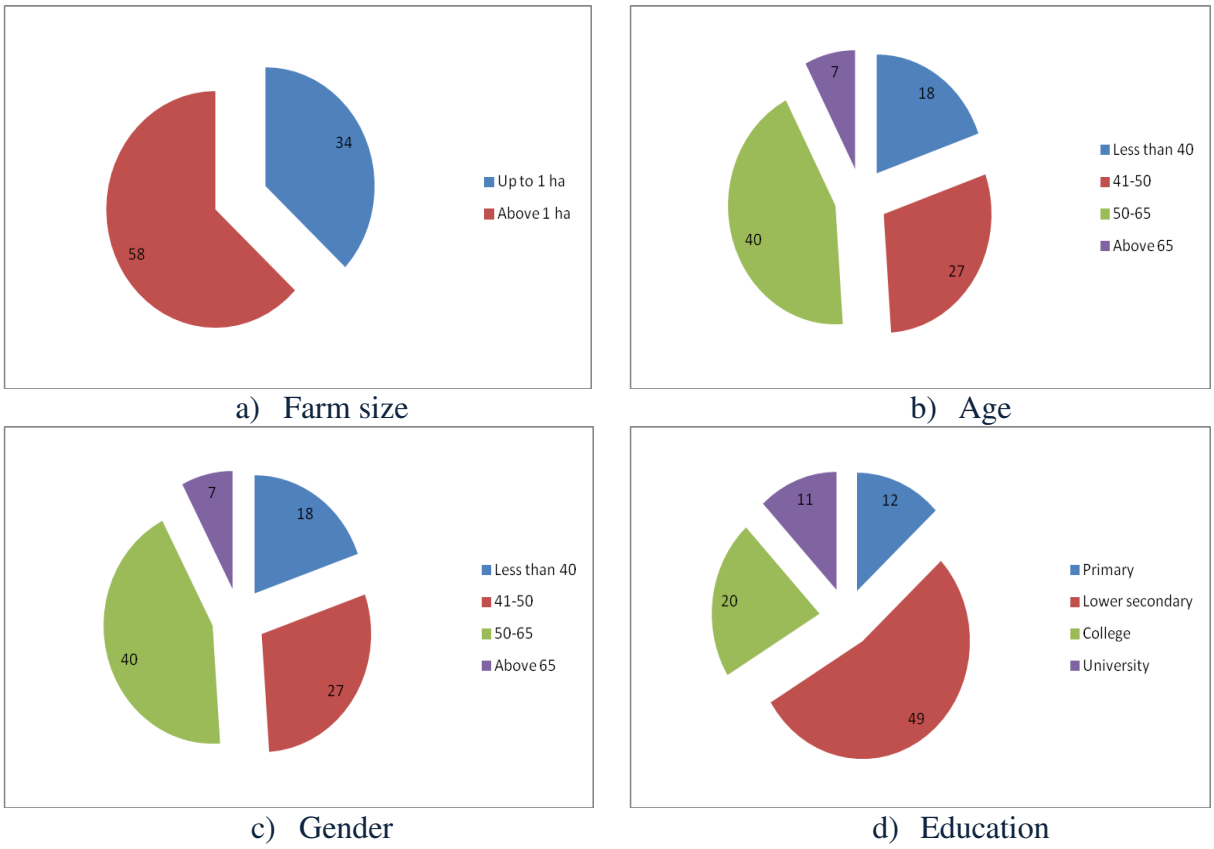


Figure 19. The number of interviewed farms by a) farm size, b) age, c) gender and d) education.

Source: S2F Exploratory Farms Survey

Economic size of raspberry farms is measured by self reported income from raspberry production and standardized by the average value of the agricultural output at farm-gate price, in euro per hectare. The average economic size of farms in our sample is 12,500 euro. The information about the cost of raspberry production is collected as well, and the average share of cost in total income collected in raspberry production is 61.82%.

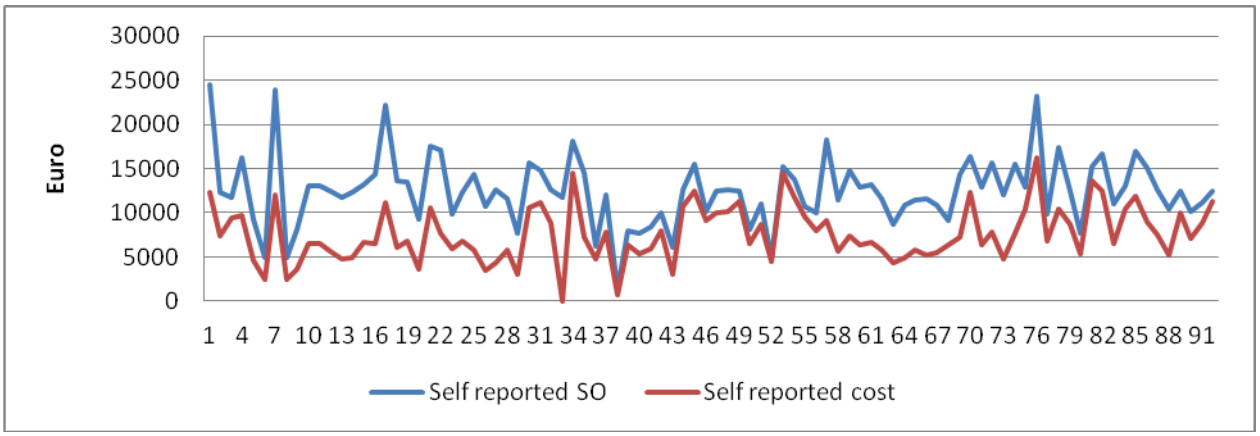


Figure 20. Self-reported income and efficiency of surveyed farms

Source: S2F Exploratory Farms Survey

The research objective is to explore the quality of connections among food chain stakeholders and to test the quality of the marketing channels used for raspberry supply in the Arilje Municipality. The specific goal is to assess the quality of services provided particularly by cooperatives and to make comparison of the coop marketing channel quality with other perspective possibilities for product realization in the market. Finally, according to our exploratory research, different recommendations related to the cooperatives sector transformation in the fruit sector in Serbia can be developed.

The structure of the questionnaire is designed as follows:

- **Part I** is related to the basic information about the farm and farm owner - legal form, farm size and socio-demographic characteristics of the farm owner (gender, age group and education). The purpose of this section is to collect data on the farm's structure which will be subsequently used to explore the extent to which some marketing channels are more likely to be adopted by certain farmers groups.
- **Part II** is dedicated to the collection of information about the dominating raspberry marketing channel, the amount of production sold in the last completed financial year, including the assessment of the overall quality of services provided (characteristics of the buyers' side within the sale arrangement).
- **Part III** informs about the quality of the arrangements between producers and buyers of their products (price arrangement – including price and payments, self-perceived costs and future plans).
- **Part IV** is designed as the administrator sheet completed by the interviewer, including interviewers mark on overall quality of farmers understanding of the questionnaire.

Cooperatives vs. other forms of business in the raspberry sector

We asked our respondents to indicate whether they sell their products directly to the market or they do their business using different forms of cooperation (cooperatives or producer organizations). It is also important to analyze quality of services provided in different marketing channels in order to support the overall farmers' activities. It is well known that there are many factors that influence the overall cooperative attractiveness for agricultural producers: (1) in the legal context, it is very easy to form a cooperative; (2) cooperatives are open for new membership and they apply democratic management procedures in their practices; (3) they are operative in economic sense, with low management cost and, in many cases, highly supported by governments; (4) there are different economic advantages (such as elimination of middleman, better price for producers, financial support etc) and (5) the membership is service motivated (advising, input supply, storage of goods etc).

Taking into account all these factors, why do farmers not opt for cooperatives? What reasons are behind other raspberry marketing channels being recognized as more attractive? Raspberry growers usually deliver their products directly to wholesalers or exporters. Almost three quarters of the respondents use the marketing channel dominated by "large players" – trade and export companies in fruit sector. Only 7 interviewed growers use direct sell model at the local market (local green market, local restaurants and local processors) and 4 of them use it as the dominated marketing channel. Only 16 respondents sell their products throughout collective (cooperative and producer organization) model.

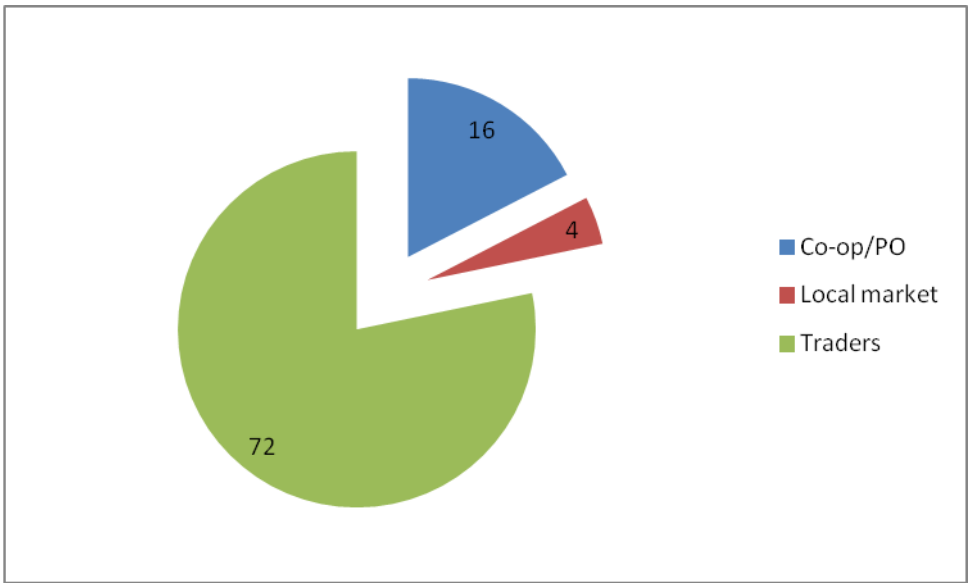


Figure 21. The selection of the raspberry marketing channel

Source: S2F Exploratory Farms Survey

When it comes to small producers, who generally suffer from insufficient market power, the common strategy would be to do business within a cooperative. In our sample, we have registered a very small number of producers who reported membership in the cooperatives (only 15) or the producers' organizations (only one producer). Producer organizations are a new form of association in the agricultural sector in Serbia and they have not been fully recognized yet as an attractive opportunity for business development. Conversely, cooperatives are well known and, unfortunately, recognized as a negative model used in the history of agricultural development in Serbia during the agricultural socialist sector transformation – from private to collective ownership (the so-called problem of resolving the agrarian or peasant question). The historical circumstances have influenced the current negative perception of cooperatives and today, this businell model is the least favourite form in the agricultural sector of Serbia. However, newly formed cooperatives might influence a new development as well. The key words are connected with the creation of a new system of cooperatives capable of fully supporting the resolution of problems immanent to the raspberry growers in Serbia - the model of cooperative business development should be entirely based on the ICA principles (International Cooperative Alliance - ICA) and the so-called New Generation Cooperatives.

As far as the characteristics of the farms are concerned, those who select fresh raspberries market have the smallest average farm size under raspberries (Area_raspberry), the lowest average standard output (AV_SO) and significantly lower average yields (Av_yield) in comparison with other marketing channels. It is also important to notice that the best performances are registered in the group of farmers that sell their products via cooperatives – the average SO in this group is almost 15000 euro with the highest average yield per ha – 7.83 t. The comparisons are further organized by three groups regarding chosen marketing channels.

Table 7. The farms characteristics regarding the dominating marketing channel

Farm characteristic	Marketing channel		
	Co-op/PO	Fresh/Local	Traders
Total_area	1.62	0.88	1.57
Area_raspberry	0.71	0.33	0.64
Av_SO	14667	8740	12213
Av_yield	7.83	2.05	5.94

Source: S2F Exploratory Farms Survey

The main reasons behind the marketing channel selection are definitely connected with the quality of marketing arrangements. Further analysis is therefore dedicated to the observation of the marketing arrangements characteristics. The food supply chain is in general very vulnerable regarding trade practices. Due to consistently lower market power, small stakeholders might be put in significantly dependant position on requirements delivered by large players. Farmers and small cold storages in our case do not have sufficient bargaining power and in many cases are faced with numerous problems in the market. The European Union therefore decided to improve the protection of farmers – as well as small and medium and mid-range sized suppliers – by providing the mandatory rules that outlaw certain unfair trading practices (UTP). The Directive on unfair trading practices in business-to-business relationships in the agricultural and food supply chain 2019/633 was adopted in April 2019. In November 2021 the Directive must be functional in the practice at the national level. This includes increasing market transparency and enhancing cooperation within the food chain.

Table 8. The characteristics of the UTP according to the Directive 2019/633

BLACK LIST	GRAY LIST
Payments later than 30 days for perishable agricultural and food products	Return of unsold products
Payment later than 60 days for other agri-food products	Payment of the supplier for stocking, display and listing
Short-notice cancellations of perishable agri-food products	Payment of the supplier for promotion
Unilateral contract changes by the buyer	Payment of the supplier for marketing
Payments not related to a specific transaction	Payment of the supplier for advertising
Risk of loss and deterioration transferred to the supplier	Payment of the supplier for staff of the buyer, fitting out premises
Refusal of a written confirmation of a supply agreement by the buyer, despite request of the supplier	
Misuse of trade secrets by the buyer	
Commercial retaliation by the buyer	
Transferring the costs of examining customer complaints to the supplier	

Source: *Directive (EU) 2019/633 of the European Parliament and of the Council of 17 April 2019 on unfair trading practices in business-to-business relationships in the agricultural and food supply chain.*

The list consists of ten black and six gray UTP. Black UTP is forbidden and gray UTP might be tolerated if both parties included in the transaction agreed upon them beforehand in a clear and unambiguous manner. In our questionnaire several answers can indicate the existence of black and grey UTP in the raspberry food chain:

Question	**Answer**
Part II – Agreement characteristics	
Do you have a legal contract with buyer? (A legal contract is written or oral agreement set out before or during the production, or at the time of sale – prior to delivery, which can be legally enforced)	Yes / No
What is duration of the sale agreement?	The agreement is set only for this particular sale Less than 6 months From 6 months to 1 year From 1 to 2 years From 2 to 5 years More than 5 years
What are the characteristics of this sale agreement? (Answer is "Yes" if the characteristic exists)	There are penalties if you fail to deliver the agreed quantities You receive compensation if the buyer fails to fulfil the agreement There are price premiums for higher quality products You receive interest in case of delayed payments from the buyer You receive storage services You receive technical assistance You receive credit assistance You receive machinery/technology Other, please specify:
In this agreement, which of the following costs do you incur in? (The answer is Yes/No for each cost that might occur)	Membership fee Collection, storage, transport, handling, etc Promotional and marketing costs Commission/margin on sales Costs of quality testing Other, please specify:
Are the specific production/quality standards included in the agreement? (The answer is Yes/No for each standard mentioned in the questionnaire)	Standards on the product quality Standards on food safety and hygiene Standards on natural resources conservation GM-free standards Other, please specify:
On a scale from 1 to 5, how satisfied are you with this sale agreement	Completely unsatisfied Somewhat unsatisfied Neither unsatisfied nor satisfied Somewhat satisfied Completely satisfied

On a scale from 1 (strongly disagree) to 5 (strongly agree) how much do you agree with the following statements? (The answer is on the scale from 1 to 5)	I do not have any alternative options to sell my products This sale agreement provides higher prices than alternative buyers There are delays in the payments The costs associated with this sale agreement are too high The production/quality standards required are too restrictive Other, please specify:
Part III – Price settlement	
Please, indicate when the price and other details of agreement are set?	Before or during the production At the moment of sale
What price did you receive in this sale agreement? (The average price per unit achieved in the last year)	Price in RSD per kg
On what basis is the price of raspberries being determined? (Multiply choice, answers Yes/No indicating the existence of the specific basis for the price determination)	Based on the production costs Based on the product quantity Based on the product quality Linked to the market price at the time of delivery Fixed at the beginning and cannot be changed Other, please specify:
When do you get paid? (One choice)	Entirely before the delivery Entirely at the time of delivery Entirely after the delivery of products Partially in advance and the rest at the time of delivery or after delivery On a regular basis (monthly) Other, please specify:

The legal contract establishes a legal relationship between the parties. The most important characteristic is that there are written "consent" or "mutual obligations" of both parties in contracting. A seller and a buyer must agree on all important elements of the contract, such as duration, quantity and quality of the product/service under contracting, and price and payment. There is also a possibility to define mutual obligations related to purchase contract using an informal agreement. It is a type of agreement that will not require any sort of legal intervention to be considered enforceable. They are different from formal contracts because they do not need to be sealed, witnessed, or written. An informal contract is often called a social contract. However, an informal contracts cannot be subject to a legal procedures and it is significantly under the so-called credit risk (both parties may violate the terms of the agreement if they feel that their business interests are affected, particularly in the situation when the market conditions are better than those defined by the informal agreement). Our exploratory survey shows that the legal contracting is more often present when the buyers are local stakeholders (shops, restaurants and processors) or traders/exporters, than cooperatives or producers organizations (Figure 22).

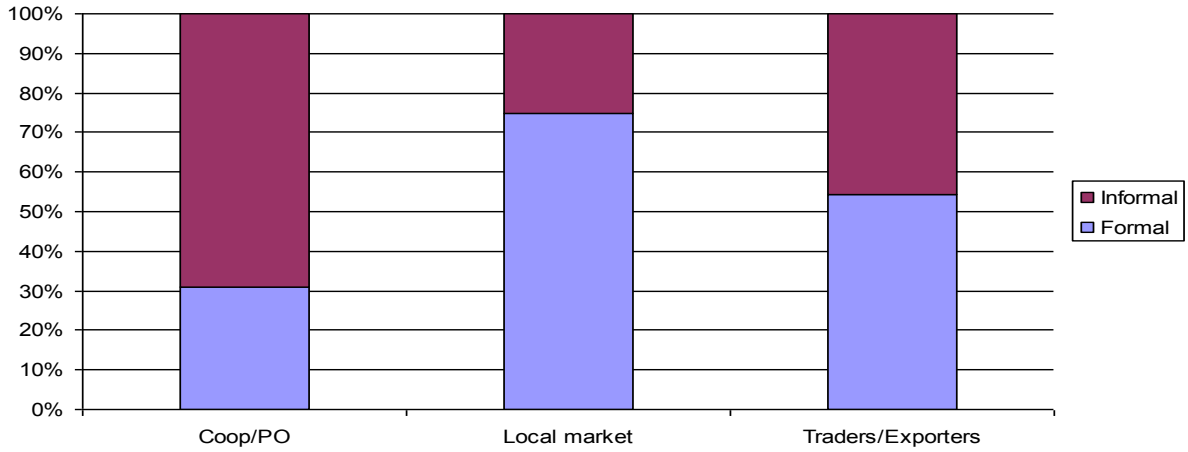


Figure 22. Share of formal/informal contracting in the raspberry marketing channels

Source: S2F Exploratory Farms Survey

Farmers pay the membership fee if they are members of the collective organizations such as coops and producers organizations. Collective organizations can offer different types of benefits to their members. In our sample, slightly less than 18% of respondents use these benefits in general. The members of the collective organization use benefits related to the price negotiation (slightly less than 70%) and direct purchase of products from farmers (around 63%). Collective organizations also take care of mediation in contracting or defining other important elements of the contract (46% and 31% respectively).

However, all elements of the sale arrangement must be compared using different marketing channels framework. The reasons behind farmers' choice of the marketing channel can be explained by observation of the sale arrangements characteristics. Figure 23 shows the basic characteristics of the sale arrangements regarding support offered to farmers.

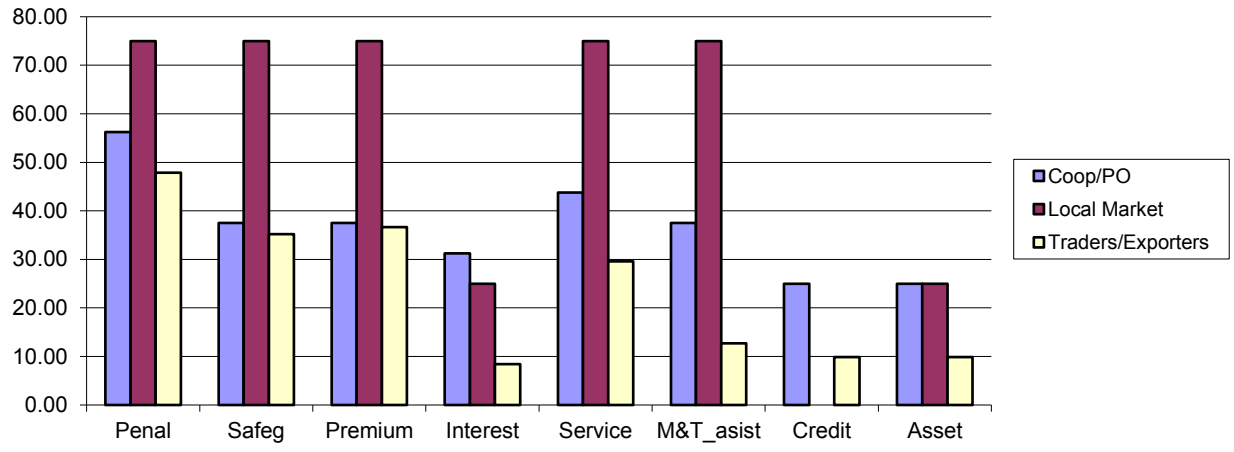


Figure 23. The main characteristics of the sale agreements in different marketing channels

Source: S2F Exploratory Farms Survey

It seems that local stakeholders define the most restrictive policy in the context of penalties that farmers have to pay if they fail to deliver the agreed quantities, but they also give the safeguards

if they fail to fulfil the agreement. Local stakeholders seems to be the best buyers in the context of the price premiums for the higher quality, offered services like collection, storage, transport and handling, as well as different aspects of technical assistance to farmers. Traders and exporters offer the worst conditions regarding paying of safeguards and interests if they fail to fulfil their obligations. The sale arrangements with traders/exporters also offer limited services related to collection, storage, transport and handling of goods. Coops and producers organizations are better than traders and exporters in offering services, management/technical assistance and credit. However, they significantly lag behind the local stakeholders if the package of all services is concerned. In general, regardless of the chosen marketing channel, buyers take less care of credit assistance and benefits related to the machinery/technology investment support to farmers.

On the other side, it is important to know who bears the additional costs related to the various services offered under the sale arrangement. Around a half of respondents who chose the traders/exporters for the counterpart announced that the latter bear the cost of collection, storage, transport and handling, while almost three quarters of the respondents that have arrangements with the local stakeholders expressed that they bear marketing and promotional costs on themselves. The members of coop and producers organizations pay only membership fee, and this fee covers different costs of services offered by the collective organization. It is important to notice that in the case of Serbia, cooperatives work with their members and their coop-partners ("kooperanti" in Serbian). Coop-partners (farmers) are not obliged to pay any fees, they can make the sale arrangement with the cooperative based on the offered criteria for the wider public who wants to participate in business activities with the coop. In our case, half of the respondents within the collective sale arrangements pay membership fees (the rest can be considered as coop-partners).

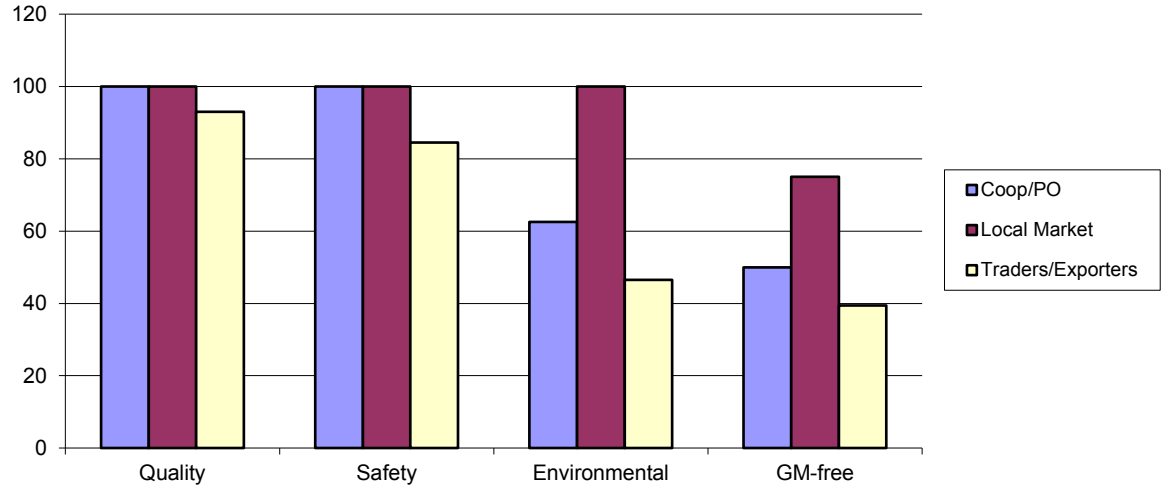


Figure 24. Standards and sale arrangements in different marketing channels

Source: S2F Exploratory Farms Survey

The sale arrangement might also involve different standards that have to be applied during the process of production and post-harvest activities. The farmers are obliged to standardize their practices along with the legislative standards on product quality, food safety and hygiene, natural resources conservation or GM-free criteria. All stakeholders present in different marketing channels do really take care of implementation of the high standards in raspberry

production regardless the final market for raspberries produced - domestic or foreign (Figure 24). It seems that all stakeholders are equally strict regarding standards implementation. This is mainly explained with the fact that the most of raspberries produced in Serbia finally ends on the table of foreign consumers, and the foreign market standards are more demanding in general (non-tariff barriers). It is also important to notice that GM-free standards are not defined in particular regulations. The general Low on Food in Serbia forbids the production of GM products for commercial purposes. Regarding environmental standards, it seems that the local stakeholders are most aware of the importance of quality of life preservation in the local community, what is in general expected. On the other side, it was not expected that coops or producers organizations do not consider environmental protection as one of their highest priorities.

The duration of the sale arrangement, price determination and time of payments are of the utmost importance for farmers when their decision about the marketing channel is concerned. Generally, most of the sale arrangements are set in the short run covering a period up to one year (Figure 25). The local stakeholders offer longer duration (up to two years), while in the case of coops or producers organizations farmers who are in position to be members of the collective organizations are offered with medium- and long-run sale arrangements.

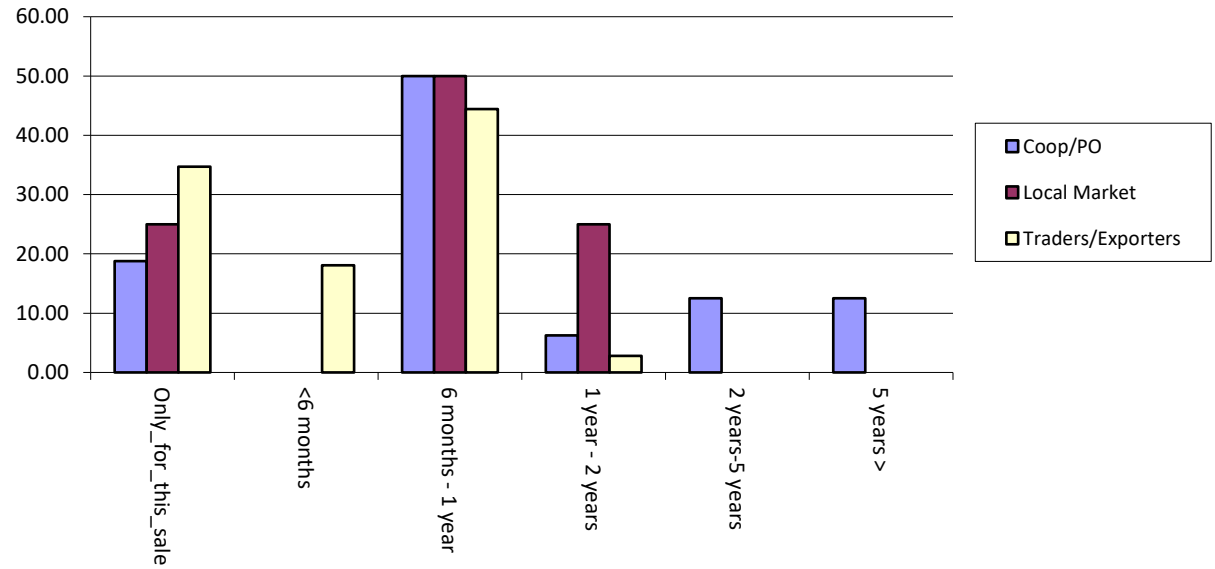


Figure 25. Duration of the sale arrangement by different marketing channels

Source: S2F Exploratory Farms Survey

Price determination can be set using different mechanisms to adjust the amount of payment per kg, i.e. using quantity or quality of products contracted or linkages to production costs or market price at the time of delivery. All this mechanisms are equally beneficial for both parties in the market - seller and buyer. For example, higher quality requires better price and it is equally good for farmer and buyer, as the latter will sell raspberries to other stakeholders in the food chain at the higher price as well. Farmers are usually interested in fixed price formation, which consinst in an agreement where the price is fixed and does not change under any circumstances later on. Every third agreement with coops or producers organizations has been supported by

fixed price determination, while only every fifth arrangement with traders/exporters has the same characteristic. Prices are mostly determined by variable mechanism that is based on the current market prices. Therefore, if the price of raspberries is more volatile, the position of farmers isn't as as good as it could be. Again, the local stakeholders who buy the raspberries fully respect the position of the farmer by offering adequate compensation for safe quantity, quality and appropriate share in covering the production costs.

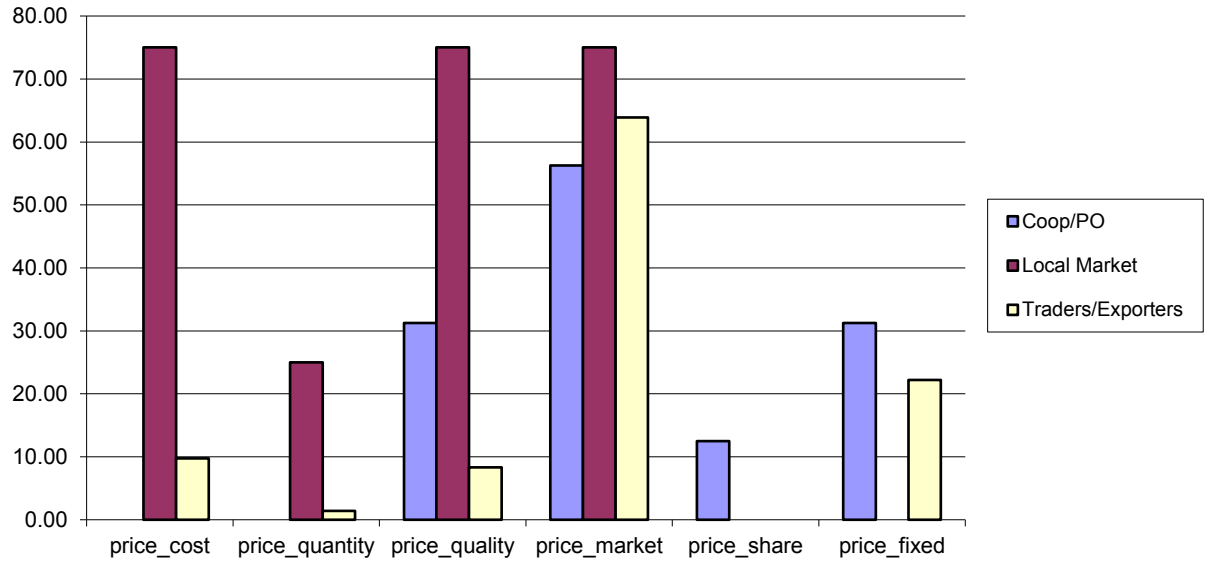


Figure 26. Mechanism of price formation

Source: S2F Exploratory Farms Survey

As far as the payment is concerned, farmers are in the worst position in relation to other market participants. According to our respondents, they are pure price takers who never receive payment before the delivery of products regardless of the counterpart (collective organizations, traders, exporters or local stakeholders). Farmers usually receive money after the delivery if the traders/exporters are those who are responsible for payment. In the case of local shops, restaurants and processors, as well as in the case of collective organizations, payments are usually partially made in the middle of the season, while the rest of the payment is sent at the delivery, or even after that.

Table 9. Average, minimal and maximal prices by marketing channels

PRICE	Coop/PO	Fresh/Local	Traders/Exporters
average	1,31	1,28	1,30
min	1,23	1,23	1,15
max	1,47	1,46	1,47
stdev	0,073	0,1145	0,072

Source: S2F Exploratory Farms Survey

Based on the qualitative research results obtained throughout focus groups discussions, the payments in the middle of the season are made using different barter arrangements, i.e. farmers purchase inputs from the counterpart without immediate payment, and the final payment is constructed as the difference between the value of the raspberries sold and the value of inputs and other product consumed by the farmers during the season. The highest average price for raspberries in the observed year is offered by collective organizations (coops or producers organizations – 1.31 Euro/kg). However, differences are not significant if the identified marketing channels are concerned. The largest differences between obtained prices for raspberries are identified in the group of producers who chose local market with restaurants, shops or processors as the counterpart.

Table 10. Average income, average costs and average profit by marketing channels

	Coop/PO	Fresh/Local	Traders/Exporters
Av_income	10360	2699	7693
Min	1256	1841	3068
Max	17550	4659	18083
St_dev	4171	1339	3941
Av_costs	6638	1245	5504
Min	942	736	1227
Max	10530	2097	14466
St_dev	2635	603	3329
Av_profit	3787	1454	2947
Min	314	920	491
Max	7200	2563	8547
St_dev	2275	750	1788

Source: S2F Exploratory Farms Survey

Finally, starting from the overall services provided, characteristics of the sale arrangement and price received, the analysis allowed us to compare the results obtained by farmers who have participated in different marketing channels (Table 10). In terms of absolute values, the highest average income is registered in the group of farmers who participate in Coop/PO marketing channels. However, if we compare relative values, the average profit margin is highest in the group of farmers who work with traders/exporters (38.30%). Furthermore, the group of farmers who participate in the collective organizations is heterogeneous; this requires further analysis to identify the main characteristics of farmers engaged in the each marketing channel (Table 11).

Table 11. Description of farms involved in identified raspberry marketing channels

Coop/PO	Fresh /Local	Traders/Exporters
Extremely mixed farms structure, from very small to large entities. Elderly farmers are overrepresented (the average age of a farmer in this group is 61), farmers with elementary and lower secondary school are overrepresented in this group.	Small family farms in general, average size of land under raspberries 0.33 ha. Youngest on average (46 years old). Higher educated and with the specific education in the field of agricultural sciences are overrepresented in this group.	Large farms are overrepresented in the sample. Around 50s and mostly with secondary education. The most efficient farms with the highest earnings on the euro invested in the production.

Source: S2F Exploratory Farms Survey

Cooperatives are faced with the problem of renewing membership, which depend on the willingness of younger people to join collective organizations. Educated people, specialized in the field of agriculture, mostly opt for other marketing channels, such as fresh/local or traders/exporters. The key problem of agricultural producers in Serbia is the existence of certain elements that indicate unfair trade practices - delayed payments, the existence of barter arrangements (inputs for the final product), prices not set in advance etc. Farmers are simply put in an increasingly difficult position. In order to cope with this situation, raspberry farmers should make significant changes as they are not satisfied with the current situation (Table 12). Raspberry farmers are more satisfied with collaboration established with local market stakeholders (shops, restaurants and processors) and traders/exporters in comparison with the overall quality of cooperation with collective organizations.

Table 12. Overall satisfaction with the different marketing channels

	Coop/PO	Local Market	Traders/Exporters
Average	2,93	3,50	3,32
Median	3,00	4,00	3,00
Mode	4,00	4,00	4,00

Source: S2F Exploratory Farms Survey

Looking for a deeper understanding of farmers' overall satisfaction with different marketing channels, the questionnaire also explores the main limitations regarding current farmers' choices of the marketing channels. It is important to know if there are no other alternatives to sell raspberries, which might indicate that all marketing channels are not equally accessible to all farmers. The main reasons behind farmers' choice of a marketing channel may be identified in (a) providing of higher prices or more stable prices from year to year than alternative buyers, or (b) facilitating better negotiations on purchase conditions. Restrictive production standards, as well as the excessive costs that are passed onto producers as a part of the sales arrangement (storage cost, marketing cost, promotion cost, etc.) can conversely discourage producers from choosing a particular marketing channel (Figure 27).

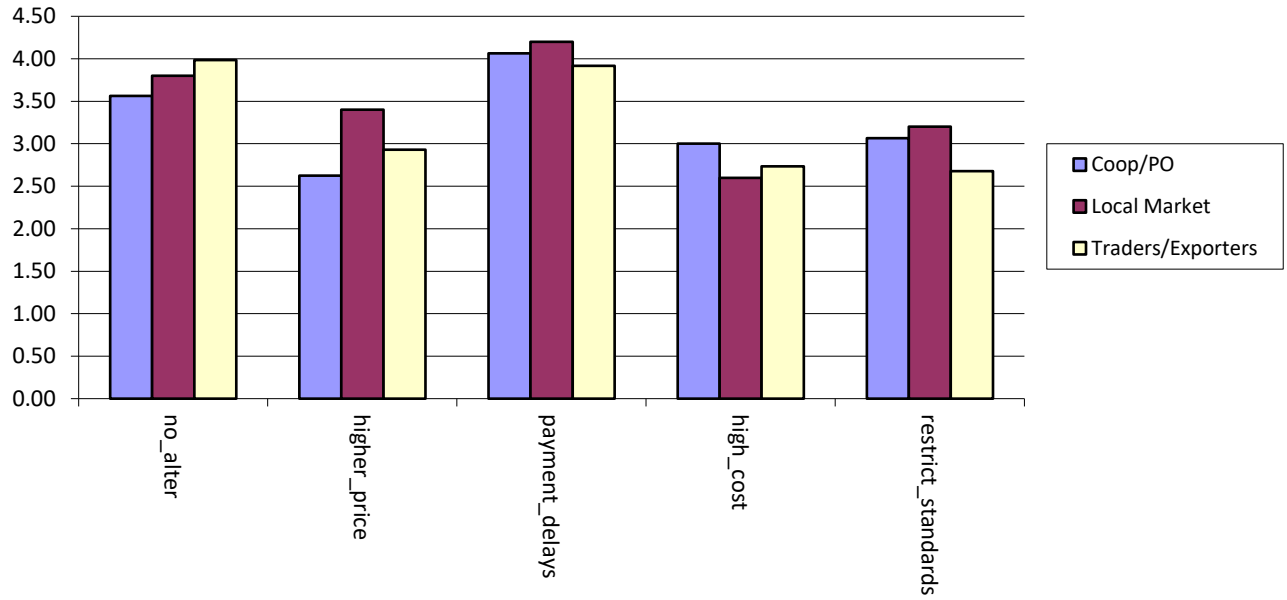


Figure 27. Level of satisfaction with respect to the sale arrangement

Source: S2F Exploratory Farms Survey

Our respondents report that there are often delays in payments and that they have a limited number of alternatives. They are obviously put in the position *"take it or leave it"*. Farmers who do not have storage capacity for perishable goods such as raspberries, are put in an even more unfavourable position. Additionally, most producers in the Arilje Municipality produce the Willamette variety of raspberries, and each year in June-July they are faced with the same problem - how to find the best buyer for large quantities of perishable agricultural product when all neighbours offer the same product on the market. As "way out" they see changes in their marketing strategy. When the specific marketing channels are concerned, farmers who work with traders/exporters seems to be most satisfied, as almost half of them wouldn't change anything in their practices. As far as different marketing strategies in the future are concerned, our respondents see the main driver in development of new partnerships (Figure 28). New cooperatives might have significant influence on the sector development. Instead of current organization of producers' cooperatives, it is worth to try with organization of trade cooperatives with small storage capacities located on family farms as the members of a new organization. Younger producers are more prone to cooperate with traders, and trade cooperatives should offer better services to their members. Around 200 small storage capacities are located on the Arilje municipality territory. Trade cooperatives could create positive impacts in the context of storage, stabilization of prices and better negotiation, which would finally help farmers to get out of their current position of pure price takers in the market.

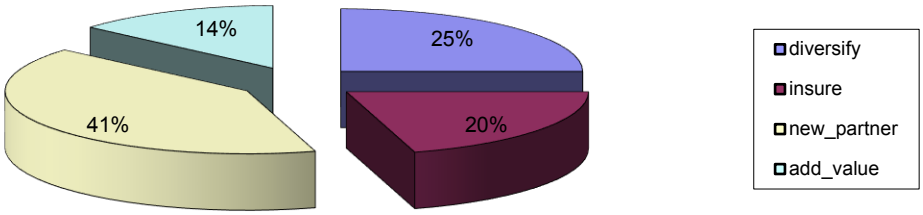


Figure 28. The main marketing strategies of raspberry farmers in the future

Source: S2F Exploratory Farms Survey

Additionally, marketing strategy should also be strongly supported by different alternatives for products diversification on the farm. One quarter of our respondents opt for this alternative.

The experimental research presented here is further dedicated to two selected case studies (CS). The first case study is based on the production of organic raspberries and a new variety of raspberries (Polana) introduction, while the second case study is based on the production of other barriers on the farm. Both alternatives are elaborated in the context of risk control and cash flow improvement on the farm which can give additional benefits to the food sector. Demonstration activities also include presentation of perspective possibilities for input control and pest management through the implementation of digital platforms for decision making in the raspberry sector in Serbia.

2.3.2 The 2nd phase: Demonstration activities - On farm management and digital agriculture

Based on our exploratory research, it is obvious that raspberry farmers in the Arilje Municipality are interested in application of different risk insurance methods which can help them to control the use of inputs, yields and income. Additionally, farmers should modernize their production and implement new technologies that can help them foster competitiveness and cost per unit of production control.

Traditionally oriented farms usually expand land under raspberry production - they expand their activities horizontally with more land in ownership or leasing. They accept lower margins to maximize returns by increasing productivity and spreading fixed costs over increased production. This strategy usually requires large capital investments in land, technology, machinery and other assets. The critical element is how to access the additional capital.

Modern oriented farms look for systems that can help them to be more efficient in the use of inputs (plant materials, fertilizers and other chemicals) on the current land (owned and/or engaged under leasing arrangement). This system can be based on IT implementation in

agriculture and big data analysis. It is also possible in the case of Serbia as the BioSense Institute from Novi Sad can offer this kind of services to small producers free of charge (https://biosens.rs).

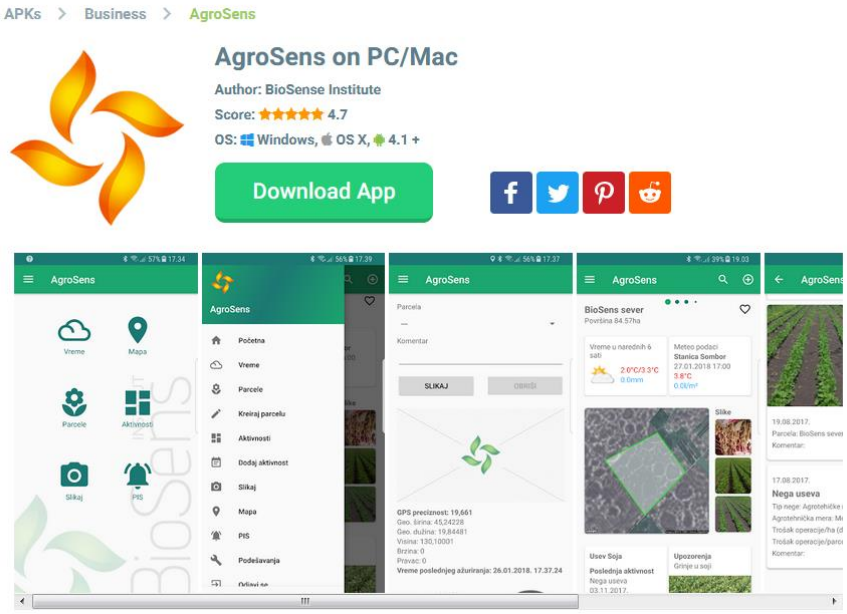


Figure 29. BioSense agriculture in the future (Cloud farming)

Source: BioSense Institute, Novi Sad

The research institute (BIOSENSE, Novi Sad - Centre of Excellence for Advanced Technologies in Sustainable Agriculture and Food Security) delivers innovative solutions accessible by all farmers, regardless of the size of their holdings. The farmers can easily reach important information about the state of their crops, crops prices, weather forecast at the micro location, input use, and optimization. This information can allow them to become sustainable in the global competitive environment. The capacity of this centre is not fully utilized, but producers all over Serbia have started to approach the system and use all available information for farm management purposes.

The following basic services are available to users of AgroSense digital platform: (a) Diary of agricultural activities; (b) Weather forecast for the location of the parcel; (c) Satellite indices of crops that describe plant growth, photosynthesis intensity and the availability of water and nutrients; (d) Overview of soil analysis; (e) Overview of photographs of crops; (f) Information about smart technologies used in agriculture; (g) Latest information about the occurrence of pests and plant diseases. Basic services are completely free of charge.

The use of chemicals can be efficiently controlled if raspberry farmers follow the strict instructions of experts in the field of research - technologists, phytopharmacy experts, meteorologists and others who joined their efforts to help facing contemporary challenges. On the other hand, the information should be efficiently communicated / disseminated. IT technologies systems particularly meet the standards of communication of younger farmers. These tools have the ability to provide farmers with vital information in critical times, and have have a great potential to change farmers' practices towards more efficient and effective methods. Just with limited amount of funds, this tools allow to control overall costs and to

improve the use of chemicals in the context of environmental protection. Based on the collected information, the Plant Protection Forecasting and Reporting Service can support overall decision making regarding pest use on the farm. This Service centre covers related advices to the raspberry producers in Serbia as well (http://www.pisvojvodina.com/Preporuke_BD/malina.aspx).

In order to help farmers and inform them about the possibilities of the digital agriculture platform use in their practices, the Faculty of Economics, University of Belgrade, organized several meetings with the aim to make the first connections between the BioSense institute and the Municipality of Arilje representatives. During these meetings, the participants were informed of the overall importance of information for managerial use and what the BioSense institute could offer for decision making improvement on the farm. This was particularly relevant to the control of chemical use, which was mentioned as the one of the biggest problems in their recent practice.

The Agricultural Centre in Arilje should help raspberry producers in disseminating information and establishing a system able to improve efficiency on the farm. The ITC system can be implemented in order to improve communication. The extension service should also cooperate with farmers in a modern way using ITC system as well (The Agricultural Extension Service is under the control of the Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia). The Faculty of Economics, University of Belgrade made a proposition to use agro-meteo-pheno network of sensors distributed throughout an area with the aim to generate big sets of extremely valuable real-time data for management improvement. This data will be fused with data coming from the Collaborative SENTINEL ground station (also foreseen at BioSense), and then processed to generate useful information for farmers, farms, extension services, companies and finally government and decision makers. The final information will be tailored to the needs of end-users and range from instructions for optimal plant management (for farmers), to national and local yield and price estimates, to indices for subsidies (for the government).

2.3.3 The 3rd phase – The experimental actions

2.3.3.1 The results obtained from the production of raspberries (Willamette variety)

The cost calculation was derived from raspberry plantation size of 1 ha, variety Willamette, in the Zlatibor district. The production conditions are average in the region. The farming is based on irrigation in the open air. Production technology includes planting distance of 2.5 x 0.25 m.

Table 13. Basic characteristics of the production line

Characteristic	Description
District	Zlatibor
Raspberry plantations size	1 ha
Variety	Willamette
Planting distance	2.5 x 0.25 m
Presence of irrigation	Yes, open air

The most important element of costs cover is labour engagement. Almost a half of all funds are spent on the payments of labour in the first year (labour costs cover regular per diems elements such as loading and unloading and spreading of mineral fertilizers, manual pruning, removal of fruiting shoots, thinning of fruiting shoots and harvesting and packaging during the year). Labour costs can reach up to 2/3 of all costs in the field. This is also linked to the main characteristic of the traditionally organized raspberry production in Serbia, which is based on intensive labour use. Additionally, the problem related to obtaining additional off-farm labour in rural areas has been more and more evident. This especially refers to the area of the Arilje Municipality, where 40% of total quantities of raspberries in Serbia are produced. The labour force comes from rural areas in the Southern Serbia. The arrival is often related to the entire relocation of family members, which increases the costs related to the accommodation and food for workers and members of workers' families. Due to a lack of the additional off-farm labour force, the daily wage is often determined in a significantly higher amount (25-30 euro in relation to the standard compensation in other parts of Serbia of 20 euro per day of work).

Table 14 presents cost calculation for the traditionally represented variety of raspberry in Serbia - Willamette. The calculation starts from the complete adjustment of the land for raspberry growing and the full application of agro-technical measures on the farm. It needs to be stressed that, with this variety on the fields, no yield can be obtained during the first year of production.

Table 14. The calculation of Willamette variety plantation costs (1 ha) during the first year

	Unit	Quantity/ha	Price (EUR)	Total Euro
Material				
Planting material	qty	16000	0,15	2400
Manure	t	40	15	600
Mineral fertilizers	kg	700	0,3	210
KAN	kg	200	0,3	60
Copper lime	kg	2	2	4
Acacia poles	qty	580	2,5	1450
Galvanized wire	kg	240	1,2	288
"U" nails	kg	10	1	10
Refined oil	l	120	0,8	96
Total				**5118**
Mechanical works				
Transport	Working day	5	150	750
Work in the field	Working day	3,5	150	525
Other activities	Working day	1	150	150
Total				**1425**
Labour work				
Loading and dispersal of manure	Working day	5	20	100
Mineral fertilizers use	Working day	5	20	100
Plant protection	Working day	10	20	200
Pruning	Working day	30	20	600
Bonding	Working day	15	20	300
Other activities	Working day	5	20	100
Total				**1400**
Other cost				
Insurance				**1100**
TOTAL COSTS				**9043**

Source: own calculation.

It should be noted that raspberries do not require high quality soil. Willamette is usually planted in a hilly area with a slope (in order to provide dry soil or "squeeze of soil"). Willamette is also usually not irrigated or grown indoors (under a greenhouse) in Serbia. Raspberry plantation is usually used for up to 15 years. The yield starts from the second year from 5.3 t/ha, and the

maximal yield is achieved from fourth to tenth year of exploitation (around 8t/ha). The average yield for 15 years is about 6t/ha.

Table 15. The average cost and profit per year in the Willamette field (1 ha)

	Unit	Quantity/ha	Price (EUR)	Total Euro
Material				
Manure	t	15	15	225
Mineral fertilizers	kg	400	0,3	120
KAN	kg	100	0,3	30
"U" nails	kg	2	1	2
Refined oil	l	20	0,8	16
Total				**393**
Mechanical works				
Transport	Working day	2	150	300
Work in the field	Working day	2	150	300
Other works	Working day	1	150	150
Total				**750**
Labour work				
Loading and dispersal of manure	Working day	4	20	80
Mineral fertilizers use	Working day	2	20	40
Plant protection	Working day	5	20	100
Pruning	Working day	20	20	400
Bonding	Working day	15	20	300
Harvest	Working day	300	20	6000
Loading of fruits	Working day	10	20	200
Other works	Working day	5	20	100
Total				**7220**
Paid labour		150	20	3000
Unpaid (family) labour		*211*	*20*	*4220*
Other costs				
Insurance				***1100***
TOTAL COSTS				**9463**

The average yield	t	8,1	Profit	1067
The average price	euro/kg	1,3	Profit margin	10,13%
TOTAL INCOME	**euro/ha**	**10530**		

Source: own calculation.

Raspberry growers usually use family labour at the full capacity, which generates some additional "savings" for unpaid labour (4220 euro/ha). Additional savings are generated through fertilizers and plant protection costs as producers use low-input technology. As a result, in the practice yields are below average. The market oriented producers, conversely, implement full input driven technology and achieve higher yields than average (in some cases the yields can be 20 t/ha in particularly convenient areas for raspberry production).

The goal of our field research/demonstration activities is to find out profitability of conversion to organic production of raspberries, as well as profitability of diversification strategy based application of different variety (Polana instead of Willamette) that is more suitable in terms of income distribution during the year. During our research the experiment was further diversified to include other berries that can be combined with raspberry and grown in the same field (such as strawberry). However, this analysis goes beyond the scope of the research and therefore it is not included in the presentation of the project results.

2.3.3.2 The 1st Case Study – Organic farming development in raspberry sector

The Global organic berries market size was USD 847 million in 2019. By 2027 it is projected to reach more than 1,000.00 million. Organic raspberries count for 18% of the observed market (*Food Processing and Processed Food, Organic Berries Market*, 2020). Researchers have published that each tenth consumer of raspberries in the developed countries purchases exclusively organic raspberries (Willer et al., 2012). Additionally, one third of all shoppers who buy raspberries purchases both organic and conventional raspberries. This makes a great potential for the organic raspberries market growth. Furthermore, organic fruits are incorporated more and more in different final products (processed food) such as baked products, confectionary products, pharmaceuticals, cakes and salads in restaurants.

Based on the conducted qualitative research (focus of group discussion), the following requirement was clearly expressed to traders by exporters, and to exporters by foreign buyers: traded goods should be diversified not only in terms of a combination of different berry-fruits, but also in the context of organic products offer (90% is requested to stay in conventional form and 10% should be organic products).

In order to avoid the costs of land conversion from conventional to organic, as well as to provide adequate distance between commercial and organically grown raspberries, in our example the production is organized in a hilly area around the City of Arilje. This required additional costs related to land preparation, but conversion period of two years was avoided. The plantation was formed in 2018 and the first crop was obtained in 2019. The plantation is about 3 ha with organic raspberries. At the beginning, the farmer was faced with a great challenge due to pest and disease problems that can be difficult to manage organically. Procurement of organic matter for the proper treatment of diseases and plant nutrition is especially difficult in Serbia, as the input sector is still underdeveloped.

Figure 30. Organic Farm in the hilly area of the Arilje Municipality

Total costs are calculated per 1 ha, based on the evidence from the farm. The organic Vilamet planting material and other inputs requested for the organic production are included in the analysis. As mentioned above, the dimension of labour force engagement is particular challenging. This aspect is even more pronounced in organic production in comparison with the conventional counterpart. The organic producer has specific trade arrangements with the local trader who possesses storage capacity (cold storage - 2500 t).

Table 16. The calculation of Organic Willamette variety plantation costs (1 ha) during the first year

	Unit	Quantity/ha	Price (EUR)	Total Euro
Material				
Planting material	qty	14000	0,35	4900
Compost	t	1	100	100
Natural fertilisers	t	0,7	100	70
Copper lime	kg	2	44	88
Acacia poles	qty	580	2,5	1450
Galvanized wire	kg	240	1,2	288
"U" nails	kg	10	1	10
Refined oil	l	120	0,8	96
Total				**7002**
Mechanical works				
Transport	Working day	5	150	750
Work in the field	Working day	5	150	750
Other activities	Working day	1	150	150
Total				**1650**
Labour work				
Loading and dispersal of manure	Working day	7	20	140
Natural fertilizers use	Working day	7	20	140
Plant protection	Working day	13	20	260
Pruning	Working day	15	20	300
Bonding	Working day	15	20	300
Other activities	Working day	7	20	140
Total				**1280**
Other cost				
Insurance				**1100**
Certification				**1000**
TOTAL COSTS				**12032**

Source: own calculation, based on the data provided from the experimental organic farm.

A well-maintained planting can continue to produce for eight to twelve years with almost the same average yeild as it is in the case of conventional raspberries (around 17 t/ha). However, the average producer can count on 10% of lower yields in comparison with the average producer of conventional raspberries in general (7,2t). The price of the organic raspberries are higher than for the conventional ones. Therefore, the market compensation will be equilized.

There is a significant startup cost in organic raspberry plantation development if the cost for irrigation is included in the calculation. In the case of conversion, the initial investment includes significant cost of land preparation (cover crop seeding and organic fertilizer). Labour costs are higher for 20% at list in organic production. Additionally, management time is usually greater for organic crops compared conventional crops. At the same time, a well-managed organic production system may also generate cost savings by integrating soil fertility and pest control concerns into a broader production system (Kaiser and Erns, 2016).

Table 17. The average cost and profit per year in the organic Willamette field (1 ha)

	Unit	Quantity/ha	Price (EUR)	Total Euro
Material				
Manure	t	15	15	225
Natural fertilizers/compost	t	0,5	100	50
"U" nails	kg	2	1	2
Refined oil	l	20	0,8	16
Total				**293**
Mechanical works				
Transport	Working day	2	150	300
Total				**300**
Labour work				
Loading and dispersal of manure	Working day	7	20	140
Natural fertilizers use	Working day	7	20	140
Plant protection	Working day	13	20	260
Pruning	Working day	30	20	600
Bonding	Working day	15	20	300
Harvest	Working day	300	20	6000
Loading of fruits	Working day	10	20	200
Other activities	Working day	7	20	140
Total				**7780**
Paid labour		150	20	3000
Unpaid (family) labour		239	20	4780
Other costs				
Insurance				**1100**
TOTAL COST				**9473**
The average Yield	t	7,2	Profit	2551
The average price	euro/kg	1,67	Profit margin	21,22%
Total Income	**euro/ha**	**12024**		

Source: own calculation, based on the data provided from the experimental organic farm.

Raspberries produced using organic practices have better prices and can be better marketed. However, farmers in Serbia are engaged only in primary production of organic raspberries and they can get slightly higher prices compared to raspberries obtained in conventional production (prices are only 20-30% higher). The total costs also contain control and recertification, which is performed every 2-3 years. These costs can be partially reimbursed through subsidies from the national agricultural budget (about a half of the costs for certification).

2.3.3.3 The 2nd Case Study – A small family farm engaged in fruit (raspberry) supply and strategy of diversification (Polana variety introduction)

A few years ago, this farm was oriented towards dairy farming. Two brothers inherithed the farm from their parents. The new owners decided to convert the farm from dairy farming to crop production in 2017. Having in mind specific position of the farm (fertile land on the river

band on 600 m altitude) in consultation with the local agricultural service experts, they chose to produce raspberry in the fields.

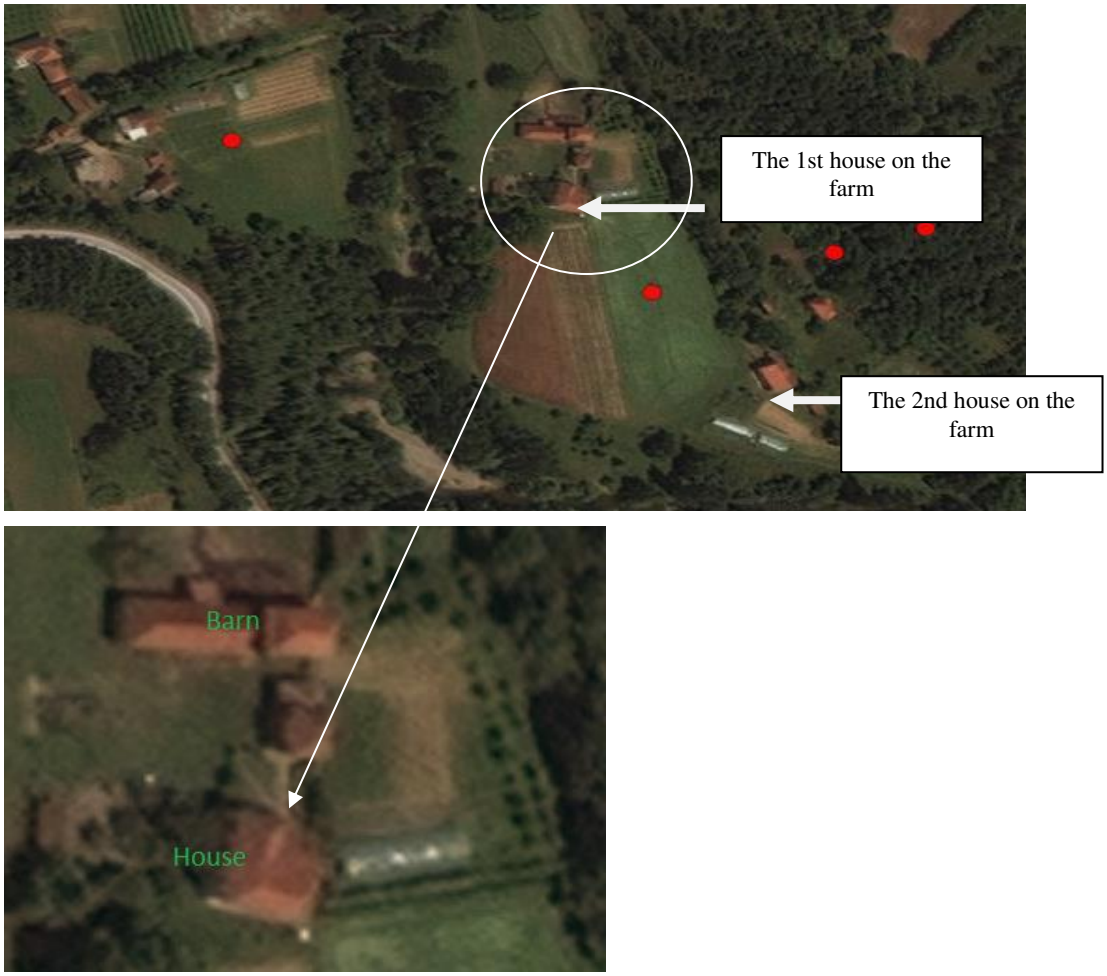


Figure 31. Family farm Radinovac, Lebane

Source: https://a3.geosrbija.rs/

This was not an usual decision for a typical producer in the region. The two brothers started to use only land around the house (1 ha of surface), starting with the variety which is the most represented in the case of raspberry production in Serbia – Willamette variety. The Strength2Food team from the Belgrade University, Faculty of Economics adviced farmers to expand the production by introducing a new variety – Polana - which completely corresponded to the production conditions in the filed. The farm started to produce Polana raspberry in 2019. Furthermore, the farmers decided in 2020 to start with production of other fruits in the farm (strawberry production on the open field).

With a total land ownership of 10 ha (arable area counts for one third of the property), the experimental farm is considered as a typical example of a family farm in Serbia. The farm has a 25-year-old tractor with supplementary equipment for land tenure and an outdoor watering system. One of two brothers lives with four members' family, while the younger brother is still single and not married. Both brothers were previously forced to work out of the farm to earn the additional money for living, while today both of them earn money based on full time farming and are able to cover the full costs for family expenses.

Table 18. The calculation of Polana variety plantation costs (1 ha) during the first year

	Unit	Quantity/ha	Price (EUR)	Total Euro
Material				
Planting material	qty	8000	0,25	2000
Manure	t	30	15	450
Mineral fertilizers	kg	700	0,3	210
KAN	kg	200	0,3	60
Copper lime	kg	2	44	88
Acacia poles	qty	500	2,5	1250
Galvanized wire	kg	240	1,2	288
"U" nails	kg	10	1	10
Refined oil	l	120	0,8	96
Total				**4452**
Mechanical works				
Transport	Working day	5	150	750
Work in the field	Working day	3,5	150	525
Other activities	Working day	1	150	150
Total				**1425**
Labour work				
Loading and dispersal of manure	Working day	5	20	100
Mineral fertilizers use	Working day	5	20	100
Plant protection	Working day	10	20	200
Pruning	Working day	15	20	300
Bonding	Working day	10	20	200
Other activities	Working day	7	20	140
Total				**1040**
Other costs				
Insurance				**1100**
TOTAL COSTS				**8017**

Source: own calculation, based on the data provided from the experimental farm.

It is important to notice that raspberry farmers from the Arilje Municipality were not enthusiastic at all at the beginning of the S2F project about the idea of changing their traditional systems of production. They strongly argued for the Willamette variety subsistence and strategy related to marketing of the very well recognized regional product "Ariljska malina". However, other advanced growers from Arilje have started to produce Polka or Polana variety on small plots to experiment with further marketing strategies definition. For the purpose of the S2F experimental research, the Faculty of Economics, University of Belgrade needed to find producers willing to diversify their production using a new variety in the fields. Therefore, the analysis was conducted in the village Radinovac in Lebane (South of Serbia).

Table 19. The average cost and profit per year in the Polana field (1 ha)

	Unit	Quantity/ha	Price (EUR)	Total Euro
Material				
Manure	t	15	15	225
Mineral fertilizers	kg	600	0,3	180
Total				**405**
Mechanical works				
Transport	Working day	2	150	300
Work in the field	Working day	2	150	300
Other activities	Working day	2	150	300
Total				**900**
Labour work				
Loading and dispersal of manure	Working day	4	20	80
Mineral fertilizers use	Working day	2	20	40
Plant protection	Working day	5	20	100
Pruning	Working day	5	20	100
Bonding	Working day	5	20	100
Harvest	Working day	300	20	6000
Loading of fruits	Working day	10	20	200
Other activities	Working day	5	20	100
Total				**6720**
Paid off-farm labour		60	20	1200
Unpaid (family) labour		276	20	5520
Other costs				
Insurance				**1100**
TOTAL COSTS				**9125**

The average Yield	t	8,1	Profit	1000
The average price	euro/kg	1,25	Profit margin	9,88%
Total Income	**euro/ha**	**10125**		

Source: own calculation, based on the data provided from the experimental farm.

Polana variety of raspberries, with a full implementation of agro-technical measures, can give 10 - 12 tons per year usually. The Polana variety raspberries have more dry matter than other varieties and they are less perishable in comparison of the Willamette variety. The Polana variety also has a longer harvest period (from July - to the beginning of November), which guarantees better cash-flow and lower cost for off-farm labour force. It is important that the plants do not require support or pruning. However, our experimental farmer wanted to have a growth support system which increased total costs in the initial investment of 1500 euro. Polana also requires irrigation. In the case of our farm, this did not incur into additional costs since the fields are located next to the river and irrigation was created in the simplest possible way - by extracting water from an accessible source via water pumps (the additional costs was only 150 euro, and this included other mechanical costs in the calculation).

Table 20. Willamette vs Polana (pros and cons)

Variety	Labour intensity	Water use	Seasonality / Cash-flow	Average Price	Average Yield
Willamette	Higher	Lower	July-August	1,3 euro/kg	6 kg/m^2
Polana	Lower	Higher	July-August-September-October	1,25 euro/kg	5,5 kg/m^2

During the implementation of the S2F project, new raspberry plantations based on the new varieties have started to appear all over Serbia. New varieties were added to Polka and Polana, such as Himpo Top, more favourable in terms of production conditions in Serbia. It is also evident that younger producers are more open to new technologies implementation and changes in the production practices. They certainly request particular attention of the agricultural extension services advisers at the local level. As early adopters, younger farmers can improve the agricultural practice in Serbia and represent a positive example for other, more traditionally oriented agricultural producers.

2.4 Conclusions and policy recommendations

The dissemination activity within the subtask 9.5.2 is important in the context of promotion of changes in the agricultural practices in Serbia. The main problems within the raspberry sector in Serbia were identified and possible way out suggested. The activities on the experimental farms took the last two years of the Project realization and generated important conclusions regarding diversification strategies that might applied on the farm. The 9.5.2 activities are strongly connected with subtask 9.5.1 (in the context of a new cooperative establishment) and 9.5.3 (in the context of the traditional food labelling and promotion).

The research results and recommendations can be summarized as follows:

A) For farmers and other food chain stakeholders:

- We recommend the development of market strategies that involve higher added value production and product diversification within the raspberry food chain. The system is no more sustainable if it relies only on traditional practices without any involvement of modern technologies.

- The drivers of progress in the agricultural sector in Serbia are early adopters, namely younger farmers who are ready to change their own business practices in order to achieve higher earnings. The agricultural sector is still low-input oriented and there is no fear that solutions which will be applied will not be in line with a good environmental practice. Furthermore, the suggested solutions are in line with environmental protection as they employ strict control of the resources use according to good practices (such as IT implementation in digital farming). It is of extremely importance to improve the quality and safety of primary products.

- The fragmented structure of the raspberry sector best suits the interests of big players at the B2B market - to large trade companies, raspberry buyers and wholesalers. The raspberry farmers cannot count on buyers' readiness and openness to support various ideas that can help farmers to improve their own business practices. Although interconnected, buyers continuously deliver new and new requirements for standardization and fulfilment of the internationally required standards for exports of raspberries. Therefore, farmers should be better organized. In the case of the raspberry sector, there is an urgent need for introduction of new cooperatives based on cooperation between small, family owned cold capacities. It will help in overcoming of huge difficulties identified in the market access, particularly due to better negotiation and more informed producers' choice. This action will also help in developing of consolidation or reducing the impact of fragmentation.

- The long run market perspective supports overall suggestions for business improvements as the product under our observation (raspberry) is considered as extremely healthy product, important not only for the fresh consumption, but also in the context of different industries development (confectionary industry, milk industry, pharmaceuticals etc). New varieties with higher dried content are recognized as more competitive. It supports overall conclusion that production must be diversified in the context of different varieties combination. It also changes the current orientation from product-driven to customer-driven strategy. Instead of trying to sell what they produce, farmers should change their point of view in producing what is demanding or required at the market.

- The raspberry market gives additional value to producers as they can opt for organic production which is better valorised in the world market. The Serbian context is suitable for organic production development due to low input use and generally unpolluted land.

- Product labelling and branding are becoming increasingly important as food demand is generally shifting towards more sustainable products. Very high interest exists for the support of additional activities "around the farm business" - such as processing (juices, jams, powder) or the development of highly demanding marketing logistics for fresh raspberry supply.

B) For policy makers

- There is an urgent need for restructuring of the state incentive system which should better support quality connections between primary and processing sectors within the raspberry food chain. This also refers to the various segments that go far beyond the food system, and include producers that use raspberries as an input for further processing and production of the high quality products for final consumption (pharmaceutical and cosmetic industry). Large systems do not have the incentive to invest in small business systems. Therefore, state support for small businesses is highly needed so that they can adapt to global trends and requirements.

- Unfair trade practices must be stopped. The implementation of high standards related to trade practices is highly recommended, or in other words, the system requires the creation of connections between stakeholders which will put UTPs under complete control. Farmers are in a condition of insufficient negotiation power and the first step to address this problem is connected with the implementation of systematic support that eliminates different elements of unfair negotiation practices - such as contracting without price definition or with significant delays in payment.

- Due to fragmented structure and limited access of farmers to capital and information, there is a need for common branding by introducing an "umbrella name" for high quality products. This also involves the local governments which might introduce specific brand for the regional products. Such an initiative will foster further standardization and quality improvement, as well as readiness of agricultural producers to offer more quantities for larger markets.

- The state advanced great efforts in the context of digitalization by introducing the digital agricultural concept in the practice, but the state extension service is not improved at all. Therefore, a closer connections between the two sides of coin - producers/farmers as information creators and producers/farmers as the final users of the agricultural information system is highly requested. A huge amount of information collected in a big data system is useless if the extension services providers do not use to advice and guide farmers.

- The establishment of a quality and safety standards control system at the national level should be one of the highest priorities of policy makers. Serbian farmers need high-genetic potential planting material, reference laboratories, subsidies for the implementation of standardization processes at the farm and other elements of the macro-system which can facilitate further improvements of farmers export-oriented practices.

- To conclude, this research has facilitated the identification of the most important problems in the Serbian raspberry production, as well as the creation of an innovative environment for problems solving using a bottom-up approach. Closer connections between farmers and local government in Arilje have fostered the innovation of the support mechanisms that best suits the farmers interests (such as the Application for allocation of funds for drilling of wells in the function of irrigation in 2021, the Application for distribution of funds for the procurement of new irrigation equipment in 2021, Free analysis of the land quality in cooperation with the State Advisory Service Office Čačak, Land leasing and use of the state-owned agricultural land in the Municipality of Arilje in a longer period suitable for fruit production etc.) Multi-actor stakeholders groups should continue this type of cooperation to facilitate a better bargaining position of farmers and other food chain stakeholders in the future.

3. SUB-TASK 9.5.3: PLACE BASED, CO-OPERATIVE LABELLING OF HIGH VALUE ADDED FOOD FOR LOCAL AND REGIONAL MARKETS.

SUMMARY

This research aimed at monitoring the impact of a local quality food system in the region of Szekszárd in Tolna County, Hungary, conducted in partnership with ECO-SEN. The research involved an investigation into opportunities, as well as the application of tools, to expand quality labels; with the aim of building up place-based agri-food marketing, territorial branding, and labelling in the region. A comprehensive survey of consumers' perceptions and attitudes towards local foods was conducted on a population representative of the city of Szekszárd. The project aimed to:

- Explore local food preferences and identify potential explanatory factors;
- Examine the local food perception in Tolna County;
- Analyse the different purchase channels for local products;
- Investigate the perception of local trademarks with a special focus on the "quality local food – Szekszárd and region" certification mark.

Local food purchasing habits and preferences of Szekszárd households were examined based on a random sample of 250 people interviewed in 2019, who were representative of the target population (residents of Szekszárd). The results obtained were compared with a previous survey carried out in 2011, enabling the identification of changes in consumers' attitudes over time. When analysing the sampled data, in addition to the descriptive statistical and relationship analysis tools, statistical induction methods were also applied to allow for significant conclusions to be drawn for the entire population of Szekszárd, based upon the representative sample.

Local product preferences

In terms of local product preferences, the focus was placed upon purchasing habits likely to be related to conscious consumer choices (such as preference for local, healthy, seasonal and fresh food). These aspects were regarded as important, or very important, by the majority of consumers. The only exception was the factor of 'product information' through the use of a label. The decision variables which were less related to conscious choice (cheap food, big-size pack, special offers) were considered less important by the majority of the consumers in the sample. Compared to the results of the 2011 survey, there were statistically significant changes: e.g. the importance of seasonal produce purchases increased, while that of cheap produce unequivocally decreased. In relation to the entire population, the preferences among the population of Szekszárd showed a similar distribution and patterns in the case of certain decision variables, such as seasonality and quality; the freshness and healthiness of the products; product information obtained by the label, special offers, and avoidance of unnecessary packaging.

The preferences affecting local produce purchases were explained by analysing respondents' demographic and socio-economic characteristics. Respondents' gender showed a significant relationship with only one decision variable, i.e. males were found to attach more importance to products labels. Regarding the influence of age on decision factors, it was found that older consumers consider the price of a product to be more important than younger consumers. Older

consumers are also more interested in the quality of products but are less willing to pay extra costs for local products.

Among the variables concerning the social status of the respondents, education level was particularly important. Respondents with a higher level of education considered the price of the product to be less important, were less likely to look for special offers, and were more inclined to pay a higher price for local produce. Moreover, higher-income households are less sensitive to special offers and are willing to pay even higher prices for local produce items.

Perception of local produce from Tolna county

Local food perception and sources of supply were analysed in relation to the geographical location of Tolna County (including Szekszárd) along with the most important food categories. The 250 residents of Szekszárd included in the sample listed a total of 1,237 local products from Tolna County, five products on average. Most of the local products included vegetables (19%), fruits (17%), meats (15%), drinks (14%), as well as honey and sweets (13%), milk and dairy (11%).

Approximately 11% of the 1,237 items discussed were specific local produce items, rather than general category mentions. Interestingly, both in absolute and relative terms, milk and dairy products, drinks, honey, and sweets had the most specific product mentions.

Compared to the 2011 results, it can be stated that the overall number of known local products increased significantly. There seems to be a significant reduction in the previous 31% share of milk and dairy products (the most frequently mentioned local produce category in 2011) to 11%. The proportion of fruits considerably increased (from 9% to 17%) gaining the first position in 2019. It is interesting to note, however, that compared to 2011, fewer *specific* produce items were mentioned by respondents (219 vs.137).

Analysing local products according to purchase channels

With regard to sources of supply, in the case of local products in Tolna County, market purchases were the most common, followed closely by in-store purchases; purchases at the farm were also significant. Compared to the results in 2011, the share of market purchases increased significantly (from 19% to 33%), mainly at the expense of in-store purchases (their share decreased from 51% to 31%).

Using a test of independence, we found a weak relationship between the source of supply and the type of food, which was also significant for the entire population of Szekszárd, and the strength of the relationship had slightly decreased compared to the 2011 survey. Using the Bonferroni correction procedure, several significant purchase patterns could be identified. For example, in the case of grain products, in-store purchases were more common than any other alternatives. It was also found that most of the patterns were similar to those identified in the 2011 survey.

Analysing the perception of local trademark products

Analysing the perception of local food trademarks, 250 respondents gave a total of 64 answers: the majority typically did not indicate any, but some did more than one. However, in 70% of the responses, the concept of trademark was misinterpreted, i.e. a wrong answer was given. The consumer awareness of the certification mark "Quality local food - Szekszárd and its region" among the entire population of Szekszárd ranged between 24% and 36% at a 95% confidence level. In more than half of the cases, respondents had encountered the trademark in one of the local food shops. At 95% confidence level, 73%-83% of the population considered the trademark to be suitable for symbolizing local produces.

3.1. Research questions and hypotheses of the consumer survey

The research aimed at analysing consumers' perception and awareness of local food among the citizens of Szekszárd, as well as examining changes over the past few years through conducting an analysis of: local foods, consumers' perception of local food trademarks and related concepts over the two time periods. Special focus was given to identifying consumers' awareness of the Eco-Sensus certification mark "Quality local food – Szekszárd and region" (see Figure 32 for the certification mark and the local food area on the map).

Figure 32. The local food certification mark and its application area

This research project also intended to measure consumers' perception of local foods; differentiating the most important produce subcategories which are the most frequently mentioned and specified by consumers. Shopping habits were also analysed with respect to sources of supply, including purchases from the City's farmers' market. The survey aimed to capture how consumers' socio-economic background and income influences their food purchasing habits and how this relates to consumers' perception of food.

With reference to the research questions the following **preliminary hypotheses** were set up:

1. Although consumers' perception of local food has increased in the past few years, it may still be regarded as low.
2. Trademark awareness may be considered low in each group of consumers.
3. Consumers' understanding of trademarks seems to be insufficient, as well as their knowledge of the related terms and concepts.
4. The perception of the Eco-Sensus certification mark "Quality local food – Szekszárd and region" is low and, what is more, it has further decreased in the past few years.

3.2. Research methods

In this chapter the methodology and the statistical approach is presented for the analysis of the research questions and the hypotheses.

The methodology applied in this empirical research on consumer preferences was based on the combination of ABC Theory (*Guagnano, Stern, & Dietz, 1995*) and VBN Theory (*Stern, Dietz, Abel, Guagnano, & Kalof, 1999*). This combination was demonstrated first by *Zepeda and Deal (2009)*, who managed to use this approach for predicting consumers' food purchasing behaviour. As *Feldmann and Hamm (2015)* argue, beyond information seeking, prior knowledge, purchase context and demographics may have a significant effect on consumers' attitudes and values. As potential explanatory factors, this research mostly applied those demonstrated by *Weatherell et al. (2013).*

The sample included the citizens of Szekszárd. The analysis period covered the year 2019, as well as the year 2011 (as a baseline comparative year) to identify the changes over time. The reason for selecting 2011 as a base reference period can be justified by the fact that an assessement had already been conducted regarding consumers' perception of local foods among the citizens of Szekszárd in 2011; therefore empirical data had already been collected using a questionnaire, which was structured according to the same methods on the topic that could serve as a basis for comparison.

The research relies on primary empirical data. As information on food choice and consumption habits were collected, it enabelled the determination of the households members to be observation units who were indirectly involved in food purchases and decision-making. The data was collected with the help of interviewers, in order to avoid any misinterpretation and incomplete responses from uncontrolled completion.

3.2.1. Sampling method

The target population, i.e. the citizens of Szekszárd, were observed and analysed by statistical inference. When determining the research method, random sampling was chosen as a criterion, i.e. making use of probability sampling to ensure the applicability of statistical inference and hypothesis testing. In accordance with this, a simple random sample was selected from among the citizens of Szekszárd. The criteria of simple random sampling was met by: selecting samples from the individual districts in proportion to the number of residents, and the interviewers randomly selecting the households across the whole district. The relevant members of the households as previously defined (observation units) were interviewed, and in case of absence, the household was not included in the sample. Determining the sample size, a minimum of 1% selection rate was agreed, as this can be highly representative in a normal case. Food purchasing decisions are generally made by one or two members of the households, which – weighted by a typical proportion of family composition – indicates that from among the citizens of Szekszárd (31,795 people on 1st January, 2019) approximately 40% (12,478 people) may be regarded as persons who regularly, or less regularly, make decisions on household purchases. In the case of a 2% selection rate, the sample size amounted to 250 people. Although these sample items were selected without replacement, due to the size of the population, and that of the selection rate, it still satisfies exchangeability.

3.2.2. The structure of the questionnaire

In order to compare the findings of the two surveys, the 2019 questionnaire was modelled on the 2011 survey. The questionnaire can be divided into two parts: the questions in the first part refer to food purchasing habits, decisions and preferences, as well as the local products purchased. The second part analyses potential explanatory variables, including questions regarding the major socio-economic background, income and demographic conditions of the responding households.

Preferences for local food consumption were investigated through 10 variables measured on an ordinal scale. These variables were linked to major decision factors and contained statements related to food purchase awareness, but also statements contradicting them. Consumers' perception of local products found in Szekszárd, and within the geographical area of Tolna county, were also investigated. Respondents had the opportunity to mention some specific local products. Consumer preferences for places of purchase were also analysed (from farmers' market /local food shop / directly from the producer at the farm/ supermarket / own production). This was followed by testing the perception of local food trademarks, with a special focus on the certification mark "Quality local food – Szekszárd and region".

The second part of the questionnaire provided information about respondents' demographic and socio-economic background based on the following variables: respondent's name, gender, age, the highest level of education, household size and income. Household income was measured by the aggregate net income with the help of income categories. In compliance with increased income since 2011, as well as in accordance with the categories applied in other surveys by Strength2Food project, in 2019 new income categories were set up, compared to those in 2011.

3.2.3. Data analysis method

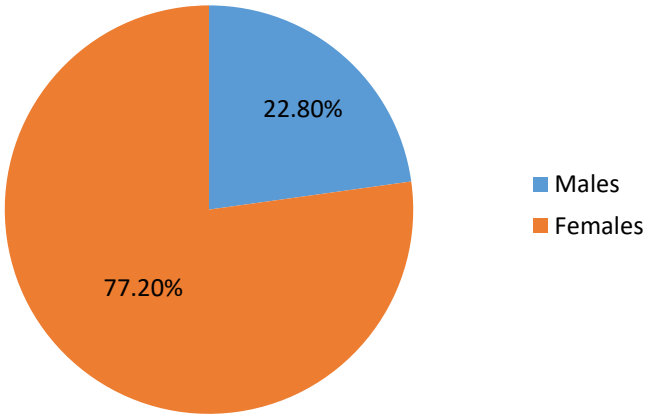
The data retrieved from the questionnaire was first analysed by descriptive statistical methods. The distribution of the individual variables was analysed, and if relevant, their measures of location and dispersion. Following this, conclusions were made using deductive methods (interval estimation and hypothesis testing) for the entire population, i.e. the households of Szekszárd. The cause and effect relationships among respondents' socio-economic background were investigated, as well as demographic conditions, income categories and consumer awareness of local food purchases by relationship-testing methods.

Following this, the findings for the recent study year (2019) were compared with those of the 2011 survey, and any changes which may have been statistically verified and significant for the entire population (i.e. the citizens of Szekszárd) were analysed.

3.3. Descriptive analysis of sample households

The households in the sample were first examined by descriptive statistical methods. The intention was to analyse the demographic, socio-economic and income characteristics of the households in the sample.

Figure 33. Distribution of respondents by gender



The distribution of respondents by gender is shown in Figure 33. More than 75% of respondents were females. However, this is not representative of the entire population, thus it does not cause any bias, it rather indicates that decisions related to food purchases are most of the time made by females.

Respondents' age ranged between 22 years and 81 years with an average age of 50 years. It showed a considerable fluctuation, the coefficient of variation amounted to 30%. Figure 34 demonstrates respondents' distribution by age compared to the curve of normal distribution.

Figure 34. Respondents' distribution by age

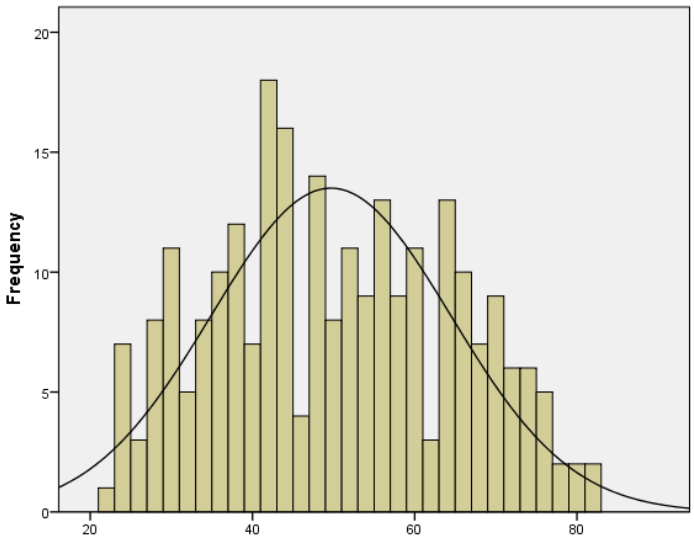
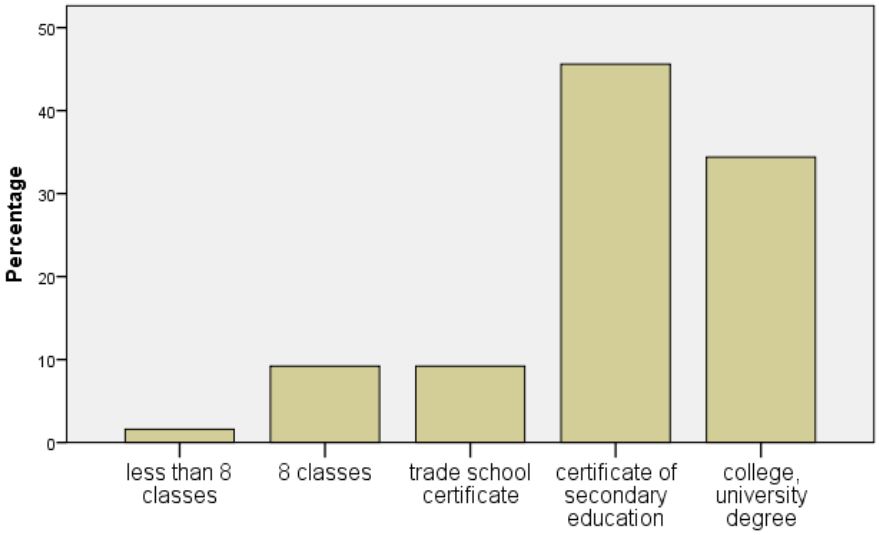


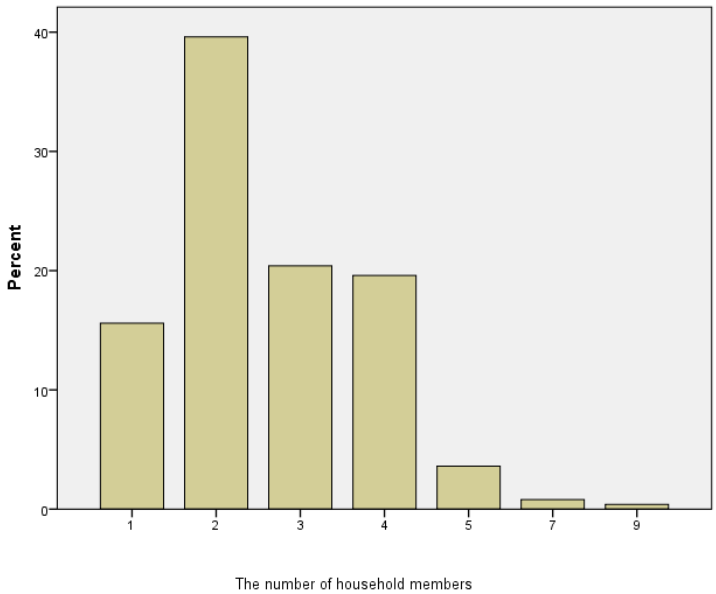
Figure 35 exhibits respondents' distribution by education level. As the bar chart shows, the majority of respondents had at least a certificate of secondary education. Only 20% of the respondents in the sample had a lower level of education, i.e. in terms of education level the national average is overrepresented by the sample.

Figure 35. Respondents' distribution by the highest level of education



As the survey firstly investigates the local food consumption preferences of households, some of the major characteristics of household compositions were collected and analysed (e.g. household size, number of children, number of active earners). The most frequent household size among the respondents contained two people (40% of the cases), while the average household size consisted of 2.63 people (Figure 36). As most households did not have any children, the number of children was one for two households on average. Most households had two active earners.

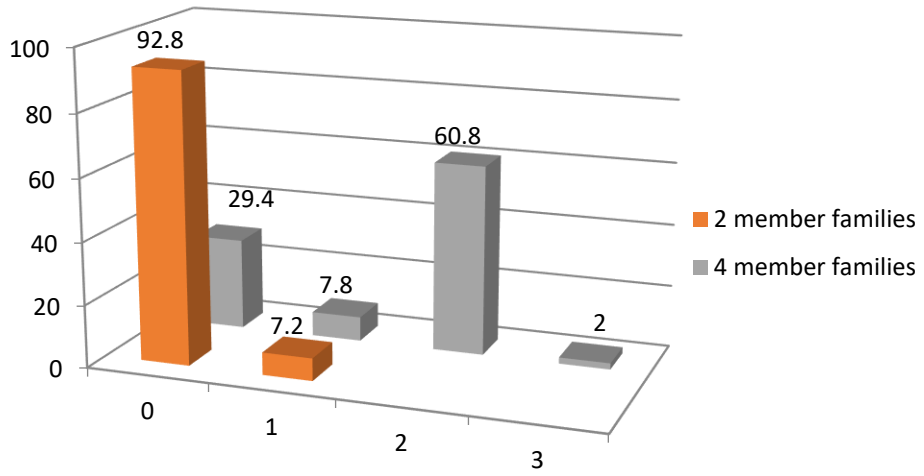
Figure 36. Distribution of households by size



In the case of the most frequent household sizes, a separate examination was conducted regarding the relationships between the household size, the number of children and the number of active earners. Figure 37 illustrates the proportion of children, while Figure 38 visualises the proportion of active earners in two-person and four-person households. Figure 37 shows that only 7.2% of two-person households had a child, and this proportion reached approximately

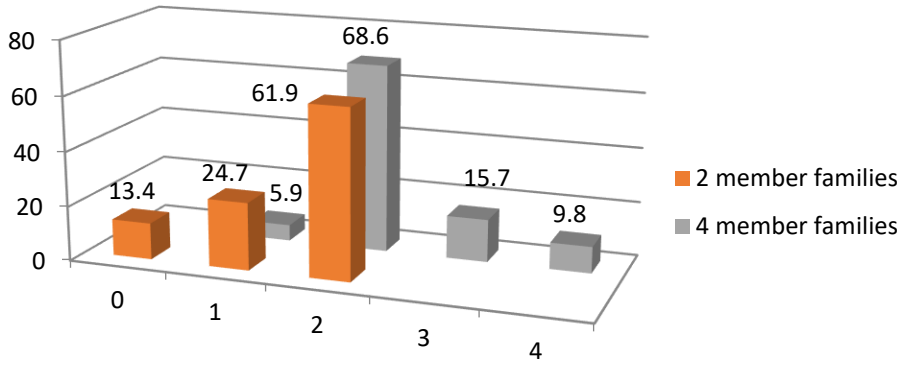
70% in four-person households. Four-person households most often have two children, which makes up just over 60% of the cases.

Figure 37. Distribution of children's number (%)



Examining households according to the number of active earners, it can be seen that in the case of four-person households it can be calculated that at least one active earner, while two active earners are the most common (68.6%). Two-person households most often have two active earners (61.9%), but there are also cases without any active earners (likely two pensioners).

Figure 38. Distribution of active earners (%)



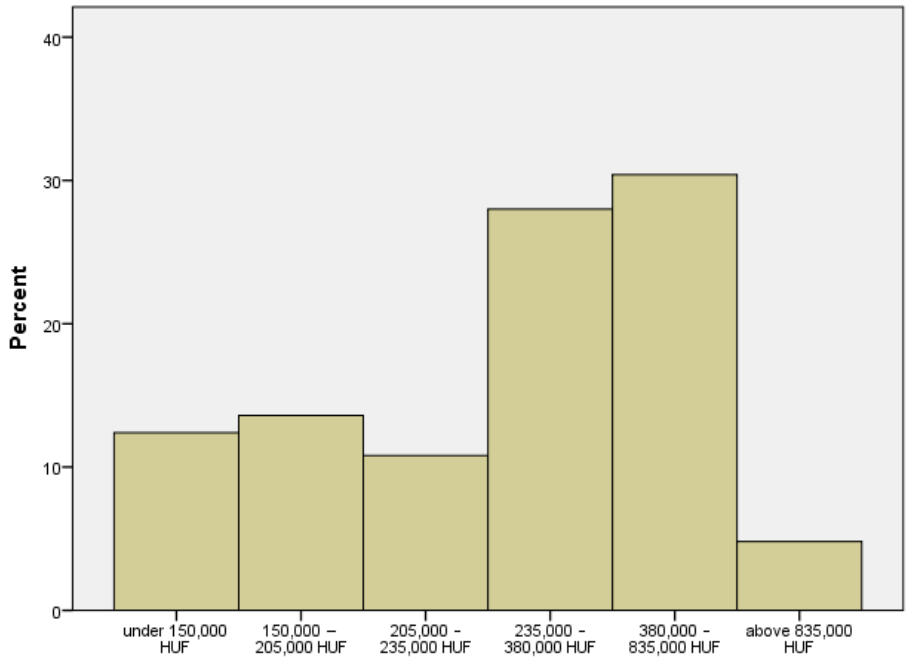
In order to measure households' income position, aggregate net income of the household was used. Six income categories were set up using different class widths. Table 21 visualises the frequency distribution of households with classes. The table reveals the majority of incomes (almost 60%) ranged between 235,000 and 835,000 HUF. The estimated average income from the distribution of households with classes amounted to 345,000 HUF, with a 14% coefficient of variation.

Table 21. Distribution of respondents by income category

Income category	*Frequency*	*Relative frequency*	*Cumulative relative frequency*
under 150,000 HUF	31	12.4	12.4
150,000 − 205,000 HUF	34	13.6	26.0
205,000 – 235,000 HUF	27	10.8	36.8
235,000 – 380,000 HUF	70	28.0	64.8
380,000 – 835,000 HUF	76	30.4	95.2
above 835,000 HUF	12	4.8	100.0
Total:	**250**	**100%**	**-**

Figure 39 is a bar chart demonstrating the frequency distribution with classes, showing how the distribution of incomes skewed to the right results in an asymmetry on the left, i.e. households with lower income show a larger proportion than those with a higher income than the average.

Figure 39. Histogram of incomes



3.3.1. Comparison with the survey in 2011

Compared with the 2011 survey, the proportion of females in the 2019 sample significantly increased. This may be explained by the fact that decisions on food-related purchases are more often made by females in households.

In comparison with the 2011 sample, respondents' average age showed a slight increase, while the variation of age-related data was lower. Based on the sample, the age of the citizens in

Szekszárd followed a normal distribution both in 2011 and 2019. With respect to the highest level of education, the proportion of people with trade school certificates significantly declined by 2019, which can be explained by the increasing proportion of people with a secondary school leaving certificate.

Compared to the 2011 survey, the proportion of one-person households showed a sharp increase (from approx. 10% to 15%); however the proportion of three-person households decreased, and the proportion of minimum five-person households showed a slight fall. The proportion of households with children did not change, and households with two earners showed the highest frequency. The proportion of two-person households without any children increased considerably (from 84% to 93%). The proportion of four-person households without any children showed a sharp increase (from 12% to 30%). While the proportion of two-children households increased, the proportion of "big families" did not significantly change.

The average number of active earners per household did not change compared to 2011. Examining the relationship between the number of active earners and household size, it can be stated that the proportion of two-person households with no active earner decreased, whereas in the case of four-person households with two or more active earners rose.

Compared to the 2011 survey, the average income of households almost doubled (87%). It can also be stated that dispersion of incomes increased, with the relative dispersion rising from 11% to 14%. Regarding the distribution of incomes, the proportion of households in the most frequent income category declined, whereas the proportion of higher category incomes showed a growth.

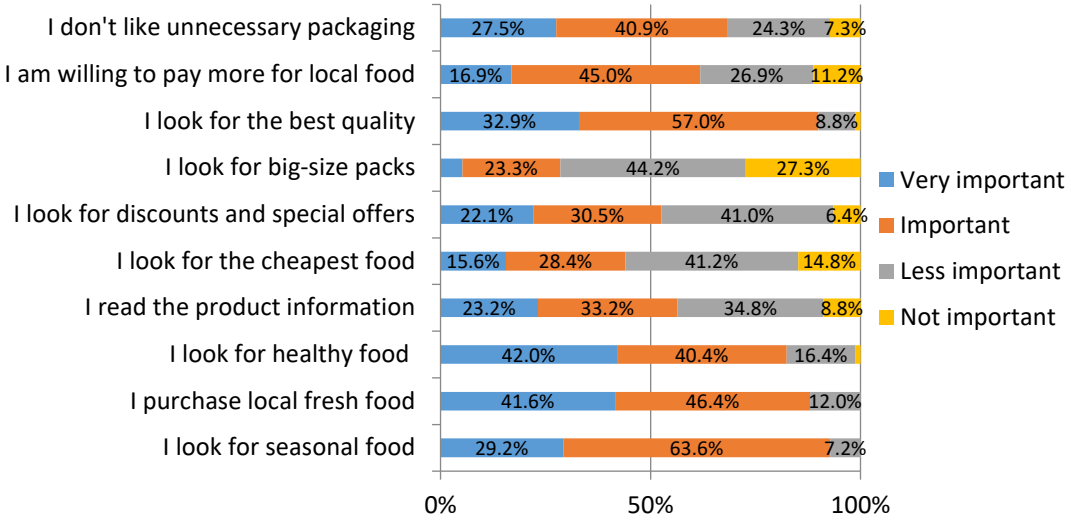
3.4. Analysing respondents' preferences for local foods

Following the analysis of respondents' demographic, socio-economic characteristics and income positions, we investigated households' preferences for local food purchases. Ten statements were formulated; based on the most important preferences related to food purchases. These included statements closely associated with (or contradicting) conscious purchase. Consumers' preferences were identified based upon the variables being measured on an ordinal scale, indicating the level of importance for each statement. We tested respondents' food choice, i.e. how often they rely on the statements below:

1) I look for seasonal food.
2) I purchase local fresh food.
3) I look for healthy food.
4) I read the product information.
5) I look for the cheapest food.
6) I look for discounts and special offers.
7) I look for big-size packs.
8) I look for the best quality.
9) I am willing to pay more for local food.
10) I do not like buying food with unnecessary packaging.

Hereinafter we refer to these ten statements as variables of preferences. The survey highlighted several decision factors linked to "conscious purchases" (Figure 40).

Figure 40. Distribution of decision factors



An explanation was provided for the preferences affecting local produce purchases by analysing respondents' demographic and socio-economic characteristics (summarised in Table 22). Respondents' gender showed a significant relationship with only one decision variable, i.e. product information on labels. It was found that males tended to attach more importance to reading the label, i.e. pay more attention to the information obtained by the label when making their food purchase decisions.

Respondents' age influenced the importance of aspects related to cheap price, the search for better quality, and the higher price paid for the local produce. Older consumers consider the price of a product to be more important than younger consumers, are more interested in the quality of products, and are less willing to pay extra costs for local products.

Table 22. Measures of association for (Cramer's V and Gamma)

Decision factors	*Demographic factors*		*Social factors*	
	Gender	*Age*	*Education level*	*Income*
Seasonal food	X	X	X	X
Fresh food	X	X	X	**0.181**
Healthy food	X	X	X	X
Product information	**0.219**	X	X	X
Cheap food	X	**0.271**	**-0.508**	**-0.425**
Price offers	X	X	**-0.321**	**-0.341**
Big pack size	X	X	X	X
Good quality	X	**0.19**	X	X
Premium for local food	X	**-0.124**	**0.339**	**0.345**

Unnecessary packing	X	X	X	X

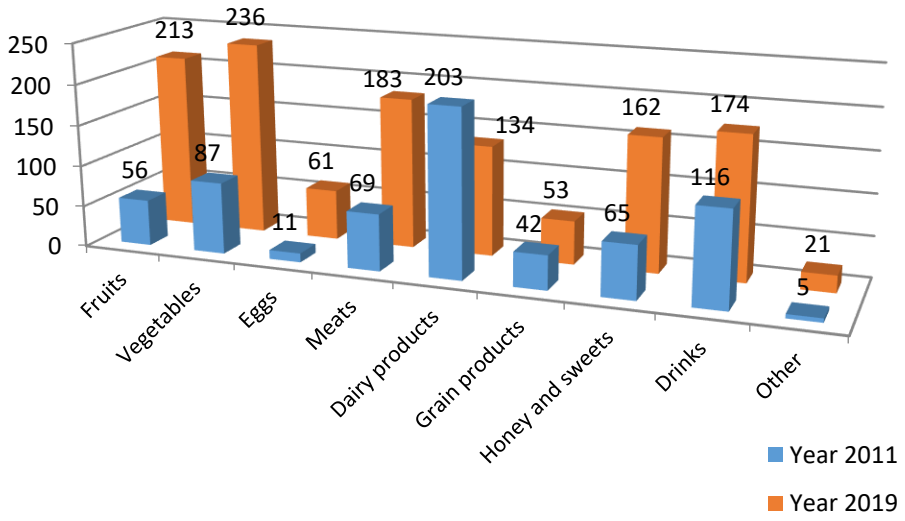
Among the variables concerning the social status of the respondents, *education level* showed a significant relationship with the same three decision factors in 2019 as in 2011: the price of food, the importance of special offers, and premium for local produces. Respondents with a higher level of education considered the price of the product to be less important, were less likely to look for special offers, and were more inclined to pay a higher price for local produce.

Regarding respondents' income as a possible explanatory variable, two types of relationships were identified that were significant for both time periods. It was found that higher-income households are less sensitive to special offers and are willing to pay even higher prices for local produce.

Perception of local produces from Tolna county

Local food perception and sources of supply were analysed in relation to the geographical location of Tolna County (including Szekszárd) along with the most important food categories. The 250 residents of Szekszárd included in the sample listed a total of 1,237 local products from Tolna County, five pieces on average. The distribution of local produce items according to their food categories in 2011 and 2019 is compared in Figure 41. Most of the local produce items included vegetables (19%), fruits (17%), meats (15%), drinks (14%), as well as honey and sweets (13%), milk and dairy (11%).

Figure 41. Distribution of local produce items according to food categories



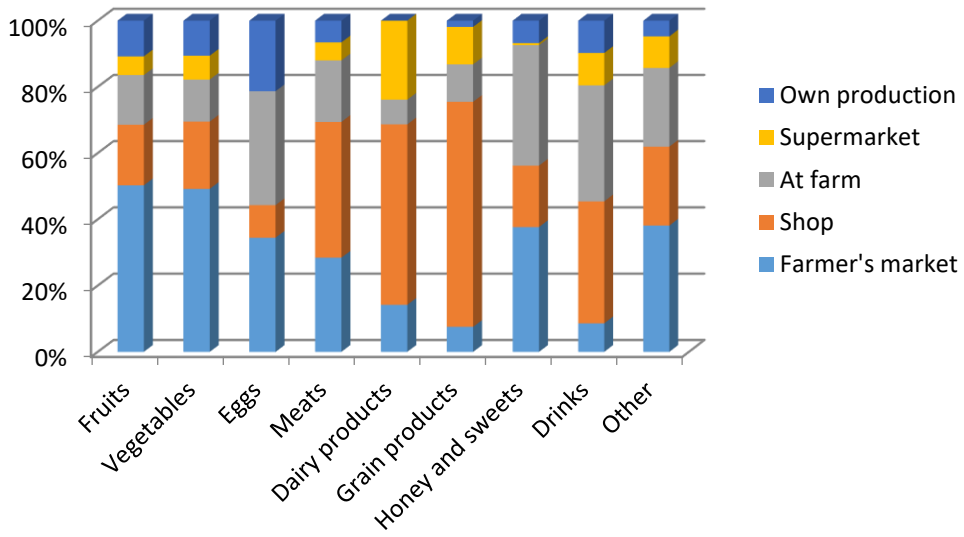
Approximately 11% of the 1,237 local produce items mentioned were specific products rather than general food categories. Interestingly, both in absolute and relative terms, milk and dairy products, drinks, honey, and sweets had the most specific mentions.

Compared to the 2011 results, it can be stated that the number of known local products increased significantly. There seems to be a significant reduction in the previous 31% share of milk and dairy products (the most frequently mentioned local produce category in 2011) to 11%. The proportion of fruits considerably increased (from 9% to 17%) gaining the first position in 2019. It is interesting to note, however, that compared to 2011, fewer overall *specific* produce items (219 vs. 137) were mentioned by respondents.

Analysing local products according to purchase channels

With regard to sources of supply, in the case of local products in Tolna County, market purchases were the most common, followed closely by in-store purchases; purchases at the farm were also significant. Compared to the results in 2011, the share of market purchases increased significantly (from 19% to 33%), mainly at the expense of in-store purchases (their share decreased from 51% to 31%). Findings are summarised in Figure 42.

Figure 42. The distribution of local produces by food category in 2019

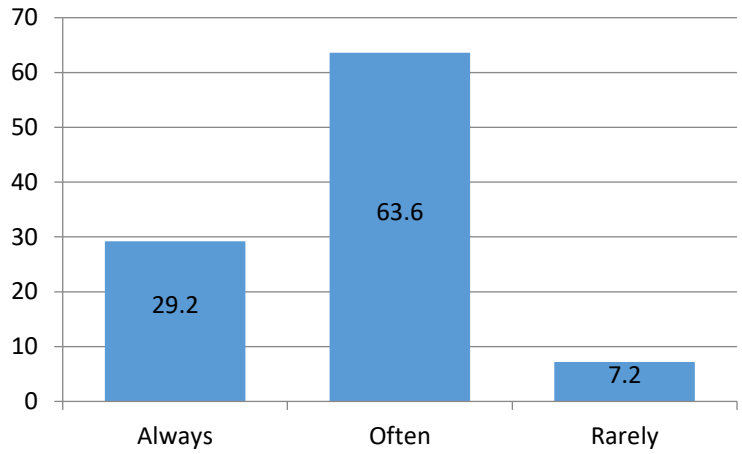


Using a test of independence, a weak relationship was found between the source of supply and the type of food, which was also significant for the entire population of Szekszárd, but the strength of the relationship slightly decreased compared to the 2011 survey. Using the Bonferroni correction procedure, several significant purchase patterns could be identified. For example, in the case of grain products, in-store purchases were more common than any other alternatives. It was also found that most of the patterns were similar to those identified in the 2011 survey.

3.4.1. Descriptive analysis of preferences

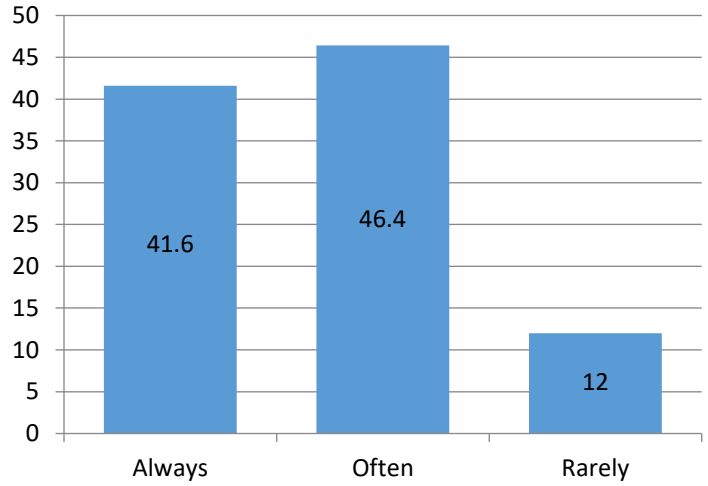
With respect to priority variables, first we examined the importance of *seasonal food.* As Figure 43 demonstrates, when shopping the majority of respondents (63.6%) regarded the choice of seasonal food as important, with almost 30% (29.2%) regarding it as extremely important.

Figure 43. Frequency of seasonal food choice (%)



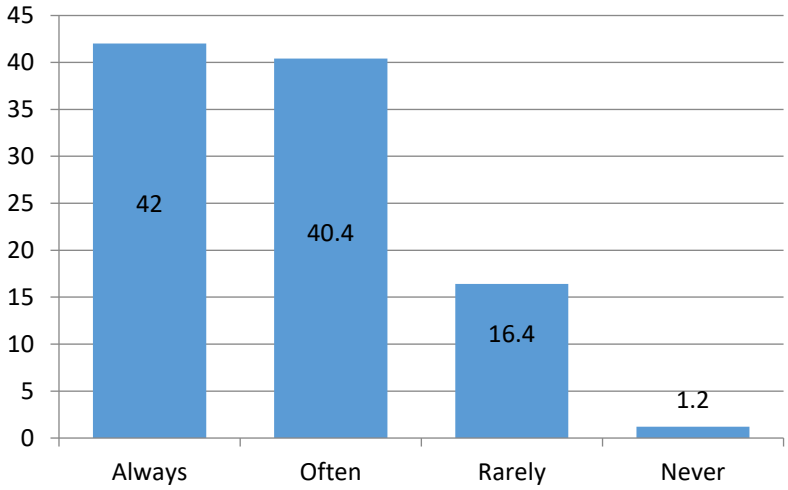
This analysis was followed by testing priorities related to *fresh food*. Figure 44 reveals proportions similar to the ones identified for seasonal food, with the difference that a larger proportion of respondents considered the choice of fresh food as extremely important.

Figure 44. Frequency of fresh food choice (%)



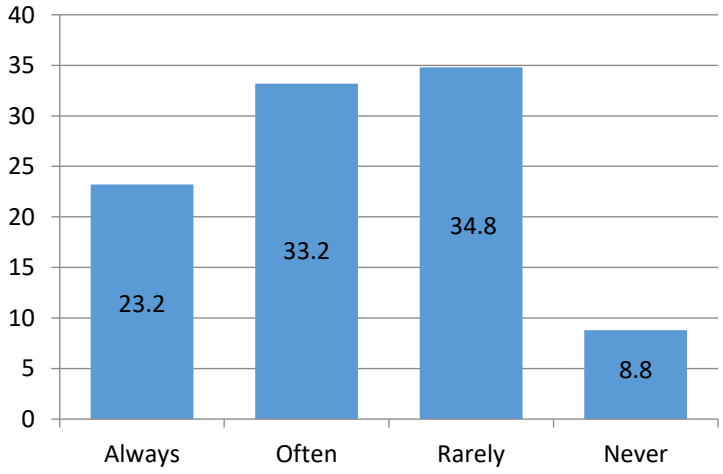
The next aspect referred to the importance of *healthy food purchase* (Figure 45). Its distribution was similar to that of fresh food, with the difference being that the proportion of respondents regarding this decision factor as 'less important' increased from 12% (fresh food) to 16.4% (healthy food).

Figure 45. Frequency of healthy food choice (%)



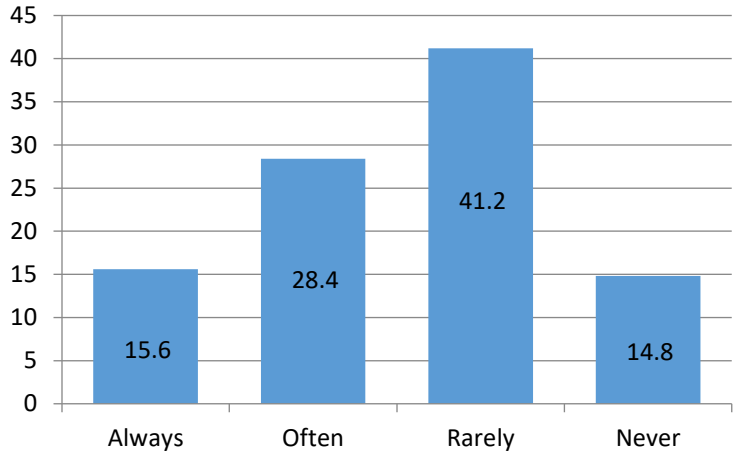
Regarding the importance of *product information* based on the label before the purchase, a lower degree of preference can be identified. It can be stated that the proportion of respondents attributing a lower degree, or no degree, of importance to product information considerably increased, exceeding 40% (43.6%) compared with the previous survey. However, as Figure 46 illustrates, more than half of the respondents still mentioned that product information based on the label plays an important role in their local food choice decisions.

Figure 46. Importance of product information (%)



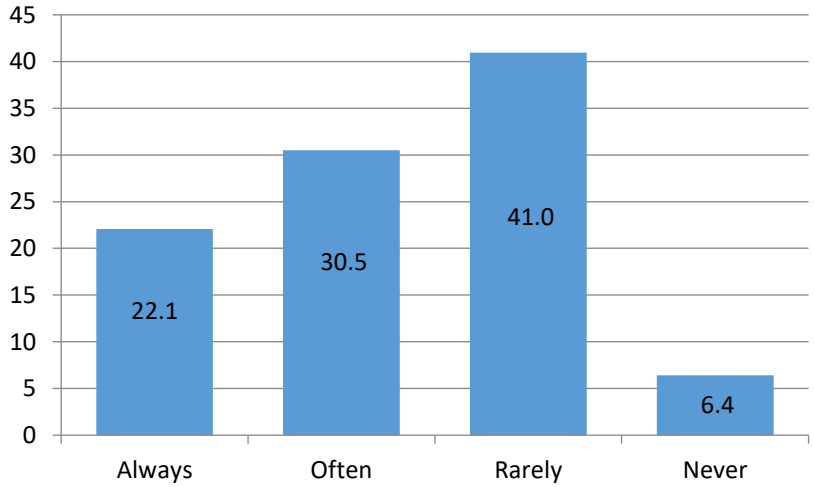
The next step involved examining the impact of price on food purchase choices (Figure 47). The investigation focused on the way in which lower priced food may affect consumers' decisions. The proportion of respondents for whom the price was less important, or not important at all, showed a significant rise (41.2%) with a strong dispersion.

Figure 47. Importance of lower price (%)



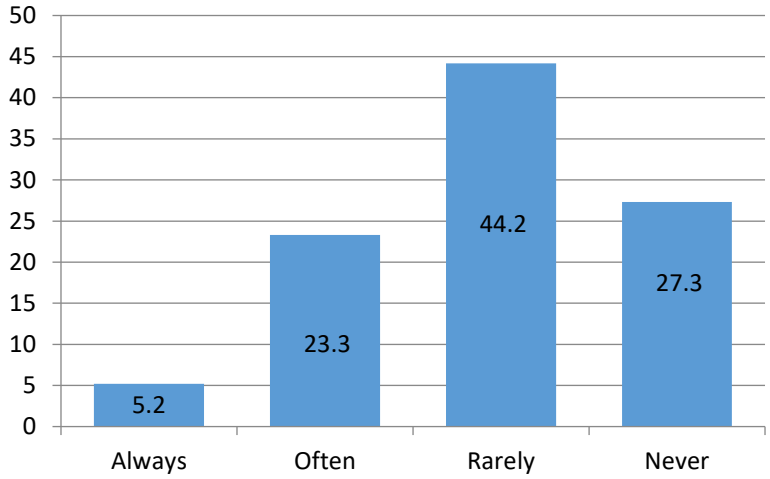
The distribution of responses with respect to the importance of s*pecial offers* is highly similar to that of lower priced food, although priority for special offers is gaining more importance among consumers (Figure 48).

Figure 48. Importance of special offers (%)



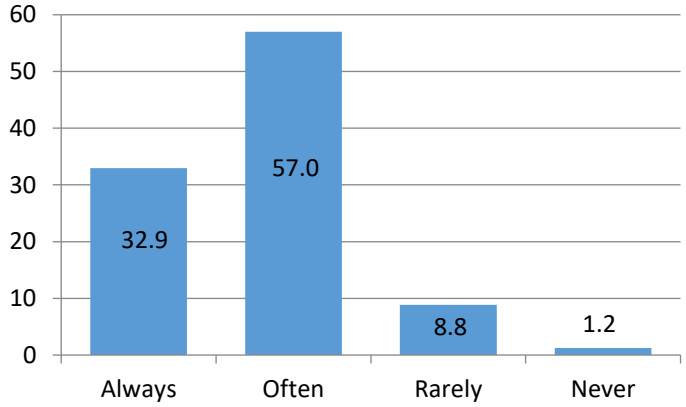
Additionally, the majority of respondents consider cost-efficiency linked to the purchase of *big-size* packs less important, or do not consider it important at all. With respect to the food choice decisions, this criterion was considered less important to respondents than lower price (Figure 49).

Figure 49. Importance of big-pack size (%)



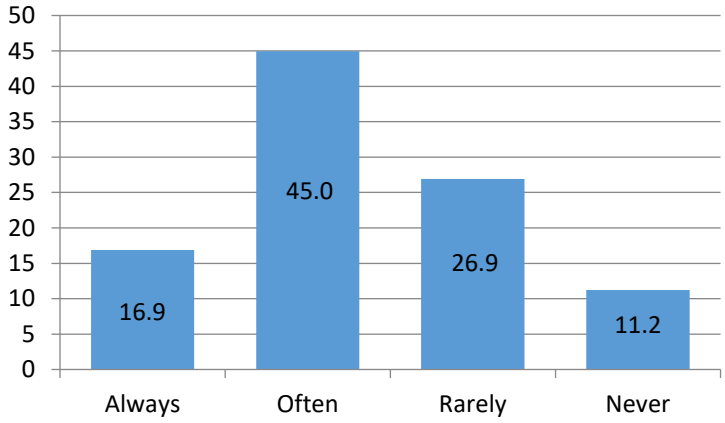
Regarding *food quality*, respondents rated this decision factor similar to the freshness of food. The proportion of respondents who attributed less importance or no importance was only 10% (Figure 50).

Figure 50. Importance of quality (%)



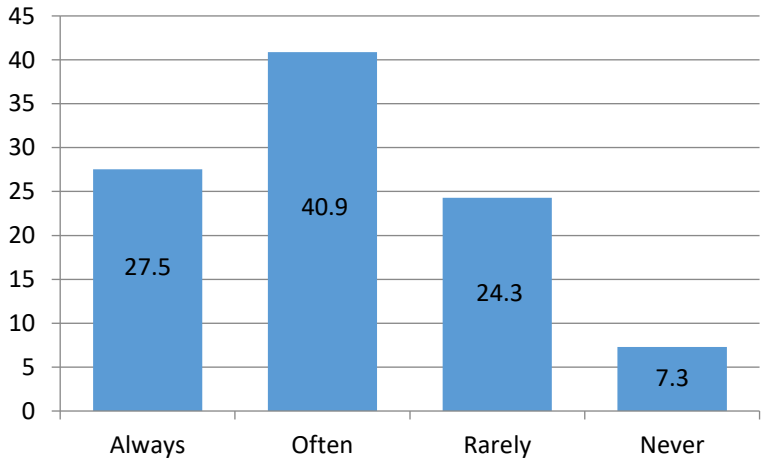
Question 9 investigated whether respondents had the propensity to pay a *premium for local food*. The distribution for this decision factor was similar to that of quality, although the fluctuation in this response category was lower, demonstrating less extreme variation in responses amongst respondents (Figure 51).

Figure 51. Premium for local food (%)



The last decision category referred to the impact of *unnecessary packaging*. In this case, responses referring to this categories importance were similar to those of product quality and local origin, although respondents' deviation increased further (Figure 52).

Figure 52. Avoidance of unnecessary packaging (%)



3.4.2. Cumulative analysis of preferences

For further analysis, the response category showing the highest frequency was analysed, i.e. which was the most common preference assigned to the individual decision criteria. Respondents showed the greatest common agreement in the case of *seasonal* and *quality food,* whilst their views on the importance of product information differed (23).

Although the variables were measured on an ordinal scale, a mean score was calculated with ranks on a 1 to 4 scale, i.e. the score reveals the average importance assigned to the individual decision criteria by respondents. As the variables were not measured on an interval scale, it can be presumed that respondents may not experience the same level of difference among the individual response categories, which might cause bias in the average value. The individual categories were also ranked based on whether respondents regarded them as less important or more important than the average. On the whole, a higher than average preference was assigned to seasonal food choice, healthy food, fresh food and quality food.

Table 23. Comparison of preferences

Preferences when choosing food	*Most frequently marked response category and its relative frequency*	*Higher or lower frequency (priority) than the average*
1. Seasonal food	Often (63.6%)	Higher
2. Fresh food	Often (46.45%)	Higher
3. Healthy food	Always (42%)	Higher
4. Product information	Rarely (34.8%)	Lower
5. Cheap food	Rarely (41.2%)	Lower
6. Special offer	Rarely (40.96%)	Lower
7. Big-size pack	Rarely (44.18%)	Lower
8. Good quality	Often (57.03%)	Higher
9. Premium for local food	Often (44.98%)	Lower
10. Avoidance of unnecessary packaging	Often (40.89%)	Lower

With respect to the preferences presented above, the first four (seasonal food, fresh food, healthy food, product information) as well as the last three (quality, premium for local food and avoidance of unnecessary packaging) may mostly be associated with the concept of conscious food purchase (in italics in Table 23). Within these categories, except for product information, the most frequently marked responses included 'important' and 'very important'. In the case of preference variables that may be less associated with conscious product choices (such as cheap food, special offers and big-size packs) the highest frequency occurrence was 'rarely', i.e. these categories were given lower importance.

Based on the average of artificially created ranks, most variables related to conscious consumption received more attention than the average. However, those related to product information, premium for local food and avoidance of unnecessary packaging attracted less attention. Variables related to less conscious consumer behaviour (cheap food, special offers, big-size pack) were also given less than average importance. In conclusion, customers' preferences related to conscious behaviour show a higher frequency, although those related to product information, premium for local food and avoidance of unnecessary packaging seem to be assessed less uniformly, in a more extreme way than the average.

3.4.3. Changes in preferences between 2011 and 2019

Changes in households' preferences for local food purchases were examined between 2011 and 2019. The relative frequencies of the ten statements analysed above were compared. The aim to draw conclusions for the entire population, i.e. the citizens of Szekszárd, also required the application of hypothesis testing methods. In doing so, a two-sample z-test for population proportions was performed for all values for each criterion variable to establish any changes in the preferences for local foods.

Table 24 contains p-values for the one-sided tests performed. Where the p-value was below 5%, we accepted that the change was significant, i.e. an increase or decrease occurred.

Table 24. P-values for z-score tests for two population proportions

Variable	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Always	**1.16%**	10.72%	**0.05%**	40.38%	**0.01%**	**3.79%**	**0.26%**	**0.14%**	48.27%	**0.02%**
Often	**0.72%**	9.87%	**0.44%**	**0.40%**	**0.01%**	**0.05%**	**1.33%**	27.84%	**0.05%**	19.76%
Rarely	**0.00%**	28.90%	30.31%	5.40%	**0.00%**	**0.00%**	29.40%	**0.38%**	**0.00%**	**2.53%**
Never	**0.03%**	**1.80%**	30.52%	3.84%	**0.00%**	9.05%	**0.01%**	14.88%	16.84%	27.61%

It can be seen that for the first and fifth variables, the selection frequency of each category changed, while for the third and fourth criteria, only one category became "more popular" or "less popular". Table 25 shows the change in the ratios for the criterion variables (absolute change measured in percentage points) for those cases when the change was considered significant.

Table 25. Changes in preferences (%)

Priorities when choosing food	*Always*	*Often*	*Rarely*	*Never*
1. Seasonal food	+8.64%	+10.64%	-14.75%	-4.53%
2. Fresh food	no change	no change	no change	-1.74%
3. Healthy food	+13.78%	-11.52%	no change	no change
4. Product information	no change	-11.40%	no change	no change
5. Cheap food	-14.02%	-15.50%	+18.2%	+11.32%
6. Special offer	-6.83%	-14.08%	+18.32%	no change
7. Big-size pack	-6.97%	-8.76%	no change	+13.37%
8. Good quality	+11.68%	no change	-7.89%	no change
9. Premium for local food	no change	+13.97%	-16.65%	no change
10. Avoidance of unnecessary packaging	+12.9%	no change	-7.76%	no change

Household preferences for seasonal food choices show an increasing tendency, with a significant rise in the categories of "always" and "often". In contrast, the preference for fresh food in 2019 was similar to the previous survey. Regarding the preference for healthy food, the category "very important" showed a further rise at the expense of the "important" category, i.e. there was no change in the proportion of those who considered it less important or not important at all.

There was a negative change in the perception of product information on the basis of the label, as the proportion of those who regarded it as important declined. At the same time, the price of the product (its cheapness) was considered to be an important criterion by fewer consumers. The same applies to special offers and big-size packs. Higher quality, however, was seen as much more important by participants. In this case, the proportion of those who considered this aspect to be very important increased significantly. When examining whether households are

willing to pay a higher price for local products, no significant change was identified; rather those who saw this aspect as less important shifted slightly towards placing more importance in the decision-category. In contrast, the proportion of those who consider the avoidance of unnecessary packaging "very important" increased significantly, primarily at the expense of those who considered this aspect to be less important.

Analysing typical consumer preferences, changes compared to 2011 can also be identified. In 2019 the freshness of the product was no longer considered "very important" but rather "less important" by the largest proportion of respondents in 2019. Less importance was also given to special offers and the product information based on the label. At the same time, a larger proportion of customers in 2019 were willing to pay a higher price for local produce than in 2011.

Compared to 2011, there was also a change identified when examining the relative importance of individual choice preferences. The importance of the price and special offers decreased: in 2019 these aspects were considered less important than the average by households.

3.4.4. Patterns of consumer preferences for local foods in Szekszárd

Next, an examination was conducted as to whether the findings obtained by the descriptive analysis, based on sample data, may be generalized to the entire population of Szekszárd. To do so, the method of statistical estimation and hypothesis testing were used to search for statistically significant results.

First, an analysis was conducted concerning the sample data obtained from a query of 10 aspects describing food purchase preferences. Then, an investigation occurred regarding whether the 10 sample distributions actually reflected existing preferences, or if they might be considered random. To determine this, a homogeneity test was performed on all 10 variables, where our null hypothesis was that the given variable follows a uniform distribution. At a standard significance level of 5%, the alternative hypothesis was accepted in each of the 10 cases. The observed level of significance was zero in each test. This also implies that at any significance level, the alternative hypothesis must be accepted, which means that the entire population of Szekszárd had clear preferences in terms of each of the 10 decision-making criteria for food purchases.

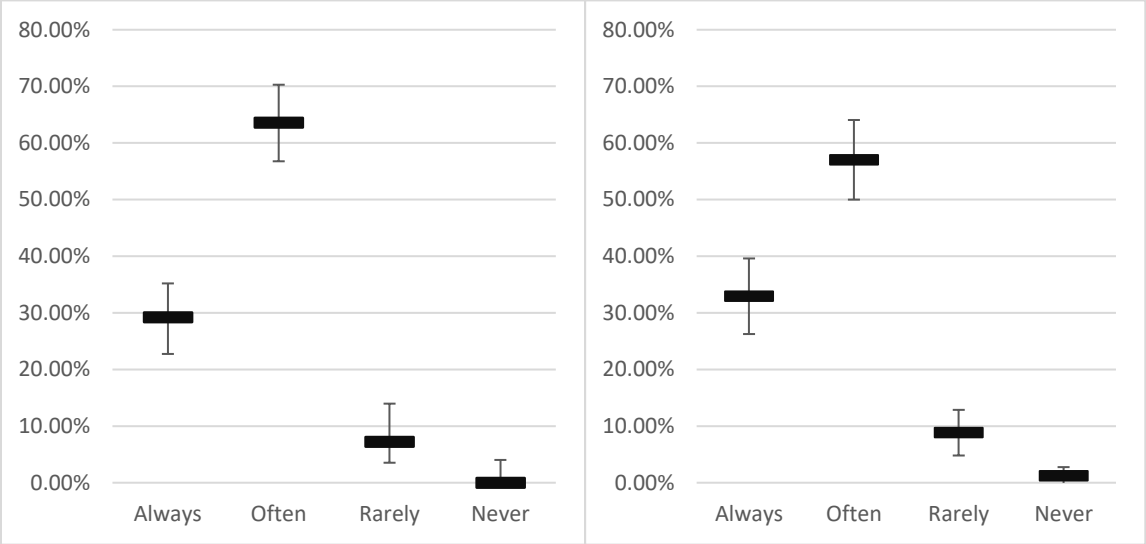
Subsequently, each aspect was examined separately in order to determine whether significant differences can also be found between the individual response categories. As the variables were on an ordinal scale, an interval estimation was performed on the population proportion for each response category. In this case:

$$Z = \frac{p - P}{\sqrt{\frac{p(1-p)}{n-1}}}$$

where variable Z follows a binominal distribution (P is the population proportion, p is the sample proportion and n is the sample size). For a sufficiently large sample, as in this analysis, the distribution of variable Z can be approximated by the standard normal distribution. Using this, it was determined that the interval estimation for the population proportion of each response category for each of the 10 decision variables at a 95 percent confidence level. In the case of non-overlapping intervals at a given significance level of 5%, there was a significant difference in the relative frequency of the given category. Based on the "pattern" of significant differences, the decision categories for which the population has similar preferences were identified.

First, a similar distribution for variables 1 (seasonal food) and 8 (good quality) were found as demonstrated in Figure 53; where the importance of each decision-variable is similarly perceived by the population. This indicates that the largest proportion consider these aspects to be somewhat important, but not very important. However, it can also be stated that seasonal food and quality are considered highly important rather than having less, or no importance at all.

Figure 53. Interval estimations of population proportions for the variables 'seasonal food' and 'quality'



Similar distribution patterns were identified for variables 2 (freshness of food) and 3 (Healthiness of food) as demonstrated in Figure 54. In this case, the freshness and healthiness of food products were evaluated with similar preferences. It can, therefore, be concluded that the majority of the population of Szekszárd assigns high importance to the freshness and healthiness of products. In our case, it also means that the proportion of those who consider these aspects have 'little importance' or 'no importance at all' is significantly lower.

Figure 54. Interval estimations of population proportions for the variables 'fresh food' and 'healthy food'

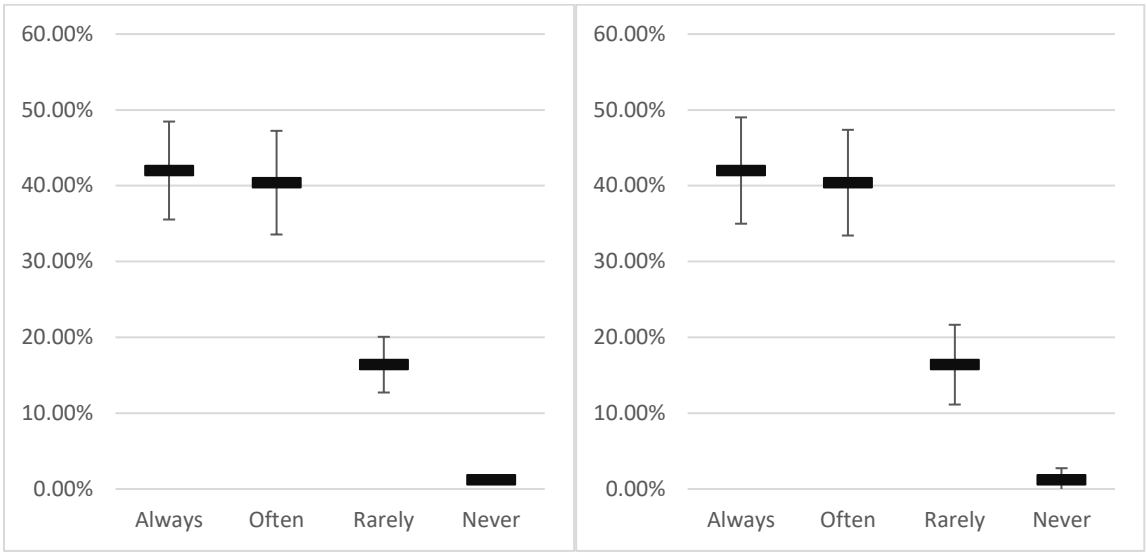
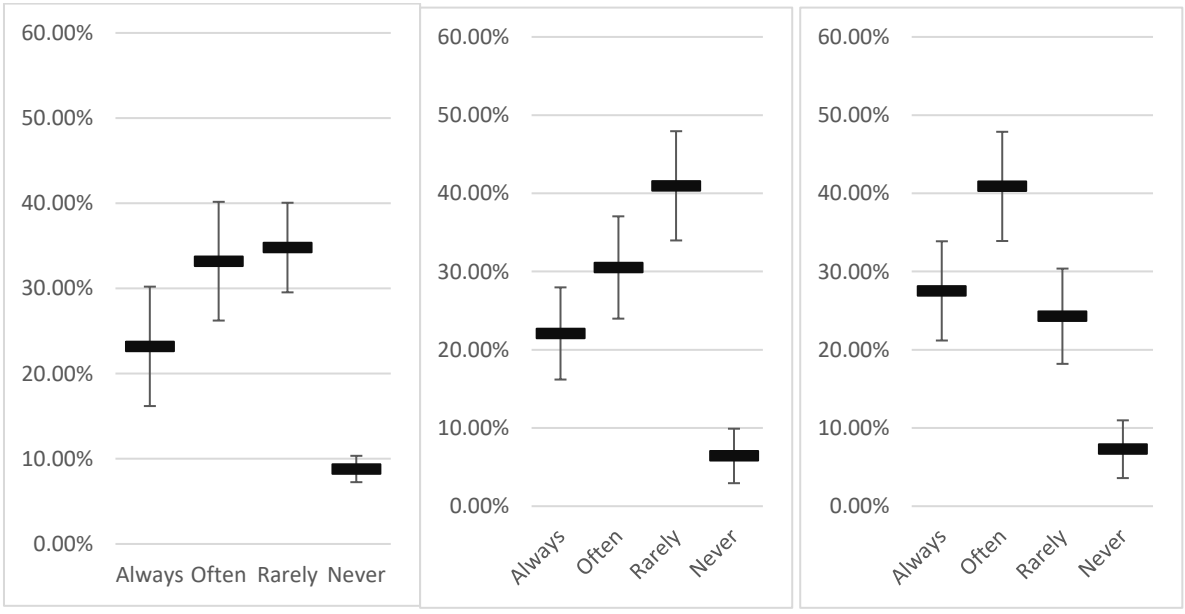


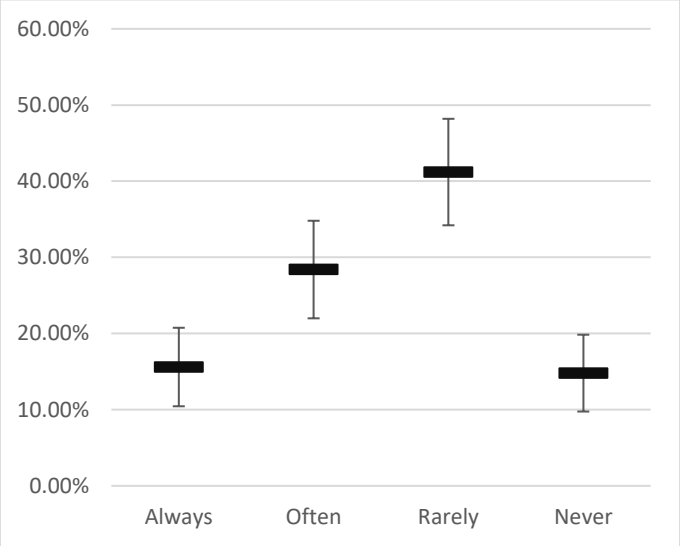
Figure 55 shows a similar result was found for the distributions of variables 4 (product information on label), 6 (price offers), and 10 (unnecessary packaging) where the population demonstrated a group convergence when perceiving the importance of these categories. This means that there is no significant difference between the proportion of those who consider these aspects 'very important' or 'less important'. In contrast, the proportion of those who do not consider these aspects important at all is significantly lower.

Figure 55. Interval estimations of population proportions for the variables 'product information', 'special offers' and 'avoidance of packaging'



Additionally, the importance of variable 5 (cheap food) should be highlighted. In this case it can be stated that the largest proportion of the population considers this aspect important or less important as shown in Figure 56. However, the proportion of those who consider the cheapness of the product very important, or do not consider it important at all, is significantly lower.

Figure 56. Interval estimations of population proportions for the variable 'cheap food'

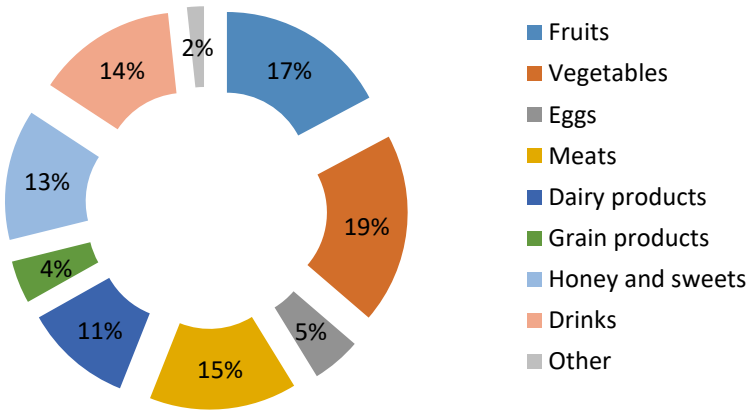


3.5. Analysis of local foods

The next part of the analysis discusses the findings on consumers' perception of local foods and their sources of supply. Local produce items were analysed with reference to the geographical area of Szekszárd and Tolna county, i.e. the analysis of the local produce items considered Tolna county and Szekszárd together. Respondents could select from 5 sources of supply (farmers' market, shop, directly from the producer at the farm, supermarket, and own production) using the 9 standard food categories outlined previously (fruits, vegetables, eggs, meats, dairy products, grain products, honey and sweets, drinks and other). Figure 57 summarises this information.

The 250 residents from Szekszárd in the sample listed a total of 1237 local produces (five pieces on average) from Tolna county including produces from the city of Szekszárd. The most frequently selected local products were vegetables (19%), fruits (17%), meats (15%), drinks (14%), honey and sweets (3%) as well as milk and dairy products (11%). The proportion of eggs and grain products ranged between 4% and 5%.

Figure 57. The distribution of local food according to food categories

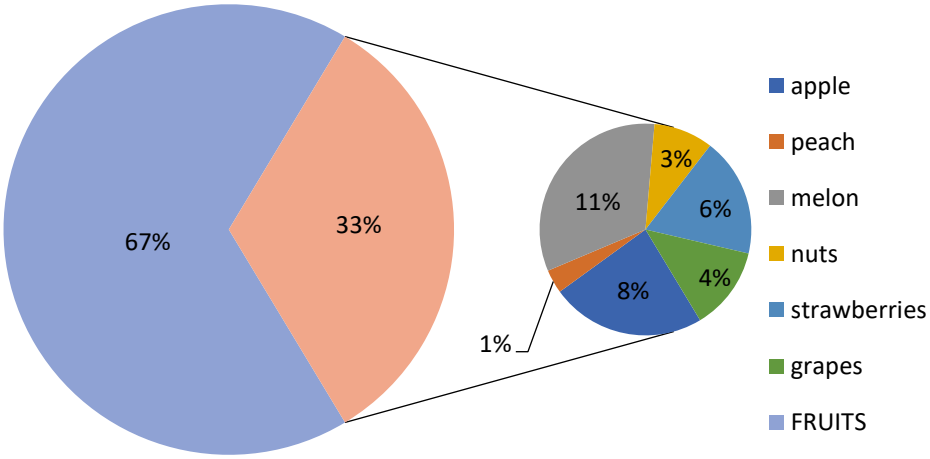


Subsequently, the types and proportions of local products within each food category were examined.

1. Fruits

Within fruits, only a third referred to any particular kind of fruit, within this, melon made up more than 30% of this category. Apples (8%) and strawberries (6%) were also mentioned in a relatively large number, whereas the mentions of nuts and grapes showed less frequency (Figure 58).

Figure 58. The distribution of local foods within the category "fruits" (%)



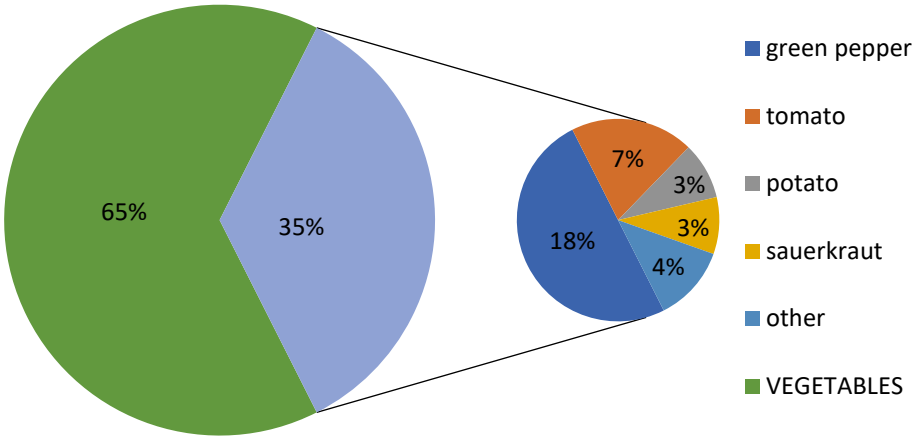
2. Vegetables

Similar to fruits, within the "vegetables" food category, nearly two-thirds of the local products included mentions of vegetables without any specific type.

About a third of respondents also gave the type of vegetables by mentioning green pepper in just over half of the specific named cases. Among the rest, tomatoes were included more

frequently (7%), while the mentions of potatoes, sauerkraut and other vegetables occurred at almost the same frequency (3-4%) (Figure 59).

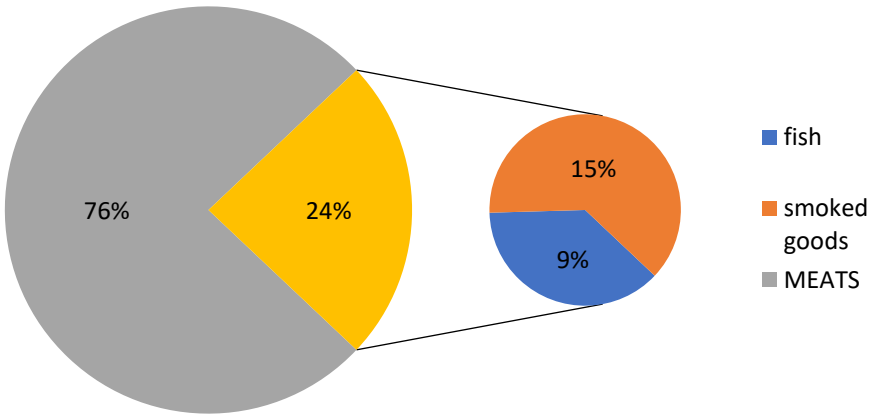
Figure 59. The distribution of local foods within the category "vegetables" (%)



3. Meat

Roughly three-quarters of local products in this food category belonged to the general category, while 24% of them included specific product types. In more than 60% of the specific named cases respondents mentioned smoked meats, whereas the rest of the responses contained fish (Figure 60).

Figure 60. The distribution of local foods within the category "meats" (%)



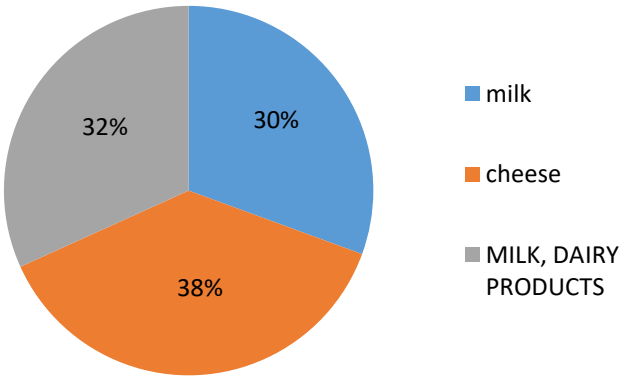
4. Eggs

Eggs were mentioned relatively rarely (61 times) among the list of local products, which does not exceed 5% of all responses. Respondents did not use any specific subcategories here.

5. Milk, dairy products

The general, all-encompassing category of "dairy products" was given by respondents in roughly one third of the cases. We received more detailed information for 68% of the products where answers could be divided into the subcategories of milk and cheese. Of these, cheese received about 30% (i.e. 8 percentage points) more mention than milk.

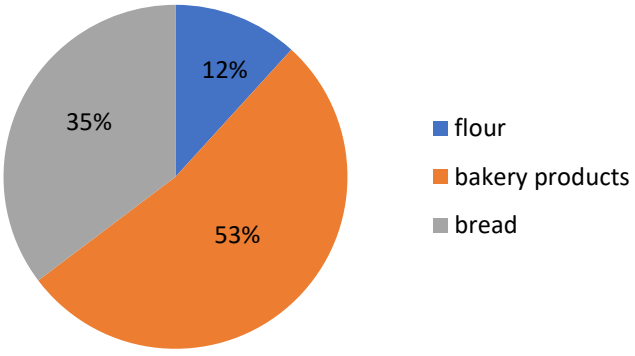
Figure 61. Distribution of local products within the category "milk, dairy products" (%)



6. Grain products

Within this group, there was no general mention of the category. Regarding the subcategories: flour and baked goods were mentioned, particularly bread. Among these subcategories, baked goods received the highest percentage of mentions (53%) followed by bread (35%) and flour (12%) (Figure 62).

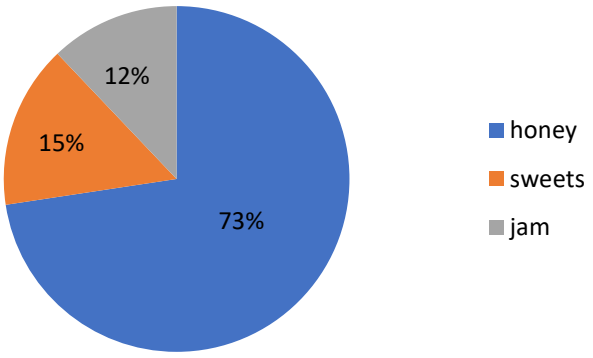
Figure 62. The distribution of local foods within the category "grain products" (%)



7. Honey and sweets

Within this group, respondents marked three specific product types: honey, jam and sweets. Of these, honey was the most frequently mentioned (73%), while sweets and jam were mentioned in a similar proportion, 15% and 12%, respectively (Figure 63).

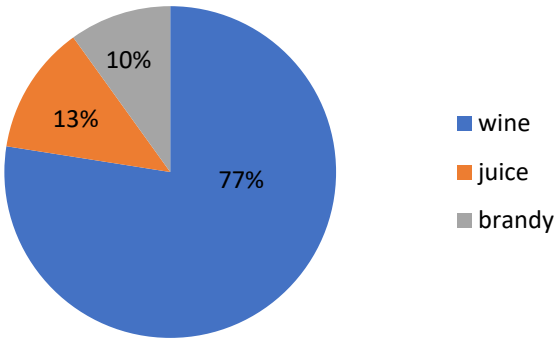
Figure 63. The distribution of local foods within the category "honey and sweets" (%)



8. Drinks

Local products in this food category could be divided into three groups: wines, juice (including syrups) and brandy. As shown in Figure 64, wines made up more than 77% of these products. The proportions of brandies and juices were similar, 10% and 13 %, respectively.

Figure 64. The distribution of local foods within the category "drinks" (%)



9. Other products

This category included local produce which did not fall into the previous eight categories. There were relatively few mentions (21) made here, which were also negligible in proportion (less than 1% percent of all mentions).

Specific local products from Tolna county and Szekszárd

Specific local products from Szekszárd which were mentioned by the respondents were also examined and aggregated by product category. The results are shown in Table 26 (number of mentions in brackets).

Table 26. Specific local products from Tolna county and Szekszárd

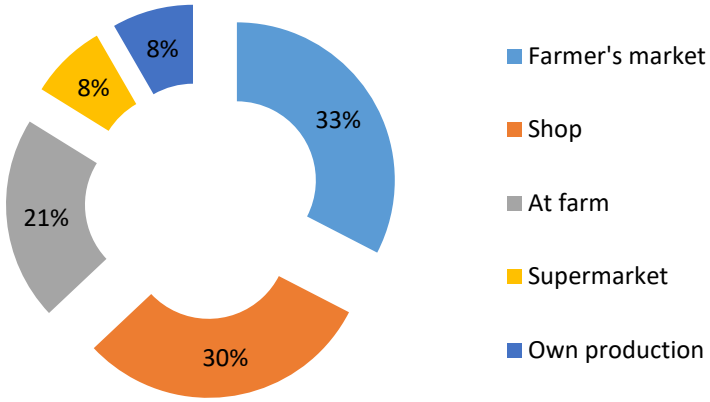
Product category	*Local products*
Fruits (8)	strawberries from Pincehely, melon from Szedres (4), strawberries from Szedres, strawberries from Acsád, walnuts (Nagy Ferencné), green pepper (Szabó Péter)
Vegetables (3)	green paprika (pepper) from Bogyiszló, green paprika (pepper) from Fadd, vegetables (Józsa Ádám)
Eggs	No mentions
Meats (14)	Czikk fish, meat (Téglás Bálint, Decs), Bezzeg puszta (smoked goods), meat (poultry) Stelcz, Heberling meat (2), meat from Kölesd, Lampek meat, Lange meat, meat from Nagydorog, Stelcz salami, Stelcz meat, Szilágyi meat, Zsikó Lajos meat from Bátaszék
Milk and dairy products (50)	Tolle cheese (11), Tolle milk (9), cheese from Németkér, Tolle dairy products (28), goat cheese (Balogh István)
Grain products (5)	flour by Mözsi malom (2), bakery products from Fábián bakery, Kaszpari bakery products, Istetits bakery products
Honey and sweets (25)	Koller honey (3), Petrits gingerbread (6), Nagy József honey, Vecsérnyés Irén jam, Völgység apiary: honey, chocolate from Szekszárd (7), Lengyel Péter honey (3), honey (Kékes Gábor), Szabó honey (2), Bors honey
Drinks (27)	Brill brandy (3), Brill juice, apple juice from Kölesd, GYÜMI (3), Kissler beer - Dombóvár (3). Sárosdi wine, Takler wine (3), Bodri wine, Mészáros wine, Dúzsi wine, Brew your mind beer, Vida wine (2), Szekszárd wine (6)
Others (5)	Solio oil (4), Decsi Hegy Delicacy

Approximately 11% of the designated 1237 local produces were specific products. However, it should be noted that Tolle products alone received 48 mentions (35% of all specific products). Tolnatej Zrt, which produces Tolle products, is a large regional company, so the mentions are still valid regardless of the fact that consumers often associate the concept of local produce with smaller-scale production. As shown in Table 26, in addition to milk and dairy products, special local products also included honey and sweets, as well as drinks. Meats also received a significant number of mentions.

Analysing local foods from Tolna county and Szekszárd according to sources of supply

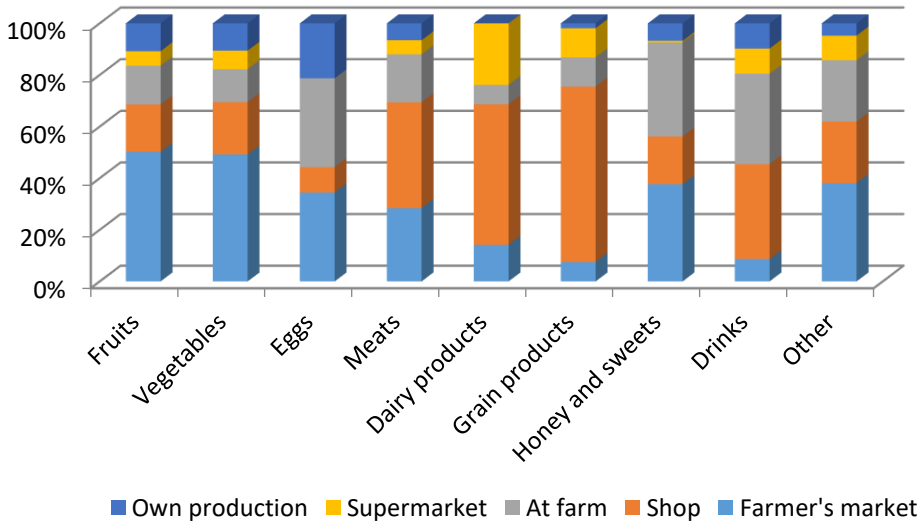
Below we examine what sources of supply respondents choose for their local food purchases from Tolna county and Szekszárd (Figure 65). Based on the sample obtained, purchasing from the farmers' market was the most common choice (33% of the cases). This was closely followed by shopping in a food shop (30%). Purchasing directly from the producer at the farm also showed a significant proportion (21%). Shopping in a supermarket and producing own food had the same proportion (8%).

Figure 65. The distribution of locally purchased produce from Szekszárd according to sources of supply



Following this, we analysed the changes in the sources of supply by food category. As shown in Figure 66, there was a clear relationship between the sources of supply (places of acquisition) and the type of food. Purchasing from farmers' markets was the most common choice in the case of fruits and vegetables, although eggs, honey and sweets also accounted for a significant proportion of this purchase channel. Shopping for milk, dairy products, and grain products was predominantly associated with the purchase in food shops. Purchasing directly from the producer at the farm was the most typical choice for eggs, drinks, honey and sweets. Shopping in a supermarket was relatively more significant for milk and dairy products, while own production was highest in the case of eggs.

Figure 66. The distribution of local produces according to food category



3.5.1. Analysing the relationship between product categories and sources of supply among the population of Szekszárd

An examination was then conducted regarding whether the conclusions from the sample, based on the analysis of product categories and sources of supply, may be applicable to the entire population, i.e. the citizens of Szekszárd. First, the analysis determined whether the population bought local products with the same frequency from each source of supply (shop, at farm, farmers' market, supermarket or own production) and how the individual product categories were distributed within local products.

To determine this, a *homogeneity test* for both observation variables (source of supply and product category) was performed. During the chi-square test, the hypothesis of uniform distribution for both variables (product category and source of supply) was rejected at a high confidence level (p-value was close to zero for each test). This means that the residents of Szekszárd do not randomly select the source of supply of local produces from Tolna County (and within Szekszárd), i.e. they have specific preferences for each food category. It can also be stated that regarding local products from Tolna County and Szekszárd, product categories do not show a uniform distribution, i.e. the proportion of certain product categories is higher or lower in case of local food acquisitions and purchases.

First of all, an examination looked into whether there might be any relationship between the product category and the source of supply. A causal analysis was considered important in both directions, as a different product category may be associated with a different source of supply. In addition, in the case of a given source of supply, the typically purchased product category may be different. As a result, symmetric association measures were also used to measure the strength of the relationship.

First, a Chi-Square test was conducted to determine whether there was a relationship between the product category of the local produce item and the sources of supply. In doing so, the independence of the variables was rejected at any significance level, i.e. the relationship could be established. Therefore, the source of supply (place of acquisition) is influenced by the type of product, i.e. the residents of Szekszárd typically buy other local produces (from Tolna County, and within this from Szekszárd) from the individual sources of supply (places of acquisition). The reliability of the findings may be underpinned by the fact that during the test of independence the expected frequency was below 5 in case of a relatively low (13.3%) combination of variable value-pairs. Secondly, the strength of the relationship between the type of the local products and the sources of supply was examined. Although the result of the test of independence was clear, for the sake of comparing current results with the findings of the previous survey (2011), products classified as "other" were excluded from further analysis. Regarding variables measured on a nominal scale, in both cases, we used Cramer's V association coefficient as a base measure, which showed a value of 0.269 as shown in Table 27. Based on this, it can be stated that in the case of local products from Tolna county (and within this from Szekszárd) a weak relationship can be established between the type of product and the source of supply (place of acquisition).

Table 27. The values of association measures

Association measures	*Value*
Cramer's V association coefficient	0.269
Theil's U uncertainty coefficient (dependent variable: product type)	0.076
Theil's U uncertainty coefficient (dependent variable: source of supply)	0.103

Based on Theil's U uncertainty coefficient, in the case of local produce items, there is likely to be a weak relationship between the product type and the source of supply. For example, product type perception seems to reduce uncertainty about the source of supply (place of acquisition) only by 10% for local products from Tolna County and Szekszárd.

As the product type and the source of supply are likely to be related, we further analysed whether specific sources of supply can be determined and significant differences identified among the residents of Szekszárd, for a given product type, using the frequency occurrence of the sources of supply for local produce.

To determine this, a pairwise comparison was performed using the sample prevalence rates of the sources of supply. For the sake of a multiple comparison, the Bonferroni-adjustment procedure was used in the analysis. The aim was to identify differences that can also be considered significant for the entire population, i.e. which may also be justified for all the residents of Szekszárd. Although the analysis revealed several significant differences, only the cases that seem to be the most suitable for practical considerations are presented.

Examining local products, the case of grain products purchased from a shop appears to be more common than all the other alternatives. In the case of drinks, the proportion of market purchase differs from the other options, typically downwards. In the case of fruits, purchasing from farmers' markets precedes purchasing directly at the farm and buying in a supermarket. In the case of honey and sweets, the proportion of supermarket purchases can be considered lower than buying the product in a shop, directly from a producer at the farm or producing it on one's own. In the case of eggs, the proportion of shop purchases is lower than that of the direct purchase at farm and own production.

3.5.2. Analysis of local products, 2011 vs 2019

Next to be examined includes the changes identified in the case of local products in Tolna county and in Szekszárd. In doing so, the data from the 2011 survey was compared with the 2019 questionnaire. The analysis focused on local products based on respondents' mentions.

While 287 residents of Szekszárd included in the sample listed a total of 654 pieces of local products (two or three pieces on average) in 2011, in 2019 a total of 250 respondents mentioned 1,237 local produce items from Tolna County including Szekszárd (five pieces on average). It can then be argued that the number of familiar local products has increased significantly. This, on one hand, can be due to an expansion of local products, whilst on the other, due to increased consumers' awareness.

The distribution of local products and its change was next examined. There seems to be a significant reduction in the share of milk and dairy products (the most frequently mentioned local produce category in 2011) from 31% to 11%. The proportion of fruits considerably increased (from 9% to 17%) gaining the first position in 2019. There was also a significant rise

in the proportion of meat products and vegetables (from 10% to 15% and from 13% to 19%, respectively), while the proportion of drinks decreased (from 18% to 14%).

Then the analysis examined the distribution of local products according to product types within each product category. Within fruits, the mentions of specific fruits showed a significant decline, the share of the previously most popular apple fell (from 25% to 8%), while the proportion of melon increased significantly (from 4 % to 11%).

In the case of vegetables, the general product category was more frequently mentioned (the proportion rose from 48% to 65%). The rate of mention of green pepper fell from 31% to 18%. The rate of mentions in the case of tomato, on the other hand, rose from zero to 7%.

In the case of meats, it can also be observed that respondents chose the general category rather than the product type (this proportion increased from 67% to 76%). The rate of mentions in the case of smoked goods decreased (from 22% to 15%), while that of fish slightly increased (by 2%).

In the case of dairy products, instead of a general mention of the category, the proportion of mentions of milk and cheese increased (from 32% to 44%). This was a significant change, indicating that by 2019 the previously higher mention of milk had already been surpassed by cheese, raising its share within the product category from 11% to 38 %. The rate of mentions in the case of eggs increased from 2% to 5%. The share of the general grain products increased (from 33% to 53%) at the expense of bread. The relative frequency of mentions in the case of flour showed only a slight change.

Within the category of honey and sweets, the proportion of honey increased significantly (from 49 to 73%), while that of sweets decreased drastically (from 51 to 15%). In 2019, jam was also mentioned with a significant 12%.

Within the category of drinks, the share of wines remained essentially unchanged (77% and 78%, respectively); the distribution of juice, syrup and brandy was similar to that of the previous survey. The proportion of local produce in ‘other’ categories was not significant in either of the years (around 1%).

Following this, we examined what specific local produce items from the Tolna county were mentioned by respondents, and their changes by product category were analysed. The number of *specific* produce items decreased significantly from 219 to 137. Their share of total local produce items fell even more drastically (from 33% to 11%). In the case of specific produce items, the proportion of Tolle products remained significant, although their number fell sharply (from 108 to 48). In addition to Tolle products, within their product category; honey and sweets received the highest proportion of specific product type mentions (52%) in 2011; by 2019 however, responses were more distributed among the other categories. Examining the distributions between product categories, it can be stated that the proportion of vegetables within the specific local produce items significantly higher in 2019, and the proportion of fruits, meats and drinks also increased, while the relative frequency of milk and dairy products decreased.

Investigating the distribution of local products by the source of supply (place of purchase) it can be determined that from 2011 to 2019 there was a significant change in the ratio of in-store and market purchases. The share of market purchases increased significantly (from 19% to 33%), mainly at the expense of in-store shopping (down from 51% to 31%). The share of purchasing in a supermarket, directly at the farm and own production increased slightly.

The change in the place of purchase was also examined. Here, no significant change was detected in most categories (fruits, vegetables, milk and dairy products, honey and sweets,

drinks). For eggs, however, the share of market purchases declined, while purchasing directly at farms increased. The variety of sources of supply for grain products increased. Market purchases of meat became more common, while for the other categories, the rate of purchases at farms decreased.

Subsequently, an examination identified whether any significant changes may be determined from the characteristics of the entire population (the residents of Szekszárd) based on the previous surveys analysing the types of local produce and sources of supply.

Based on the homogeneity test performed for the observation variables (source of supply and product type), it can be stated that in both periods of research, the residents of Szekszárd did not randomly select the place of acquisition when purchasing local produce either from Tolna County or Szekszárd, i.e. they have specific preferences for where they purchase their local goods. This means that no changes were identified in this aspect.

We also examined whether there was a link between the type of product (product category) and the place of acquisition. In the case of the test of independence the independence of the variables was rejected both for 2011 and 2019 (at any level of significance), i.e. the place of acquisition is determined by the product type, and different local produce items (from Tolna county or Szekszárd) are purchased at a specific place of acquisition by the residents of Szekszárd. While in the case of the 2011 survey, the fulfillment of the assumptions for conducting a test of independence test was questionable, in 2019 this problem no longer existed.

As the relationship between the local product type and the place of acquisition could be established for both years, the change in its strength was also examined. In 2019, the value of the Cramer's V association coefficient (which was used to measure the change in strength) found it had decreased significantly, i.e. the strength of the relationship between the two variables weakened. The same trend was indicated by the change in the value of the Theil's U uncertainty measure in both directions (from 0.298 to 0.076 and 0.205 to 0.103, respectively).

Since the relationship between the place of acquisition and the type of product was probable for both years, further analysis identified whether any changes in specific places of acquisition could be found for a given product type, i.e. whether significant differences could be identified in the occurrence of the places of acquisition of local produces for the population of Szekszárd. For pairwise comparisons, the results obtained with the Bonferroni correction method indicated the most important similarities and differences are highlighted for the two periods.

In the case of drinks, market purchases were less common in 2011 compared to all other sources of supply - this can also be stated for 2019. For eggs, market purchasing is still more common than in-store purchase. For fruits, market purchasing continues to precede direct purchase at the farm and shopping in a supermarket.

Both in 2011 and 2019, the purchase of grain products in-store was more common than market purchasing. In the case of dairy products, however, in-store purchases no longer preceded own production, market purchasing and purchases at farm. One change occurring by 2019 in the case of honey and sweets, includes how the proportion of purchases in supermarkets was lower than in-store purchases, purchases at farm and own production. In the case of vegetables, market purchasing showed a higher frequency than in-store purchase and purchasing at farms.

3.6. Perception and recognition of food trade marks

As a next step, an analysis was conducted concerning the extent to which respondents were familiar with food trade marks and how aware they were of the difference between a brand name and a trademark. Special focus was given to testing the perception of the "Quality local

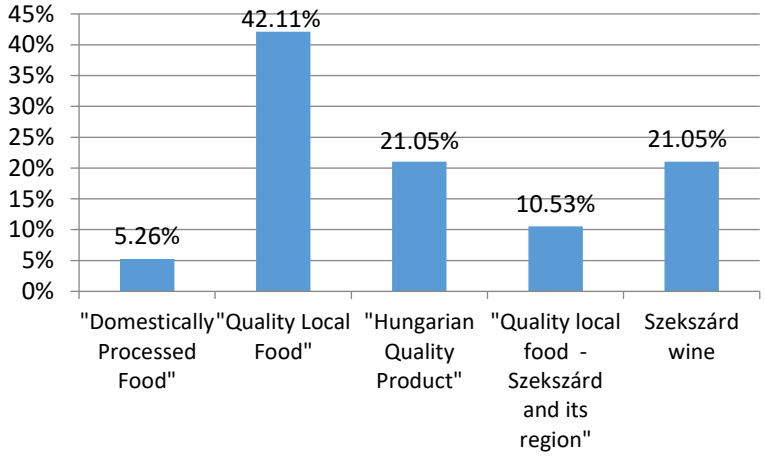
food - Szekszárd and its region" certification mark, registered and introduced to local consumers by Eco-Sensus Nonprofit Kft. within the framework of a wide-ranging marketing campaign in 2012.

3.6.1. Perception of local food trade marks

In the course of the investigation, one aim sought to identify what local food brands respondents were familiar with, how aware they were of the concept of a trademark, and whether they confused it with other concepts. Conclusions are drawn from the sample which are applicable to the entire population of Szekszárd.

Next to be investigated included which local food trademarks respondents were familiar with. Respondents could give their responses freely; and were not offered options. 250 respondents gave a total of 64 answers, the majority typically gave none, but there some mentioned more than one. Overall, approximately a quarter of those surveyed answered this question. Out of the 64 responses, 19 were correct, i.e. in nearly 70% of cases, respondents showed a misinterpretation the concept of a trademark. The distribution of correct responses is shown in Figure 67.

Figure 67. The distribution of local food marks



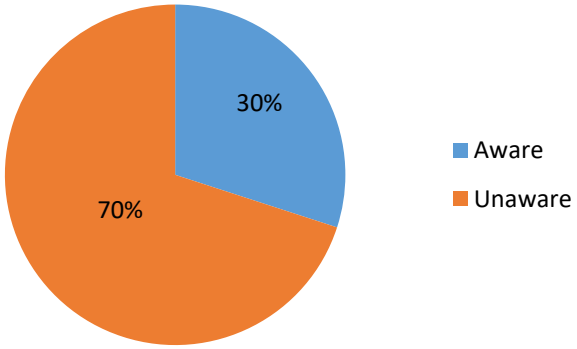
As shown in the figure above, in roughly half of the cases the “Quality Local Food” mark was present among the correct answers. Within this, the certification mark “Quality local food - Szekszárd and its region” was specifically mentioned in every fifth case. The “Hungarian Quality Product” mark and Szekszárd wine accounted for roughly 20% of the answers. The “Domestically Processed Product” mark made up 5% of the correct answers.

The wrong answers mainly resulted from the fact that instead of a trademark, respondents gave a specific local product (brand name). The most common here was Tolle cheese and Petrits gingerbread.

3.6.2. Perception of the "Quality local food – Szekszárd and its region " certification mark

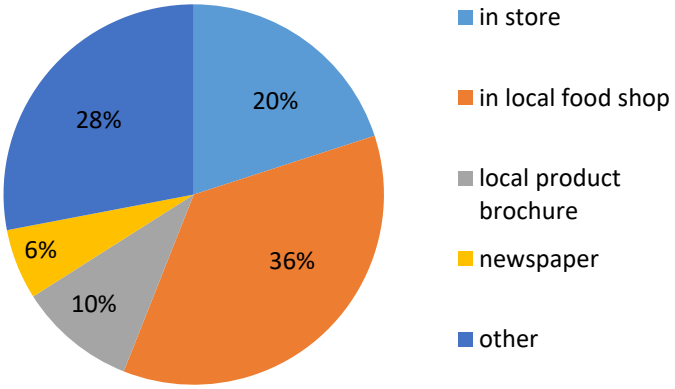
The perception of the Eco-Sensus "Quality Local Food - Szekszárd and its region" certification mark was examined. Here, 30% of the 250 respondents stated that they knew the trademark, i.e. 70% were not aware of it at all (see Figure 68).

Figure 68. Perception of "Quality Local Food - Szekszárd and its region" certification mark



The channels in which consumers learned about the trademark were then analysed; only considering the information given for the correct answers. In our case, respondents gave a total of 50 answers to this question; the answer's distribution is shown in Figure 69.

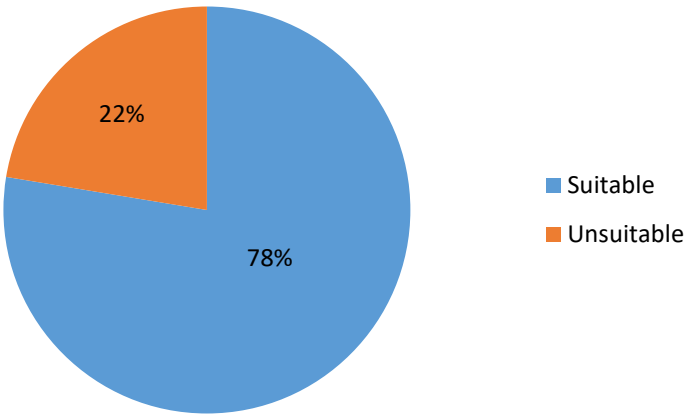
Figure 69. Where did you hear about the "Quality local food – Szekszárd and its region" certification mark?



In more than half of the cases, respondents heard of the trademark in one of the stores, particularly at the local food shop (this accounted for more than a third of all answers). Educational booklets (local product brochures) and newspapers were mentioned in 10% and 6% of the cases, respectively. Responses in the "other" category (28% of the responses) included in the market, on the Internet, on the packaging. etc., but none of them had a significant proportion.

We then asked whether the trademark was suitable to symbolise local products. Here, the vast majority of respondents (77.6%) considered the design of the mark appropriate which is shown in Figure 70.

Figure 70. Is the trademark suitable to symbolise local products?



Those who disagreed primarily objected to the fact that the figure was too general (did not show a local characteristic appropriately), or too simple (not eye-catching enough).

3.6.3. Perception of local food marks among the residents of Szekszárd

Next the analysis examined whether the previous findings, based on the food mark perception of the sampled households, may be referred to the entire population of Szekszárd and, if so, in what ways.

To do this, research was conducted regarding the reputation of the "Quality local food - Szekszárd and its region" certification mark in the sample. As previously mentioned, only 30% of respondents indicated their familiarity with the trademark. Using this value as a point estimate, an interval estimation was performed for the population ratio at a 95% confidence level. This resulted in a lower limit of 24% and an upper limit of 36%. As a result, it can be stated that with 95% reliability, the proportion of the residents of Szekszárd who know the trademark ranges between 24% and 36%.

Following this, the intention was to investigate whether it could be stated that the majority of consumers are familiar with the trademark, for the entire population of Szekszárd. To determine this, a hypothesis test was performed where an alternative hypothesis may be formulated as H_a: $p > 0.5$, where p is the value of the population ratio. Based on the assumptions of previous findings at a significance level of 5% the null hypothesis was accepted and the p-value was practically zero. In this sense, it can be stated that at virtually any significance level, the majority of the population of Szekszárd is not familiar with the Eco-Sensus "Quality Local Food - Szekszárd and its region" certification mark.

The proportion of the population of Szekszárd who considered the trademark to be suitable for symbolising local produces was next examined. Using a similar methodology, it can be concluded that with 95% reliability, the proportion of those who consider the mark to be acceptable ranges between 73% and 83%. For any level of significance, it can therefore be stated that the trademark is considered by the majority of the population of Szekszárd to be suitable for symbolizing local produces.

3.7. Explanatory factors influencing local food preferences

After exploring local food preferences, respondents' socio-economic and demographic characteristics were analysed to identify the impact they have on food purchase habits and, should there be any relationship identified, how it may be characterised. In terms of the demographic characteristics, the focus was on respondents' gender and age. Regarding socio-economic background, the highest level of education achieved, and net income of the household, were considered the independent variables. Then the analysis was carried out for each of the ten variables used to describe food purchase preferences, which were considered the dependent variables. Thus, in the course of the relationship analysis, it was assumed that an asymmetric relationship existed between the variables.

In each case, it was first tested (primarily with the help of a chi-square test) whether a significant relationship could be established between the two variables. During the analysis an extremely low alpha was used, = 1% significance level, to reveal the correlations indicating a stronger relationship. If a relationship could be established, the aim was to characterize the strength of the relationship with the help of association measures that could be adjusted to the measurement level of the variables. In doing so, a separate examination occurred for those significant coefficients which demonstrated a strong relationship. In each case, it was attempted to highlight the conclusions from the relationships between the variables from a practical point of view.

3.7.1. Effect of demographic characteristics on food purchase preferences

With respect to the demographic characteristics, focus was given to respondents' gender and age. First to be examined was whether food purchase preferences might be affected by respondents' gender and, if so, how. As a first step, significant pairs of variables were identified using a test of independence. Subsequently, the strength and direction of the relationship was then determined using Phi and Cramer's V coefficients. As can be seen in Table 28, there was a significant relationship between respondents' gender and their view on the importance of product information by the label. Based on the value of the association measures, a weak positive relationship is likely to exist, not only in the sample, but for the entire population of Szekszárd. In our case this means that males tend to attach more importance to product information on the label, i.e. they pay more attention to the information based on the label when making their food purchase decisions.

Table 28. Significant relationships of the variable "gender"

Explanatory variable	*Dependent variable*	*Measure*	*Value of measure*	*p-value*
Gender (male/female)	*Importance of product information by label*	Phi	0.219	0.007
		Cramer's V	0.219	0.007

The analysis then investigated the impact of respondents' age on their food purchase preferences. Age was measured on a ratio scale using the questionnaire which required an initial transformation of the ratio measurements into an ordinal-scale variable. This may explain why age showed a significant dispersion, and due to the ordinal nature of the dependent variable, too many value pairs could have been created which may cause bias in the results of the test of independence. Therefore, it can be assumed that the loss of information may be offset by an

increasing reliability of the results. Kendall's tau (c) was used to measure the relationship strength, since the variables were measured on ordinal scale and an asymmetric relationship.

Table 29. Significant relationships of the variable "age"

Explanatory variable	*Dependent variable*	*Measure*	*Value of measure*	*p-value*
Age	*Cheap food*	Kendall's tau(c)	-0.206	0.002
		Gamma	-0.271	
	Best quality	Kendall's tau(c)	-0.115	0.000
		Gamma	-0.19	
	Premium for local produce	Kendall's tau(c)	0.091	0.000
		Gamma	0.124	

As shown in Table 29, respondents' age influenced the importance of aspects related to cheap food, best quality and premium for local produces. In each case, a weak relationship was found between age and the three decision factors mentioned. For the first two variables, a negative relationship could be measured, which means that as people get older, they consider the price of the product (cheapness) to be increasingly important; at the same time, they also check product quality. In contrast, young people consider cheapness and product quality to be less important, i.e. they make less conscious decisions. The weak positive relationship between age and higher price for local produce suggests that older buyers are less willing to take on extra costs for local products.

3.7.2. Effects of socio-economic characteristics on food purchase preferences

Following the demographic factors, the analysis examined how respondents' socio-economic backgrounds might impact food purchase preferences. In doing so, focus was placed on respondents' highest level of education and the total net income of the household as a potential explanatory variables. In the survey, the level of education and income were measured on an ordinal scale. Decision factors for food purchases were applied as the dependent variables, thus Kendall's tau (c) and gamma coefficient were used to measure the relationship(s). As shown in Table 30, the level of education presents a significant relationship with three decision factors: cheap food, special offers, and premium for local products. In the first case, there was a positive relationship of medium strength, i.e. respondents with a higher level of education regarded the cheapness of products as less important for their decisions. A similar relationship was found for special offers. In this sense, respondents with a higher level of education were less attracted by special offers and discounts. This is very likely to be associated with a higher income. The third significant relationship was found between the level of education and premium for local products. A weak, negative relationship was detected here. In this sense, in general, more educated customers are willing to pay a higher price for local produce.

Table 30. Significant relationships of the variable "education level"

Explanatory variable	*Dependent variable*	*Measure*	*Value of measure*	*p-value*
Education level	*Cheap food*	Kendall's tau(c)	0.322.	0.000
		Gamma	0.508	
	Special offers	Kendall's tau(c)	0.288	0.000
		Gamma	0.321	
	Premium for local produces	Kendall's tau(c)	-0.207	0.000
		Gamma	-0.339	

Next to be examined was the effect of income on food purchase preferences (Table 31). Identification of four significant relationships was enabled for this variable. It was found that a moderately strong, positive relationship existed between income and the cheapness of food. As a result, higher income groups consider the price of food less important.

Table 31. Significant relationships of variable "income"

Explanatory variable	*Dependent variable*	*Measure*	*Value of measure*	*p-value*
Income	*Fresh produce purchase*	Kendall's tau(c)	-0.129	0.01
		Gamma	-0.181	
	Cheap food	Kendall's tau(c)	0.319	0.000
		Gamma	0.425	
	Special offers	Kendall's tau(c)	0.248	0.000
		Gamma	0.341	
	Premium for local produces	Kendall's tau(c)	-0.247	0.000
		Gamma	-0.345	

Moreover, there was a weak, positive relationship between income and special offers. In this sense, higher-income households pay less attention and are less sensitive to special offers. A weak, negative relationship was measured between income and the importance of fresh produce purchases, as well as a higher price to be paid for local products. Thus, families with lower incomes seem to be satisfied with less-fresh produce, or they may not intend to pay a higher price for local produce.

To summarise, it can be established that, of the 10 decision variables describing food purchase habits, respondents' education level and income showed a relationship with three variables (of similar strength and direction). This may be explained by the fact that a higher level of education is usually coupled with a higher income. To test this, an independence test was performed on the two variables where we marked income as a dependent variable. During the test, the

independence of education and income was rejected at virtually all significance levels (p-value was 0). In addition, Kendall's tau (c) (= 0.408) and gamma index values (= 0.616) also indicated a moderately strong relationship between the two variables. As a higher level of education usually leads to a higher income, the preliminary hypothesis was accepted.

3.7.3. Temporal changes in factors affecting local food preferences (2011-2019)

The next step involved observing what temporal changes can be associated with local food purchases, and the socio-economic and demographic conditions affecting them. Among the demographic characteristics, respondents' gender and age were used as a basis. Based on the two surveys, it was argued that respondents' gender does not explain any food purchase preferences along the examined dimensions. The only exception was the variable "product information by label" and the relationship with the male gender, but this was only based on the 2019 sample. Here, a weak relationship could be identified, which meant that males tended to attach slightly more importance to product information by label, i.e. they considered the information obtained in this way to be slightly more important for their food purchase decisions than women.

Following this, the relationship between respondents' age and their food purchase preferences was analysed, and the change between the two different research time periods. In contrast to gender, age showed a relationship with the shopping habits in both time periods, albeit a weak one. While in 2011, older shoppers gave a higher preference to the freshness of food than young people, by 2019, cheap price and the importance of higher quality showed a similar difference according to age. However, younger people were more willing to pay a premium for local produce.

Following the demographic factors, the examination considered the relationship between respondents' socio-economic situation and their food purchase preferences, as well as its change over time. Among the possible explanatory variables, education level showed a significant relationship with the same three decision factors both in 2019 and 2011: the cheapness of food, the importance of special offers and premium for local produce. There was a weak positive relationship between the importance of special offers and the preferences, i.e. respondents with a higher level of education regarded cheap price as less important. There was a further weak negative relationship between education level and the higher price paid for local products: consumers with a higher level of education were willing to pay a higher price for local products. Education levels in 2019 also affected the importance of cheap food, although when compared to 2011, a medium strength relationship – rather than weak – was detected in 2019 .

Subsequently, the investigation considered the effect of income on food purchase preferences and its change over the research time periods. For this variable, two relationships were identified that were significant in both time periods. First, a weak positive relationship between income and special offers was present both in 2011 and 2019. Secondly, there was a weak, negative relationship between income and a higher price for the local produce in both time periods. However, two additional dimensions 'the importance of fresh food' and 'price' (cheapness) were identified in 2019 to signify the relationship between households' income and their food purchase preferences.

In conclusion, it can be established that respondents' education level and income showed a significant relationship with two of the 10 decision variables describing food purchase habits in 2011, and three in 2019. This was also confirmed by a test of independence, since a positive relationship of average strength between respondents' educational and income levels was identified in both 2011 and 2019.

3.8. Producers interviews

Besides the examination of consumers' perceptions, 30 local producers were interviewed in relation to the tendencies of local food production in the Szekszárd local food system. The sampled included local quality mark users and non-users proportionally, to gain a real picture of the local supply side. The producers' profile in the sample reflects the real composition of the producers in the Szekszárd area (Figure 71 and 72), but simple arable farmers were excluded. Although most of the arable land of the region is cultivated by arable farmers, this category was excluded because they sell to wholesalers rather than to local farmers' markets.

Figure 71. Distribution of interviewed producers by settlement (place of production).

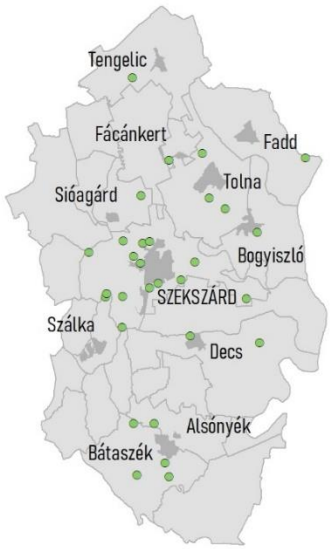
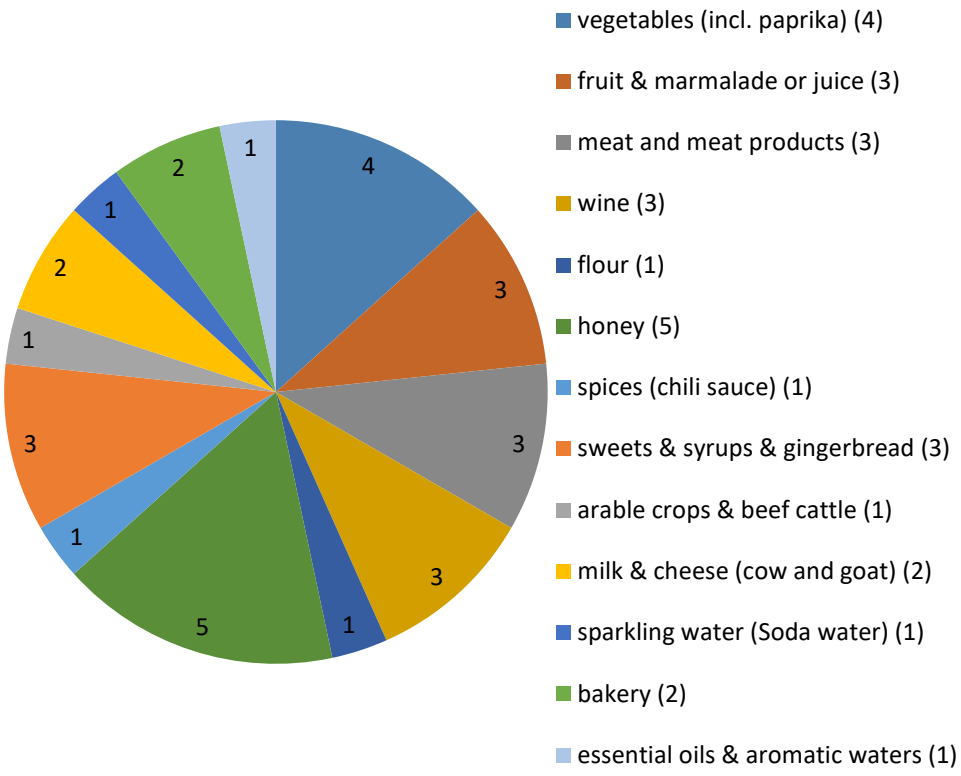


Figure 72. Profile of the sampled 30 producers



Out of the 30 producers interviewed, 11 agreed to share pictures with permission to publish (Figure 73):

Figure 73. Photos of the interviewed producers, Szekszárd region



The average length of local farming experience is about 15 years, with individual numbers varying between 1 and 41 years. This reflects an experienced and knowledge-based producer group. Among motivation factors, "family tradition" and "I like to do it" were most often mentioned, while profitability was never mentioned. These findings show the persistent attitude, and strong commitment, of local producers to maintain production, although generational change is becoming more challenging and several families did not have new generations of farmers to continue the activity.

The producers interviewed are more active in marketing than expected: roughly one third of the producers have their own label (linked to the family name of the producer, e.g. Petrits gingerbread, Daniel Szekszárd wine, Neiner Szekszárd wine, Gerencsér Szekszárd wine, Stelcz meat products, Lampek meat etc., or a fantasy name, like Völgy honey, Janchili spices, Decsi Hegyi Finomságok marmalade etc.) and about 40% of the producers have an online presence, both through personal websites[4] or social media pages. This represents a high proportion,

[4] Among the interviewees: danielpince.hu; decsihegy.hu; neinerpince.hu; mezeskalacs.hu; volgymeheszet.hu; neiner.hu; stelcz.hu; nektarfarm.hu; www.janchili.com;

considering that several interviewees produce basic products, like fruits or vegetables, where sales activity is characterised by traditional channels.

A small proportion of the producers focus on a single product (like wine or honey), while the majority produce a range of products, including the processing of the base-product (e.g. fruit and marmalade or juice production, vegetable and canned vegetables, own arable crops fed to the cattle, etc.). This is an effective integration, where producers use their knowledge and resources to diversify their production and produce added value products such as jams or juices.

Further potential channels to diversify economic activities are local tourism (e.g. wine production combined with accommodation services and catering), the sale of surplus machinery services, and home deliveries of products.

In terms of local production, the interviewed producers mentioned the following problems:

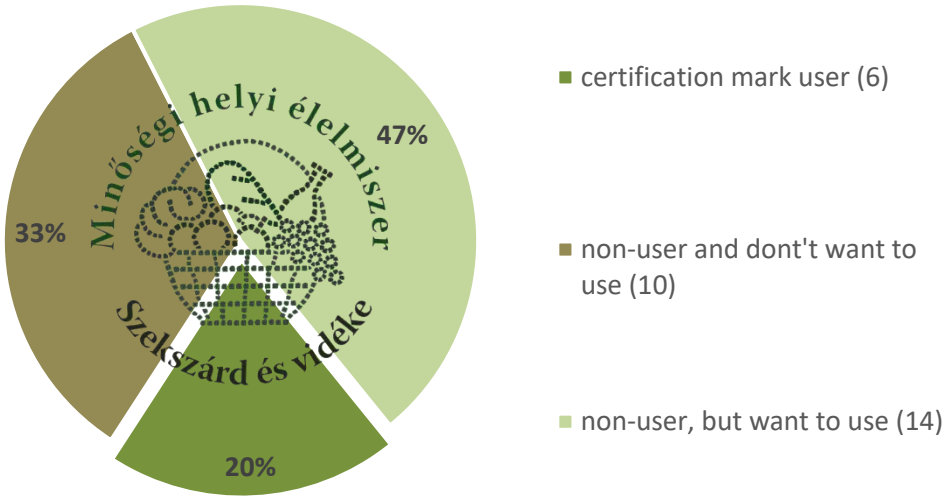
- Lack of agricultural labour force (primarily in the labour-intensive fruit and vegetable production);

- Lack of support from the municipality of Szekszárd, which results in poor management of the local farmers' market (short opening period, availability problems, non-preference of local farmers).

- Price-sensitivity of local consumers, which hampers demand for quality local products.

Producers' attitudes towards local quality food labels are demonstrated in Figure 74.

Figure 74. Producer attitude towards local quality food label



Producers' attitude towards quality food labels in general is skeptic, because of the redundancy of diverse labels in the last 20 years. Different organisations introduced several labels with different concepts in many respects (geographical designation, standards, offered services for label users etc.). There has been a massive lack of compliance and respect between the operators of the different labels. We also have experienced that our registered producers were visited by other organisations with other labels and this has weakened the effectiveness of our label and the trust towards it. The reason of this phenomenon is primarily the lack of control in the granting system: there has been diverse granting schemes for support of local and regional quality labels and marks, but the institutions have not controlled the content of the applications and that ended in a confusion of different label systems existing simultaneously. This confusion

caused a distrust for labels among the producers. A further issue is the nature of local politics, which prefer to use the trendy theme of local food system, continuously eroding the trust towards such local systems. A key strategy to cope with these challenges is to adopt long-term promotional activites in order to create stable awareness and trust in labels. From this perspective, Eco-Sensus has several years of experience. However, this approach might result challenging for other organisations or producers, as there are no subsidies which cover long periods of 5 or 10 years. A shift in the granting policy would be helpful to handle this issue. This characteristic, as a lesson, was also passed on to the Serbian colleagues of Arilje.

The existing quality food label of Eco-Sensus suffers also from the general condition of the label 'market': 20 per cent of the producers is a “passive” label user, namely producers have the accreditation but don’t actively use it on packaging or for marketing and promotional purposes. Conversely, 50 per cent of producers state to have positive attitude towards the label and would be willing to use it. However, in order to move a producer from the "I like it and I would use it' category to the 'I'm an active user' category large efforts from the label operator are needed.

We can conclude that more than half of the local producers are potential users of the local food label, which is a very fair proportion, but we (Eco-Sensus) are lacking the human and financial capacities to maintain a long term promotional activity. The current neutral or rather positive picture of the attitude towards labels is due to the very intense promotional activity of Eco-Sensus in the past, made in local and county level targeting both consumers and producers, between 2010 and 2015.

3.9. Verification of the Szekszárd consumer's evaluation toolkit in Serbia

3.9.1. Background information

The research conducted in the city of Szekszárd (task 9.5.3) identified several notable conclusions which were tested in Serbia. The findings of the consumer evaluation highlighted the need for examining both *consumers’ preferences* toward local products and *points of sales* of local products. In other words, the research emphasised the need to take into account both the demand and supply sides when assessing the potential for improvement of local product sales. It should be noted that the study undertaken in Serbia also builds on the findings of the pilot action 9.2, thus combining lessons learnt from two compatible projects conducted in Central Europe (Hungary, Croatia, Slovenia and Serbia) and allowing for drawn measures to be applied by domestic actors in the local food supply chain.

The research was conducted in Belgrade (capital of Serbia) at the beginning of March of 2020, following the Hungarian research and adopting its evaluation toolkit. Belgrade was selected for this testing due to the fact that a quarter of the national population is situated in the capital, making it the most valuable marketplace for all kinds of products in the country. Overall, seven different municipalities (varying in their demographic, social and economic profiles) were included in this survey.

The research instrument is two questionnaires developed within task 9.2, which have been verified and applied in the Serbian market in 2018. The first questionnaire includes questions on consumers’ attitudes, subjective norms and purchase intention towards buying local food. In total, 38 respondents participated in this research. The second questionnaire investigated consumers’ assessment of the specific retailer, based on their perception of the retailer’s

dedication to the support of local producers and the sale of local products in their facilities. Overall, 134 consumers participated in the survey.

Two different retailers, the biggest in Serbia, were chosen for the subject survey. The testing for the pilot action was conducted for 9.2 in four IDEA retailer shops (sister company of Konzum and part of Agrokor group) in Belgrade, in 2018. On the same occasion, a short promotional campaign for local products was running at their points of sales. Regarding the second retailer, Maxi was chosen to have an intensive campaign conducted for the promotion of their local suppliers of fruits and vegetables over several years. Some examples of various promotional materials on their points of sale are presented in Figure 75 and 76.

Each of the pictures reported in Figure 75 depicts:

1. Producers (their personal picture and their name and surname);
2. Types of vegetables and fruits they produce (picture and name);
3. Name of the village where it is produced (presented in the map of Serbia in the bottom left corner).

Figure 75. Points of sale creative solutions

Watermelons and melons

Onions, radishes and greens

Lettuce

Cherry tomatoes

<table>
<tr>
<td> 

Carrot (PDO protected)</td>
<td> 

Chilli peppers</td>
</tr>
<tr>
<td> 

Apples, plums and cabbage</td>
<td> 

Chard, onions, radishes and greens</td>
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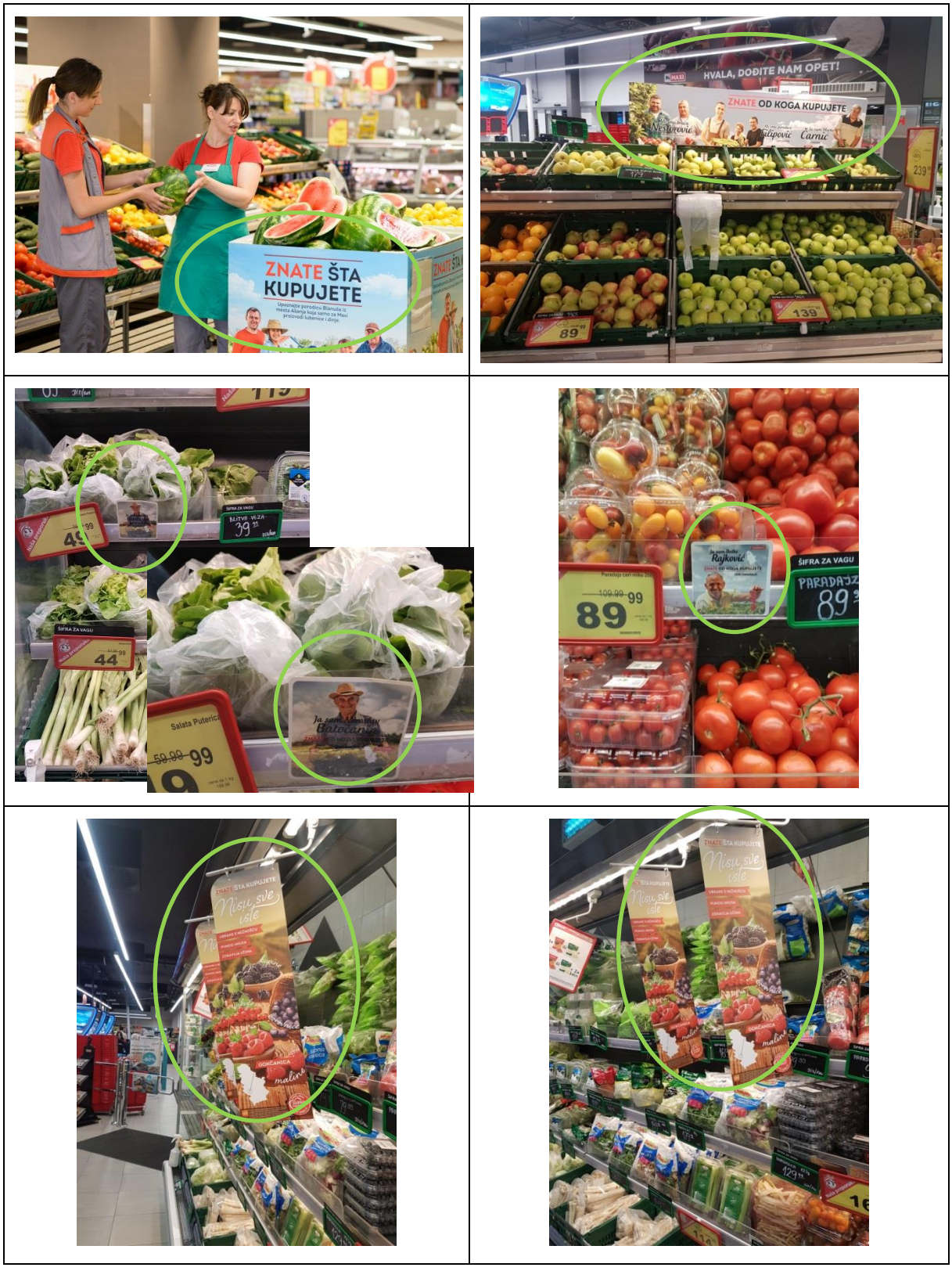
<tr>
<td> 

Berries</td>
<td>The opposite picture is the only different creative solution, featuring raspberries and blueberries in the front and blackberries and currants in the back of the picture. All of them are mostly produced in the South-Western part of Serbia.

While other posters featured the message “You know who you are buying from”, this picture presented the message “They are not all the same”.</td>
</tr>
</table>

In Figure 76 it is possible to observe the point of sale positioning of the promotional materials of the campaign “You know who you are buying from”. Promotional banners are mostly located next to the products they promote (e.g. lettuce, cherry tomatoes, blueberries), while the bigger POS materials are located over fruit/vegetable departments (circled in light green).

Figure 76. Points of sale placement of promotional materials



3.9.2. Analysis of the results

Local/Non-local preferences

All questions in the survey, besides the ones that pertain to socio-demographic characteristics, employed 7-points Likert scales, ranging from 1 – I completely disagree to 7 – I completely agree. Grade 4 indicated that the respondent is indecisive and cannot tell if he/she agrees or not (neutral attitude). Utilizing a list of 36 statements, consumers assessed their attitudes in eight domains: attitudes towards the purchase of local food, caring for the local economy, health awareness, food for enjoyment, food as a need, control over behaviour, subjective norms and intentions to buy. Following protocol for data analysis established by ECO-SENSUS team, the results are provided in Table 32.

Table 32. Measures of association between attitudes and consumers demographic and social attributes (Cramer's V and Gamma)

Attitudes	Gender	Age	No. of children in hh	No. of people in hh	Income
Attitudes and engagement in the purchase of local food					
Local better than non-local food	X	0.401**	X	X	-0.240*
If local and non-local have the same price, I choose local	X	X	X	X	X
Regardless of price, I always choose local food	X	X	X	X	X
Before I buy, I check if the fruit is local	X	0.438***	X	-0.365**	X
Before I buy, I check if the food is local	X	0.468**	X	-0.407**	X
I know a lot about local food	X	0.395**	X	-0.339**	X
I believe that loc and non-loc food significantly differ	X	X	X	X	X
Before I buy local food, I know exactly what I want	X	0.253*	X	-0.338*	X
Caring about local economy					
Buying local food supports local economy	0.509*	X	X	X	X
Buying local food supports local agriculture	0.456*	X	X	X	X
Buying local food supports my community	0.599**	X	X	X	X
Health awareness					
I think a lot about my health	X	0.460**	-0.381**	-0.371**	-0.283**
I am very conscious of my health	X	0.530***	-0.353**	-0.383**	-0.238*
I monitor changes of my health status	X	X	-0.416**	-0.386**	-0.365**
I am usually aware of my health	0.517*	X	-0.384**	-0.436**	-0.390**
I am responsible about my health	X	0.342**	X	X	-0.368**
I think about my health all day long	X	X	X	-0.411**	-0.367**
Food as enjoyment					

Attitudes	Gender	Age	No. of children in hh	No. of people in hh	Income
Everything related to food it's very important to me	X	X	X	X	X
Tasty food is an important aspect of the weekend for me	X	X	X	X	X
Food is the highlight of my day	X	-0.401**	X	X	X
I like to consume really tasty food	X	-0.462**	X	X	X
Food as need					
I don't care what I eat as long as I'm not hungry	X	X	X	X	-0.318**
I don't care how it is produced the food I eat	X	X	0.385**	X	X
I don't care what kind of food is served on feasts	0.517*	X	X	X	X
I don't need information on new food	X	X	X	X	X
Perceived behaviour control					
Purchase of local food is an easy activity for me	X	X	X	X	X
Whenever I want I can buy LOC instead non-LOC food	0.564**	X	X	X	X
Subjective norms					
Most people who are important to me think that I should buy local instead of non-local food whenever it is possible	X	X	X	X	-0.291**
If local food is available, most people I appreciate would rather buy it instead of non-local food	0.539**	X	-0.425**	X	X
Intention to buy					
I will buy local food in the near future	0.481*	X	-0.352**	X	X
I plan to buy local food regularly	X	X	X	X	X
I intend to buy local food because of the long-term health benefits	X	0.285*	X	X	X
I intend to buy local food because it is safer	0.484*	X	X	X	X
I intend to buy local food because it is better for the environment	X	X	X	X	X
I intend to buy local food because I care about animal welfare	X	0.343**	X	X	-0.283*

Note: * - signifies that it is significant at 0.100 level, ** - at 0.050 level, *** - at 0.001 level

Drawing conclusions from the results presented in Table 32, it can be seen that the consumer's gender, household income and the number of children in the household do not present significant differences in individuals' attitudes and engagement towards the purchase of local food. Consumers of older ages and households with lower income prefer local food more than non-local food, compared to their younger or richer counterparts. The role of age and its strong inclination towards local food is consistently demonstrated in all statements. On the other hand, it appears that larger households are less ready to actively engage in the purchase of local food. Interestingly enough, price does not play an important role in consumer's intention to buy local or non-local food. The only variation in the dimension of "caring about the local economy" was

found regarding the respondent's gender – females appeared to care more about the local community than males.

Unsurprisingly, the personal characteristics of the survey participants are major determinants in their health awareness. Females and older citizens give more attention to the impact of food upon their health status than males, and the younger population. Conversely, households with higher earnings and of larger size (including the higher number of children) are less concerned about their health condition. This might be due to their easier access to medical help or less time available to dedicate to the monitoring of the individual's health state.

Furthermore, it appears that older respondents link food with enjoyment less so than younger respondents. Males consider the quality of food offered at celebrations more than females, while the opposite is true in their perceived access to local food. Findings on the correlations between subjective norms and purchase of local food echo and confirm the previously described consumers' attitudes according to their personal characteristics.

Future Intentions to buy local food revealed no new information related to respondents' attributes. Women, more than men, are more prone to purchasing local food in the near future, and consider it to be safer than non-local products. Older consumers recognise the long-term beneficial effects of local food on their health. They also perceive better animal welfare in the production of local food. Finally, more children present in the household appears to decrease the chances that that family will buy local food in the near future.

Maxi/IDEA retailers' perceptions

The Szekszárd study clearly indicated the importance of time in the examination of consumers' preferences towards local food. Changes can be ascertained in their knowledge, attitudes and consumption over the course of time, due to various market interventions implemented throughout the time-span of this research. As previously stated, the research was conducted among consumers of two retailing chains – IDEA (where the short-term promotion of local food was undertaken in 2017) and Maxi (where a continuous promotional campaign of local food has been ongoing since 2017). In both cases, promotional campaigns occurred in their shops in Belgrade.

The study was performed in seven municipalities of Belgrade, including 134 respondents. The survey was organized as an intercept interview, where consumers were stopped upon their exit from the particular supermarket and asked to be interviewed. One work and one weekend day were both selected for conducting the interviews, in order to ensure diversity of consumer groups.

The findings of task 9.2 demonstrated that exposure of consumers to the promotional materials of local food fosters the sale of these products, probably by increasing the consumers' awareness of local food in the short run. This study tests whether continuous exhibition of promotional materials at these points of sale affects consumers' attitudes towards local food consumption.

The first stage of the analysis aimed to establish whether there are significant differences between consumers of these two shops, in terms of their demographic (gender, age), social (number of people and number of children in the household) and economic (income level) characteristics. For that purpose, One way ANOVA was performed (df=1) and the test showed no statistically significant variations between shoppers of the two subject retailers. In the next phase, a One way ANOVA was conducted to establish differences in attitudes towards the retailer based on consumers' perceptions on specific aspects of the interrelation between that

retailer and their local food offer. Out of 19 investigated statements, 5 proved to be statistically relevant and their results are displayed in Table 33.

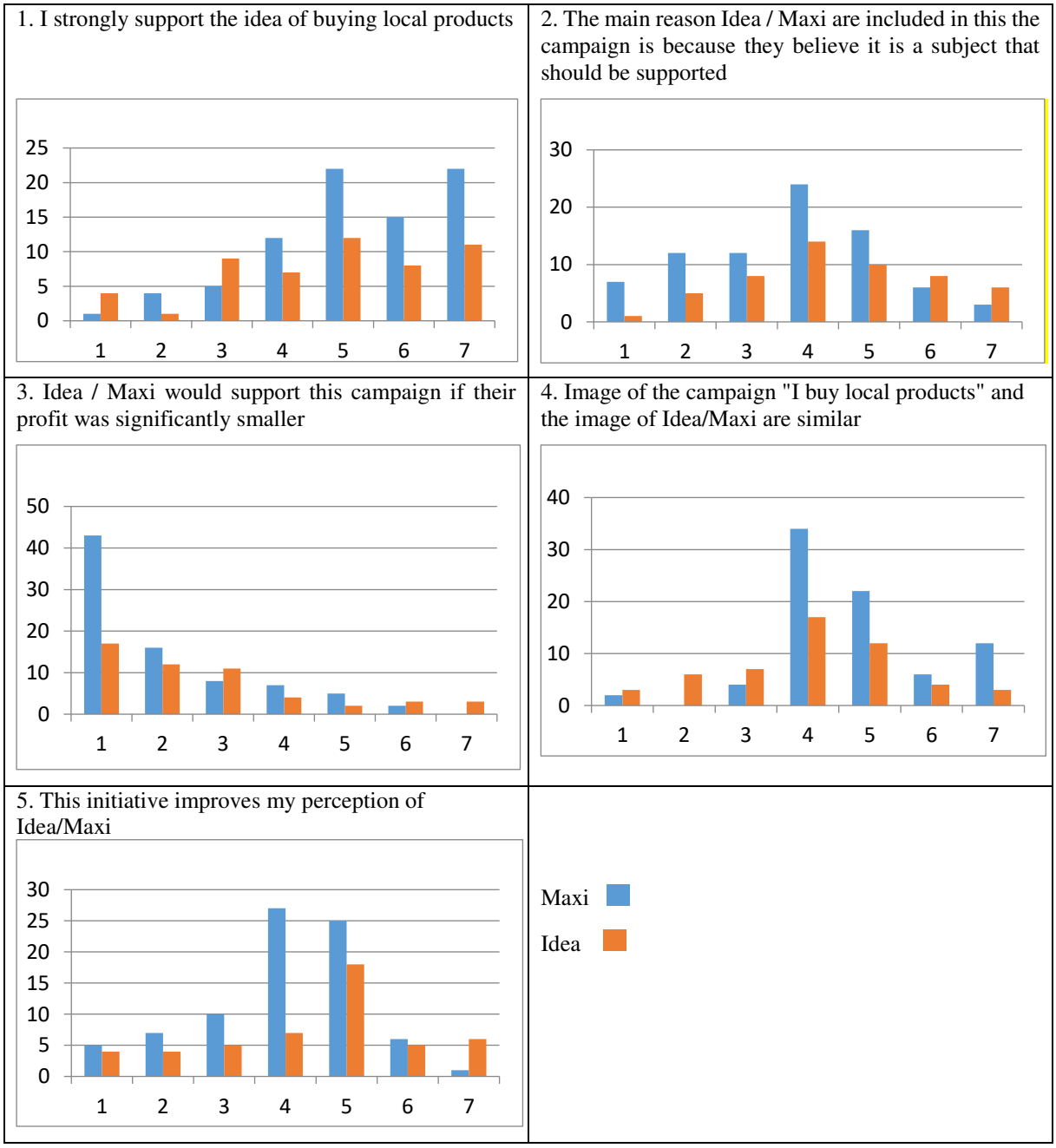
Table 33. Results of One way ANOVA perceptions of IDEA and Maxi

Statement	df	F	Sig.
I strongly support the idea of buying local products.	1	3.351	0.069
The main reason Idea / Maxi are included in this campaign is because they believe it is a subject that should be supported.	1	6.379	0.013
Idea / Maxi would support this campaign if their profit was significantly smaller.	1	5.495	0.021
Image of the campaign "I buy local products" and the image of Idea/Maxi are similar	1	8.967	0.003
This initiative improves my perception of Idea/Maxi	1	2.409	0.123

In order to gain deeper insights into the differences in respondents' perceptions of the two retailers, we assessed the frequencies of each 'importance' grade for each significant statement. An overview is displayed in 077. Importance grades for Maxi are coloured in blue, while grades for Idea are presented in red. The analysis of data provided several important conclusions:

1. Consumers who buy in Maxi are more positively oriented towards buying local products than consumers who usually shop in IDEA. This can be explained with the ongoing exposure to promotional messages of local food in Maxi stores.
2. Given approximately the same distribution of respondents' answers for IDEA and Maxi in relation to their perception of the campaign, and taking into account that IDEA does not run the campaign on local products at all, it could be deduced that consumers do not process promotional materials in an entirely conscious manner, with some promotional messages being processed subconsciously.
3. The third chart shows that consumers believe that Maxi does not promote local production with the right motivation, but rather does so in order to generate higher profits. Therefore, retailers aiming to promote local produce in order to improve their business results (social marketing) should communicate the benefits the local community can obtain if consumers buy local products through their promotional campaigns. There are opportunities to frame campaign messages in a way that highlights the mutual benefits of local consumption for all actors involved.
4. The majority of shoppers in Maxi correlate the image of this brand with local production. Thus, even though consumers seem to think that Maxi promotes local food for economic reasons rather than for ethical/social purposes, they recognize their effort. Interestingly, IDEA consumers also associate the brand image with the promotion of local products, although IDEA does not run ongoing and long-term campaigns on this issue. This reinforces the point that consumers might process marketing material in an unreflective fashion.
5. Most probably, respondents gave socially desirable answers to the question depicted in the fifth chart, provided that it deviates from their other responses in this survey.

Figure 77. Charts to show different consumer attitudes based on their importance grade indicated on a Likert scale



Most of the findings in this study support the conclusions of the pilot action conducted in Szekszárd city, signalling that the tested evaluation toolkit can be applied adequately for the research and monitoring of local food acceptance and preferences over different periods of time.

RECOMMENDATIONS

In order to develop local product systems, it is of paramount importance to explore consumers' preferences for local produce. On the basis of this, we may adjust the local product system to consumers' needs and/or try to shape and influence consumers' preferences in the medium and long term, to be in line with the characteristics and main values of the local production system.

In order to investigate consumers' preferences, a statistical methodology was developed for the analysis. This research presented, and successfully tested, its practical application regarding the population of Szekszárd as a target group. Therefore, when developing and transforming local product systems, the application of this methodology may be useful for consumer surveys due to its ability to measure policy effectiveness, as it may be used for the comparison of time periods. In addition, when developing product systems, the exploration of the interrelated demographic and socio-economic characteristics influencing local product systems may provide added value, as they can influence the preferences related to local produces.

It was also considered important to examine the perception of local produce along the main food categories, as this will reveal product type characteristics, which may induce different policy measures. In addition, it was important to examine sources of supply and places of purchase. This can provide information about shopping habits and develop an appropriate sales strategy for local produce. Finally, the perception and recognition of local food trademarks can be an important indicator for identifying the added value associated with local products and the local production system.

ANNEXES

Annex 1. Research instruments 9.5.2

A) FGD GUIDE

Introduction - 2 min, Basic information about the H2020 S2F project. Additional two minutes for the each stakeholder short presentation.

Exercise 1. The sector issues insights - 15-20 min

1a. When I say raspberry sector in Serbia, what are you first thoughts?

1b. Please, identify three most important problems in the sector functioning in the last five (three) years?

Let the FGD participants be free to express their opinion regarding main problems in the sector functioning. Let them write the three main issues on the paper (added document) and ask them to explain it: Why do you think about it? Based on the common discussion, ask what problem they see as the most important?

Exercise 2. The way out

What are the main solutions for identified problems solving? How they are fighting against identified issues? What can be improved in the future? Are you able to deal with nominated problems by your own? Who can help you to overcome the problems? Explain the role of your farm and other stakeholders - what you can do to solve the problems.

Exercise 3. The sector in the future - 15-20 min

Could you please describe your business in the context of future market development. Identify the main factors that will shape your farm functioning in the future. What will be your strategies to make your business successful?

END

B) QUESTIONNAIRE

INSTRUCTION FOR THE INTERVIEWER:

Participant is the farm owner. Raspberry production is the main occupation at the farm. The answers should be derived from the last financial year. Interviewees can optionally comment the additional issues in the column “Other, please specify:”

Interview should last 20 minutes.

Part I asks about the farm business in general and socio-demographic questions. Part II is dedicated to the identification of the main sale channel and the main characteristics of sale arrangement between farmer and buyer of his products. Part III refers to the financial characteristics of sale arrangement (price and payment). It is the most sensitive part of the questionnaire. Note that interviewee should indicate the average price obtained during the last financial year. At the end of each interviewing, interviewer should answer on the questions in the Part IV. This part of the questionnaire is dedicated to the interviewers’ observations regarding the overall understanding of the questions by the interviewees.

All answers should be treated confidentially and anonymously.

Instruction for coding is given in the questionnaire (column CODE).

Pre-selection question

Do you produce raspberries as the main product on the farm?

Yes No

If the answer is “Yes”, continue interviewing (to to Part I).

If the answer is “No”, the farmer is not eligible for interviewing. The interviewer can thanks and end the interview.

Questionnaire

Part I: FARM CHARACTERISTICS			
No.	QUESTION	Answer	Code
I-1	What is the farm's legal status? Please select one option.	Individual farm Private company Publicly owned Public-private partnership Cooperative Other, please specify: text	1 2 3 4 5 (Text)
I-2	Indicate the total farm size: Explain: Total farm size includes total land ownership and rented land in ha.	…….. ha	Number
I-3	Indicate the total hectares cultivated with raspberries:	…… ha	Number
I-4	Indicate the percentage of your production of raspberries that is certified organic:	…… %	Number
I-5	What is your status on the farm?	Owner Manager Owner and manager Other, please specify:	1 2 3 (Text)
I-6	Indicate in which age group you belong.	<40 40-50 51-65 65>	1 2 3 4
I-7	Gender	Male Female	1 2
I-8	Education	Primary Secondary College University	1 2 3 4
I-9	Do you have a specific educational qualification in agriculture (e.g. agricultural degree, diploma etc.)?	Yes No	1 0

Part II: MARKETING CHANNEL AND SALE ARRANGEMENT CHARACTERISTICS			
No.	QUESTION	Answer	Code
II-1	Please indicate the total production of raspberries in the previous year. Note: in tons.	…… t	Number
II-2	What percentage of production of raspberries have you sold? Note: products stored or used for self-consumption are excluded.	…… %	Number (%)
II-3	Are you a member of a cooperative (Coop)/producer organization (PO)	Yes No	1 0
II-4	If Yes, please indicate what kind of services is provided by collective organization? If No, go to II-5. Note: Multiply answer, circle the service provided.	Buys my production. Puts me in contact with a buyer. Negotiates the price for me. Supports the contract design. Other, please specify:	1 2 3 4 (Text)
II-5	To whom did you sell your production of raspberries in the latest financial year? Note: Multiply answer is possible.	Coop/PO Local green market Local shops and restaurants Processor Trader Exporter Other, please specify:	1 2 3 4 5 6
II-6	Please breakdown your marketing channels as a percentage of total sales.	Coop/PO Local green market Local shops and restaurants Processor Trader Exporter Other, please specify:	% % % % % % %
II-7	Do you have a legal contract with buyer?	Yes No	1 0

	Explain: A legal contract is written or oral agreement set out before or during the production, or at the time of sale – prior to delivery, which can be legally enforced.		
II-8	What is duration of the sale agreement? Please select one option.	The agreement is set only for this particular sale Less than 6 months From 6 months to 1 year From 1 to 2 years From 2 to 5 years More than 5 years	1 2 3 4 5 6 7
	What are the characteristics of this sale agreement? Note: Interviewee can choose more than one option, Answer "Yes" for each option means that the indicated characteristic exists. Code 1 for Yes and 0 for No.		
II-9 II-10 II-11 II-12 II-13 II-14 II-15 II-16 II-17	There are penalties if I fail to deliver the agreed quantities I receive compensation if the buyer fails to fulfill the agreement There are price premiums for higher quality products I receive interest in case of delayed payments from the buyer I receive storage services I receive technical assistance I receive credit assistance I receive machinery/technology Other, please specify:	Yes……..No Yes……..No Yes……..No Yes……..No Yes……..No Yes……..No Yes……..No Yes……..No ……. …….	1/0 1/0 1/0 1/0 1/0 1/0 1/0 1/0 (Text)
	In this agreement, which of the following costs occur?		

	Note: Interviewee can choose more than one option, Answer "Yes" for each option means that the indicated costs occur. Code 1 for Yes and 0 for No.		
II-18 II-19 II-20 II-21 II-22 II-23	Membership fee Logistic costs (collection, storage, transport, handling etc.) Marketing costs (e.g. promotion) Margin on sales Costs of quality testing Other, please specify:	Yes…….No Yes…….No Yes…….No Yes…….No …… ……	1/0 1/0 1/0 1/0 (Text)
	Are the specific production/quality standards included in the agreement? Note: Interviewee can choose more than one option, Answer "Yes" for each option means that the indicated standard exists. Code 1 for Yes and 0 for No.		
II-24 II-25 II-25 II-27 II-28	Standards on the product quality Standards on food safety and hygiene Standards on natural resources/nature conservation GM-free standards Other, please specify:	Yes No Yes…….No Yes…….No Yes…….No ……. …….	1/0 1/0 1/0 1/0 (Text)
II.29	On a scale from 1 to 5, how satisfied are you with this sale agreement. Please select one answer.	Completely unsatisfied Somewhat unsatisfied Neither unsatisfied nor satisfied Somewhat satisfied Completely satisfied2	1 2 3 4 5
	On a scale from 1 (strongly disagree) to 5 (strongly agree) how much do you agree with the following statements? (Note: The answer is on the scale from 1 to 5 for each statement)		
II-30	I do not have any alternative options to sell my products	1-2-3-4-5	1 to 5

II-31 II-32 II-33 II-34 II-35	This sale agreement provides higher prices than alternative buyers There are delays in the payments The costs associated with this sale agreement are too high The production/quality standards required are too restrictive Other, please specify:	1-2-3-4-5 1-2-3-4-5 1-2-3-4-5 1-2-3-4-5 ……..	1 to 5 1 to 5 1 to 5 1 to 5 (Text)

Part III – Price settlements and plans			
III-1	Please, indicate when the price and other details of agreement are set?	Before or during the production At the moment of sale	1 2
III-2	What price did you receive in this sale agreement? Note: The average price per unit achieved in the last year.	……. Price in RSD per kg	Number
III-3	On what basis is the price of raspberries are determined? Multiply choice, answers Yes/No indicating existence of the specific basis for the price determination.	Based on the production costs Based on the product quantity Based on the product quality Linked to the market price at the time of delivery Price is fixed at the beginning and cannot be changed Other, please specify:	1/0 1/0 1/0 1/0 1/0 (Text)
III-4	When do you get paid? Please select one answer.	Entirely before the delivery Entirely at the time of delivery Entirely after the delivery of products Partially in advance and the rest at the time of delivery or after delivery On a regular basis (monthly) Other, please specify:	1 2 3 4 5 (Text)

III-5	What percentage of the selling price represents the cost of production in the last observing year?	…….. %	Number
	What are your plans regarding sale in the future? Note: Interviewee can choose more than one option, Answer "Yes" for each option means that the indicated standard exists. Code 1 for Yes and 0 for No.		
III-6	To diversify (incl. introduction of new varieties)	Yes……..No	1/0
III-7	To add value (use of organic or traditional labels)	Yes……..No	1/0
III-8	To insure against adverse market changes (against volatile prices, to avoid loss of income etc.)	Yes……..No	1/0
III-9	To develop a new partnership (with producers, processors or traders)	Yes……..No	1/0
III-10	Remain the same strategy	Yes……..No	1/0
III-11	Other, please specify:	……..	(Text)

	Part IV – For Interviewer Please indicate overall quality of understanding of the questions by interviewee.		
IV-1	Interview ID	(from the first to the last conducted interview, starting from 1)	Number
IV-2	Name of the interviewer	……	(Text)
IV-3	Date of the interview	……..	(Date)
IV-4	Time start	……..	(Time)
IV-5	Time end	……	(Time)
IV-6	Indicate the level of farmer's understanding of answers Please select from the scale from 1 to 5.	Very bad Bad Normal Good Very good	1 2 3 4 5
IV-7	Explain the score given if necessary:		

Annex 2. Local Product Survey 9.5.3

Name of questioner:

Place of the interview: .....

Date of the interview.....

LOCAL PRODUCT SURVEY - 2019
QUESTIONNAIRE

Dear Local Producer!

The ECO-SENSUS Nonprofit Kft has been active in promoting a local food system in Tolna County since 2009. In 2011-2012 we made interviews with more than 200 producers in the region of Szekszárd. Based on the survey a database of local small-scale producers and food processors around Szekszárd was set up, which is available at a dedicated website: www.szekszarditermek.hu. In case of request we made introduction videos for the producers, also available at the webpage, but freely available for own purposes. We also have introduced and registered a food quality certification mark (with the denomination 'Szekszárd and its region - quality food product').

This current interview aims the further development of the local food system with the assistance of the EU funded Stengt2Food project. With this survey we also would like to expand and update our database. As part of the survey, we visit the producers around Szekszárd already registered to the database, but we also would like to visit all the other small scale producers of the area. Upon request all the producers participating in the survey will be added to the database (free of charge) and have the possibility to be member of a community, and to show themselves for the public.

Please help our work with answering the following questions!

1. BASIC DATA *(regarding the producer and the company)*	
1.1. NAME / COMPANY NAME	**1.2. CONTACT:** **Address:** **Tel:** **E-mail:** **Web:**
1.3. Where are the farmland located and where is the center of production?	☐ place of farming and company center the same ☐ other, namely:.....
1.4. THE FIRST 8 DIGITS OF THE TAX NUMBER OR STATISTICAL NUMBER	
1.5. Total cultivated area of the farm/company:	..... hectare / not relevant

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2. PRODUCTS			
2.1. In the following we are asking about the products of the farm. Please name the products you have produced in 2018! Please also indicate the place of selling and some buyer! (Approximate data are sufficient)			
Product	Quantity of sale (pieces, t, q, kg)	What is the size/package of the product? (volume, material of the package)	Place of selling/name of buyer (e.g.: local market/fair, at home etc.)

2.2. What kind of technology do you use for the abovementioned products?

☐ Homemade:……
☐ Small scale:……
☐ Conventional: ……
☐ Other: ……

2.3. Waste management
What happens with the waste/side products?

☐ managed together with the manure
☐ collected in closed containers
☐ use for feed animals
☐ collected with communal waste
☐ disposed as waste
☐ delivered for other utilizations (e.g. animal shelter,)
☐ other: ……

2.4. Do you have your own BRAND? (Your family name, if used, is also a brand!)

☐ No
☐ Yes, namely……

2.5. Do you have any SPECIAL PRODUCT, or a product with SPECIAL CHARACTERISTICS? (pl.: local breed or plant, designation of origin etc.)

☐ No
☐ Yes, namely: ……

2.6. Do you have any outside control for the abovementioned products? (e.g.: control of the ecological production certification body, veterinary checks)

☐ Yes, on a regular basis, namely:
☐ Occasionally, namely:
☐ No

2.7. Since when do you produce this product? .....
2.8. Has anybody in your family produced this product before? .....
If yes, who and from when? .....

2.9. Local varieties: Do you produce/raise (ancient or traditional) local varieties?

☐ No
☐ Yes, namely: .....
☐ No, but I plan to do, namely: .....

3. SALES

3.4. To whom do you sell typically? (more than one aswer is possible)

☐ Acquaintances
☐ Natural persons
☐ At farm gate, in own shop, in festivals, Szekszárd farmers market, other: .....
☐ Shops
☐ Wholesalers

3.5. If you sell directly, your opening hours

☐ All around the year, opening hours: .....
☐ Seasonally, in the following period(s) .....

3.6. Do you provide any service beside production? (e.g.: home delivery)

☐ Yes, namely: .....
☐ No

4. FOOD SYSTEM

4.1. Do you provide any SERVICES connecting to your production?

☐ No, I only produce
☐ Yes, the following:
  ☐ Lease-work (ploughing, harvesting etc.)
  ☐ I sell my free storage capacity
  ☐ Farm tourism and/or catering
  ☐ Other, namely: .....

4.2. Do you participate in any producer cooperation?

☐ Yes, namely: .....
.....

☐ No, because: .....

4.3. Do you know the local food certification mark?

☐ Yes, and I'm a user of it.
☐ No, but I would like to use it.
☐ No, and I use other trade mark, namely.....
☐ No, and I don't want to use any trade mark.

4.4. Which other labels suitable to differentiate local products in the Szekszárd region do you know? .....

5. ECOLOGICAL FARMING

5.1. Do you have any ecological production?

☐ Yes
☐ No

If not, do you plan to become ecological farmer?

☐ Yes
☐ No

5.2. Do you have anything to comment on ecological production?

.....
.....

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6. VISION

6.1. What are your plans with your farm or shop? (Please explain it!)

- ☐ I would like to continue. Explanation: .....
- ☐ I would like to finish. Explanation: .....
- ☐ Other: .....

6.2. What kind of investments do you plan in your farmland?

- ☐ There are no planned investments.

The three most important investments	Year of realization	Expected costs

6.3. Do you plan to expand your activities?

- ☐ I do not want to expand.
- ☐ Yes, namely (More than one answer is possible, please give an explanation)
  - ☐ supplement manufacturing, namely: .....
  - ☐ energy production: .....
  - ☐ service (tendering, machine lease, capacity lease etc.): .....
  - ☐ processing: .....
  - ☐ lease-work: .....
  - ☐ tourism .....
  - ☐ other .....

7. ANY OTHER, LOCAL FOOD SYSTEM RELATED REMARKS

.....

.....

.....

.....

8. Please, recommend other local producer you suggest to interview.

.....

.....

.....

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Annex 3. Consumer Questionnaire 9.5.3

ecosensus

Dear Respondent!

ECO-SENSUS Nonprofit Ltd is conducting a consumer survey in 2019 to get a better understanding of consumer preferences. Please help our work with answering the following questions! Your answers will be treated anonymously.

1. With the following questions we examine local food consumption in Tolna county and the county seat Szekszárd

How do you choose food products? Always (1) Often (2) Rarely (3) Never (4)

Looking for seasonal products		Looking for discounts and price reductions	
I buy fresh products locally		Looking for the biggest package	
Looking for chemical-free, healthy food		Looking for the highest quality	
Carefully read the label on the product		Ready to pay higher price for local products	
Looking for the lower price		Don't like buying products with unnecessary packaging	

2. Please list the local products you know that are from Tolna county or Szekszárd. If you consume local products, where do you purchase them?

Local product from Szekszárd	at the market	in shops	at the producer	in supermarket	own production
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
Local product from Tolna county					
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐

3. How often do you shop in the local farmers market of Szekszárd?

Regularly (every second week or more frequently) ☐ Occasionally (pl.: before holidays) ☐ Almost never ☐

4. What kind of local certification labels do you know ?

[Let the respondent speak on his/her own!]:.....

ecosensus

5. Do you know this label?

☐ Yes - if yes, where did you see it? .....
☐ No

6. In your opinion is the (above) label suitable for symbolising local food and products?

☐ Yes
☐ No, because .....

7. Finally some personal questions

Your sex: male ☐, female ☐ 1. **In which year were you born?** ☐

What is the highest level of your education?

I didn't finish 8 classes ☐ 8 classes ☐ Skilled workman ☐ Matriculation ☐ College/university degree ☐

How many persons live in your household?

Number of the household, including you	☐
Number of the children in your household (age under 18)	☐
Number of working members in the household	☐

In which range would you put the income of your household (including all the working members)?

0-150.000 HUF	(☐)	235.000-380.000 HUF	(☐)
150.000-205.000 HUF	(☐)	380.000-835.000 HUF	(☐)
205.000-235.000 HUF	(☐)	above 835.000 HUF	(☐)

THANK YOU FOR THE ANSWERS AND FOR YOUR HELP!

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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.

www.strength2food.eu