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Perception of Quality Attributes in Short Agri-food Chains

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ABSTRACT

This paper aims to identify quality attributes in products from short agri-food chains, highlighting the perception of these attributes in three types of short chains (face-to-face, spatial proximity, and spatially extended). We conducted a survey with 904 consumers in six distribution channels. The results indicate that the perception of quality attributes for consumers in short agri-food chains is not homogeneous. The results also shed light on the mechanisms adopted for transmitting information from producer to consumer in spatially extended short chains, restricted to the use of seals or brands.

Keywords: Agri-food chains; Product quality; Quality turn.

1 Introduction

The behavior in agri-food product consumption has been affected by two main issues. The first one refers to various food scandals as mad cow disease in 1997 in Great Britain, milk contaminated with caustic soda and hydrogen peroxide in Brazil in 2007 and 2013/14, avian influenza in Asia in 2005/06, dioxin in eggs in Germany in 2011, among others. The second is the valorization of goods produced locally through qualification processes in agri-food production chains (Niederle, 2013). These main issues are causing transformations in agri-food chains mainly related to the adoption of new production techniques and commercial transaction dynamics.

Besides, these transformations also cause changes on the mechanisms that inform all links in the chain referring to attributes that differentiate the product. Previously, industrialized and globally products prevailed, where valuation was in the standardization of products and processes. Now, there is a growing consumer movement that values products that aggregate a set of elements such as transparency, traceability, rooting (ecological and social), localism, regional identity, cultural identity, trust, relocation (reconnection, history, and tradition). and production mode (Goodman and Goodman, 2007; Fonte, 2008), known as the "quality turn movement" (Goodman, 2003).

According to Marsden (2006), Bakudila (2013), Guadagno (2013), Brunori & Marescotti (2008), Rossi and Brunori (2010), and Migliore *et al.* (2015), all the transformations that have occurred in consumer behaviors are more related to the cultural issue than to the economic issue. Consumers are more concerned about linking "food" and "territory", since they tend to have a different perception regarding the consumption of food products to obtain greater knowledge regarding the purchased product and also the food production means. Furthermore, according to Goodman (2003), given the various scandals that fostered the consumers' feeling of distrust, there was a need to establish the means that could generate a quality guarantee of the consumed products.

The valorization of territories in terms of goods produced in certain regions, through the reputation based on local know-how, tradition, or customs, is a strategy that brings food production and consumption closer, which often breaks the spatial barrier. That is, such knowledge is not only conditioned on the physical proximity between production and consumption but is added to the product. For establishing this dynamic between production and consumption, mechanisms such as seals and certificates are used, which mediate economic relations between anonymous and dispersed agents (Niederle and Silva, 2017). In this sense, Renting *et al.* (2003) classified three short-chain configurations that differ by the interaction between producer and consumer, by time and physical space criteria (see details on Table 1).

The difference between these three configurations is mostly related to the physical and temporal distance between production and consumption. The three configurations seek to approximate production and consumption through direct face-to-face or information obtained during the acquisition of the product (spatial proximity or extended spatiality) (Table 1).

The authors highlight that the meaning of "short" for chains goes beyond physical space, but rather it is an integration between individuals consolidated by the consumer's intention to buy, in terms of ecological and social motivation. According to the authors, products with social or geographical reputation seals, even if inserted in the context of long distribution chains, are linked to the discussions of the so-called quality turn, which considers the quality attributes in short agri-food chains associated with the valorization of the territory, producer, location, tradition, customs, trust, food safety, the respect for the environment, and other quality attributes. In this sense, a product can be purchased in a supermarket, for example, be far from its origin of production, but be perceived by the consumer that the product has these characteristics mentioned above.

Considering the typology presented for short chains and the valorization of consumer quality attributes, the question is, what is the consumer's perception in aspects related to quality attributes that correspond to the quality turn movement? Moreover, are the quality attributes equally perceived among consumers in the three chains presented?

Table 1.
Short food supply chain categories

Category	Face to Face	Space Proximity	Extended Spatiality
Characteristics	Consumers buy products directly from producers locally, personal interaction between agents creates trust and legitimacy of authenticity and origin. This category resembles the definition of direct selling.	Consumers purchase products at points of sale, but are informed about the specific region where they were produced. Because consumer relations are not direct sales, more complex institutional arrangements are often required.	Products are sold to consumers outside the production region, can travel long physical distances, but carry production, product, region or producer information.
Types	Agricultural Products Store; Marketing by the farmer on property; Harvest by the consumer himself; Roadside Sale; Home Delivery; Delivery by mail; Internet selling; Agroecological Fairs.	Groups of Agricultural Products Stores; Regional brand; Consumer Cooperatives; Community Supported Agriculture (CSA); Thematic Routes: (articulation with space); Special Events & Fairs (articulation in time); Local shops, restaurants and tourism companies; Specialty Retailers (specialty foods, diet stores); Supply of institutions (canteens and schools).	Certification Label; Production code; Reputation effect (example: geographical indication, fair trade, sipaf);

Source: Adapted from Renting, Marsden & Banks (2003) apud Scalco et al. (2020).

The national and international literature addresses a range of attributes related to product quality concerning the consumption of products in short chains, as previously mentioned. However, it does not explore the scope of these attributes regarding the short-chain typology (face-to-face, spatial proximity, spatially extended). Previous studies presented examples of generalizations of quality attributes, regardless of the structures of short chains (Giuca, 2013; Marsden,2004; Kirwan, 2006;, Climent-Lopes (2014), Ruiz Budria *et al.* (2013), and Tessitore *et al.*, 2020. However, the literature also highlights disagreements among quality attributes perceived in specific channels and in specific short chains (Silva *et al.*, 2013), Morgan *et al.* (2006), Ferrari (2013), Migliore *et al.* (2015), Rikkonen *et al*. (2013), Kjeldsen *et al.*, 2013). The innovative proposal of this paper is to identify the attributes of quality in the three categories of short chains, highlighting the perception of these attributes for each of the types presented.

This paper is organized as follows. The main aspects concerning the quality turn are briefly described in Section 2. Section 3 presents the methodological procedures of this research. In Section 4, the results and discussion are presented followed by a concluding section.

2 The Quality Turn

Product quality is a subject that has been discussed for decades. At the beginning of the twentieth century, the quality of a product was easily observed, as the product designer simultaneously inspected its quality. At that time there was greater interaction between those who produced and those who consumed, which facilitated meeting the needs and expectations of customers. This was possible due to low demand. Over the years, due to population and production increase, observation through product quality inspection was no longer a reality, requiring various quality control mechanisms, mainly statistical instruments such as control charts, histograms, among others to increasingly standardize products (Garvin, 1992).

Today, companies need to address different needs and also for multiple markets, often in different regions. Product quality has thus become a goal of continuing research by companies.

In addressing the issue of quality, specifically in products of short agri-food chains, the approach should be based on another concept of product quality, as opposed to products of long agri-food chains. For these specific products, the standardization of processes and products makes no sense, since what consumers value is a product whose aspects are related to tradition, trust, customs, history, place, rooting, justice, and environment (Marsden, 1998; Murdoch and Mielle, 1999; Murdoch, 2000; Migliore *et al.*, 2015).

In this regard, a consistent movement called 'quality turn' emerged, which represents the increasingly active role of consumers in structuring the food quality policy (Goodman *et al.*, 2012). The quality turn underscores a shift in the quality concept of the industrial world emphasizing trust, tradition, custom, history, and ecological practices instead of standardization of products and processes (Murdoch and Mielle, 1999; Murdoch, 2000). This modern concept for product quality can be explained by the convention theory, which explains the behavior of consumers in the process of purchasing agri-food products. The convention theory addresses sociological aspects in the assessment processes of consumer product quality (Migliore *et. al*, 2015).

The consumer's purchasing decision is based on social interaction dynamics between the agents in a buy and sell relationship, measured by the interaction between individuals who interpret and coordinate the quality during the transactions (Migliore *et al*., 2015). Such relationships between consumer and seller (producer) involves issues related to trust, commitment and shared values as e.g. ethics, respect and a sense of social and environmental justice.

New food production chains seek to meet these demands, without losing focus on the needs of consumers, by being concerned with what is consumed in terms of health and its impacts on the environment, food production, climate change and future generations (Schinaider et al., 2020).

The authors Jarzębowski, Bourlakis, and Bezat-Jarzębowska (2020) emphasize that short food supply chains support the general sustainability concept, which is based on three pillars: environmental, social, and economic dimensions. The environmental dimension is characterized by issues such as ecological production methods, the decrease of GHG emissions and energy use, or reduced utilization of packaging and measured in terms of e.g. food miles, carbon footprint, and many more. The social dimension refers to connections between producers and consumers, and may involve consumers' trust and recognition of producers. The economic dimension may be related to the generation of local employment and income.

Consumption habits are changing in a dynamic process influenced by the impacts of new media and of decision variables with changing priorities in purchase decisions. In the first case, the changes are due to the democratization of information, which leads consumers to value shared opinions on social networks and online media, actively participating in discussions about food products. In the second case, the variables that have a high influence on purchase decisions are related to e.g. health and well-being, food security, social impact, experience with the brand / product, and the transparency in processes (Portugal Foods, 2020).

Recently, artisanal production is getting more attention from consumers considering local production and the proximity between consumers and producers (Moreno and Medina, 2014). This tendency could encourage changes in eating habits towards healthy eating and the experience of taste as well as towards orientation at the seasonality of production (Darolt et al., 2016) resulting in more sustainable consumption patterns. From producers' perspective, it brings more autonomy, absence of intermediaries in financial transactions, fairer remuneration, and less risk of losing market share.

From a theoretical point of view, the theory of conventions has been used to explain this behavior in the purchase of agri-food products. The theory of conventions addresses sociological aspects in the processes of product quality evaluation by the consumer. The emphasis is not on market dynamics, based on market price, but rather on the dynamics of endogenous social construction, whose quality evaluation is measured by the interaction between individuals who interpret and coordinate quality during market transactions (Migliore et al., 2015; Boltansky and Thévenov, 1991).

Boltansky and Thévenov (1991) argue that in certain situations people must justify their actions based on the valuing principles that refer to the "orders of worth", as a means justifying a particular course of action or decision (Scalco *et al*., 2020). These orders of worth were proposed by Boltanski and Thévenot (1991) and called conventions.

They were classified into:

- inspiration convention (refers to creativity and grace),
- domestic convention (refers to embeddedness and trust),
- opinion convention (refers to public regard and recognition),
- civic convention (refers to benefits to society as a whole),
- market convention (refers to performance outputs and profitability), and
- industrial convention (efficiency, reliability, organizational capacity, and standardization).

Scalco *et al*. (2020) point out, that these conventions were adapted by other authors such as Sylvander (1994; 1995), Renard (2003; 2004), Migliore *et al.* (2015), Offer (1997), and Kirwan (2006). To identify the quality attributes from consumers' perspective, specifically in short agri-food chains, a quality convention could be integrated into the framework of Boltnski and Thévenot (1991) as follows:

- Domestic convention: it involves consumers' product quality assessment taking into consideration the location of production, reinforcing questions related to e.g. tradition, area, and rooting.

- Civic convention: it involves the analysis of benefits generated for society as a whole by participants of the transaction, putting emphasis on attributes such as food miles and carbon credits. It involves, in addition, consumers concern about e.g. fairness, responsibility, commitment and sustainability (Kirwan, 2006; Climent-Lópes, 2014) as well as about economic and local social developments (Ruiz Budría *et al*., 2013).

- Regard (opinion) convention: it involves the consideration of criteria related to feelings of trust, friendship, respect, recognition and coexistence, and communication (Kirwan, 2006, Morris and Kirwan, 2011; Rikkonen et al., 2013).

- Institutional conventions: it involves the analysis of institutions where quality assessment is measured through formal criteria, such as seals and certification systems (Renard, 2005).

- Market convention: it refers to social connections, but not excluding the importance of price. The idea is to balance the notions of marketness and instrumentalism (Hinrichs, 2000).

The increased value of short agri-food chain products is not due solely to the physical proximity between consumer and producer, aimed at cutting transportation costs and eliminating intermediary agents (Sellito, Vial, and Viegas, 2018). Products with seals or certificates of origin or geographical identification inform about cultural, traditional, historical, and ecological attributes related to certain regions, highlighting the quality of a product (Morgan *et al*., 2006; Ferrari, 2011). On this subject, the importance of formal conventions is emphasized through the formal mechanisms used to inform about the attributes that make up the product.

There have been several studies aimed at understanding consumers' motivation and perception when purchasing products in specific short channels. Ferrari (2011) points out that the attributes and quality criteria vary among different countries. As examples, this author cites studies by Marsden (2004), where in southern Europe (Italy, France, and Spain) quality is measured by regional production activities and longstanding tradition, reinforcing cultural attributes, local knowledge, tradition, local family farming, and artisan foods (domestic convention). In northern European countries (UK, Germany, and the Netherlands), conventions are more rooted within an institutional and market context, with more health and safety concerns.

Scarabelot and Schneider (2012) analyzed the social construction process of family farming food production, industrialization, and marketing initiatives in the municipality of Nova Veneza, South of the Santa Catarina state, Brazil. They noted that the quality attributes valued by consumers emphasize immaterial aspects such as culture, gastronomy, landscapes and architecture, which can be added to the notion of more contemporary quality (domestic convention). The researchers also point out that "it is essential for the 'typical product' to retain its characteristics without neglecting requirements that guarantee its quality in all parameters, and that it is essential to advance the discussion regarding the mechanisms that allow consumers to associate the origin of food with identities and cultural values" (Scarabelot and Schneider, 2012, p. 124). They conclude that "there are numerous themes to be explored, such as the discussion on 'quality' and its multiple dimensions, which are still very incipient and not quite clear to farmers, consumers, public managers and technicians" (p. 125).

Kjeldsen, Deleuran, and Noe (2013) conducted a study on a short salt production chain (for food, medicines, therapies, etc.) in Denmark and verified the relocation process in producer and consumer integration, identifying that the term "short" for this specific chain refers more to the social than spatial context, which they called resocialization, since visitors from various places in Denmark visit and purchase products from this region due to its historical-cultural context. In the past, these areas in Denmark were underdeveloped. Their revitalization indicates a domestic convention. According to the authors, even in distant places, the interaction between producer and consumer has generated a process of exchanging experiences and learning. Rikkonen *et al*. (2013) argue that in the pig chain in Finland, producer-consumer communication is a key factor in conveying trust in the product, which indicates regard and institutional conventions. Migliore *et al*. (2015) analysed the organic farmers' market in Italy (face-to-face short chain), and noted that all conventions as civic, domestic, and regard are considered in the decision to purchase products, with less emphasis placed on institutional conventions such as certification.

Jensen *et al*. (2019) sought to analyze the perception of local food by different consumer groups in Denmark as well as the influence of locality and organic production methods. They found that one group of consumers tends to understand local products based on proximity and considers in the purchase of these products aspects related to small enterprises, short food chains, and values related to transparency, freshness, and authenticity indicating institutional and civic conventions.

Tessitores *et al*. (2020) carried out a study with young university students in Milan, Italy. The researchers identified that labels are important in the decision to purchase products, and prioritize attributes such as health, origin, environmental protection, and fair trade (Tessitore *et al.*, 2020) which indicates institutional and civic convention.

An earlier study indicates that perception of food quality and the level of process innovation depend on economic and social factors, regions, and countries. The quality of products such as cheese, wines, and coffees are dependent on the original location where they were produced, considering the raw material, production method, and geographical specificities (Cidell and Alberts, 2006).

For Marsden *et al.* (2000) and Sage (2003), the short agri-food chains can better communicate their characteristics to end consumers, and consumers are better able to recognize these characteristics. From producers' side, short chains support the creation of a product image and, consequently, facilitates the reference to the locatiopn of production. This makes distance not essential, given that a product can be traded nationally or internationally and still carry relevant information on the place of production, mode of production, traditions, local culture, and historical data.

In summary, the national and international literature addresses a range of product quality attributes related to consumers' preferences for products from short chains. However, it does not explore the scope of these attributes regarding the short-chain typology (face-to-face, spatial proximity, spatially extended). Thus, the innovative proposal of this paper is to identify and highlight the attributes of quality and their perception in the three categories of short chains.

3 Methodology

Tha analysis is based on descriptive research with a quantitative approach, characterized by the use of quantification (statistical techniques) in treatment and analysis of the data (Gil, 1994; Diehl and Tatim, 2004). The units of analysis are consumers of agri-food products in three types of short chains, face-to-face, spatial proximity, and spatially extended.

Scalco *et al*. (2020) developed and validated a seven-points scale, ranging from 1 ("strongly disagree") to 7 ("strongly agree") for twenty items of quality attributes as seen from the perspective of consumers in short food distribution channels in Brazil, comprising the domestic, civic, regard, institutional, and market conventions. The obtained data were analyzed through exploratory and confirmatory factor analysis, which resulted in the final semantic differential scale presented in Table 1.

Table 1.
Scale of quality attributes in short agri-food chains

Conventions	Attributes	Items
Regard	Friendship	1) Product contributing for approximation (friendship) with the producer
	Respect	2) Product produced by producers who deserve respect
	Quality of life	3) Product that provides health and welfare to the worker
	Empathy	4) Product produced by people I identify with
Civic	Ecologic	5) Product that uses less packaging
	Environment	6) Product that is produced without degrading the environment (soil, air, and rivers)
	Justice	7) Fair remuneration for all agents in the chain
	Distance	8) Product that contributed to the reduction of pollutant emissions due to the short distance between production and consumption
Institutional/ Formal	Communica-tion	9) Product that allows all necessary information about it to be transmitted (consumer safety).
	Place of origin	10) Product certificate that guarantees where the product is produced
	Producer	11) Product certificate that guarantees who produced the product
	No pesticide	12) Product certificate that guarantees it has no pesticides
Domestic	Localism	13) Product produced close to where it is sold
	Landscape	14) Product produced in a place where the landscape is preserved
	Artisanal Process	15) Artisanal produced product
	Artisanal Product	16) Product with artisanal characteristics
	Traditions	17) Product is produced in a place where traditions and customs are preserved and interfere with the product production process.
	Geographical characteristics	18) Product produced in a place where physical characteristics such as climate and vegetation differentiate the product
Market	Status	19) Product transmits status social
	Expensive product	20) Product is more expensive

Source: Prepared by the authors

Data collection was performed from a non-probability sample consisting of 904 consumers of agri-food products in Brazil, distributed in the following chains and respective channels, from 2018 to 2019:

- Face-to-face: 274 consumers, 140 at organic producers' fair, and 134 at-home delivery.
- Spatial Proximity: 295 consumers, 136 in local product stores, and 159 in community-supported agriculture (CSA).
- Spatially extended: 335 consumers, 195 in Supermarkets, and 140 in specialized stores that sell products with reputable seals (geographical or social indication, and regional brand). Six supermarkets in municipalities of the Sao Paulo state, Brazil, were considered, where consumers data collection was equally distributed (Sao Paulo, Sao Carlos, Sao Caetano do Sul, Sao José do Rio Preto, Marília, and Vale do Paraíba), and two specialized stores located in the municipality of Sao Paulo.

Data were collected through a survey including closed-ended questions related to the consumer's profile (gender, locality of establishment, age group, educational level, per capita family income, and educational level), and questions based on the quality items or attributes listed in Table 2 asking consumer's evaluation according to the seven-point semantic differential scale described above. In all channels, the data collection was based on interviews, except for home delivery, where data were collected by electronic mail.

It is noteworthy that the consumers surveyed do in fact frequent these channels and purchase products from them. The data obtained were first analyzed using descriptive statistics (tables, and descriptive measures).

In addition to the frequency distributions of three levels of agreement (strongly agree (range 7), agree (range 6), and somewhat agree (range 5)) for the 20 variables corresponding to short-chain quality attributes, the non-parametric Kruskal-Wallis test (a non-parametric alternative to analysis of variance when data are not normal) was performed to identify significant differences between the chains. This test is used to verify if k independent samples (k>2) come from populations with equal averages. In this work, three samples (k=3) of consumers (one sample for each short chain) were considered. Thus, for p-value (significance probability of the test obtained from data) less than or equal to α (significance level established for the test), the hypothesis H0 of equality between k populations is rejected (Martins & Domingues, 2017). When the hypothesis H0 is rejected, the Dunn method is applied to test samples two by two to verify which pairs have significant differences.

Subsequently, the 20 quality attribute variables which compose the quality convention set were summarized by three regression lines (each representing a chain, i.e., the set of relative quality dimensions related to a short chain).

To identify whether or not there is a significant difference in the perception of quality attributes for a given variable or profile characteristic of the consumer samples of each chain (face-to-face, spatial proximity, and spatially extended), the Kruskal-Wallis test was used again, since the coefficients that compose each regression line are not distributed normally. Then, under the hypothesis H0 of equality between means (i.e., there is no significant difference in perception), if the p-value is less than or equal to α, H0 is rejected (Martins and Domingues, 2017).

All analyses were performed using the SPSS software and a significance level (α) of 5% was considered for all hypothesis tests performed.

4 Results and Discussion

4.1 Characterization of Consumer Profile

Table 2 shows the profile of consumers who were part of the research in the three short chains studied. It is observed that among the three types of short chains, the consumer profile is similar concerning the age group, where over 60% are between 31 and 50 years old. For face-to-face and spatial proximity categories, 70% of respondents are female, while in the spatially extended category respondents are equally distributed between men and women. As for income, in both types (face-to-face and spatial proximity) almost 50% of the sample belong to income ranges between 3 and 8 times of minimum wage[1] with the vast majority belonging to a range of 3 to 5 times of minimum wage. The same happens with the spatially extended category, with incomes of 19% between 3 and 5 times of minimum wage. It is noteworthy that about 29% of consumers of the face-to-face chain (mainly the organic fair consumers) and 38% of consumers of the spatially extended (mainly supermarket consumers) declined to inform about their wages. Finally, in terms of education, it is observed that over 60% of consumers in all short chains have at least completed higher education, and in the spatial proximity chain type more than half of this group involves consumers with postgraduate education.

[1] Wage: $250,68 (american dollars)

Table 2.
Consumer sample profile in the three types of short chains

	FACE-TO-FACE (%)			SPATIAL PROXIMITY (%)			SPATIALLY EXTENDED (%)		
	Organic fair	**Home delivery**	**Face-to-face chain**	**Local stores**	**CSA**	**Spatial proximity chain**	**Supermarket**	**Specialized stores**	**Spatially extended chain**
Distribution channel	51.09	48.91	100.00	46.10	53.90	100.00	58.20	41.80	100.00
Age range (years)									
15 a 20	0.00	2.99	**1.46**	5.88	0.63	**3.05**	1.03	2.14	**1.49**
21 a 30	10.00	14.93	**12.41**	21.32	5.03	**12.54**	11.79	13.57	**12.54**
31 a 40	22.86	34.33	**28.47**	36.76	40.25	**38.64**	15.38	27.86	**20.60**
41 a 50	13.57	23.13	**18.25**	14.71	31.45	**23.73**	26.67	18.57	**23.28**
51 a 60	25.71	18.66	**22.26**	11.03	15.72	**13.56**	25.13	20.00	**22.99**
over 61	27.86	5.97	**17.15**	10.29	6.92	**8.47**	20.00	17.86	**19.10**
Total	100.00	100.00	**100.00**	100.00	100.00	**100.00**	100.00	100.00	**100.00**
Gender									
feminine	61.43	91.04	**75.91**	65.44	76.10	**71.19**	53.33	47.14	**50.75**
masculine	38.57	8.96	**24.09**	34.56	23.90	**28.81**	46.67	52.86	**49.25**
Total	100.00	100.00	**100.00**	100.00	100.00	**100.00**	100.00	100.00	**100.00**
Family income									
Minimum wage (m.w.)									
Up to 1 m.w.	0.00	0.75	**0.36**	2.94	0.63	**1.69**	0.51	1.43	**0.90**
1 to 3 m.w.	2.86	10.45	**6.57**	7.35	1.26	**4.07**	6.67	7.86	**7.16**
3 to 5 m.w.	12.86	38.81	**25.55**	30.88	19.50	**24.75**	19.49	19.29	**19.40**
5 to 8 m.w.	17.14	12.69	**14.96**	16.91	20.75	**18.98**	9.74	19.29	**13.73**
8 to 10 m.w.	4.29	11.94	**8.03**	11.03	20.13	**15.93**	8.21	7.86	**8.06**
10 to 15 m.w.	7.86	5.97	**6.93**	14.71	9.43	**11.86**	7.69	15.00	**10.75**
More than 15 m.w.	10.00	7.46	**8.76**	6.62	18.87	**13.22**	7.69	10.00	**8.66**
Did not inform	45.00	11.94	**28.83**	9.56	9.43	**9.49**	40.00	17.86	**30.75**
Total	100.00	100.00	**100.00**	100.00	100.00	**100.00**	100.00	100.00	**100.00**
Education level									
No education	0	0	**0**	0	0	**0**	0.51	0.00	**0.30**
Incomplete elementary school	0.00	0.75	**0.36**	0.00	2.00	**0.00**	1.03	0.71	**0.90**
Complete elementary school	0.71	1.49	**1.09**	0.00	0.63	**0.34**	1.54	3.57	**2.39**
Incomplete high school	0.71	0.75	**0.73**	0.74	0.63	**0.68**	2.56	0.00	**1.49**
Complete high school	20.71	8.96	**14.96**	8.82	5.03	**6.78**	21.54	15.71	**19.10**
Incomplete higher education	2.86	10.45	**6.57**	19.12	3.77	**10.85**	5.13	9.29	**6.87**
Complete higher education	50.71	33.58	**42.34**	34.56	22.64	**28.14**	47.18	30.00	**40.00**
Incomplete post-graduation	0.71	5.22	**2.92**	8.09	4.40	**6.10**	3.08	6.43	**4.48**
Complete post-graduation	22.86	35.82	**29.20**	28.68	62.80	**47.12**	17.44	25.71	**20.90**
Did not inform	0.71	2.99	**1.82**				0.00	8.57	**3.58**
Total	100.00	100.00	**100.00**	100.00	100.00	**100.00**	100.00	100.00	**100.00**

Source: Research data

4.2 Perception of quality attributes in short agri-food chain typology

Table 3 summarizes the distribution levels of frequencies regarding consumers' levels of agreement (strongly agree (range 7), agree (range 6), or somewhat agree (range 5) with the quality attributes in short chains. Overall, more than 60% of consumers agreed to 75% of the quality attributes (15 out of 20 quality attributes). This indicates that regardless of the short-chain, the perception of quality products is very similar and corresponds to a wide range of perceptions related to quality conventions (regard, civic, domestic, and formal). However, as regards the attributes related to the market convention (product status and price), this is not considered by consumers in any of the studied short chains.

This finding consolidates the convention theory that emphasizes sociological aspects in consumers' product quality assessment processes, where the emphasis goes from market dynamics, in terms of price-based purchasing decision (market convention), to the dynamics of endogenous social construction, where quality assessment is measured by the interaction between individuals who interpret and coordinate quality during market transactions (Migliore *et al*., 2015).

Table 3.
Percentage of consumer agreement (strongly agree (range 7), agree (range 6) or somewhat agree (range 5)) on quality attributes according to short agri-food chain

Conventions	Attributes	Short chains (%)		
		Face-to-face	Spatial proximity	Spatially extended
Regard	Friendship	91.60	88.81	61.79
	Respect	96.71	97.62	79.10
	Quality of life	90.51	88.47	69.55
	Empathy	90.51	85.42	64.47
Civic	Ecological	93.79	90.84	67.76
	Environment	98.54	97.62	76.41
	Justice	88.68	90.84	57.61
	Distance	95.62	94.23	58.20
Institutional/Formal	Communication	91.60	80.33	79.40
	Place of origin	82.48	76.27	76.71
	Producer	80.65	71.18	73.43
	No pesticide	79.56	51.18	68.95
Domestic	Localism	73.72	80.00	32.23
	Landscape	80.65	79.32	69.25
	Artisanal process	95.98	94.91	79.10
	Artisanal product	90.14	89.83	77.31
	Traditions	79.92	76.61	73.13
	Geographic characteristics	75.91	64.07	71.04
Market	Status	12.04	11.52	22.68
	Expensive product	23.72	13.89	32.83

Source: Research data

Table 3 also shows that comparing the perceptions of quality attributes between the short chains, there is an order of agreement. There are higher percentages in the face-to-face chain, followed by spatial proximity and spatially extended ones. In all cases, the market attributes had lower percentages. Disregarding market attributes, in the spatially extended category, the agreement range is between 57.61% and 79.40% for most attributes considered important when purchasing products. However, in the face-to-face chain, this agreement range is between 73.72% and 98.54%. Thus it is clear that the further away the consumer is from the producer, the less perceived and valued are the quality attributes.

Specifically, two attributes received low agreement by consumers in the spatially extended chain. The distance traveled from production to consumption, which refers to concerns about fuel consumption and the emission of pollutants into the environment (58% considered it), and localism (32% considered it), which is related to the

valorization of the goods produced in the procurement region. To this end, it was already expected that consumers buying products with seals such as Farroupilha wine or Canastra cheese, which were the most representative in this short-chain typology, would not have this concern since the place where these products are produced is far from the place of sale, the Brazilian Rio Grande do Sul and Minas Gerais states, respectively.

Authors such as Kirwan (2006) and Climent-Lópes (2014) assume that when purchasing products, consumers are concerned with aspects related to a sense of fairness, responsibility, commitment, and sustainability. Evidence was found in both types of chains, face-to-face, and spatial proximity. However, it was not fully evidenced in the spatially extended chain. In terms of fair remuneration beginning with the farmer up to the distribution channel, 57% of long-chain consumers considered it at some level of importance, whereas in physical proximity chains where there is the proximity between producer and consumer, it was considered by over 88% of consumers.

Although in theory, the regional seals, certificates, and regional brands are considered to be efficient mechanisms for conveying information about the product, the place of production, historical and cultural values. According to Renting *et al.* (2003) and Sage (2003), these attributes are not perceived by consumers in long chains, as in supermarkets and specialized stores, in the same proportion as in face-to-face chains. The same is true for the spatial-proximity short chains. Thus, the mechanisms used (seals, certificates, or regional brands) are not as efficient when compared to channels that provide producer-consumer interaction.

The Kruskal-Wallis test was performed to identify whether there is a significant difference in consumer perception between the three short chains. The H0 hypothesis of equality between chains at a significance level of 5% is rejected (p-value=0.0002). By the Dunn method, it is also concluded that there is a more specific difference between face-to-face and spatially extended typologies (p-value<0.05) and between spatial proximity and spatially extended typologies (p-value<0.05). It is also observed that between the face-to-face and spatial proximity chains there are no differences in terms of perception regarding quality attributes.

The analysis of the average points obtained by the Kruskal-Wallis test using the coefficients of the three regression lines (each one representing a chain, i.e., the set of quality dimensions related to a short chain) was also performed. The average point represents the average of the ranks of a chain, which are absolute values (from a sample of data) ordered from lowest to highest. According to Table 4, the results corroborate those obtained by the Dunn method.

Table 4.

Kruskal-Wallis test average points according to the short-chain typology

	Classifications		
	Chain type	**N**	**Average points**
Consumers' perception of quality attributes	Spatially Extended	335	284.90
	Spatial Proximity	295	527.94
	Face-to-face	274	576.19
	Total	904	

Source: Research data

Finally, the Kruskal-Wallis test was used to verify if, in general, the perception of the set of quality attributes is affected by characteristics of the consumer sample profile in each type of chain (face-to-face, spatial proximity, and spatially extended).

Table 5 shows the result of the significance probabilities (p-values) obtained in all tests performed for each of the profile characteristics versus the set of quality attributes for a given chain.

Table 5.
Significance probabilities (p-values) obtained in the Kruskal-Wallis tests

Profile	Face-to-face	Spatial Proximity	Spatially Extended
Channel	0.101	0.143	0.000*
Gender	0.360	0.112	0.857
Locality	0.789	0.094	0.000*
Age	0.687	0.030*	0.404
Schooling	0.112	0.548	0.315
Income	0.156	0.160	0.771

*Significant at 5% Source: Research data

According to the results of Table 5, the profile characteristics influence consumers' perception. Therefore, the relationships between respondent scores related to the type of channel and the locality of establishment in spatially extended chains are significantly different from these relationships in the other two chains (face-to-face and spatial proximity). In the same way, the relationships between respondent scores related to the age group in spatial proximity are significantly different from these relationships in the other two chains (face-to-face and spatially extended).

To emphasize the results obtained above, a comparison of the percentage of consumer agreement (strongly agree -range 7, agree -range 6, or somewhat agree - range 5) for each chain typology is presented in Table 6. Some differences can be observed in the perception of quality attributes, as pointed out in Table 5.

In the face-to-face category, the two channels (organic fair and home delivery) were similar and with very close responses in terms of the perception of quality attributes. Some perception differences were observed in only three attributes. Most consumers at the organic product fair (90,71%) consider the need for organic product certification (no pesticide) with a 23% difference in-home delivery (69,91%). This finding is corroborated by the "localism" attribute that corresponds to production and sale at the same location. The last one was not considered by most consumers at the organic fair, but it was representative of home delivery. In the organic fair, located in the municipality of Sao Paulo, products from various regions of the state are marketed, and in this regard, the organic product seal is relevant for the consumer, since the consumer does not know about the producer's reputation, who does not produce at that location. In in-home delivery, the producer has a closer relationship with the consumer, which allows the consumer to obtain information on harvest, off-season, and other particularities of the agricultural activity. This allows the development of the producer's reputation, and excludes the need of certification. The geographic characteristics variable, related to the physical characteristics of the location (climate and vegetation) in terms of product differentiation, obtained a lower agreement percentage because the marketed products are not products in which the location characteristics interfere with the characteristics of the products, such as Canastra cheese.

In the spatial proximity category, the level of agreement that showed to be different between CSA channels (Community Supported Agriculture) and local stores was attributed to the same two face-to-face attributes. In CSA, the consumer is considered a co-farmer, since he or she "finances" the producer's undertaking, and does not need mechanisms to prove that the product is organic. In local stores, even if located in the production region, they still need mechanisms such as seals and certificates to prove that the product is organic. Regarding the attribute related to production and sale in the same region, in CSA this attribute is valued by the consumer, while in local stores it is much less representative for consumers, with a difference of 27%.

In the spatially extended category, it can be observed that the vast majority of attributes were different in terms of percentage agreement for both channels, specialized stores, and supermarkets. The attributes related to regard conventions (producer appreciation, proximity, friendships, etc.) and civic conventions (fair remuneration of agents, environmental impacts on product production and marketing, etc.) have lower percentages in supermarkets when compared to specialized stores. It is also noteworthy that, for both channels, the formalization-related mechanisms (certificates, seals, and labels) are considered in product acquisition in these channels. Besides, 42% of consumers in supermarkets relate the high price of the product to its reputation, i.e., to some degree of agreement these consumers believe that because the product is expensive it generates a sense of trust.

Table 6.
Percentage of consumer agreement (strongly agree (range 7), agree (range 6) or somewhat agree (range 5)) on quality attributes in distribution channels for each type of short-chain.

Conventions	Attributes	Face-to-face		Spatial Proximity		Spatially Extended	
		Home delivery	Organic Fair	CSA	Local stores	Specialized Stores	Supermarkets
Regard	Friendship	86.57	96.43	89.94	87.50	84.30	45.60
	Respect	96.27	97.14	97.48	97.79	92.10	69.70
	Quality of life	91.04	90.00	89.31	87.50	77.90	63.60
	Empathy	91.79	89.29	86.79	83.82	77.90	54.90
Civic	Ecological	94.03	93.57	94.34	86.76	80.70	58.50
	Environment	97.01	100	98.11	97.06	91.40	65.60
	Justice	86.57	90.71	94.97	86.03	75.00	45.10
	Distance	94.03	97.14	96.23	91.91	78.60	43.60
Institutional	Communication	91.04	92.14	76.73	84.56	81.40	77.90
	Place of origin	81.34	83.57	72.33	80.88	85.00	70.80
	Producer	78.36	82.86	65.41	77.94	81.40	67.70
	No pesticide	67.91	90.71	34.59	70.59	79.30	61.50
Domestic	Localism	89.55	58.57	92.45	65.44	55.70	15.40
	Landscape	79.85	81.43	83.02	75.00	74.30	65.60
	Artisanal process	97.76	94.29	94.34	95.59	91.40	70.30
	Artisanal Product	88.06	92.14	87.42	92.65	90.70	67.70
	Traditions	78.36	81.43	76.10	77.21	84.30	65.10
	Geographic characteristics	69.40	82.14	66.04	61.76	75.00	68.20
Market	Status	13.43	10.71	10.69	12.50	20.70	24.10
	Expensive product	27.61	20.00	10.06	18.38	19.30	42.60

Source: Research data

5 Conclusion

This paper contributes to the discussion about the perception of quality in agri-food products from short chains. There is a scarcity of studies about different chains and channels. Moreover, the literature that portrays the quality aspects considered by consumers in short chains points out several attributes without discriminating the type of chain and channels.

Based on a scale of quality attributes in short chains already validated in the three chains (face-to-face, spatial proximity, and spatially extended), it was possible to identify the quality attributes considered by consumers in the most diverse short agri-food chains and their channels.

It can be concluded that it is not possible to generalize the quality attributes of agri-food products in the three types of short chains from the consumers' points of view. It is evident that, although producers of agri-food products use mechanisms such as stamps, certificates, and brands, the attributes of quality in short chains are not fully recognized in the distribution channels by their consumers. Agri-food products in literally short chains, where there is the physical proximity of producers/consumers, the short-chain quality attributes, based on quality conventions (regard, civic and domestic) are broadly perceived by consumers.

The results also shed light on the fragility of the mechanisms used for transmitting information from producer to consumer in spatially extended short chains, restricted to the use of seals or brands. Although the agri-food product certification and/or seals are relevant tools to transmit such information from producer to consumer, the producer must provide all the necessary information to consumers. Investments in such mechanisms have not been broadly justified and need to be readjusted to improve efficient communication between producer and consumer. Actions aiming to add value and access to market must go together. Some institutional mechanisms have been created to add value to family farming products such as the Family Agriculture seal and the "Quilombolas do Brasil" seal. However, consumers do not recognize these labels on products. Thus, public policies must promote products with such seals.

For further research, it is suggested to apply the analysis in other distribution channels with short agri-food chains, and in other countries, whose historical, political, economic, and cultural contexts are different. These elements might interfere with food system and consumer buying behavior.

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