food for sustainability

Feel Local: Boosting primary production by improving farmers' meta-skills

Report I: Producers' characterization and consumers' perspectives on local food products

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Abstract

Agri-food chains play a key role in altering the biophysical dynamics of the global food model. The actors of this system, namely farmers, processing, distribution and retail industries and consumers, are an essential link in taking decisions that produce and consume resources that are seen as indispensable to achieve sustainable development. In light of the current events, in which the food system is also responsible for the transgression of key planetary limits, is imperative to build resilient agri-food chains that cope with sustainable production and consumption. Aiming to keep the integrity of the agri-food chains and foster resilience of the ecosystem, this report shares the consumer preferences and awareness about local food supply chains and products to identify and discuss the strengths and weaknesses of the production chains. To collect data to apply this research a quantitative survey was distributed online, throughout the Food4Sustainability and BGI (Building Global Innovators) networks. The purpose is to develop tools and professional skills to promote farming best practices and develop communication between farmers, consumers, and producers of short supply chain, in their RIS areas.

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1. Introduction

The agri-food system encompasses the primary sector, namely the agri-food industry and distribution, and the members of society as consumers. This sector plays an important role in Portugal and throughout Europe, with a strong socio-economic action and environmental component – it employs many people in rural areas, contributes to reduce depopulation, and keeps the ecosystem services. Recently, we have witnessed that there is an imbalance in the producer-distributor equilibria, i.e., large companies are the link between producers and consumers, and they hold the power to control the selling process. As such, farmers see their bargaining power reduced and sell their produce for very low prices, which is not seen as positive by many consumers. Therefore, a lot of attention has been placed into promoting short supply chains, as alternative to the mainstream food supply model. This growing interest reflects the consumers demand for quality and traceability. Nowadays consumers seek more direct contact with food producers, avoiding intermediaries in the supply chain and getting better deals when purchasing their food.

Local food production may benefit regional development and should be recognized one of the pillars for sustainable development in rural areas since farmers share a common cultural and historical heritage, which ties them to the regions and the consumers. Local products are associated with higher quality, healthy eating, and environmentally friendly production methods. Furthermore, they are considered of small-scale production, which promotes local food traditions. Nevertheless, some of the qualities of local foods are debatable. In this sense, farmers who directly sell their products to consumers are the link to reinforce and keep the local food chain supply alive. However, farmers may lack skills to manage direct selling, which leads to the failure of many initiatives.

This project aims to shed light on the consumers behavior and characterize the farmers production to fill the gap in local production and add value to national and regional products. In line with the results obtained by each one of the countries participating in the *Feel Local: Boosting primary production by improving farmers' meta-skills* project, the development of a platform is envisaged, and the importance of the networks is discussed, aiming to promote the resilience of short supply chains. To accomplish this goal the report presents the methodology for survey development and the results obtained from the consumers and the farmers are also summarized. These results will be further discussed in a presential meeting and be used as recommendations to support the development of the platform.

2. Methods

2.1. Research method

The research in this project covered producers and consumers of local food products. A quantitative approach was adopted to uncover the farmer perspective on the awareness of the agri-food chain regarding the value of their production system and products. This project also shed light on consumer's understanding of local production systems and the quality of local food products.

2.2. Detailed survey assessment and data collection

To conduct surveys regarding the production systems and products for farmers, and perception of local food products for consumers, surveys were organized in three dimensions as described below (Figure 1).

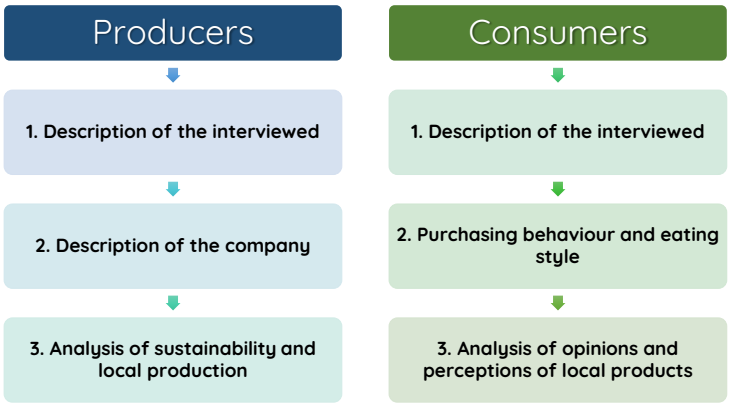

Figure 1. Structure of surveys for producers and consumers with a three-dimension framework.

Producer and consumer analysis: analytical framework

To conduct the analysis at the local level, a framework was developed and organized in three dimensions for both producers and consumers and structured with closed-ended questions. Examples of surveys are attached (Annex 1). The three dimensions of the survey framework are described below for each one of the groups.

Producers

- **1. Description of the interviewed:** within this dimension the interviewed was characterized regarding its age, education and training qualifications, role in the company and place of residence.

- **2. Description of the company:** within this dimension the size of the company was assessed, and its production was characterized. A marketing section was added to understand the products available in the market and current sale channels.
- **3. Analysis of sustainability and local production:** within this dimension the importance of local foods was assessed, and an evaluation of local products characteristics was performed. The perception of local products cost was also made.

Consumers

- **1. Description of the interviewed:** within this dimension the consumer was characterized according to its age, education and training qualifications, income, and closeness to countryside.
- **2. Purchasing behaviour and eating style:** within this dimension the consumer was characterized according to its eating pattern, namely eating style, number of meals and meal preparation. This was followed by an analysis of food supply methods, importance of selling points and aspects the consumer considers when purchasing food products.
- **3. Analysis of opinions and perceptions of local products:** within this dimension consumption of local foods was evaluated and characteristics of these products were assessed, including price.

Online surveys were conducted in Portugal and data was gathered between April and May 2022. Food4Sustainability and BGI sent e-mails throughout their networks and farmer's surveys were also shared throughout farmer's groups on social media.

3. Results

3.1. Producers survey

Description of the interviewed

Thirty producers were reached, 73% of which were male and 27% female, with ages between 25-34 (3%), 35-44 (43%), 45-54 (27%), 55-64 (23%) and 65-74 (3%) years (Figure 2 (a) and (b)).

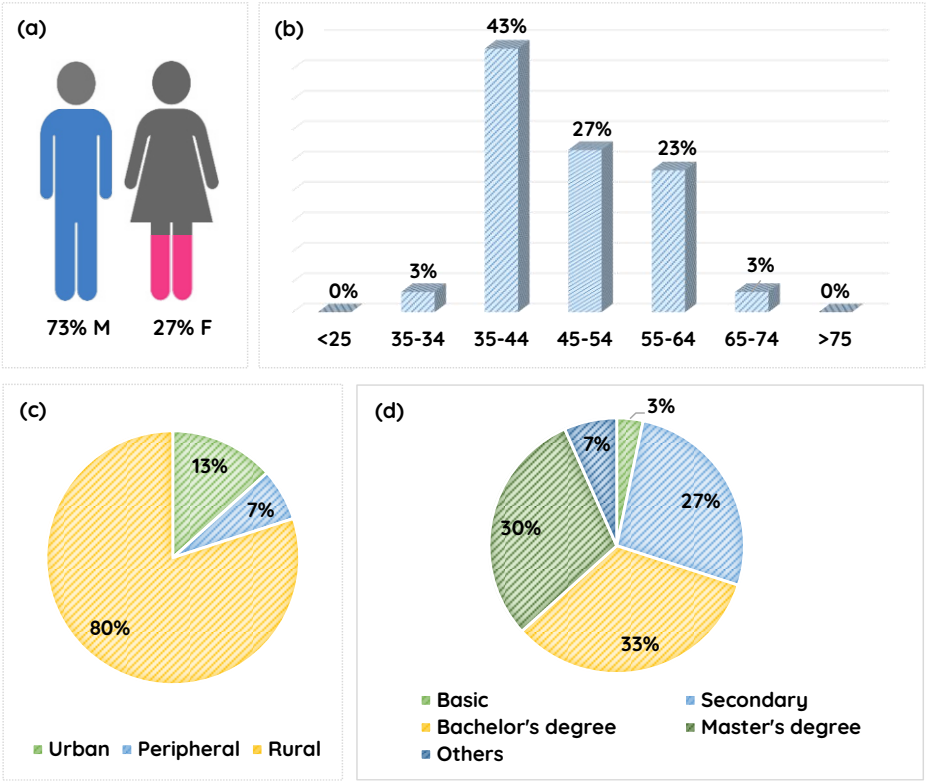

Figure 2. Survey demographics. Gender profile (a), age of producers (b), distribution of residency area (c) and education (d).

Regarding location 80% of producers live in rural areas (Figure 2 (c)) distributed throughout the country (11 in 18 districts were reached): Bragança, Vila Real, Porto, Viseu, Coimbra, Castelo Branco, Santarém, Setúbal, Lisboa, Évora, Beja. The results reveal that 27% of interviewed hold the secondary degree and 63% have reached higher levels of education, i.e., bachelor and master's degree. A minor fraction, 3 and 7% respectively, has basic training or is a specialized trainee, respectively. Information on the interviewees job revealed that 43 are the companies' owners, 47% are producers and 33% are technicians and representatives of farmer's associations.

Description of the company

Looking at the description of the companies, all interviewed represent micro-enterprises (<10 employees), however data show that the farm size is diverse. Figure 3 reveals that about 64% of farms are of 6-50 ha and 23% are small farms of up to 5 ha, which leaves a minority of 13% of producers allocated to farms ranging from 51 ha to more than 500 ha.

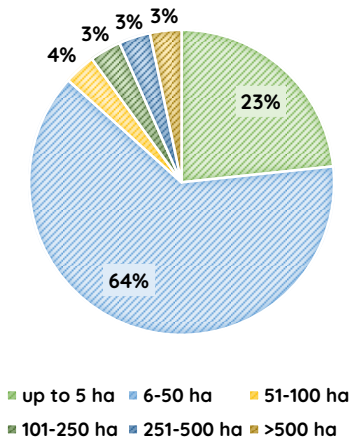

Figure 3. Distribution of interviewees according to farm size in percentage.

When looking at the agricultural production (Figure 4 (a)), 68% of producers farm fruits, vegetables, cereals, and legumes, whereas 26% produces meat, milk, and derived products. Only a minority of 3% works in honey and 3% in egg production.

Specifically, from the group of meat, milk, and derivatives producers, 50% are meat producers, 31% produce milk and derivatives, namely cheese, and 17% take advantage of meat production to harvest wool (Figure 4 (b)). Regarding animal breeds in the farms, small ruminants – Merino sheep - were reported (annual production rate of 30-120 heads of sheep and 1 000-80 000 L milk), as well as cattle, namely dairy cows (annual production rate of 700 000 L milk), crossed Wagy cattle, Holstein Frisian, Limousin, Mertolenga and Charolais cattle (annual production rate of 90 heads of cows, and 5-14 tons of meat). Beekeepers mentioned to manage up to 30 beehives and extracting about 300 kg of honey per year. In particular, 67% of dairy producers sell fresh milk and deliver to an external dairy processor whereas 33% sell milk processed in their own farm. To what concerns breeders, 25% sell up to 25% as fresh meat, 25% sell 25-50% of total production as fresh meat and 50% sell all production non-processed. Then, the meat is delivered to an external processor.

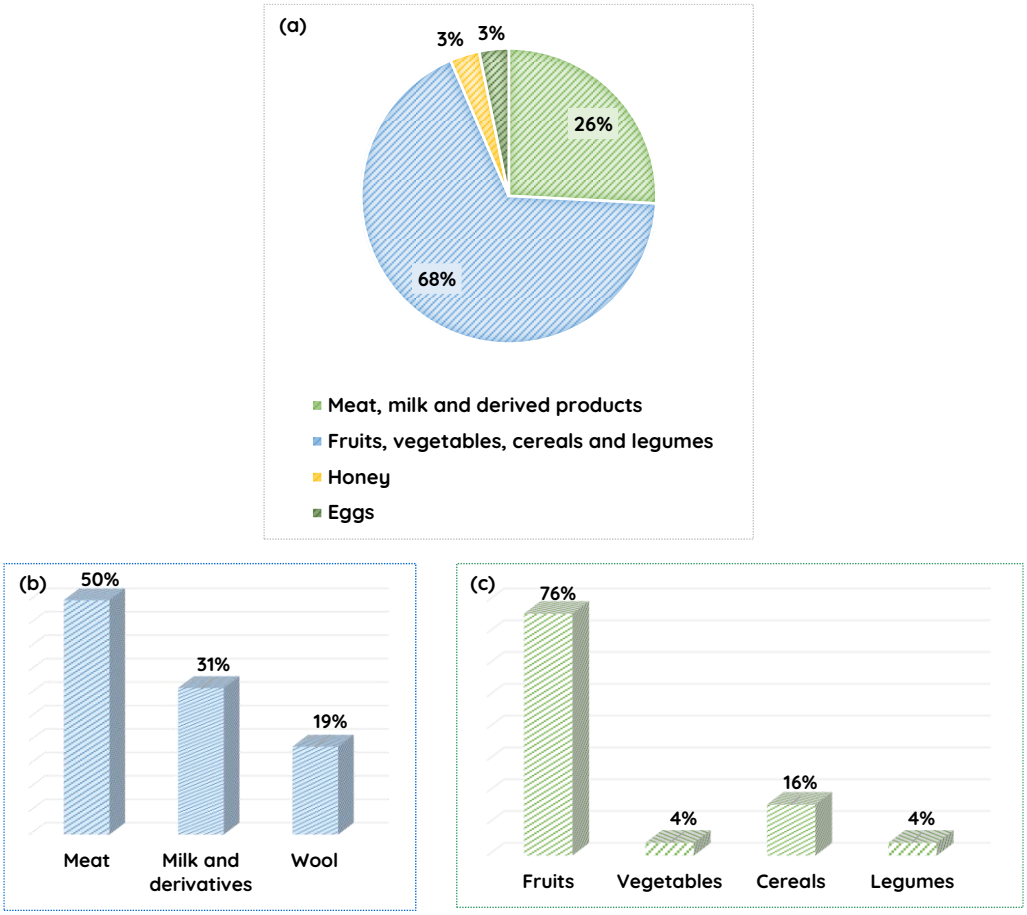

Figure 4. Characterization of the interviewees' agricultural production (a), distribution of the percentage of producers of meat, milk and dairy products and milk (b) and distribution of the percentage of producers of fruit, vegetables, cereals and legumes (c).

Considering the fruits, vegetables, cereals, and legumes producers (Figure 4 (c)), 76% of interviewed farm fruits and report the production of quince, citrus (oranges, lemons and limes), apples, pears, kiwis, prickly pear, blueberries, olives, and dried fruits (dried figs, almonds, chestnuts, hazelnuts and walnuts). Annual production of fresh fruits ranges from 2.5 tons for small berries up to 120 tons for citrus which are sold as fresh produce. Olive farmers get an annual production of 2-400 tons of olives that are then delivered to an external processor to make olive oil. Production of dried fruits is diverse as farmers point out an annual production ranging from 0.5 tons of hazelnuts and walnuts to 1 ton of dried figs, 2.5-7 tons of chestnuts and higher yields to almonds – from 1-10 tons for small farms and up to 250 tons for bigger ones.

For legumes, up to 10 ton of peas were reported to be directly sold. Cereals account for annual productions ranging from 1 ton of corn up to 25 tons of rice and its derivatives. In this section, breeders point out the production of up to 30 tons forages for animal consumption. Olives, cereals, and dried fruits that need further processing (almonds and other nuts that require cleaning, hulling, or shelling) are delivered to external processing units prior to market sell.

Analysis of sustainability and local production

The agricultural system of farmers was assessed (Figure 5) and results show that almost 50% of the interviewed work under an extensive regime, while 33% are organic and 10% are intensive and semi-intensive respectively (Figure 5 (a). Regarding the production system, about 47% of farmers are organic certified whereas 40% farm under conventional mode and 13% are PDO (Protected Designation of Origin) (Figure 5 (b)).

To further evaluate the factors farmers value in the management of their business, they were asked to classify a series of parameters (Figure 5 (c)). Results show that technological innovation, managerial approach (both in production and sales) and differentiation of sale channels were the most important factors for farmers to manage and boost their business, with 76-77% of interviewed classifying it as important/very important. The need to invest to increase in product marketing and lower the impact of the production process is also important, with 54 and 60% of farmers rating these topics as important/very important. On the other hand, diverse opinions were obtained for the parameters of development of training programs and training courses to increase knowledge of communication and marketing of products. Interestingly, ensuring animal welfare is not important/less important for 47% of respondents. Finally, economic support from local authorities is indicated as less important/not important by 50% of farmers.

The analysis of sustainability and local production contemplates a marketing section. Here, producers described what they produce and we can find in the market (Figure 6 (a)): 42% of indicated fresh fruit, followed by fresh meat (16%), processed fruit (11%) such as jams and juices, ripened cheese (8%), milk, honey, cereals with 5% each, and legumes and vegetables with 3% each respectively. In addition, 3% of producers referred producing cereals for animal feed (others section).

The great majority of producers sell their production to third parties (80%) whereas 20% sell the production directly to consumers. Specifically, for the ones selling to third parties, 50% indicate delivering the production to associations, 46% to individual operators and only 4% to industry (Figure 6 (b)). In this sense for the sale channels of these products, 58% of interviewed reported that local markets are the main distribution channel, followed by 21% indicating the super and hypermarkets, 13% of organic markets and only 4% indicated online sales and fair-trade markets respectively. Later, producers had the opportunity to evaluate how the following sale channels are important for their activity. Super and hypermarkets are perceived as important and very important by 63% of the producers. In addition, grocery stores, organic and fair-trade markets, online stores and selling directly to consumers was classified as important and very important by 46-58% of producers. The results unveiled that 58% of interviewed classified local markets as not and less important.

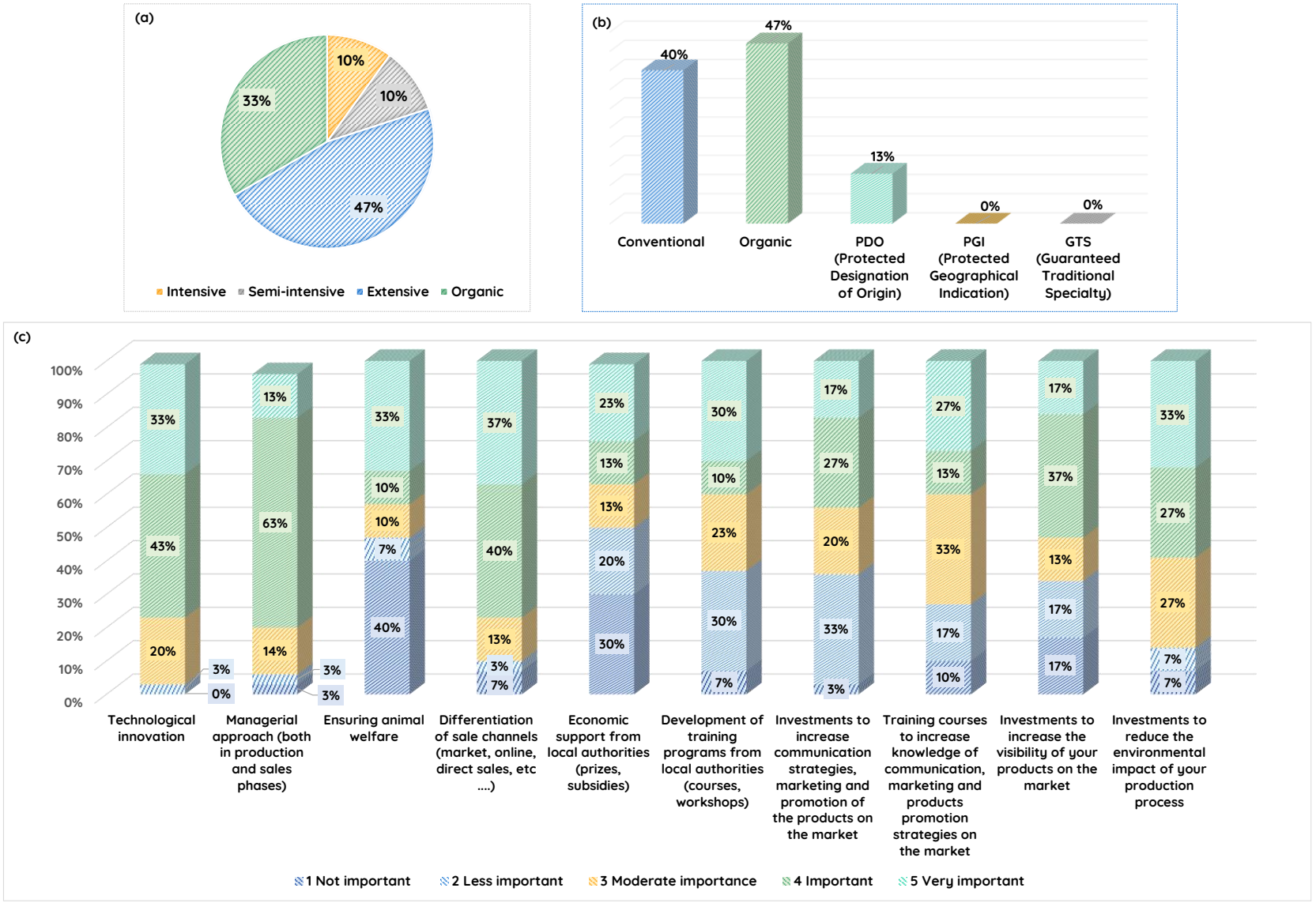

Figure 5. Agricultural production system (a), farming regime (b) and factors farmers value in the management of their business (c).

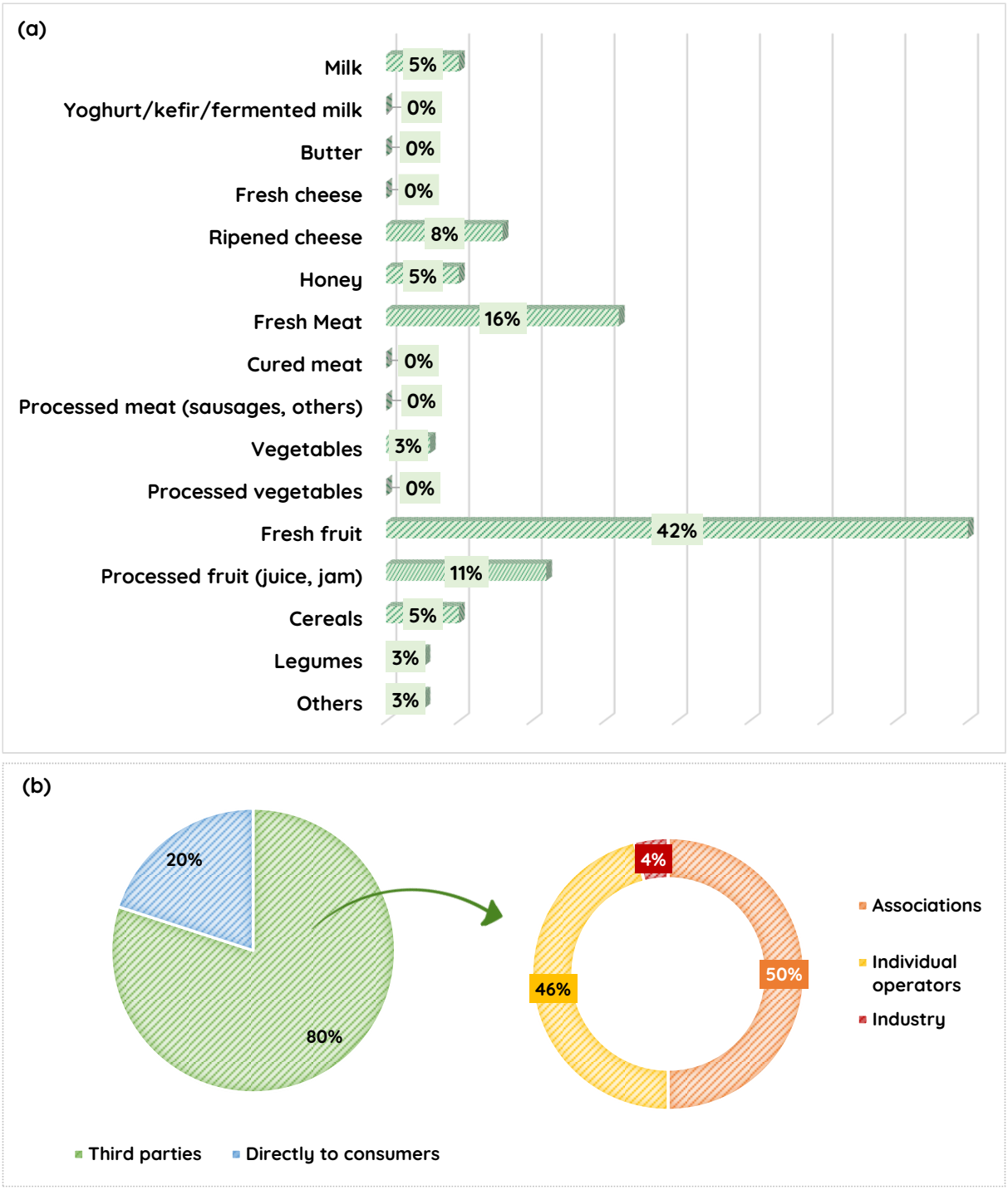

Figure 6. Products found in the market based on the agricultural production of interviewed producers (a) and delivery of production (b).

Regarding marketing actions adopted by the producers, only 10% indicated having a website and 20% uses social media. However, only 13% of the interviewed recognised developing advertising campaigns for their products. As regards the presence in trade fairs, only 10% attend often (7% more than twice a year and 3% twice per year). 33% of producers attend annual trade fairs while 27% indicated they attend less than once every year. Among producers, 30% reported never making presence at trade fairs.

With regard to the current situation of the companies (Figure 7), most producers (60%) indicated that they neither agree or disagree when asked that the income of companies' productive activities is sufficient, against 30% which indicated that they strongly disagree/disagree. However, 83% demonstrated that they agree/strongly agree that their company has room to grow and 63% indicated that their position is suitable for diversification.

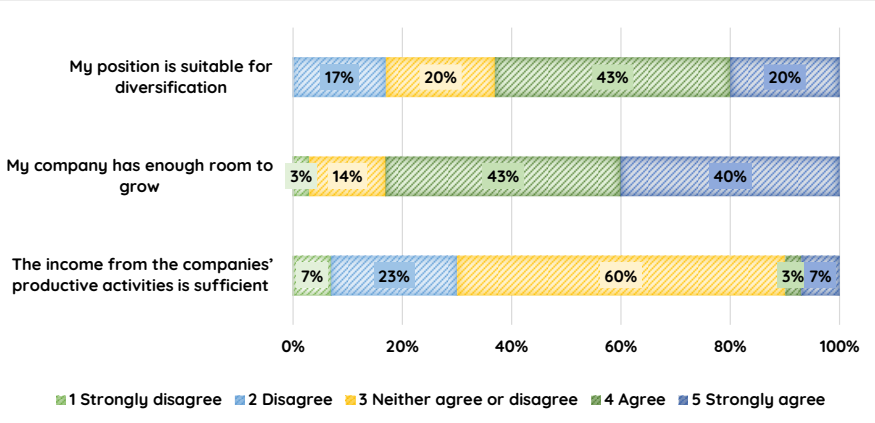

Figure 7. Current companies' situation regarding growth and diversification.

When asked about sustainability and local production, characteristics of local products and awareness were assessed. When asked which characteristics of the product or production process producers communicate to consumers through labels or promotional activities (Figure 8), 73% mentioned origin indication followed by 40% indicating born/raised/produced near the place of sale (local growth). These characteristics were perceived as very important. Other characteristics communicated by the producers followed a pattern accordingly to the importance attributed by them, i.e. the lower the importance, the lower the characteristics of the product communicated (Figure 8).

In a different perspective, when asked about the important characteristics of a product (Figure 9), producers highlighted that all parameters were important/very important: link with territory of origin, use of safe food, respect for the environment and resources, respect for animal welfare, reduction in the use of antibiotics, energy sustainability and use of innovative technologies. Finally, with respect to local products, producers point out that local products are important for local economy, national or produced close to their residence and important to the culture and territory identity (Figure 10).

The last section of this dimension revealed that producers (53%) consider that their products are cheaper than similar traditional products, however only 16% consider that the price reflects their real value. From the 83% interviewed that indicated selling their products within a range of 100k from their point of origin, 27% confirmed that their products are more expensive than others while 47% specified that theirs are cheaper. Interestingly, 40 and 43% of producers indicated that local products should be more expensive than conventional products and the majority (75%) specified that they should cost more 20-30%. Also, 43% producers unveiled that local products should be or cheaper than conventional ones.

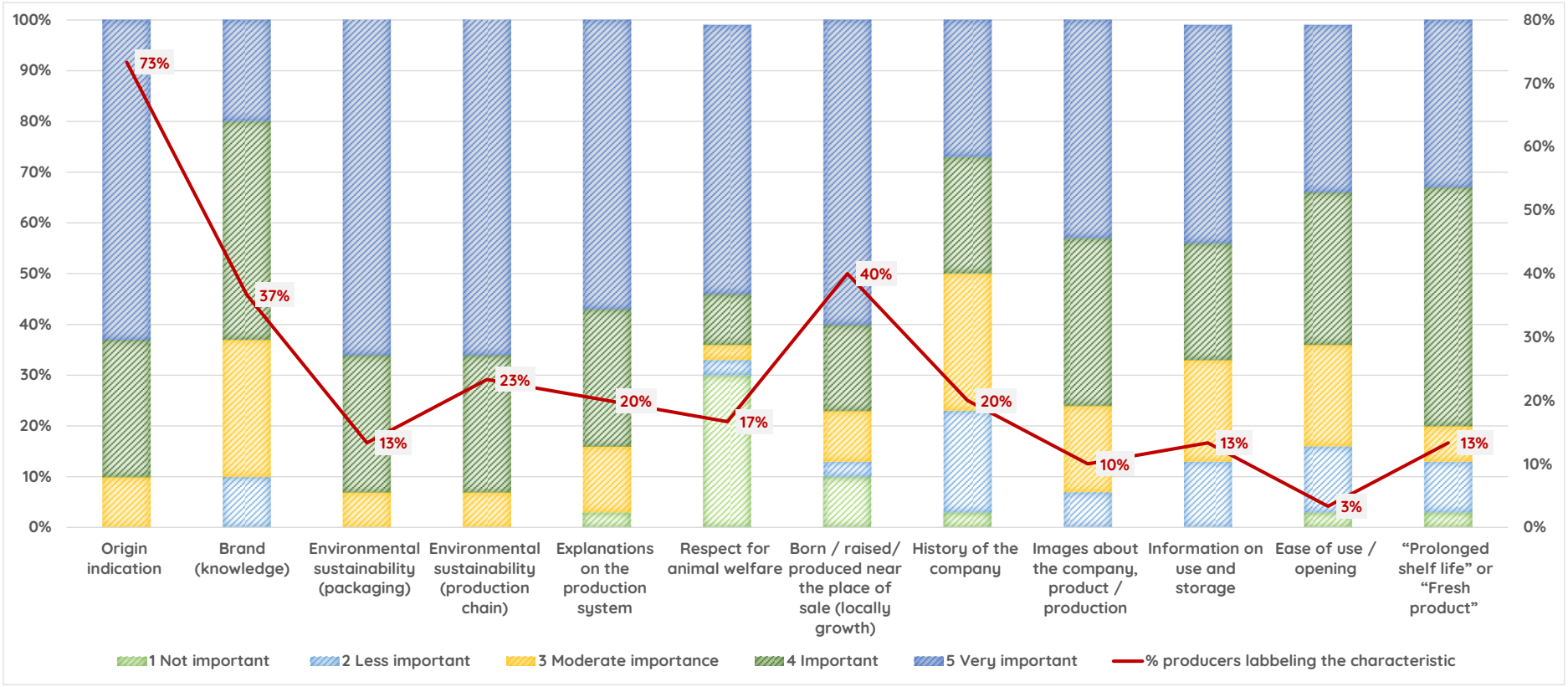

Figure 8. Importance of communicating the products' characteristics (bars) and % of producers that communicate the characteristics of their products (line).

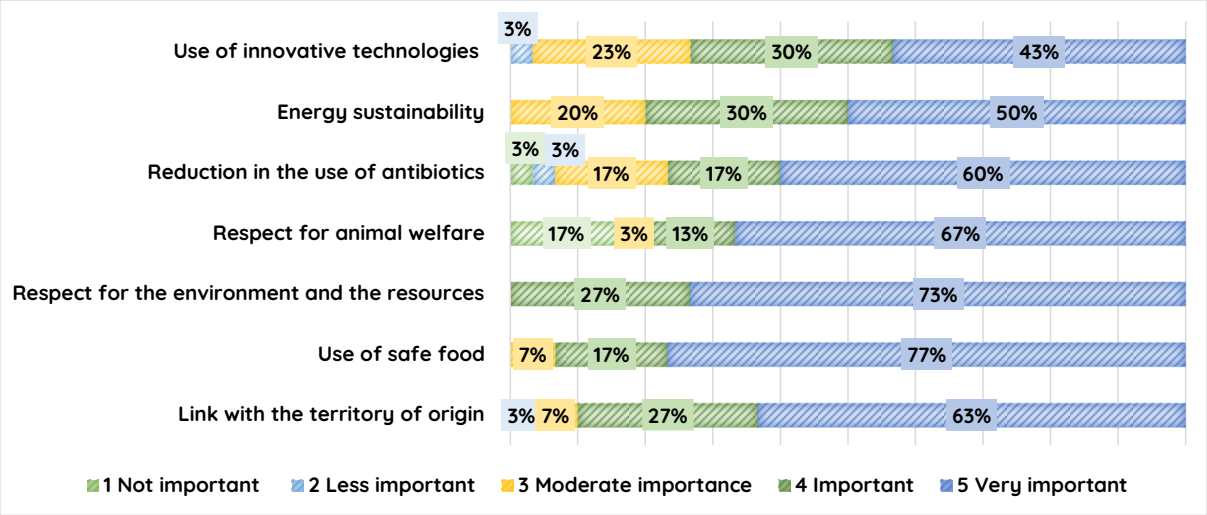

Figure 9. Rating of production process by producers.

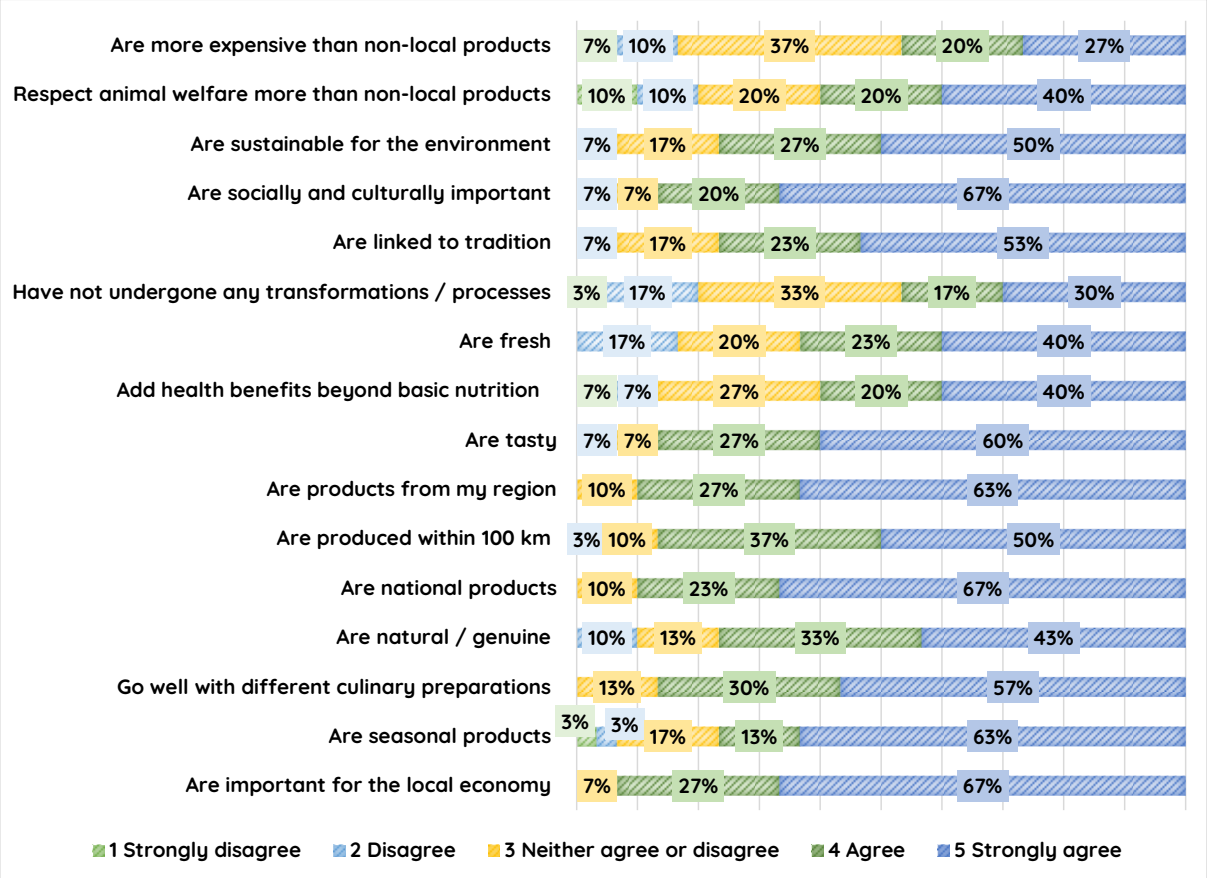

Figure 10. Classification of characteristics of local foods according to producers.

3.2. Consumers survey

Description of the interviewed

One hundred and twenty-three consumers were reached, 30% of which were male and 70% female. 75% of interviewed are between 25-54 years old, 18% are 55-64 years old and a minority of 3 and 4% is represented by consumers of <25 and 65-74 years old.

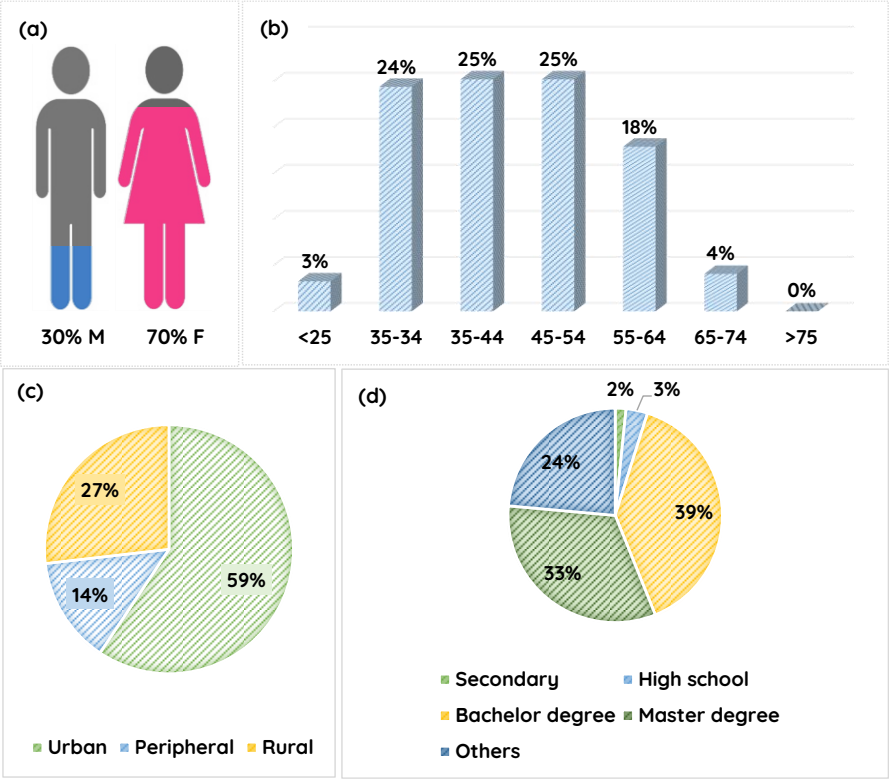

Figure 11. Survey demographics. Gender profile (a), age of consumers (b), distribution of residency area (c) and education (d).

Regarding location, consumers reported living mostly in urban areas (59%), followed by rural areas (27%) and peripheral (14%), and are distributed throughout the country (16 in 18 districts were reached): Braga, Vila Real, Viana do Castelo, Porto, Aveiro, Viseu, Castelo Branco, Guarda, Coimbra, Lisboa, Leiria, Santarém, Setúbal, Portalegre, Évora, Faro. This survey reached consumers from Açores and Madeira as well (islands). 39% interviewed hold a bachelor degree, followed by 33% of masters and 24% of other educational levels. As such, the majority of respondents are employed (77%), only 9% are self-employed and a minority are students, retired, searching for a job and others. When asked how many people comprise their household, most consumers answered between 3-5, as seen in Figure 12 (a).

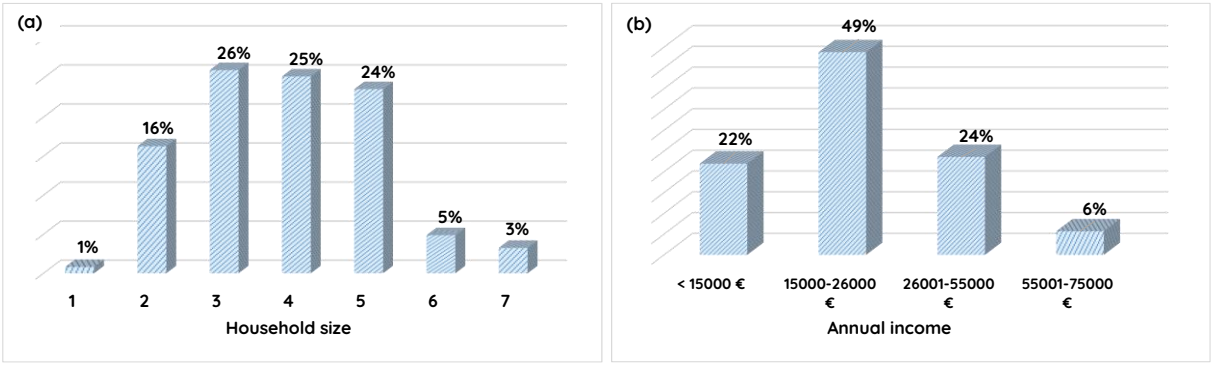

Figure 12. Household size (a) and annual income (b) distribution among consumers.

The annual income (Figure 12 (b)) of 49% of consumers interviewed in this survey varies between 15000-26000€ whereas for 22% it is lower than 15000 and is 26001-55000 for 24%. Only 6% of consumers interviewed have an annual income of 55001-75000€. With respect to the experience in rural areas and agricultural production, 52% grew up in a rural area against 48% who did not, but 97% of consumers already visited a farm and 96% contacted directly to a food producer.

Purchasing behaviour and eating style

When asked about the eating style, 52% of consumers eat proteic traditional (pasta, bread, vegetables, fruit, cheese, eggs and meat or fish almost every day), 40% balanced traditional (pasta, bread, vegetables, fruit, cheese, eggs and meat or fish 2-3 times a week) and only 3-4% are vegans and vegetarians (Figure 13 (a)).

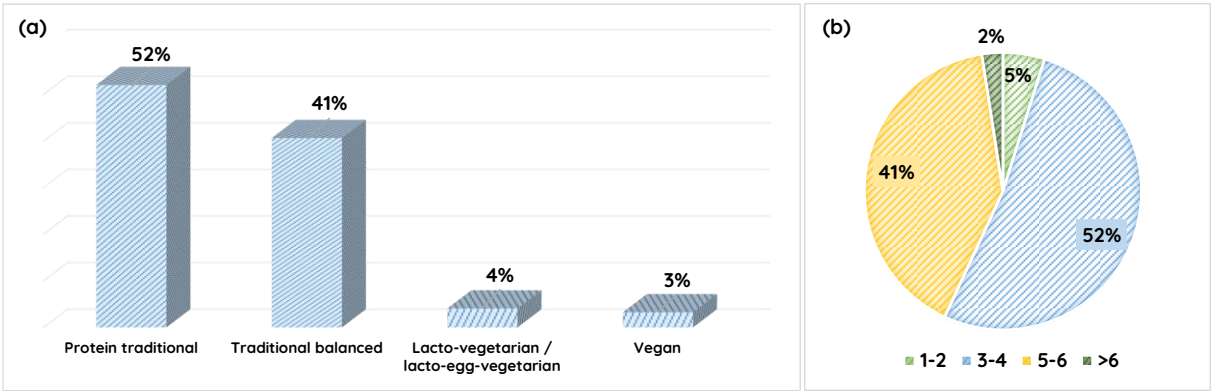

Figure 13. Eating style (a) and eating frequency (b).

Concerning how many times a consumer eats a day (Figure 13 (b)), 52% answered 3 to 4 times whereas 41% answered 5-6 times. On a different perspective, 5 and 2% of the interviewed highlighted having 1-2 or >6 times a day respectively. Furthermore, most consumers indicated cooking once (39%) or more times a day (28%), while having pre-cooked meals and having lunch and dinner outside occurred less frequently, mostly once a week or once a month (Figure 14).

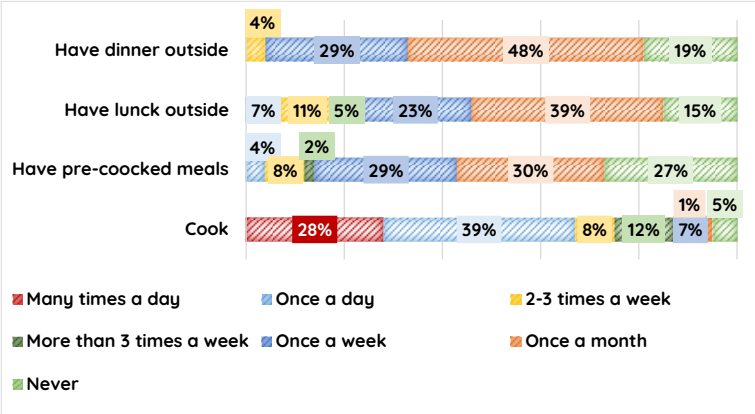

Figure 14. Frequency of cooking.

Regarding the food supply chain there's a clear distinction between channels and frequency of shopping (Figure 15 (a)).

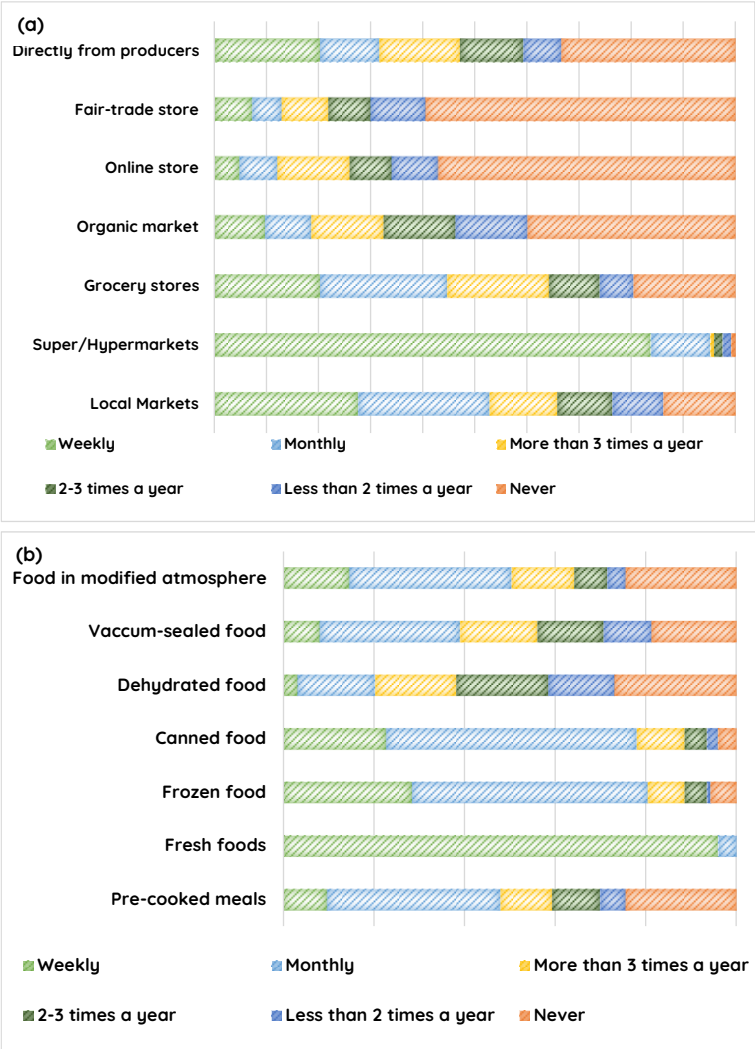

Figure 15. Frequency of shopping (a) and buying defined food categories (b).

Most consumers go to super/hypermarkets once a week (84%) and go to local markets, grocery stores and buy directly from producers less frequently. On the other hand, buying from fair-trade stores, organic markets does not garnish much attention from the consumers as only 7, 5 and 10% use these food supply channels on a weekly basis (Figure 15 (a)). Concerning the food categories that consumers buy, fresh foods are bought weekly by 84% of interviewed, while foods in modified atmosphere, pre-cooked meals, canned and frozen food are bought monthly (36, 38, 55 and 52% respectively) (Figure 15 (b)). The following food categories are bought less frequently: vacuum sealed food and dehydrated food. When purchasing food products, the most important aspects to consider are national origin (65%), followed by local origin (57%), nutritional value (50%), price (44%), local and organic (32%), organic (32%) and lastly, brand (3%).

Interestingly, when consumers were asked to indicate if they agree or disagree with some statements concerning agriculture and food (Figure 16), 53% indicate they disagree that food is not as safe as 10 years ago and 63% disagree that the use of technologies has a negative impact on the food supply chain.

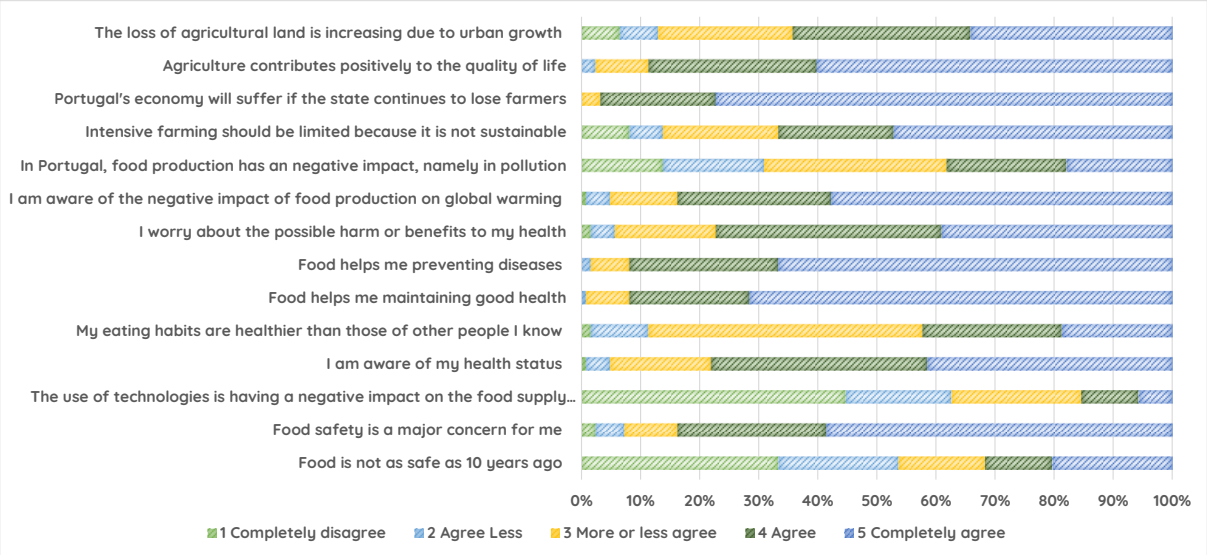

Figure 16. Opinions of consumers regarding agriculture and food.

On a different perspective, most consumers (88%) indicate that agriculture contributes positively too the quality of life in Portugal and that Portugal's economy will suffer if the state continues to lose farmers (97% of interviewed). Furthermore, food safety is a major concern for 74% of consumers, with 92% indicating that food helps preventing diseases and maintaining good health.

Analysis of opinions and perceptions of local products

This dimension refers to local production and to what concerns the frequency of buying local food products. In this survey, consumers indicated that they prefer to buy local products often (46%), always (33%), and some indicated sometimes (20%) and rarely (2%).

Referring to the following product categories (Figure 17), consumers indicated how often they purchased each one of these items.

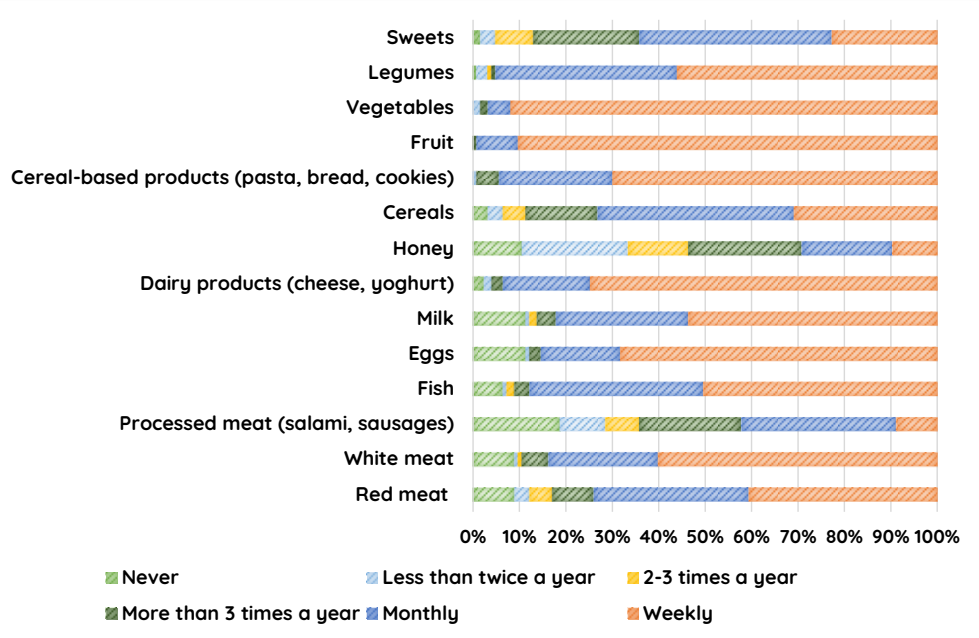

Figure 17. Purchase frequency of food categories.

In general, vegetables, fruits, dairy products and eggs are bought by the majority of consumers weekly. Sweets, legumes, cereals and processed meat are bought monthly whereas foods such as honey are bought with a varied frequency. In addition, when the consumer was asked to think about local production, the top 3 products that come to their mind among those listed were fruits, vegetables and eggs.

Regarding the attributes that characterize local products (Figure 18) consumers agree that they are an important support for local economy (80% completely agree), seasonal (60% completely agree) and versatile (72% completely agree). More than 70% agree completely that these are national or regional products. Furthermore, consumers agree and completely agree that these are important to define the territory and that local products are connected to tradition. Nevertheless, there is less agreement in the fact that local products are less treated with fertilizers and pesticides, are safer for their health, are too expensive or the fact that they are more expensive than non-local food products.

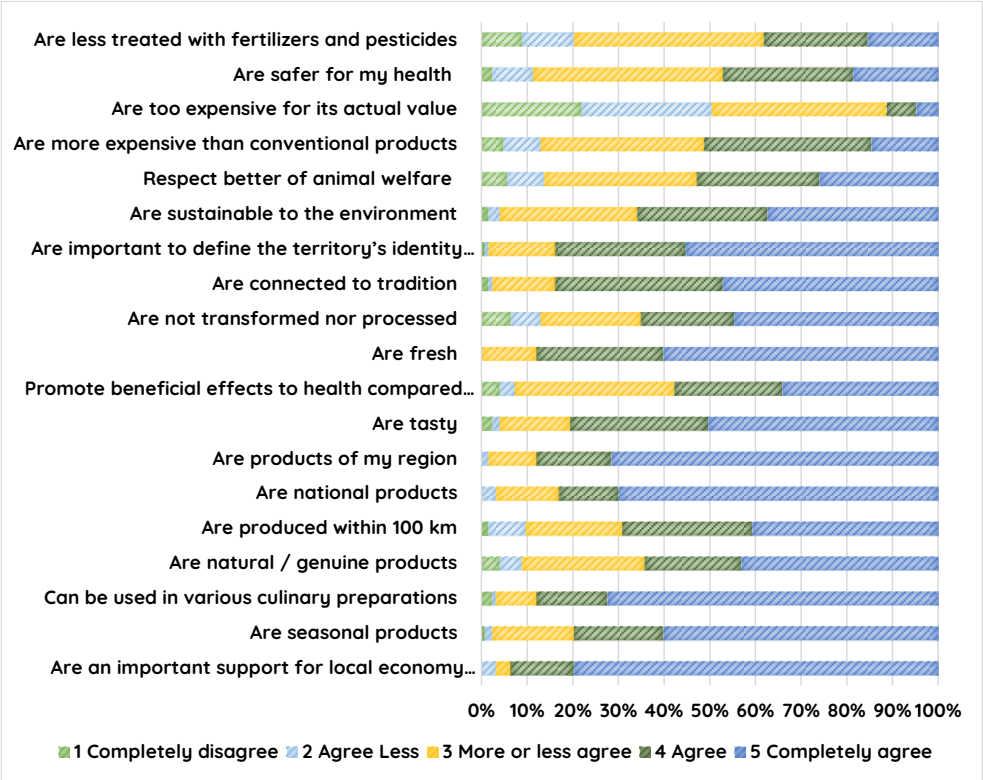

Figure 18. Characterization of local products.

Regarding the price of the local products, 59% of interviewed consider the price fair, against 18% that answered no and 24% that doesn't know. In addition, 61% of consumers is willing to pay more for a local product (61%), in contrast with 14% that answered no and 25% that answered that doesn't know. In this sense, when asked how much more would you be willing to pay for the following guaranteed local products compared to a conventional product most consumers answered about 10% more. When buying a local product, consumers give importance to origin indication, environmental sustainability, animal welfare, ease of use/opening, expiration date and produced close to their region. The less valued assets were the brand, history of the company and pictures of the company or product.

In general, consumers prefer to buy most local food products in super/hypermarkets, except for honey in which most interviewed are buying directly from the producer (Figure 19). The purchase of vegetables, fruits and eggs is dispersed between super/hypermarkets, directly from the producer and in local markets in some extent.

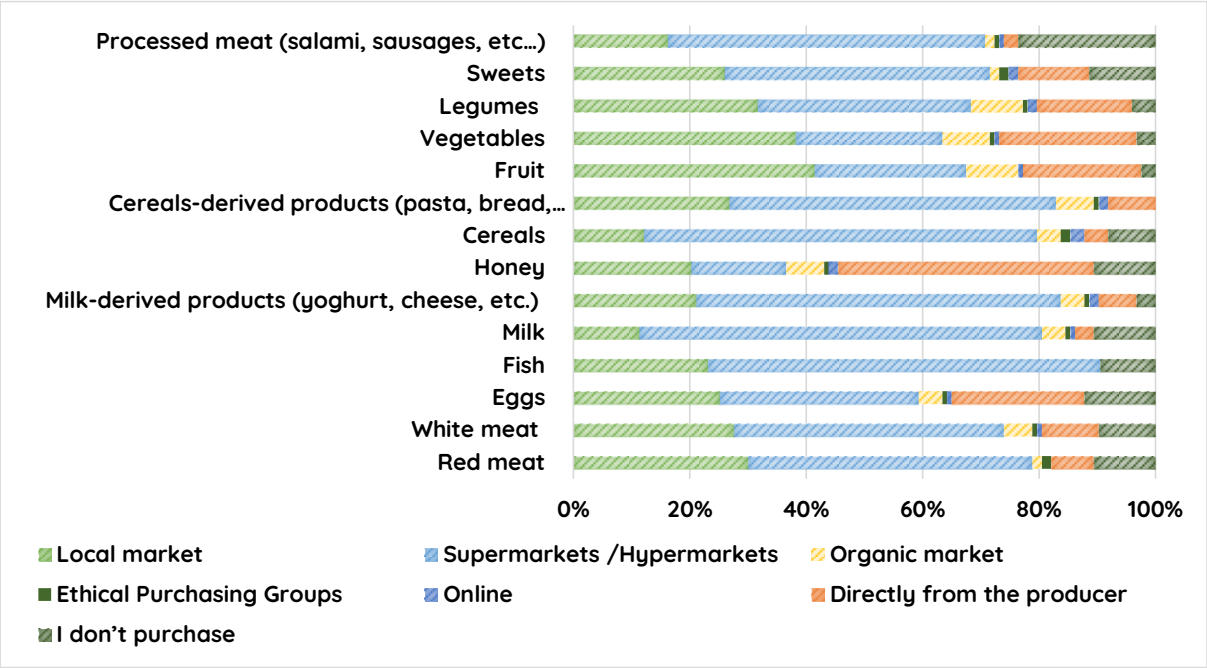

Figure 19. Preferred place to buy foods.

Furthermore, consumers agree that local products are recognisable in the market, and more available in local markets than large supply chains like super/hypermarkets or even grocery stores. Finally, the knowledge of Portuguese consumers on autochthonous races unveiled that the group of cattle is the most recognized and consumed (Figure 20), together with the group of pigs, sheep and poultry. Goats are the less known and less consumed.

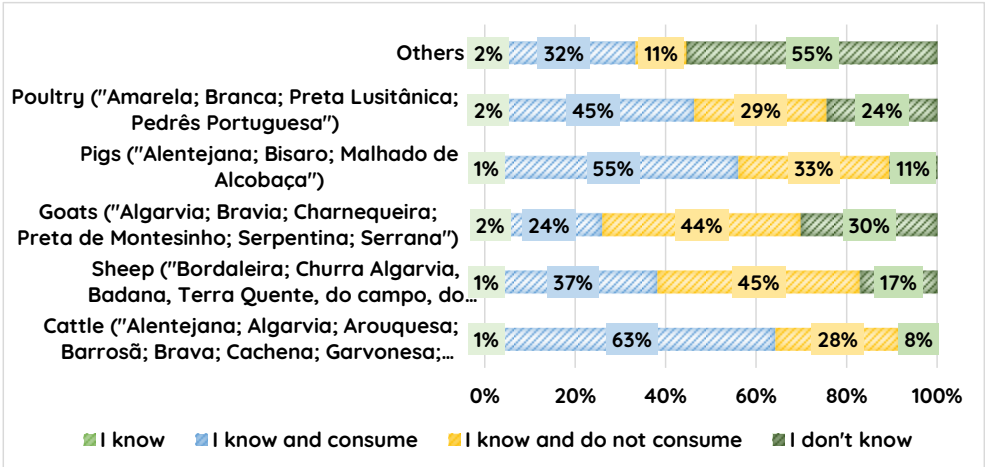

Figure 20. Knowledge and consumption over Portuguese authoctonous races.

4. Concluding remarks

The findings in this contribution were constructed from a series of surveys conducted to Portuguese producers and consumers. This has proved to be a suitable system to evaluate local food purchasing behavior and characterize the local food production. This theoretical information will be further used in a presential meeting with representatives of the food sector to better understand existing gaps in the short supply chain of local foods, in research on local food consumption and will allow the development of stronger food networks.