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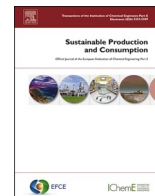
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## Business strategy pathways for short food supply chains: Sharing value between consumers and producers

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### ABSTRACT

Short food supply chains play a vital role in connecting local producers with consumers, promoting sustainability, supporting local economies, and providing access to fresh, high-quality products. However, their market is still underdeveloped due to the mismatching between consumer demand and producer supply.

The aim of this work is to identify a common vision between producers and consumers in short food supply chains proposing key actions for an effective business strategy to improve alternative food systems at a territorial level. The strategic long-term vision to foster short food supply chains is based on a direct farmer-to-retailer model. Grounded on the case of an ancient grains supply chain located in Emilia-Romagna, Italy, this research relies on a mixed-method approach including quantitative and qualitative methodologies. A household survey conducted with a representative sample of 1122 Italian households allowed to identify four consumer profiles. Then, two focus groups conducted with 10 food supply chain stakeholders led to the identification of six thematic areas of action. By the backcasting methodology, ancient grains supply chain actors proposed a set of business actions to reach consumers' preferences. Finally, a two rounds Delphi conducted with 23 food supply chain experts allowed to validate the results and the 18 actions to be adopted from 2023 to 2030 for the business strategy pathway. The business strategy pathway can increase the local market presence of ancient grain products, helping producers to plan future business activities and disclose changes in consumer preferences or market conditions.

### 1. Introduction

The evidence-based observation of the unsustainability of the global food system (Willett et al., 2019) has fostered the attention of researchers and international community to the role of short food supply chains (SFSCs) in contributing to more sustainable food systems (Bisoffi et al., 2021; Sonnino, 2013). Thus, there is a growing interest in reconsidering the design of food supply chains connecting producers with consumers and local territories, through several organisational forms of SFSCs such as direct farmer-to-retailer, farm shops, farmers' markets, on-farm direct sales, community-supported agriculture, local catering procurement and digital platforms (Chiffolleau and Dourian, 2020; Kneafsey et al., 2013; UNIDO, 2020). Turning the spotlight on beneficial expectations and potential issues of producers and consumers, the UNIDO report "Short Food Supply Chains for promoting Local Food on Local Markets" (2020) highlights the challenge of matching producer

and consumer needs in SFSCs. For instance, several studies have demonstrated a significant increase in profitability for farmers involved in SFSCs, while other findings do not confirm this trend, thus showing the ambiguity of the relationship between SFSC participation and farmer income (Chiaverina et al., 2023). Similarly, many studies report contradictory results on the willingness to pay of consumers for purchasing products in SFSC (Enthoven and Van den Broeck, 2021). Moreover, the economic dynamics that regulate the relationships between producers and consumers in SFSCs, shape new configurations of the supply and demand systems (Chiffolleau et al., 2019).

Producer and consumer coordination and matching in SFSCs are, therefore, challenged by economic, management, and organisational strategic factors. Recent studies demonstrate that there is a lack of research aimed at identifying operational solutions for viable producer-consumer coordination strategies in SFSCs (Bayir et al., 2022; Evola et al., 2022). The consequent research question addressed in this work

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aims to fill this research gap and, thus, relates to what are the strategic visions and needs of producers and consumers to be involved in SFSCs and what are actions that stakeholders and policy-makers should put in place at a territorial level to implement effective business strategies. To answer this research question, within the context of the research project Valcea, this research builds on a case study related to production and consumption of ancient grains in Italy. This work develops an integrated producer and consumer analysis, with the aim of structuring a strategic long-term vision to foster SFSCs based on a direct farmer-to-retailer model. To do so, and to provide evidence-based information to local stakeholders and policy-makers, it relies on a quali-quantitative integrated mixed-method approach based on the results of a household survey, the outcomes from participatory focus group discussions, and a two-rounds Delphi method.

The first section summarizes the most relevant literature on the role, impacts, perceptions and views on SFSC by both producer and consumer sides, to grasp the challenge of matching common leverages of strategies and coordination factors that make SFSCs viable for supply and demand. Therefore, this work illustrates the need for research that considers both producer and consumer perspectives throughout planning and implementation of activities for effective SFSCs. The second section introduces the methodological workflow, the data collected, and the stakeholder involvement in the design and implementation of the mixed-methods approach. Finally, the third section presents the results and discussion in terms of consumer behaviour and business strategy trajectories, in light of previous findings from literature.

## 2. Literature review

In recent years SFSCs has increased remarkably (González-Azcárate et al., 2021). SFSCs can be defined as supply chains that “consist of a maximum of one intermediary between producer and consumer” (EIP AGRI, 2014). They are often associated with positive outcomes on the environment and society since they provide fresh and nutritious food for healthier diets (Sonnino, 2013), reduce carbon footprint (Pradhan et al., 2020), contribute to close nutrient flows (Billen et al., 2021), support local economy and employment in rural areas (Jarzębowski et al., 2020), improve the sustainability of agricultural practices (Mundler and Laughrea, 2016), and empower sustainable consumption patterns (González-Azcárate et al., 2021; O'Neill et al., 2022). Literature on SFSCs demonstrate their positive environmental effects, while the impacts on economic and social aspects is related to context-specific conditions and dynamics. Also, compared to global and long value chains, SFSCs are acknowledged to preserve the agro-biodiversity in food systems, from production to consumption (Brunori et al., 2016).

Most of the research address producer dynamics to a greater extent, while a few of them focus on consumer attitudes (Evola et al., 2022). On producer dynamics, several strategies to meet consumer expectations from SFSCs have been investigated, such as increasing the number of production processes and products, re-integrating activities in their business (e.g., transport, conservation, presence on the markets for sale), processing food to extend the shelf life and added value, and diversifying non-traditional multi-functional activities (e.g., tourism and education) (Brunori et al., 2010). In addition, literature that targets farmers' activity in SFSCs mainly addresses farming system characteristics, value addition dynamics, competency challenges, intentions, as well as motivations and perceptions for their participation in SFSCs (Bayir et al., 2022; Evola et al., 2022). Instead, literature on the consumer side investigates mostly the socioeconomic characteristics of consumers participating in different types of SFSCs, their attitudes, motivations and perception which lead to purchase decisions, while other research classifies groups of SFSC consumers (Bayir et al., 2022; Evola et al., 2022).

Recently, the UNIDO report on Short Food Supply Chains (2020) has provided a comprehensive global picture of benefits and issues for both producers and consumers involved in SFSCs. Benefits for producers are identified in the increase of sale prices and value-added (Nazzaro et al.,

2017; Testa et al., 2020), easier market access and differentiation (Aubert, 2015), improved opportunities for cooperation with consumers and other producers (Ortolani et al., 2014), as well as the opportunity to better communicate and inform consumers on production activity and characteristics (Banwell et al., 2016). For consumers, benefits are represented by the access to affordable prices (Chiffolleau et al., 2019) of higher quality and healthier food products (Benis and Ferrão, 2017), and by the fact that purchasing those products allows for supporting the local economy (Wang et al., 2022) - including social and ethical objectives - as well as reconnecting food to farming and processing activity (Yacamán Ochoa et al., 2020). On the other hand, specific issues still need to be faced. Producers can be exposed to several challenges such as the increase in costs due to newly requested functions which require investments in new equipment (e.g., for processing, transportation, sales) (Keech et al., 2023), workforce (Paciarotti and Torregiani, 2021), new competencies and skills (Cesaro et al., 2020; Charatsari et al., 2018), and in the diversification of production (Aubert, 2015). In addition, competition between SFSCs producers can increase and those who are located in remote areas might be disadvantaged (Collison et al., 2019). Consumers with lower access to information and knowledge on product characteristics adapted to food preparation and supplied and price-accessible stores may be excluded from the consumption of SFSC' products (Vittersø et al., 2019).

This extreme diversity of impacts, perceptions and views on SFSC by producers and consumers - highlighted by Chiffolleau et al. (2019) through the analysis of new relationships among producers and consumers as active components of new supply and demand systems - challenges the coordination of the short food supply chains and their economic viability. Within this context, to date, only a limited number of scientific researches address simultaneously producer and consumer perception of their activities and attitudes within their participation in SFSCs (Mancini et al., 2019; Vittersø et al., 2019). Also, these studies only focus on perceptions and do not propose operational strategies for building shared supply. Based on the quantitative literature analysis of Bayir et al. (2022) and Evola et al. (2022), there is an emerging need for further efforts in research on operational planning to achieve holistic and integrated SFSCs vision and more realistic and concrete design and implementation strategies. Therefore, to the best of our knowledge, there is a need for further research on SFSCs that considers both producer and consumer perspectives and that proposes structured planning and implementation of activities toward more effective SFSCs. In particular, among SFSCs, those built on ancient grains are becoming an interesting option for farmers, millers and bakers to meet recent consumer trends in developed countries (Longin and Würschum, 2016). Scholars stress the need to develop interdisciplinary and multi-stakeholder coordination and collaboration among all actors participating in these specific SFSCs to ensure their effective and long-term functioning (Chiffolleau et al., 2021; Longin and Würschum, 2016; Stefanini et al., 2017). In fact, achieving a fair balance of the different interests of stakeholders and warranting transparent information are crucial factors for a win-win strategy for SFSCs (Casalegno et al., 2019) that can provide evidence-based information for local stakeholders and policy-makers. Therefore, there is a call for further exploring, at a local level and through expert and transdisciplinary elicitation, the way how the implementation of SFSCs can positively impact producers in their business activity, consumers as a society, and governance of food value chains (Chiffolleau and Dourian, 2020).

## 3. Materials and methods

Given the complexity of the topic, a multifaced approach to the analysis of SFSCs can provide more solid and structured results. To do so, Mixed-Methods Research (MMR) has recently gained momentum in the fields of social and behavioural sciences, due to its flexibility and adaptability to field research (Timans et al., 2019). MMR has been recently adopted to investigate a wide range of aspects and typologies of

SFSCs in different stages, with a particular focus on the primary production sector (Hvitsand and Leikvoll, 2023; Connolly et al., 2022; Lang et al., 2022; Coopmans et al., 2021) and consumption stage, including food services provision (Hvitsand and Leikvoll, 2023; Török et al., 2022). Fig. 1 describes the methodological workflow and the stakeholder involvement in the design and implementation of the mixed-methods approach. After having identified a business orientation problem within the short food supply chain of ancient grains, a household survey of a representative sample of consumers from Centre-North Italy led to the identification of several consumer needs which influence the willingness to pay for ancient grain products. These needs have been translated to business strategies and aims for the actors involved, and by the backcasting and focus group discussion, the key actions to reach the target aims have been identified. Finally, by two rounds Delphi these actions have been validated and ranked based on stakeholder knowledge. The methodological approach has been tested on a case study within the Valcea Project, a program of rural development of the Emilia-Romagna region and the University of Bologna, the Oroset consortium. The consortium includes stakeholders from different stages of the ancient grain supply chain: seed producers, farmers, processors, and retailers (Fig. 1).

Through this approach, this research highlights the societal benefits in the production and consumption of goods at the local level. On the one hand, the definition of business strategy for short food supply chain leads to economic strengthening on the actors involved. In terms of societal impact, the development of alternative networks generates more welfare for the territory, increasing territorial and social capitals and ensuring safe access to healthy food. All these benefits spill over to increase private and public wellbeing of others in society and future generations.

### 3.1. Case study on ancient grains

Ancient and minor cereals can be classified into several categories closely related to wheat (spelt, emmer, and einkorn) and other cereals (rye, foxtail millet, oats, sorghum, barley, common millet, and teff) (Pontonio and Rizzello, 2019). Although there is no consensus on the definition of ancient grains, for this study, they are classified on the degree of human intervention in their development. Landraces and old varieties are referred to as grains developed by natural and human selection, genetically heterogeneous, and locally adapted (Boukid et al., 2018). Ancient wheat-based products are becoming more popular in the food market as a substitute for durum and common wheat flour. The renewed interest in ancient grain species is to preserve genetic diversity, their adaptability and nutrients content. From an agricultural point of view, they also contribute to the reduction of the genetic erosion risk caused by the intensive production of modern varieties. Furthermore, ancient wheat is suitable for organic farming system due to its adaptability to low agronomic inputs and its high resistance to disadvantageous growing conditions (Arzani and Ashraf, 2017).

In this context, Valcea project aimed to build a SFSC that enhances organic production of ancient grains in an area in between the Emilia-Romagna provinces of Forlì-Cesena and Rimini, Italy. The project focused on environmental sustainability, as it concerns biological production respecting the soil and local biodiversity; economic sustainability, as it is committed to the involvement of small-scale farmers; and social sustainability, as the actors involved are promoters of food security for local communities. The final aims of the project were to disseminate the cultivation of an ancient grains population identified as Bioadapt, transformed then in Oroset, and to increase the income of the actors involved in the supply chain. To reach the first aim, a supply chain agreement on production and technical lines for the cultivation of the Oroset population has been signed by all actors involved in the project. To deal with the second aim, the supply chain actors were engaged in the

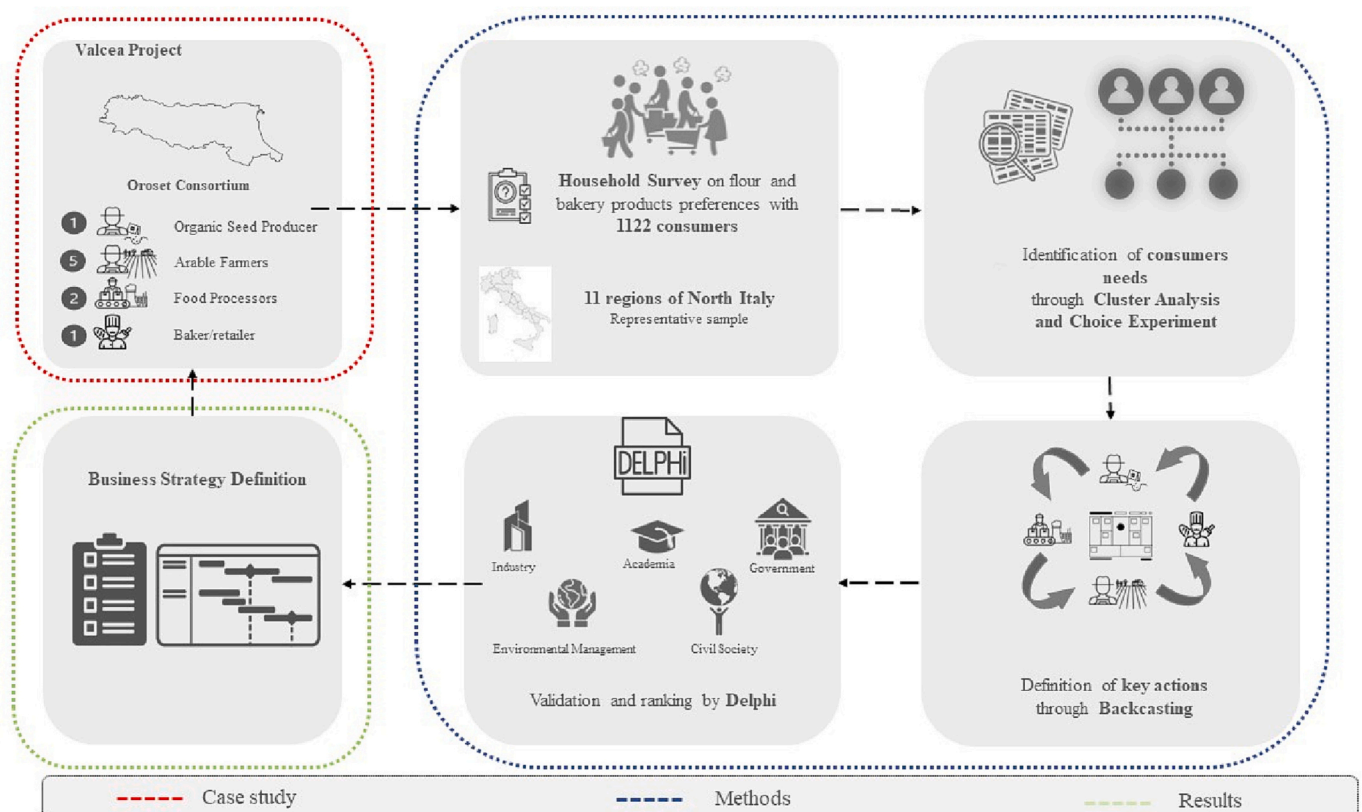


Fig. 1. Summary of the methodological workflow and of the stakeholders involved in the design and implementation of the work.

construction of a strategic future vision with consumers to improve the production-consumption matching in their territorial context. The actors involved for this study were one organic seed producer; five arable farmers; two processors; and one baker/retailer.

### 3.2. The household survey

Consumers' attitude toward flours and bakery products derived from ancient varieties of grains was investigated through a questionnaire. The latter was developed based on the Motivation-Opportunity-Ability (MOA) theoretical framework, as shown in Fig. 2. The MOA framework was developed within the seminal works by Maclnnis et al. (1991) and Rothschild (1999) and in the domain of the analysis of information processing and decision-making of consumers. Then, it has been adapted to several other contexts, including those related to food management (Bos et al., 2016; Van Droogenbroeck and Van Hove, 2017; Yang et al., 2020).

Within MOA, *Motivation (M)* is defined as the intention to perform certain actions, in this work defined as purchasing bakery products. It is influenced by the personal awareness of consumers, and by injunctive and descriptive social norms. *Opportunity (O)* refers to the accessibility of external resources needed to perform intended actions, such as the availability of ancient grain-based products in shops, the availability of financial resources, and the possibility to expand one's food preparation skills or know-how. Finally, *Ability (A)* refers to the consumers' capability to deal with the creation, management, and conscious consumption of food. It includes food knowledge, know-how and skills, such as the capability to bake with ancient grains-based flours or the capacity to understand the nutritional information provided on product labels.

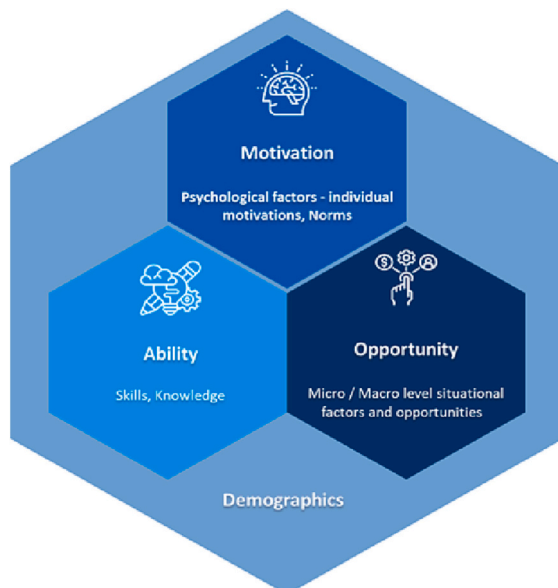
The questionnaire adopted for the survey was co-designed with contributions from 9 members of Orosset consortium: 1 organic seed producer; 5 farmers; 2 processors; and 1 baker/retailer (Fig. 1). Data were collected in March 2021 by an independent market research organization. The questionnaire was submitted to a sample of 1122 consumers in charge of at least 50 % of grocery shopping and meal preparation within their households. The sample was representative of the population of 11 regions of Centre-North Italy: Emilia-Romagna, Friuli Venezia-Giulia, Liguria, Lombardia, Marche, Piemonte, Tuscany, Trentino Alto Adige, Umbria, Valle d'Aosta and Veneto. Those regions were chosen based on the suggestions of the consortium since they represent the core potential market for ancient grain products within the

Orosset consortium.

The questionnaire included two sections. The first aimed to investigate consumers' preferences and habits related to purchasing flours and bakery products. To avoid biases in the answers, questions were organized to reproduce the phases of purchasing decision-making process: reasons for choosing flours and bakery products, general food purchasing habits, frequency of purchasing, use of flours and bakery products, as the frequency of home baking. The second section included a discrete choice experiment to simulate the purchasing 1 kg of bread with different characteristics, or attributes, in terms of digestibility, perceived quality, social and environmental sustainability.

Discrete choice experiments include different quantitative techniques for the analysis of individual preferences that are widely adopted in the domain of food choice studies. This study implements a choice experiment based on a conjoint analysis of consumers' preferences related to bread, or choice-based conjoint analysis (CBC). Conjoint analysis is a widely adopted research tool to investigate consumers' preferences and to identify consumers profiles, through the simulation of an actual buying situation and imitating real shopping behaviour (Agarwal et al., 2015; Fergus et al., 2023; Lin et al., 2023). Preferences are investigated by presenting respondents with different sets of product profiles each with defined levels of relevant attributes. Respondents are asked to rank them in terms of preferences or to choose one. The level of utility given by respondents to each attribute is then calculated through the trade-offs they perform between the sets of attributes at different levels (Caruso et al., 2009).

The choice experiment proposed in this work was designed around 9 questions included in the questionnaire adopted for the household survey. In each question respondents were asked to express their preferences by choosing among 4 alternatives: buy one of three different loafs of breads or do not buy anything. Each loaf of bread was characterized by four attributes, digestibility, perceived quality, sustainability, and price. Digestibility was defined as the ease of digesting bread and not feeling weighed down after consuming it. Perceived quality was defined as the presence of a pleasant aroma, of light, crunchy, and not too thick crust with ochre-yellow and brown colour, of a crumb with pleasant consistency that adheres well to the crust, and of a high nutritional value. Sustainability was mainly investigated relatively to social-economic and environmental dimensions. For the environmental side, raw materials for making bread were investigated. For the social side, the focus was on the working conditions and the respect for the rights of



Examples of questions for each construct		
Motivation	Opportunity	Ability
Q3: How relevant do you consider the following elements for your grocery decisions?	Q1: On average, how often do you do grocery shopping in your household?	Q6: How often do you use the following sources to collect information about the characteristics (benefits, intolerances etc.) of the food products you buy?
Q15: When you buy flour and flour-based products from a local shop or directly from the producer, how do you rate these aspects?	Q11: Have you ever bought ancient grain flours (produced from varieties and species of wheat that were once widely cultivated, such as Senatore Cappelli, spelt etc.)?	Q28: How often do you use flour for cooking meals at home?
	Q32: In the last month, which of the following products from ancient grains have you bought?	Q33: Do you think that ancient grains products, compared to the conventional one, are: [several options presented]

Fig. 2. Authors elaboration of MOA framework (adaptation from Van Geffen et al., 2020).

workers. Digestibility, perceived quality, and sustainability could assume a level among “high”, “medium”, and “low”, while the price could be 2 €, 4 €, or 6 € for 1 kg of bread. The questionnaire including the household survey and the choice experiment is provided as Supplementary Material.

### 3.3. Cluster analysis on survey data

The outcome of the questionnaire was a dataset with 1122 observations and 238 variables, including the screening questions and demographics. Several clustering options were applied to the results of the survey (single linkage, complete linkage, average linkage, Ward's method, and centroid method) to identify homogeneous groups of consumers. Ward's method applied to the items of the questionnaire related to Opportunity led to the most balanced number of observations in clusters' compositions. The Caliński–Harabasz pseudo-F stopping-rule index (Calinski and Harabasz, 1974) and the frequency of distribution of each cluster were applied to select the most suitable number of clusters of consumers, which resulted to be 4.

Then, ANOVA models and Bonferroni multiple-comparison tests were used to assess whether the clusters differed significantly in terms of socio-demographic characteristics. Once assessed the demographic differences, the same tests were used to investigate whether the clusters presented significant differences in the sets of *Motivation*, *Opportunity* and *Ability* connected to the consumption of cereal-based ancient grain products for cluster profiling.

### 3.4. Choice-based conjoint analysis

After the identification of consumer profile groups, a choice-based conjoint analysis was performed on the answers provided by the members of each cluster to the questions related to the simulation of purchasing 1 kilogram of bread. The results allowed to estimate levels of utility attributed by consumers to a set of characteristics proper of ancient grains-based bread, provided by consumers preferences through the simulation of real bread purchasing. As explained above, preferences were tested related to three different levels of digestibility, perceived quality, sustainability, and price of bread.

### 3.5. Backcasting

Backcasting was used to identify key relevant actions to be implemented within the SFSCs to reach the endpoints desired by consumers. Backcasting is used for future studies that involves a systematic process for planning backwards, starting from a desired endpoint, to identify the steps necessary to link the future to present state (Galli et al., 2016; Kok et al., 2011; Mendoza et al., 2017; Robinson et al., 2011; Vervoort et al., 2014). Backcasting approach differs from forecasting since it aims at identifying and exploring the feasibility and implications of achieving specific desirable goals in a future state (Robinson, 2003), by targeting what needs to occur before those goals are attained (Vervoort et al., 2014). It consists of a stepwise approach, from an envisioned future to the present, that allows to co-create “actionable” and “proactive futures” (Galli et al., 2016: p. 242) with stakeholders who have, in this manner, the opportunity to tackle and question uncertain and challenging future issues. Therefore, stakeholders taking part in backcasting participatory activities are guided to work backwards from a desired future to the present state, by identifying all actions needed, and considering – at each step - the barriers to overcome from the present (Galli et al., 2016). In previous research, backcasting was applied to study SFSCs but specifically with respect to alternative food networks (Cerrada-Serra et al., 2018) and to the establishment of contracts for ecosystem services (Defrijn et al., 2021), and not - to the best of authors' knowledge - to direct farmer-to-retailer SFSCs as it is the case of the present research.

According to this study, three main activities were carried out: a) defining and validating an overarching and desirable vision based on

consumers' needs by the strategic problem orientation and future strategic objectives; b) discussing past and present drivers and barriers to the implementation of the desired vision to improve the clarity of the desired future state; c) identifying future concrete actions that could help in achieving the vision, according to their consistency and feasibility. These activities were developed during two focus group discussions with ancient grain producers with 5 participants each. Building on Galli et al., 2016, each action has been identified starting from the question “if you want to attain [future step] what would we need to do/have in place for that to be possible?”. According to Quist and Vergragt (2006) this method helps in defining sustainable future vision by defining changes in the business models.

### 3.6. Two rounds Delphi

Delphi method helps to gather points of view from experts through a structured survey (Nowack et al., 2011). To develop a robust Delphi process, often a series of rounds are performed with at least 12 experts and stakeholders to be engaged (Zartha Sossa et al., 2019). Although this method presents some weaknesses (e.g., it's time-consuming, or the potential lack of participation (Fink-Hafner et al., 2019)), it provides high-quality results when combined with other methods (Rowe and Wright, 2011), as in the case of the present research. For this study, experts were selected based on the Quintuple Helix Approach, which allows to involve a wide range of experts and stakeholders from academia, industry, civil society, government and environmental management to obtain an overall consensus within societal parties (Carayannis et al., 2022), and to guarantee and consider principles of democracy and environmental concerns (Carayannis et al., 2012). For this study two rounds were implemented with the following aims. The 1st Round: to validate three most appropriate actions that ancient grains producers may adopt to reach consumers' demand in the future. The 2nd Round: to rank the three actions identified over three years. Both rounds were developed through an English-language surveys, shared via email. The first round was conducted through a survey developed in Google Form, while Qualtrics has been adopted for the second round, since it was necessary to rank the answers.

## 4. Results and discussion

As highlighted by Bayir et al. (2022) and Evola et al. (2022), there is an emerging need for further efforts in research on operational planning to achieve holistic and integrated SFSCs vision and more realistic and concrete design and implementation strategies. The literature review highlights the need to address simultaneously producer and consumer needs, but only on the perception of their activities and attitudes within their participation in SFSCs. This work aims to fill this gap by disclosing operational solutions to effectively connect needs of short food supply chain actors. To reach the scope, it stands to propose a methodological approach for identifying a strategic vision for SFSCs that takes into consideration simultaneously consumers' and producers' needs. It proposes an approach based on the consultation of a large number and typologies of stakeholders and on a mixed methods approach to collect and analyse data on the preferences and characteristics of SFSC actors and stakeholders. This mixed methods approach allows for developing an integrated producer and consumer analysis, to structure a strategic long-term vision to foster SFSCs based on a direct farmer-to-retailer model. Then, to provide evidence-based information to local stakeholders and policy-makers, it proposes a quali-quantitative integrated mixed-method approach based on the results of a household survey, the outcomes from participatory focus group discussions, and a two Delphi rounds. The final outcome of the mixed method approach is the definition of a business strategy pathway designed including 18 specific actions responding to six main areas of intervention and covering all the segments of the ancient grains supply chain. To ensure its efficiency and to maximize its feasibility, the pathway is intended to be developed in

the medium term, from 2023 to 2030, considering sub-periods of 3 years each, 2023–2025, 2025–2028, and 2028–2030.

#### 4.1. Characteristics of the sample

The household survey led to the definition of a dataset including 1122 observations. The main socio-demographic characteristics of the sample are presented in Table 1.

The sample is slightly unbalanced toward women (54.5 %), in line with previous studies investigating the habits of Italian consumers and highlighting the prevalence of women in managing household food (Fondazione Censis and Coldiretti, 2010) The most represented age class is 45–54 years old (24.9 % of the sample), followed by respondents in class between 35 and 44 years old. Elderlies (> 65 years old) account for 4.3 % of the total sample, while younger generations, from 18 to 25 years old, represent 10.5 % of the respondents. The numerosity of

**Table 1**  
characteristics of the sample.

Variable	Share of sample (%)
Gender	
Male	44.7
Female	54.5
Not binary	0.5
Not specified	0.4
Age	
18–24	10.5
25–34	18.7
35–44	22.6
45–54	24.9
55–64	19.0
>65	4.3
Household size	
1 member (%)	11.1
2 members (%)	23.1
3 members (%)	29.5
4 members (%)	27.5
>4 members (%)	8.8
N° of children aged 0–12 (798 out of 1122 observations)	
0 children	59.5
1 child	29.2
2 children	9.9
3 children	1.3
4 children	–
5 children	0.1
6 children	0.1
N° of teenagers aged 13–18 (778 out of 1122 observations)	
0 children	64.3
1 child	28.5
2 children	6.2
3 children	0.5
4 children	0.4
5 children	0.1
Residence	
Big city (>100.000 inhabitants)	31.1
City (20–100.000 inhabitants)	31.5
Small city (10–20.000 inhabitants)	13.0
Town (5–10.000 inhabitants)	15.0
Rural or mountain area (<5.000 inhabitants)	9.4
Education	
Elementary school or lower	0.3
Middle school diploma	10.1
High school diploma	44.9
Technical diploma or other specialization	8.0
Bachelor	29.3
Master/PhD	7.4
Income	
I don't know/don't want to declare	5.7
<1.000 euro	10.2
1.000–1.500 euro	7.1
1.500–2.000 euro	17.7
2.000–3.000 euro	19.9
3.000–5.000 euro	25.0
5.000–7.500 euro	14.4

households varies mainly between 2 and 4 components (these households represent >80 % of the sample). Also, most of the households do not include children aged 0–12 and teenagers aged 13–18. However, almost one-third of them (29.1 %) include at least a child, and 28.5 % of at least one teenager. >60 % of respondents live in cities (20–100.000 inhabitants) or big cities (>100.000 inhabitants), 13.0 % in small cities (10–20.000 inhabitants), 15.0 % in towns (5–10.000 inhabitants) and 9.5 % in rural areas.

0.3 % of respondents declared to have a primary education degree (elementary school or lower), almost two thirds, or 63% declared to have a secondary education degree (middle school, high school, or technical diploma or specialization), while the remaining 36.7% declare to have a tertiary education degree (bachelor or higher).

Finally, the largest share of households declared a total net monthly income of 3000–5000€ (25 %), followed by the 2000€–3000€ class (19,9 %) and the 1500€–2000€ class (17,8 %). The upper- and lower-income classes include respectively 14,4 % and 10.2 % of households reached by the survey.

#### 4.2. Profiling of consumers

The cluster analysis based on answers related to the Opportunity to purchase flour and bakery products led to the identification of four homogeneous groups of consumers (profiles), in which the internal differences in the answers are minimized. Table 2 summarizes the main socio-demographic characteristics of each cluster of consumers. The identified groups are different also in terms of demographics, except for the ‘citizenship’ and ‘region of provenance’, which are not statistically different between groups. The clusters are named as: ‘Conscious consumers’ (22.1 % of the sample), ‘Low-involved consumers’ (33.4 %), ‘Pragmatic consumers’ (26.5 %), and ‘Demanding consumers’ (18.0 %).

##### 4.2.1. Behavioural characteristics of clusters of consumers

The cluster analysis allows to define the 4 profiles of consumers, on the base of their declared behaviours and preferences related to the purchase and consumption of flour and bakery products. Results of ANOVA test for differences in clustering variables among the 4 profiles of consumers are provided as Supplementary Material.

*Aware consumers* purchase groceries more than once a week, especially in supermarkets, but they are also interested in local shops. They are interested in taste of products and Italian/geographical indications. They cook and bake (especially bread and pasta) at home 3–4 times a week, and their main sources of information about food are labels and family members. They purchase ancient grains-based products at least once per month and perceive them as tastier, richer in fibre, healthier, and more digestible than conventional bakery products. They generally like ancient grains-based products, preferring pasta and bread.

*Low-involved consumers* do groceries around once a week, especially in supermarkets. They are interested in the taste and price of food, while having low interest in organic labels and brands. They cook at home 4–5 times a week and bake bread and pasta at home at least once a week. Their main information sources about food are labels and vendors. They buy ancient grains-based products less than once per month. They consider those products tastier, more digestible, healthier, and richer in fibre than conventional bakery products. They are not interested in the caloric and gluten content of ancient grains-based products. They prefer bread and pasta made with ancient grains and have some interest in breakfast cereals and snacks.

*Pragmatic consumers* buy food less than once a week in supermarkets and dislike online food shopping. They are interested in the taste and price of food and have a low interest in brand and organic label. They cook at home 5–6 times a week, but they seldom bake. They are not much informed about food, with food labels and family members as main information sources, disliking online information. They have never purchased ancient grains-based products but they know them. Those products are perceived as tastier, richer in fibre, healthier, more

**Table 2**  
Demographics by clusters.

Variable	Aware consumers	Low-involved consumers	Pragmatic consumers	Demanding consumers
% of sample	22.1	33.4	26.45	18.0
Gender				
Male (%)	54.0	46.9	40.7	34.7
Female (%)	44.4	52.3	58.3	65.4
Not binary (%)	0.8	0.5	0.7	0.0
Not specified (%)	0.8	0.3	0.3	0.0
Age (years)				
18–24 (%)	15.3	13.3	6.1	5.9
25–34 (%)	28.6	20.5	10.4	15.4
35–44 (%)	27.0	26.1	17.89	17.8
45–54 (%)	21.3	21.6	29.0	29.2
55–64 (%)	7.3	16.8	25.9	27.2
> 65 (%)	0.4	1.6	10.8	4.5
Education				
Elementary school or lower (%)	0.4	0.23	0.0	0.5
Middle school diploma (%)	6.5	11.2	12.8	8.4
High school diploma (%)	34.7	44.8	52.9	46.0
Technical diploma or other specialization (%)	10.1	8.3	5.4	8.9
Bachelor (%)	37.1	29.3	24.6	26.7
Master/PhD (%)	11.3	6.1	4.4	9.4
Household members				
1 member (%)	4.8	9.	18.2	12.4
2 members (%)	14.1	24.8	27.6	24.3
3 members (%)	28.6	27.2	31.3	32.2
4 members (%)	39.1	29.9	17.9	23.3
>4 members (%)	13.3	9.1	5.1	7.9
N° of children 0–12 y.o.				
0 children (%)	40.7	59.7	76.2	60.0
1 child (%)	40.2	30.6	17.5	28.3
2 children (%)	16.4	8.5	4.9	11.0
3 children (%)	2.1	0.8	1.45	0.7
5 children (%)	0.5	0.0	0.0	0.0
6 children (%)	0.0	0.4	0.0	0.0
N° of teenagers 13–18 y.o.				
0 teenagers (%)	52.2	60.2	76.7	69.2
1 teenager (%)	35.89	29.9	20.5	28.6
2 teenagers (%)	8.7	9.6	2.9	1.5
3 teenagers (%)	1.6	0.4	0.0	0.0
4 teenagers (%)	1.6	0.0	0.0	0.0
5 teenagers (%)	0.0	0.0	0.0	0.8
Residence				
Big city (>100.000 inhab.) (%)	38.7	31.7	30.0	22.3
City (20–100.000 inhab.) (%)	33.9	32.5	25.6	35.2

**Table 2 (continued)**

Variable	Aware consumers	Low-involved consumers	Pragmatic consumers	Demanding consumers
Small city (10–20.000 inhab.) (%)	10.5	14.7	12.6	13.9
Town (5–10.000 inhab.) (%)	13.7	14.1	16.5	15.8
Rural/mountain area (<5.000 inhab.) (%)	3.2	6.9	15.5	12.9
Income (average, Euros)	1.500–3.000	1.500–2.000	1.000–2.000	1.500–2.000
I don't know/ don't want to declare (%)	5.2	10.4	12.8	11.9
<1.000 euros (%)	4.0	8.3	10.4	4.0
1.000–1.500 euros (%)	14.1	18.3	19.2	19.8
1.500–2.000 euros (%)	21.0	19.2	20.2	19.3
2.000–3.000 euros (%)	25.00	24.3	23.6	28.2
3.000–5.000 euros (%)	20.56	14.7	10.1	12.4
5.000–7.500 euros (%)	10.08	5.1	3.7	4.5

nutrients, slightly lower in gluten and calories and easier to be cooked at home than conventional products. They might consider buying bread and pasta produced with ancient grains.

*Demanding consumers* do groceries around once a week, almost only in supermarkets. They are quite interested in the taste and salubrity of food, cook at home 4–5 times a week, and bake at home less than once a week. Their main source of information about food is food labels, family members and, rarely, online resources. They bought ancient grains-based products at least once in the last few months, especially flour and pasta. Demanding consumers consider ancient grains-based products as tastier, more digestible, healthier, richer in fibres, slightly higher in gluten, less caloric, and easier to be prepared at home than conventional products. They are interested in flours and bread from ancient grains, with some interest also in breakfast cereals and snacks.

**4.2.2. Bread purchase simulation by clusters**

Results of choice-based conjoint analysis conducted on the answers provided in the choice experiments are presented in **Table 3**. **Table 3** includes the average scores attributed to the different levels (high, medium, low, price per kg) of the attributes of loafs of bread by members of each clusters and the shares of utility attributed by consumers to digestibility, perceived quality, social and environmental sustainability, and price of bread.

*Aware consumers* cluster bases its bread preferences on digestibility, followed by price, quality and lastly sustainability. It is also the group that assigns the highest importance to digestibility; indeed, they seek products that are very digestible or quite digestible. They are not very interested in the perceived quality; concerning sustainability, sustainable bread is chosen more often than bread with high or low sustainability. This group is also price sensible, perceiving the higher level of utility from bread costing 2 euros per kilogram.

*Low-involved consumers* assign the same level of utility to price and sustainability, followed by digestibility and perceived quality. Digestibility and perceived quality are not a priority for them, since they are more satisfied by products that are quite or poorly digestible and tend to prefer low-quality options. Also, they express high levels of utility for poorly sustainable bread and for a price of 2 euros per



**Table 3**  
Results of Bread purchasing simulation for each cluster of consumers.

	Digestibility (score of importance)	Perceived quality (score of importance)	Social and Environmental sustainability (score of importance)	Price (score of importance)	Share of utility attributed to bread characteristics (%)
<b>Aware consumers</b>					
High - 6€/Kg	17.8	-0.6	-0.6	1.1	Digestibility: 63.3 % Perceived quality: 14.3 % Social & environmental sustainability: 2 % Price: 20.4 %
Medium - 4€/kg	14.4	-5.6	1.1	-8.9	
Low - 2€/kg	-32.2	6.1	-0.6	7.8	
<b>Low involved consumers</b>					
High - 6€/Kg	-3.3	-1.7	0	-3.3	Digestibility: 23.5 % Perceived quality: 15.3 % Social & environmental sustainability: 30.6 % Price: 30.6 %
Medium - 4€/kg	1.7	0	-3.3	0	
Low - 2€/kg	1.7	1.7	3.3	3.3	
<b>Pragmatic consumers</b>					
High - 6€/Kg	6.1	-3.9	-3.9	2.8	Digestibility: 37.4 % Perceived quality: 37.4 % Social & environmental sustainability: 15.2 % Price: 10.0 %
Medium - 4€/kg	9.4	-10.6	-2.2	-3.9	
Low - 2€/kg	-15.6	14.4	6.1	1.1	
<b>Demanding consumers</b>					
High - 6€/Kg	16.1	-2.2	26.1	-35.6	Digestibility: 18.4 % Perceived quality: 16.3 % Social & environmental sustainability: 25.5 % Price: 39.8 %
Medium - 4€/kg	-13.9	-12.2	-13.9	7.8	
Low - 2€/kg	-2.2	14.4	-12.2	27.8	

kilogram.

*Pragmatic consumers* give the same level of utility to digestibility and quality, followed by sustainability and price, they prefer bread that is at least quite digestible, with good chances to buy also the very digestible. They are also satisfied with low quality perceived and not very sustainable bread. Although the low level of importance is attributed to price, Pragmatic buyers are satisfied by loafs of bread with a price of 6 euros per kilogram.

*Demanding consumers* assign higher level of importance to price, followed by sustainability, digestibility, and perceived quality of the product. They buy very digestible and very sustainable products, but they present the higher levels of utility for bread with low perceived quality and a price of 2 euros per kilogram.

The analysis of consumer profiles and their answers to the choice experiments allows to identify peculiarities related to attitude and habits related to the consumption of flour and bakery products. The 4 groups of consumers express defined preferences in the typology of shops in which they buy flour and bakery products, the sources from which they collect food information, and the level of awareness of characteristics of ancient grains-based products.

#### 4.3. Business strategies pathway

The peculiarities of consumer profiles on consumption of flour and bakery products of ancient grains are translated in six thematic areas for ancient grain producers:

- i) Nutritional values and sustainability characteristics;
- ii) Presence in local markets and shops;
- iii) Presence in large-scale markets;
- iv) Awareness events of ancient grain products;
- v) Consumption of ancient grain flour, bread, and pasta;
- vi) Geographical origin of ancient grains products.

Building on this rationale, during the two focus group discussions organized on the 11th of June and 27th of July 2022, involving ancient

grain producers, for each thematic area several key actions are identified and listed chronologically from the future state (2030) back to the present (2023). The list of possible actions provides business alternatives that should be put in place to change the current business structure of the SFSC of ancient grain for the desired outcome.

Finally, a two-rounds Delphi is implemented to validate and consolidate actions proposed by ancient grain producers and provide a long-term business vision. In the 1st round of Delphi, 23 stakeholders have been involved, of which 48 % are from academia, 22 % from industry, 13 % from civil society and environmental management, and 4 % from local level government. The result provides a validated a list of the three actions for each business aim. The three most appropriate actions have been selected based on the expert opinion. Table 4 summarizes the results per thematic areas, key actions, and acronyms.

Afterwards, with the 2nd round of Delphi provides, the three actions are ranked over the selected period of 2028, 2025 and 2023 (i.e., the present situation). In this second round, 20 stakeholders have participated: 48 % from academia, 22 % from industry, 13 % from civil society and environmental management, and 4 % from local level governmental bodies.

Results of Delphi rounds led to the definition of 6 sets of 3 actions each for the promotion of ancient grains-based products, as shown in Fig. 3. Cases of uncertainty in the definition of the year in which an action should be conducted (PLM1, PLM2, PAW1, PLS3, PFPB2) were solved comparing answers from the participants to Delphi rounds to identify the most frequent indication.

Among key actions for the communication of nutritional values of products, 60 % of experts identified as the most urgent key action to be implemented “the inclusion of nutritional and sustainability values data on packaging” (NVSC1). “The communication of environmental, economic and social impacts through social events” (NVSC3) was indicated as the key action to be implemented in 2025 with 45 % of preferences, and “the Communication of nutraceutical properties of ancient grains products on packaging” (NVSC2) was considered as the last key action, to be implemented in 2028, by 65 % of experts.

Concerning the actions to be adopted to increase the presence in

**Table 4**  
Thematic areas, key actions, and acronyms.

Thematic areas	Key actions identified	Acronym
Nutritional values and the sustainability characteristics	Inclusion of nutritional and sustainability values data on packaging	NVSC1
	Communication of nutraceutical properties of ancient grains products on packaging	NVSC2
	Communication of environmental, economic and social impacts through social events	NVSC3
Presence in local markets	Creation of a local brand	PLM1
	Collaboration with local public procurement (e.g., canteens) and restaurants	PLM2
	Development of social media channels to increase awareness and visibility	PLM3
Awareness events	Usage of a social media channel	PAW1
	Promotion of local events directly to the farms	PAW2
	Promotion of baking courses with local grains	PAW3
Presence in large scale retailers	Agreement with large retail for fair prices and fair income for ancient grains consortium	PLS1
	Establishment of a consortium with a defined regulation	PLS2
	Creation of a certification system based on a participatory guarantee	PLS3
Increase production of flour, bread, and pasta	Promotion of economic advantages in producing ancient grains (economic sustainability)	PFBP1
	Construction of infrastructure for common use (e.g., grain storage centre)	PFBP2
	Increase the number of ancient grains producers in the supply chain	PFBP3
Geographical origin	Definition of a territorial label, based on the location of the supply chain	GO1
	Transformation in organic production supply chain	GO2
	Adoption of a “Talking” label	GO3

local markets, “*the setup of collaboration with local public procurement and restaurants*” (PLM2) was identified as the most relevant for the current time with 45 % of preference. Delphi participants considered “*the creation of a local brand*” (PLM1) as action to be conducted at the present state (2023) or in 2025 by 35 % of interviewees, as well as “*the development of social media channels to increase awareness and visibility*” (PLM3), with 40 % of answers. PLM3 action was considered in the definition of the business strategy in 2025 given the number of preferences accorded, while PLM1 has been set to be adopted in 2028.

For the promotion of awareness events, the key action “*promotion of local events directly to the farms*” (PAW2) has been identified as the most relevant for the actual moment, with 55 % of preferences. “*The usage of a social media channel*” (PAW1) has been considered suitable for the current moment and for 2025 by 40 % of respondents. Given the preferences accorded to PAW2 to be adopted as first key action for this thematic area, PAW1 has been identified as the key action for 2025. “*The promotion of baking courses with local grains*” (PAW3) was selected as action to be conducted in 2028 by 65 % of interviewed experts.

The most urgent key action to be implemented to increase the presence in large scale retail market has been identified as “*the establishment of a consortium with a defined regulation*” (PLS2) by 45 % of respondents. “*The creation of a certification system based on a participatory guarantee*” (PLS3) has been considered suitable for 2025 and 2028 by 40 % of experts. However, since “*the definition of agreements with large retail for fair prices and fair income for ancient grains consortium*” (PLS1) was indicated by 40 % of respondents to be adopted in 2028, PLS3 has been considered for the implementation in 2025.

Concerning the increase of the production of flour, bread and pasta, the key action “*promotion of economic advantages in producing ancient*

*grains*” (PFBP1) should be the first to be adopted by 50 % of experts. “*Increasing the number of ancient grains producers in the supply chain*” (PFBP3) has been considered for the implementation in 2025 by 45 % of respondents, and “*the construction of infrastructure for common use, as grain storage centers*” (PFBP2) has been proposed for the implementation in 2028 by 35 % of interviewed experts.

Finally, for the promotion of the geographical origin of products, the most urgent action has been identified in “*the transformation in the organic supply chain*” (GO2) by 65 % of experts. “*The definition of a territorial label, based on the location of the supply chain*” (GO1) has been proposed for the implementation in 2025 by 75 % of respondents, and 80 % of experts identified “*the Adoption of a ‘Talking’ label*” (GO3) as key action to be adopted in 2028 (Table 5).

The final outcome of this research is the definition of a timeline for a business strategy pathway to increase the presence of the products of the consortium in the market by matching production and consumers' demand at the territorial level of Emilia-Romagna region. This pathway is based on the key actions identified through the Mixed Method approach, sorted from the most urgent, to be adopted in the present state, to the less urgent, to be adopted by 2028.

Actions that should be undertaken at the present state (2023) are “the inclusion of nutritional and sustainability values data on packaging” (NVSC1), “the setup of collaboration with local public procurement and restaurants” (PLM2), “the promotion of local events directly to the farms” (PAW2), “the establishment of a consortium with a defined regulation” (PLS2), “the promotion of economic advantages in producing ancient grains” (PFBP1), and “the transformation in the organic supply chain” (GO2). Those actions are propaedeutic to the establishment of a well-defined and structured consortium at territorial level (PLS2, PLM2, GO2), taking advantage from results of previous research to enhance the promotion of the ancient grain products (NVSC1, PAW2, PFBP1).

Actions to be conducted in 2025 include “the communication of environmental, economic and social impacts through social events” (NVSC3), “the creation of a local brand” (PLM1), “the usage of a social media channel” (PAW1), “the creation of a certification system based on a participatory guarantee” (PLS3), “increasing the number of ancient grains producers in the supply chain” (PFBP3), and “the definition of a territorial label, based on the location of the supply chain” (GO1). Those actions are focused on the consolidation of the consortium (PLM1, PLS3, GO1) and on the partnership with external actors, to increase the visibility and the diffusion of ancient grain products (NVSC3, PAW1, PFBP3).

Finally, actions foreseen for 2028 include “the communication of nutraceutical properties of ancient grains products on packaging” (NVSC2), “the development of social media channels to increase awareness and visibility” (PLM3), “the promotion of baking courses with local grains” (PAW3), “the definition of agreements with large retail for fair prices and fair income for ancient grains consortium” (PLS1), “the construction of infrastructure for common use” (e.g., grain storage centre) (PFBP2), and “the adoption of a ‘Talking’ label” (GO3). This final set of key actions is focused on the elaboration of promotional activities to increase the awareness about ancient grain products (NVSC2, PLM3, PLS1) and on the further consolidation of material and immaterial infrastructures available to the consortium (PFBP2, GO3). Awareness increasing actions should also include agreements with large scale retailers (PLS1) that can guarantee fair prices for consumers and fair income for producers, while preserving the identity and values proper of the consortium. The timeline for the business strategy pathway is presented in Fig. 3.

#### 4.4. Discussion

The theoretical contribution of this research is represented by the definition of an original methodology based on a mixed methods approach. This approach allowed matching consumers' preferences

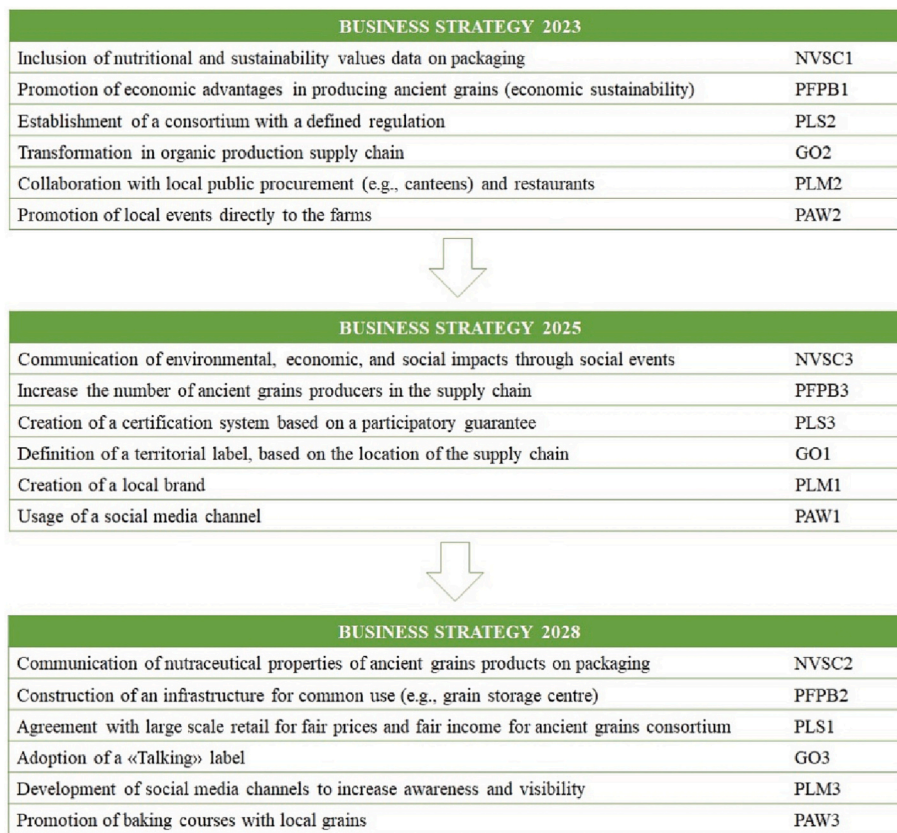


Fig. 3. Business strategy pathway timeline.

Table 5

Ranking of the three actions over the selected period of 2028, 2025 and 2023 (present state), following the backcasting time choice.

	Promotion of geographical origin of products			Promotion of awareness events		
	2028	2025	2023	2028	2025	2023
GO1	0	<b>15</b>	5	PAW1	4	<b>8</b>
GO2	4	3	<b>13</b>	PAW2	3	<b>11</b>
GO3	<b>16</b>	2	2	PAW3	<b>13</b>	6
	Communication of nutritional values			Increase presence in large scale markets		
	2028	2025	2023	2028	2025	2023
NVSC1	1	7	<b>12</b>	PLS1	8	5
NVSC2	<b>13</b>	4	3	PLS2	4	<b>7</b>
NVSC3	6	<b>9</b>	5	PLS3	8	<b>8</b>
	Increase presence in local markets			Increase production of flour, bread, pasta		
	2028	2025	2023	2028	2025	2023
PLM1	6	<b>7</b>	7	PFPB1	6	<b>10</b>
PLM2	6	5	<b>9</b>	PFPB2	7	7
PLM3	<b>8</b>	8	4	PFPB3	7	<b>9</b>

Note: in bold the most frequently selected actions for each year.

related to bakery products and ancient grains to the supply side of the food chain, designing the activities to be adopted by producers, processors, and retailers to meet consumers' demands while preserving their peculiarity in terms of production and identity. The combination of quantitative and qualitative research methodologies allowed to collect and process a wide range of information, so to design a business strategy pathway able to respond to the actual requests of all actors involved in the considered ancient grains food supply chain.

Results of this research highlight how interventions and policies to strengthen the diffusion and importance of Short Food Supply Chains should be rooted in the in-depth analysis of the needs and characteristics of all the actors involved. Coherently with previous findings of Vittersø et al. (2019), our analysis shows that the awareness about the demand side, intended as the different characteristics of consumers and their approach to SFSC products, should be the focal point for the definition of actions to be implemented in the short and medium term. Nevertheless, preserving the identity and peculiarities of SFSC, as territoriality of products, economic, social, and environmental sustainability, specific production techniques, and cultural bonds with an area of production and processing of SFSC products is a value-added for those productions. Moreover - as it is demonstrated in previous studies (Aubert, 2015; Nazzaro et al., 2017; Ortolani et al., 2014; Testa et al., 2020) - this value added is, indeed, a key factor for the marketability of SFSC products and can ensure supply chain actors have adequate income levels. In addition, according to previous literature (Chiffolleau et al., 2019), our analysis considered the fact that keeping SFSC products affordable for the largest possible share of consumers is a key factor to ensure the economic sustainability of the model and to guarantee consumers access to healthy and sustainable food products. Furthermore, as demonstrated in previous analysis (Vittersø et al., 2019; Yacamán et al., 2020), the present research highlights the importance for their effectiveness to design policies and interventions for the enhancement of Short Food Supply Chains starting from the peculiarities of the each of them. Particular attention should be given to the expectations of their actors and stakeholders and the socioeconomic context in which they are embedded. Therefore - according to previous observation of Casalegno et al. (2019) for a win-win strategy for SFSCs - we have observed that “one-size-fits-all” solutions, despite being appealing as easy to design and implement, should be avoided, since they could not express the full potential of SFSCs. The proposed business strategy definition can support stakeholders and policy-makers interested in food policy planning in better

shaping alternative food systems at the local level.

Despite the results achieved through this research, a few limitations can arise during its replication. Regarding the methodology, the use of a mixed-method approach required the involvement of a large number and typologies of stakeholders. On one side, the difficulty of reaching all different actors in the food supply chain, on the other, building a sample of consumers can be challenging. These aspects may represent a potential glitch in replicating the study due to time and resource consumption. Finally, as highlighted in the literature review, very few researches include operational results for SFSCs. Even though this study proposed a clear business strategy definition for the ancient grain supply chain, other supply chains should be explored to lead to solid generalizations on business strategy results and the proposed mixed-method approach.

## 5. Conclusions

This study aims to develop a tailored business strategy pathway to match food production-consumption patterns at the territorial level, through an integrated methodology that allows the identification of a long-term vision for a short food supply chain. To do so, the work adopts an original methodology based on a Mixed Methods Research.

A household survey conducted on 1122 Italian consumers led to the identification of peculiar behavioural consumer characteristics and attitudes toward flour and bakery products using ancient grains. By the cluster analysis, 4 profiles are identified, namely, aware, low-involved, pragmatic, and demanding consumers.

Then, through the backcasting methodology adopted in two focus groups with 10 members representing all the stages of the ancient grain SFSC, six thematic areas of interest between producers and consumers are disclosed: the promotion of nutritional values and sustainability characteristics; a more frequent presence in local markets; organization of awareness events; a more frequent presence in large scale retail shops; increased production of flour, bread, and pasta; promotion of geographical origin of the products. Finally, 18 business actions that provide a shared and clear business strategy for the development of the short food supply chain are validated by an expert consultation based on a two rounds Delphi.

This original methodology adopted in this research provides a well-positioned comprehensive understanding of consumer preferences, attitudes, and motivations for ancient grain products, considering consumers' and producers' needs. It is tested on an ancient grains SFSC located in the Emilia-Romagna region of Italy and represents a key step for the definition of an effective business strategy pathway to foster the market presence of SFSC products. The long-term strategy allows producers to plan for future business activities and anticipate potential changes in consumer preferences or market conditions. Thus, it can help them to increase the competitiveness of SFSC actors and predict potential market evolutions. Finally, a well-defined strategy can help producers to attract and retain customers, as it demonstrates a commitment to matching their needs and staying up-to-date with market trends.

This study design allows for a comprehensive and holistic analysis of different typologies of SFSC, providing valuable insights for future research, as well as providing practitioners methodological tools to foster and promote local products while keeping a global perspective.

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## Declaration of competing interest

None.

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## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.spc.2023.07.017>.

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