

Commercialization in family farming fairs: a case study on the structure of these channels

Comercialização nas feiras da agricultura familiar: um estudo de caso sobre a estrutura desses canais

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Abstract: Fairs of family farming on agroecological bases are direct sales channels of great importance for local supply. Thus, it is essential to devise ways to evaluate and monitor their evolution. In the present case study, a methodology was applied to analyze commercialization at the Family Agriculture Fair (FAF) held at the Seropédica Campus of the Federal Rural University of Rio de Janeiro (UFRRJ). The objective of this study was to analyze gross sales and the seasonality of the supply and demand of products in the FAF, relate these factors to agroecological production in the Baixada Fluminense, and both demonstrate and understand the relationships among the supply, prices and sales of products. A literature review was conducted on the short circuit and commercialization forms of family farming, and data from 1,664 marketing reports, self-completed by market traders from 2017 to 2019, were analyzed. The results allow us to conclude that (i) the stallholders farmers at FAF are not mere price takers; (ii) gross sales are influenced by the seasonality of demand and supply; (iii) the effects of seasonality have an impact on supply and sales but are reduced with low price volatility; and (iv) the offers are diversified, and the items have close substitutes within the same product category.

Keywords: agroecology, short marketing circuits, localized agri-food systems, organic products.

Resumo: As feiras da agricultura familiar em bases agroecológicas são canais de venda direta de grande importância para o abastecimento local. Desse modo, é imprescindível tecer formas de avaliar e acompanhar a sua evolução. No presente estudo de caso, aplicou-se uma metodologia para a análise da comercialização na Feira da Agricultura Familiar (FAF), realizada no Campus Seropédica da Universidade Federal Rural do Rio de Janeiro (UFRRJ). Objetivou-se analisar o faturamento bruto e a sazonalidade da oferta e da demanda dos produtos na FAF e relacionar esses fatores com a produção agroecológica na baixada fluminense; demonstrar e compreender as relações entre oferta, preços e vendas dos produtos. Para isso, realizou-se uma revisão de literatura sobre circuitos curtos e formas de comercialização da agricultura familiar e analisaram-se dados de 1.664 relatórios de comercialização, autopreenchidos pelos feirantes no período de 2017 a 2019. Os resultados permitem concluir que (i) os agricultores inseridos nas FAF não são meros tomadores de preços; (ii) o faturamento bruto é influenciado pela sazonalidade da demanda e da oferta; (iii) os efeitos da sazonalidade são impactantes sobre a oferta e as vendas, mas reduzidos com baixa volatilidade de preços; (iv) a oferta é diversificada e os itens apresentam substitutos próximos dentro de uma mesma categoria de produtos.

Palavras-chave: agroecologia, circuitos curtos de comercialização, sistemas agroalimentares localizados, produto orgânico.



Introduction

Agroecology is a paradigm that incorporates principles for the construction of agroecosystems based on socioecological processes and interactions (Gliessman, 2001; Anderson et al., 2019). With regard to markets, strategies are designed to articulate agroecological production and marketing based on fairer and more equitable relationships. For this purpose, short marketing circuits (SMCs) represent opportunities for farmers and consumers, contributing to the appreciation of family farming products (Rover & Darolt, 2021).

In the set of channels in SMCs, the fairs of family farming on agroecological bases (FAAs) portray the supply of local, organic foods and the agroecological transition, considering the breadth of Brazilian climates and soils and the coevolution of agrobiodiversity managed by farmers. The richness of locally produced food offered in the FAAs brings together knowledge and practices in the construction of culture, security and food sovereignty (Pereira et al., 2017).

FAAs are part of territorial supply systems that are channels that are easier to coordinate and manage by farmers themselves, in addition to promoting more direct flow from the countryside to markets. Given its importance, it is essential to devise ways to evaluate and monitor its evolution to better characterize and understand marketing through these channels to support public policies and to make decisions about how to participate in these channels. Nevertheless, the production that is marketed at fairs is often not recorded, and the data are not usually analyzed. These studies involve collection time, persistence and dedication, and among the limitations of their performance, we highlight the difficulty of collecting data due to the lack of commercialization records by farmers, limited computerization, expressive diversity and forms of presentation of the products (Araujo & Ribeiro, 2018; Verano et al., 2021).

In addition, FAAs are organized by specific institutions that differ from traditional open-air markets (TOMs), starting with the origin of production and the dynamics of supply and demand throughout the year (Cruz & Schneider, 2022; Rover & Darolt, 2021). In this sense, the central question that guided the present study was as follows: how are the economic elements of family farming fairs structured as direct sales channels mediated by organizational forms and supply dynamics based on the agroecological approach?

In public universities, supported by articulated teaching, research and extension actions, institutional FAAs have been strategic for promoting the integration of the academic community with local farmers. These channels provide the creation of ties in an environment conducive to the exchange of knowledge and, in this sense, provide the opportunity for the development of projects that include instruments for the registration and monitoring of commercialization in a systematic, continuous and articulated way. Thus, the idea arises of developing and applying a methodology for the analysis of targeted commercialization and developing with stallholders farmers in the day-to-day of an FAA, represented by the case of the Feira da Agricultura Familiar (FAF), held at the Seropédica Campus of the Federal Rural University of Rio de Janeiro (UFRRJ) since 2016.

The general objective of this article was to identify, understand and analyze the economic elements that constitute an expression of the Family Agriculture Fair at the UFRRJ in the first three years of operation. The specific objectives were to analyze the relationship between gross sales and the seasonality of the supply and demand of products; to relate these factors to the specific soil and climate conditions of agroecological production in the Baixada Fluminense; and to demonstrate and understand the relationship between the supply, prices and sales of products. In addition to this introduction, in the second section, a literature review was produced focused on presenting and defining the theoretical constructs for data analysis, focusing especially on the short circuits of the commercialization of fruits and vegetables by family farming on

an agroecological basis, as well as on the relationships among supply, seasonality and prices. In the third section, the systematization of an expressive effort was presented for the analysis of 1,664 marketing reports self-completed by the stallholders farmers of the FAF for the years 2017, 2018 and 2019. In the fourth section, the results were presented; in the fifth section, the conclusions and, finally, the bibliographic references. No other studies were found using index numbers or the relationships presented in the present article applied to FAAs, which thus represents a new approach to the study of the economic structures of these channels.

Theoretical Foundation

Markets, social construction and short marketing circuits

The commercialization of agricultural products can be understood as a set of activities that establishes the transfer of goods and services that are distinct and dispersed in terms of production locations and consumption points. The flows have directions such as what, how much, when, where and how to distribute products and services. These questions also have implications for the choice of or opportunity for insertion of farmers in different markets (Mendes & Padilha, 2007).

From the perspective of economic sociology, markets are social constructions of a contractual nature between their agents shaped by the existing institutions for their operation, including norms, rules and cultural values that determine, as a result, the prices charged, the quality of the products and the commercialized quantities (Cruz & Schneider, 2022; Raud-Mattedi, 2005).

The marketing channel is the path followed from production to consumption, including its agents; this channel can also be understood as a sequence of markets where products undergo transformations that affect the attributes of differentiation and value addition. The complexity and length, given by the presence, number of intermediaries and operations involved in the flows, define the typologies of channels (Mendes & Padilha, 2007). Channels are also systems in which interdependent relationships occur among their agents, producing specific results. According to the number of these means used by family farmers to offer their products, marketing channels can be classified as exclusive (single channel), diversified (two or three channels) or super diversified (more than four channels) (Deggerone & Schneider, 2022).

One of the approaches to channels that bring farmers and consumers together is alternative food networks—short food supply chains (SFSCs)—in which, ideally, there is no intermediary between farmers and consumers in marketing relationships, and when they occur, the intermediaries act as partners who share information about food (Renting et al., 2017)

In this context, there is a rescue in resocializing and respatializing food in farmer–consumer relationships, in which consumers have access to information on origin and food quality attributes that refers to the values attributed to the products and to the production techniques (Marsden & Banks, 2017; Mundler et al., 2008). New forms of management are also explored, as well as criticism of the dominant agri-food system by consumers who value forms, cultural values and traditional preparation (Gazolla & Schneider, 2017).

Another approach is short marketing circuits (SMCs), which represent a set of sales channels directed from the farmer to the consumer (or with at most one intermediary) under the logic of geographical and relational proximity and are associated with the trajectory and the itinerary of products, which are cyclic and circulate in the system, presupposing exchanges and interactions (Cassol & Schneider, 2015; Rover & Darolt, 2021). The following aspects related to the functioning of SMCs can be highlighted: identification of the origin of the product (proximity, location), the

role or attitude of the farmer in marketing, the use of local raw materials, and the availability and continuous flow of information between consumers and farmers (Darolt, 2013). In this sense, SMCs are similar to SFSCs; however, the approach of agroecology and social innovations in food production and supply helps to conceptualize SMCs.

Agroecology is a systemic approach capable of integrating agriculture, food, health, the environment and education, including aspects from production to consumption; it is consolidated through organic production and markets that emerge and are constantly reincorporated into social relations of proximity between its agents. When inserted in territories, markets allow local self-determination and meet the material needs of farming families, valuing their functions and ecological, social, economic and political results (Anderson et al., 2019).

The social innovations that promote agroecology involve new networks for marketing products of specific quality—such as organic ones—and the agroecological transition, comprising relationships of reciprocity with the rescue of the appreciation of the image of farmers and the rural environment, with solidarity and transparency. Innovations also arise from new forms of production and marketing organizations that seek to overcome obstacles, such as regularity in the supply of products, logistics, insufficient local demand and the spatial extension of sales in short circuits (Rover & Darolt, 2021).

Innovation practices and approaches are also related to the emerging properties of agroecological systems, which are characterized by the optimization of diversity in several dimensions. Diversity increases ecological and socioeconomic resilience, performs ecosystem services and increases productivity and resource use efficiency (Gliessman, 2001).

The interaction between farmers and consumers can also increase confidence in the quality of the products offered and the price charged, which is itself an asset (Gazolla & Schneider, 2017). In the set of direct sales channels in the SMCS, FAAs stand out by reducing the dependence of farmers on distributors and retailers in terms of price negotiation and the definition of marketing strategies that are consolidated in social innovations. FAAs are channels that differ in terms of the prices and supply and demand of products; accordingly, the next section of this study provides a theoretical overview of these categories.

Seasonality and prices at family farming fairs on an agroecological bases

Fairs of family farming on agroecological bases have roots in Brazilian street markets that, as markets, are highly diverse because of the regional specificities that influence socioeconomic relationships. Thus, they can be seen as territorial markets rooted in informal institutions from which operating rules and norms are defined (Cruz & Schneider, 2022; Araujo & Ribeiro, 2018).

Although fairs do not constitute a homogeneous socioeconomic system, some typologies can be sought to better understand the determinants of these markets. Regarding the commercialization of traditional products, the agents involved can be divided into “producers”, who produce the merchandise they sell, or most of it, and “traders”, when they buy and resell the products. In traditional open-air markets (TOMs), these two types of stallholders coexist (Araujo & Ribeiro, 2018).

FAAs differ from TOMs because they sell food produced by stallholders farmers themselves using specific techniques and because they rely on the principles of associativism for their organization (Araujo & Ribeiro, 2018). Organic fairs also include processes to ensure the quality and traceability of organic products. These institutions imply profound differences in the structures of these channels regarding prices, products, sellers and buyers (Cruz & Schneider, 2022).

In a market economy, prices are formed from the dynamic interaction between supply and demand. The supply curve shows that as the price rises, the interest of farmers in producing and selling certain products increases; moreover, as the price falls, the interest of consumers in purchasing larger quantities of products increases (substitution effect) (Mendes & Padilha, 2007).

With respect to the structure of perfectly competitive agricultural markets, products are supposed to be homogeneous, and farmers compete with each other. In addition, there are many buyers and sellers. These markets atomize family farmers, emphasizing those who produce for subsistence and sell the surplus, placing them as price takers of intermediary marketing agents linked to the wholesale and retail markets (Angulo, 2003). Farmers are not able to influence the price, which is considered the main factor of competition since the items are considered substitutes for each other. The sale is made in cash at the price fixed in the competition—“the price that runs” (Araujo & Ribeiro, 2018; Angulo, 2003). Thus, these economic structures are closer to the TOMs.

Nevertheless, farmers can compete not necessarily by price but also by their innovations, differentiating their products with regard to a new quality, production methods and new markets. This occurs with products from family farming, organic products and the agroecological transition (Waquil et al., 2010). There are numerous family farmers, but they are geographically dispersed, which facilitates meeting with consumers. In addition, production is diversified and on a small scale, and the sustainable use of natural resources is valuable.

In this sense, FAAs are spaces for optimizing relationships with consumers and establishing new structures for commercialization channels. For family farming, this includes using small- and medium-scale production and directing marketing to the SMCs (Gazolla, 2012). Thus, the products are not homogeneous; they differ from agro-industrial production and among the farmers themselves. The entry of new agents into FAAs is restricted by technical and social organization requirements.

There is convergence between the FAAs and the TOMs regarding exchanges: revenue calculations; expenses and profits with the fair; the determination of prices so as not to incur losses; the ways of measuring products; and the promotions and adjustments of quantities, means and personal strategies of measurement and bargains, which are expressions of ethnomathematics developed in everyday life (Nascimento & Bispo, 2020). At the end of the fair, the “xepa”, resulting from the reduction in the prices of the products, aims to minimize sales losses, especially of highly perishable items (Araujo & Ribeiro, 2018).

Fruits and vegetables (FVs) are the main products traded in FAAs, and this trade occurs *in natura*. These products are characterized by a low degree of transformation, a low production scale, geographical proximity and high perishability; additionally, they require a more efficient and agile channel with accessibility, trust and lower uncertainty due to the guarantee of sale (Brandão et al., 2020).

Due to their biological nature, FVs concentrate production at certain times of the year due to the seasonality that comprises the succession between agricultural harvest and off-season (Carvalho et al., 2019; Faulin & Azevedo, 2003). Prices vary significantly throughout the year and between years, determined by factors such as supply, seasonality, intermediaries, urban commerce and quality, under the influence of retail markets, in the presence of intermediaries, wholesalers and traders.

Pino (2014) highlights the advantages for farmers of knowing the seasonality of the prices of products to try to produce them in such a way as to market them at times of higher price so that production out of season can lead to the achievement of higher prices, better marketing margins and alleviate the pressure of prices and competition on farmers. For consumers, the

interest in seasonality has the opposite effect, as it aims to consume at harvest time to pay the lowest possible price.

In addition to seeking lower prices, the short-chain approach results in fair prices for organic foods, the agroecological transition, the absence of pesticides and other aspects, such as the environment, justice, ethics and loyalty. The value attributed by consumers is according to their satisfaction with regard to the search for health and well-being, trusting relationships, quality and diversity (Cruz & Schneider, 2022). Products in FAAs can be classified as goods that contain special attributes that are valued by consumers willing to pay premium prices and reward farmers for their role in providing healthy foods (Renting et al., 2017; Souza, 2000). In this direct relationship, the aim is to convey, through eye-to-eye or face-to-face contact, the value of the food, which includes the name and credibility of the farmer who also appropriates most of the value of the product (Gazolla & Schneider, 2017).

Regarding the consolidation of agroecological innovations, the adoption of strategies for the design and management of agroecosystems by family farmers to reduce external dependence and optimize the flows of matter and energy stands out, as these strategies positively impact production costs and induce different degrees of independence of input markets in agroecosystems. It is the observation of the practices of family farmers and peasants around the world that has accounted for the resilience of production units and that indicate the practices for organic production. This dimension is related to the reproduction of family farms, which is dependent on the ability to orient itself toward production and the expansion of added value, thus strengthening the endogenous resource base of the units (Gliessman, 2001; van der Ploeg, 2008).

Under an agroecological approach, crop production at the recommended time is essential for plants to have a lower susceptibility to pests and diseases when associated with strategies introduced in agroecosystems, such as conservative biological control and ecological management of soil fertility. Production at the recommended time allows plants to express their maximum productive potential, with a reduction in production losses and risks (Paschoal, 2019).

Another point to note with regard to fairs is that there is often a concentration of consumption that increases demand for products, for example, on festive dates and holidays, in a period of the month related to the proximity of salary payment dates, amid an increase in income due to the 13th salary and even under certain weather conditions—rainy or sunny days. This is reflected in the seasonality of demand related to consumers (Pino, 2014).

Methodology

This case study is classified as descriptive, and the research techniques used were qualitative and quantitative. The data collection procedures involved bibliographic and documentary research. The literature review included the analysis of articles and books for the composition of the theoretical framework. The documentary analysis included 1,664 marketing reports from the Family Agriculture Fair (FAF) for 2017 (February to December), 2018 (March to December) and 2019 (February to December). The sales report consists of a form that is self-completed by the stallholders farmers and contains the following fields: date, item, unit, price, quantity supplied and quantity not sold. Its adoption was performed by all the fairground stallholders farmers since the first edition of the FAF was held on Wednesdays at the Seropédica campus of the UFRRJ.

Seropédica is a municipality in the extreme west of the metropolitan region of Rio de Janeiro. There are 444 agricultural establishments, 61.5% of which are family farmers (Vianna, 2020).

Historically, agriculture in this region was an activity with great socioeconomic relevance; however, it was negatively impacted by the industrialization of the municipality of Rio de Janeiro. Urbanization returned to an endogenous dynamic with the interiorization of the economy, while metropolization increased the dependence and connection of the municipality with the capital. Deruralization occurred due to the economic and political emptying of rural areas, in addition to the urban appreciation of land competing with agricultural use (Alentejano, 2005). This process continues in the municipality, which recorded a reduction of 31.7% in the harvested area and 45% in the production volume between 2009 and 2017 (Monteiro et al., 2019).

Seropédica did not have a family farming fair on an agroecological basis until 2016, when the Family Agriculture Fair (FAF) was created at the UFRRJ through a university extension project. In 2017, the project was transformed into the Program to strengthen family farming in baixada fluminense and central south of the State of Rio de Janeiro (PSFF), with integrated projects: the Family Agriculture Fair, Food Acquisition Program; Education for Conscious Food Consumption; and Training and Agronomic Residence. The PSFF aims to strengthen family production on agroecological grounds, marketing and local and conscious consumption in the surroundings of the three UFRRJ campuses—Seropédica, Nova Iguaçu and Três Rios (Universidade Federal Rural do Rio de Janeiro, 2024a).

The management of the FAF involves participatory and collective decisions that are made in assemblies. The principles of organization and operation expressed in the regiment are those of agroecology and solidarity economy, and relations of cooperation, unity and care for the environment and people are encouraged. The criteria for the admission of farmers to the FAF included their own production, local production, organic production and production from the agroecological transition. The agroecological transition is understood as a process of adopting ecologically based practices for the management and design of production units, including the nonuse of pesticides and synthetic and highly soluble mineral fertilizers and a low dependence on external inputs. These farmers are not linked to the organic quality assurance mechanism, but they rely on technical assistance for this purpose. It is important to note that this organization differs fundamentally from the expressive part of the street markets in Seropédica and the surrounding area, which include mostly traders who buy products at the supply centers and resell them.

In the FAF, prices are freely charged by stallholders farmers, as are bargains with consumers; however, there is an agreement among farmers not to charge prices that are too different from each other or to lower prices too much to encourage unfair competition. Organic farmers differentiate their products using the SisOrg federal seal, present the organic producer certificate at their stalls and, in general, charge slightly higher prices.

Twenty-two stallholders farmers from the municipalities of Seropédica, Itaguaí, Paracambi, Rio de Janeiro and Engenheiro Paulo de Frontin participated in the FAF in 2019; most of them were women classified as family farmers, holders of the Declaration of Aptitude for Pronaf and members of the Participatory Guarantee Systems linked to the Association of Biological Farmers of the State of Rio de Janeiro (Associação de Agricultores Biológicos do Estado do Rio de Janeiro, 2024).

The FAF represents a commercialization channel in the SMCs that allows for the generation of income for farmers and a better flow of information between farmers and buyers, who, in this case, are part of the academic community. Thus, it seeks to promote the multiple two-way gains of this interaction, resulting in teaching, research and extension actions aimed at local agriculture and, at the same time, resignifying teaching and student practices. In addition, it is

a sales channel that can be seen as an informal space for consumer education at the university, providing an opportunity to stimulate organic production and the agroecological transition.

Based on the data from the marketing reports, the gross sales (R\$) per stallholder farmer and the monthly and annual totals of the FAF for the period 2017 to 2019 were estimated. In the second stage, the sales were estimated by group and subgroup of products, and the amounts of food offered and traded in the three years were analyzed. During the study period, more than 300 different items were recorded in the FAF marketing reports. The items were grouped into vegetable, fruit and animal products. To construct the basket of FAF products, the 26 most relevant items were selected in terms of share (%) in gross sales, quantity supplied, regularity of supply in the three years analyzed and socioeconomic relevance for family farming in the municipality of Seropédica.

The vegetables were grouped according to the part consumed in i. Hardwoods: lettuce, bertalha, cabbage, mustard, arugula and taro; ii. Aromatic, spices and medicinal: green onion, parsley and green onion, coriander and basil; iii. Tuberoses: cassava, sweet potato, beetroot and carrot; iv. Fruit: pumpkin, eggplant, green corn and okra. In the fruits group, the following items were selected: avocado, 'Rio' banana (Prata subgroup), 'Prata Mel' banana (Prata subgroup), 'D'água' banana (Cavendish subgroup), green coconut, galician lemon and tahiti lemon; and in the group of products of animal origin: eggs. The FAF product basket was used to construct the Commercialization Calendar and estimate the Index Numbers.

Marketing calendars are resources used to guide the pricing of agricultural products, especially horticultural products, based on their supply in unstable markets, marked by seasonal price variation with fluctuations due to harvest periods, off-season periods and random movements (Carvalho et al., 2019). Thus, they constitute a way to guide supply and demand and are more common in equipment such as supply centers. In the present study, a marketing calendar was developed for the items in the FAF basket of products, with the sum of the quantities supplied (kg) in each month in the years 2017, 2018 and 2019. The supply of each item was grouped into three classes (low, medium and high). To define the classes, $CI = A/NC$ were considered, where CI: class interval; A: amplitude given by the difference between the highest and lowest quantity supplied to the item in the basket during 11 months; and NC = number of classes = 3 (low, medium and high). The marketing calendar was used to demonstrate the seasonality of the supply of the main items in the FAF and relate it to price indices and quantities supplied and sold.

Index numbers are statistical measures used to compare groups of related variables with each other and to systematize a summary of the economic conditions that occurred during a period of time (Fonseca et al., 2000). They are used to estimate quantities, prices, or values of one or more data series over time and to identify the behavior of these variables in the analyzed period. The simple index was used to measure the evolution of the price (Equation 1) and the quantity supplied and traded (Equation 2) for each item of the FAF basket of products throughout the year based on the previous month. The simple price index number was calculated using the formula

$$p_{0,1} = \frac{P_t}{p_0} * 100 \quad (1)$$

and quantity

$$q_{0,1} = \frac{q_t}{q_0} * 100 \quad (2)$$

where $p_{0.1}$ = simple price index; p_0 = average price in the reference period; p_t = average price in the analyzed period; $q_{0.1}$ = simple quantity index; q_0 = average quantity (kg) in the reference period; and q_t = mean quantity (kg) in the analyzed period (Modificado de Fonseca et al., 2000).

Correlation analyses were performed between price indices and quantity supplied and traded. Correlations were classified according to Pearson's correlation coefficient (r) as negligible (± 0 to 0.30), weak (± 0.31 to 0.50), moderate (± 0.51 to 0.70), strong (± 0.71 to 0.90) or very strong (± 0.91).

Results and Discussion

Relationship between gross sales and seasonality of demand in the FAF

In 2017, 2018 and 2019, the Family Agriculture Fair on the Seropédica Campus (FAF) generated the equivalent of R\$ 518,331.22, and in this context, some observations are in order. The academic calendar was changed due to a stoppage that led to the interruption of classes in December 2016 and March 2017 (Figure 1). Thus, revenue was recorded in February but not in March 2017. Total gross revenue decreased in July and December due to the end of the school year and the beginning of the academic recess—a common factor in the three years analyzed. The FAF functioned fully for eight months, excluding the months of January, February, July and December. Interruptions accounted for fewer editions and lower gross sales. This condition influences the income generation of farmers who trade in fairs that take place in university spaces, which are also subject to unscheduled interruptions, such as strikes and work stoppages. This dynamic of functioning also limits access to locally produced food by consumers.



Figure 1. Gross monthly revenue for the years 2017, 2018 and 2019 of the Family Agriculture Fair at UFRRJ, Seropédica campus. Source: The authors (2022)

Linked to the total gross sales, the average sales per stallholder farmer fluctuated between the months of each year (Figure 2). In 2017, the average billing ranged between R\$ 709.10 and R\$ 1,227.69; in 2018, the average billing ranged from R\$ 472.85 to R\$ 1,191.75; and in 2019, it ranged from R\$ 512.84 to R\$ 1,463.60. The highest average revenue per farmer between the years analyzed was recorded in the second half of 2019, contributing to the increase in the overall average, offsetting the weak average revenue in the first half of that year. The average annual revenue per farmer was close to R\$866.49 in 2017, R\$767.54 in 2018 and

R\$ 800.31 in 2019. These results are relevant because the average monthly gross revenue was approximately 800 reais in the three years analyzed, which was 55% and 13% higher than the average nominal monthly per capita income of the rural (R\$ 514.76) and urban (R\$ 704.90) populations, respectively, of the municipality of Seropédica (Vianna, 2020). The analysis of gross sales over the three years showed that the FAF generated income for agroecological farmers in six municipalities in the region, with an increase in gross sales. Thus, more than 50% of FAF's total gross revenue (approximately 240,000 reais) came from agroecological farmers in the municipality of Seropédica.

Chiffolleau & Dourian (2020) corroborate that production units operating in short circuits have a higher income per asset and per hour, although the results are very heterogeneous. In general, prices are more adequate, and there is greater added value to products. Collective initiatives to produce, trade and transport; the combination of short chains; the appreciation of organic products; and the agroecological transition have positive effects on income. In addition to revenue, economic uncertainties are reduced in contrast to the volatility of typical channels of long chains, and a regular cash flow is ensured that favors agroecological practices, motivated by an increase in farmers' income. Economic performance depends not only on skills and work organization but also on the chain and territorial levels; therefore, the added value also requires equipment and processing facilities adapted to address supply in small quantities, which can also be seasonal (Chiffolleau & Dourian, 2020).

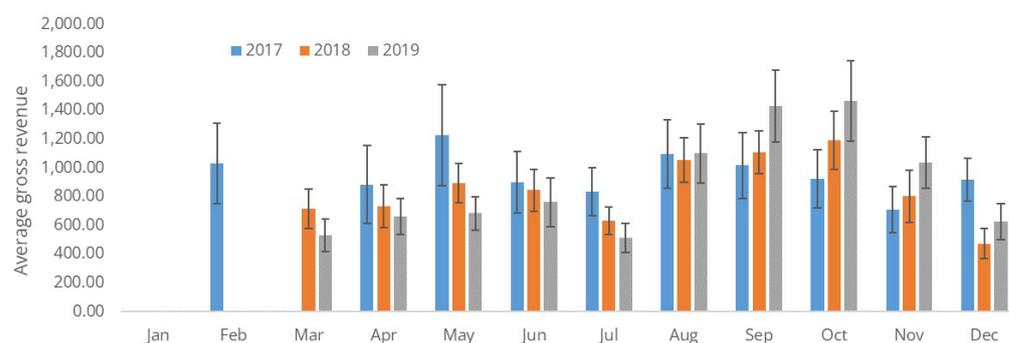


Figure 2. Average gross revenue per stallholder farmer, in R\$, in the period 2017–2019. The bars indicate the standard error of the average monthly billing. Source: The authors (2024).

Influence of specific conditions on the supply of products and revenue at FAF

In the months of May and June, the highest concentrations of leafy vegetables and fruits were supplied, and in the months of September and October, the highest concentrations of aromatic and fruit vegetables, and eggs were supplied according to the marketing calendar (Table 1). In addition, in these periods, the FAF functioned fully, encouraged by the flow of students, professors and technicians to the academic activities in progress, while in the months of January, February, July and December, there was a reduction in demand due to the decrease in attendance during the academic recess period.

The seasonality of supply is marked by seasonal changes typical of the climate of the Baixada Fluminense region, which is characterized by mild, dry winters and hot, rainy summers. Thus, each year, high temperatures and rainfall concentrations are recorded from October to March, which limits the production of most vegetables originating in temperate climates. In the warmer

months, there is greater consumer demand for leafy vegetables (lettuce and arugula), and as an alternative, during these periods, local farmers adopt the use of shade nets and increase the planting of flowering tolerant varieties and unconventional food plants (UFPs) that serve to replace these items, such as bertalha (*Basella alba* L.), tannia (*Xanthosoma sagittifolium* (L.) Schott), mustard, purslane (*Portulaca oleracea* L.), almeirão roxo (*Lactuca canadensis* L.), hibiscus (vinegar), milkweed and ora-pro-nóbis (*Pereskia aculeata* Miller). The first three items are among the leafy vegetables most common in the FAF and had the highest regularity of supply in the three years analyzed.

According to Table 1, in the tuberose subgroup, cassava and sweet potato were supplied throughout the year. For these crops, local farmers depend on rainfall at planting to ensure proper sprouting of vegetative propagation elements—vines and cuttings. These are rustic crops that are associated with mycorrhizae in the soil. Lower temperatures are more conducive to tuberization in sweet potato plants, but the greatest root losses occur in winter, which is the driest period of the year. As a strategy to reduce losses, farmers harvest early, which results in a reduction in the length and diameter of the roots marketed in the FAF during this period. However, the calendar data showed that even with this reduction, the supply of sweet potatoes was high during this period. In addition, the sweet potato variety most consumed in the FAF is a differentiated product, with an orange pulp rich in beta-carotene, called “carrot potato” by consumers and farmers. The ‘IAPAR 69’ sweet potato was socialized to FAF farmers through extension actions developed at Fazendinha Agroecológica Km 47, partnership: CTUR, Embrapa Agrobiologia, Pesagro Rio and UFRRJ) (Universidade Federal Rural do Rio de Janeiro, 2024b).

Compared to cassava and sweet potato, beetroot and carrot are more demanding tuberous plants with respect to soil preparation, climate and cultural practices. High temperatures negatively affect seed germination and root quality (Filgueira, 2012); therefore, the supply of these plants is limited.

Regarding the seasonality of fruits, a highlight is the bananas that are cultivated throughout the year, especially the Prata Mel cultivar, which was historically cultivated by local farmers. Owing to the high content of soluble solids, its flavor is highly appreciated by consumers; therefore, it is the most commercialized flavor in the FAF. In the winter, there is a reduction in the length and diameter of the fruits due to the lower temperatures, and therefore, there is a reduction in the commercialized quantities, although the supply is continuous.

When the logic of the organization of family farming is applied to markets, given the challenges presented for the supply of products, there is room for the flow of information to occur without asymmetries in one’s relationship with the consumer. In this sense, the perception of quality by the consumer can be based on the view of the process, biological quality, freshness, flavor, gastronomy, and food safety, as opposed to standardization and specialization, given by the view of the product—appearance, size and shape—and the reciprocal relationships with consumers associated with exchanges and symbolic gifts, which include explanations about the products and their seasonality (Rover & Darolt, 2021; Sabourin et al., 2014).

Table 1 - Calendar of the commercialization of produce from the Family Agriculture Fair at the Federal Rural University of Rio de Janeiro, Seropédica-RJ campus.

Item	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Leafy vegetables												
Lettuce		Low	Low	Mean	High	Mean	High	High	Mean	Low	Low	Low
Bertalha				Low	Mean	Mean	Low	Mean	Mean	High	Mean	Low
Kale		Low	Low	Mean	High	Mean	High	High	Mean	Low	Low	Low
Mustard				Mean	High	High	Mean	Mean	Mean	High	Mean	Low
Arugula		Low	Low	Mean	High	High	Mean	High	Mean	Low	Low	Low
Tannia		Low	Low	Mean	High	High	Mean	High	Mean	Low	Low	Low
Aromatic vegetables												
Green onion			Mean	Mean	Mean	Mean	Mean	Mean	High	High	Mean	Low
Parsley and green onion		Low	Low	Mean	Mean	Mean	Mean	High	High	High	Mean	Low
Coriander				Mean	High	High	Mean	High	High	High	Mean	Low
Basil			Low	Mean	Mean	Mean	Low	Mean	Mean	High	Mean	Low
Tuberous vegetables												
Cassava		Low	Mean	High	High	High	Mean	High	High	Mean	Low	Low
Sweet potato				Low	Mean	Mean	Mean	High	High	High	Mean	Low
Beetroot				Low	Mean	Mean	Mean	High	High	High	Mean	Low
Carrot				Low	Mean	Mean	Mean	High	High	High	Mean	Low
Fruit vegetables												
Pumpkin		Low	Low	Low	Low	Low	Low	Mean	High	High	Mean	Low
Jilo		Low	Low	Low	Low	Low	Low	Mean	High	High	Mean	Low
Green corn		Low	Low	Mean	Mean	Mean	Mean	High	High	High	Mean	Low
Okra		Low	Low	Mean	Mean	Mean	Mean	High	High	High	Mean	Low
Fruits												
Avocado		Low	High									
'D' água' banana		Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
'Rio' banana				Low	Mean	Mean	Mean	Mean	Mean	High	High	High
'Prata Mel' banana		Low	Low	Mean	Mean	Mean	Mean	High	High	High	Mean	Low
Green coconut		Low	Low	Mean	Mean	Mean	Mean	High	High	High	Mean	Low
Galician lemon				Low	Mean	Mean	Mean	High	High	High	Mean	Low
Tahitian lemon				Low	Mean	Mean	Mean	High	High	High	Mean	Low
Product of animal origin												
Eggs		Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low

There was no offer Low Mean High

Source: The authors (2023).

The seasonality of the supply of items in the basket is associated with multiple factors, such as changes in the rainy season, photoperiod, temperature, and conditions that, together with the biodiversity introduced into agroecosystems, such as artificial and built environments, converge during production for the family and for the markets. These changes imply a variation in the surplus of own production offered throughout the year and a consequent change in the production profile, bringing as a characteristic the dynamics of supply/demand that, like the itinerant space of the FAF, also interferes with the income of the fairground farmer.

Thus, income varies throughout the year and is strongly influenced by seasonality. Intensifying the supply of vegetables and fruits during the crop season is a strategy to compensate for the loss of revenue in the weak sales months and reconcile with the agroecological principles of production. In this sense, collective supply planning is a form of innovation for FAAs, and the quantitative results can be analyzed using the methodology used in the present study.

As presented in the theoretical framework, in production systems based on agroecology, the greatest advantage of seasonality is that it allows more efficient production from biological

processes that operate during periods in which the conditions are suitable for crop production reducing the risks of production losses (Gliessman, 2001). In addition, it is possible to construct locally referenced diets, which may imply a greater diversity of foods produced and offered throughout the year.

Regarding the seasonality of supply, interactions and face-to-face farmer-consumer relationships, as shown by Chiffolleau et al. (2017) in the SMCs, France, were able to induce the evolution of new consumption practices by consumers with different profiles, levels of sensitivity, engagement and political consumption. These changes were able to rebuild the relationships between people and the products they consume and with farmers or partner intermediaries. In addition, concerning the season, consumers rediscovered flavors and rescued foods. As such, the FAF provides a channel for reconnection and relocation in the SMCs.

Stallholders farmers maintain diversified production, despite the skills and preferences of flagships (the main products of each establishment); therefore, at the FAF, the supply profile seeks to meet the desires and needs of consumers and the individual choices and preferences of farmers aligned with certain informal institutions. The main social institutions surveyed in three markets in Paraíba, Pernambuco and Rio Grande do Sul listed in the marketing and consumption practices of the actors in the markets are bargaining, variety, price and quality attributed to food (Cassol & Schneider, 2021; Cassol, 2018). The need for a diversified composition of the fairground stall, with the logic of taking a little of everything, involves the view of financial return as a component of the decision-making process at FAF, which is in line with greater control over the production process, conferring greater weight on the knowledge and work of the farmer, an aspect valued in the SMCs as a process to favor the individual agency of farmers (van der Ploeg, 2008).

In this context, the commercial strategies adopted are based on the reflection that the FAF represents an opportunity to facilitate the flow of fresh products that should be produced at the recommended time, impacting the offer of products with greater diversity—which is following agroecological principles for production and the promotion of agrobiodiversity—preserving the greater autonomy of farmers in the decision on marketing and guaranteeing the supply of markets to consumers who are not passive but active to different degrees in the process of reconnection with the products (Viegas et al., 2017; Chiffolleau et al., 2017).

Relationships among supply, sales, and prices in the FAF

Corroborating the marketing calendar, the index numbers that represent the quantity supplied reflect high variation throughout the year (Table 2). The supply of vegetables and fruits in the FAF grows between February and June when temperatures become milder and more favorable to production. In July, the quantity supplied decreased due to the academic recess, increased again in August with the return of activities, and continued to increase in September but declined in October until December, when the increase in temperature was recorded again, which restricted production. The largest negative change in the quantity of supplied indices compared to the previous month occurred in December (-820.3).

In the months of July and December, the seasonality of demand influenced supply because, due to the academic recess, the FAF editions were interrupted. Thus, supply was modulated by two factors—agroecological production in Baixada Fluminense (December)—and by demand, which was interrupted during recess periods (July and December). In July, only pumpkin, beetroot and eggplant showed no reduction in quantities supplied even with the reduction in the number of markets.

The indices of quantities supplied showed positive variation throughout the year for almost all items in the basket, with the exception of mustard, Galician lemon, Tahiti and coriander, which may be related to the irregularity of the supply of these items throughout the year. Cassava, despite being supplied and harvested throughout the year, showed negative variation, which suggests that other factors influence supply, such as the number of stallholders selling this item in the FAF, signaling that there is an opportunity to expand the supply of cassava.

With regard to prices, the index numbers showed changes throughout the year, but these changes were much lower than the changes in quantities supplied. While the quantities supplied showed very expressive changes, which exceeded 200% for several items in the basket, the largest positive changes were detected for the price indices of pumpkin and green corn (+89.4) in May compared to April.

When investigating how supply influenced sales, the correlation between the indices of supplied and sold quantities was positive, very strong or strong for all items in the basket, which suggests that, with increased supply, there was an increase in the quantities sold (Table 3). In relation to the marketing calendar, an increase in the quantity supplied may indicate that the stalls were supplied more with products in quantity and of better quality, thus meeting demand more effectively. Qualitative studies on consumer habits and preferences for vegetable products in FAAs relate aspects such as presentation, freshness, appearance, flavor and shelf life, as well as the diversity of products and more sustainable production methods, to a positive influence on purchase decisions (Cazane et al., 2014; Rover & Darolt, 2021; Souza et al., 2008).

With the increased consumption of vegetables and fruits in Brazil as a response to the demand of consumers more aware of the relationship between food and quality of life, opportunities are opening up for family farmers to act with improvements at strategic points to optimize the flow of production, such as horizontal cooperation aimed at production and supply planning (Santos et al., 2022). To this end, technical assistance and rural extension actions that connect production, marketing and the organization of farmers to meet to FAAs, also including actions that improve the infrastructure and best practices in these channels, in addition to organic certification and the processing of products.

This finding was also related to the increase in average gross sales. In the three years analyzed, the average billing capacity increased in the first semester (February to July), with a peak in the months of May and June and, in the second semester (August to December), in the months of September to October. These periods coincided with the highest concentration of the supply of products in the FAF, which was related to the influence of the soil and climate conditions in the Baixada Fluminense and with the operation of the FAF at the University, directly impacting the income of the stallholders.

Regarding the seasonality of demand, it is argued that the diversification of commercialization channels, especially in the strengthening of relationships with consumers with home deliveries and sales on the property, is strategic for maintaining income generation beyond the operation of the FAF. in the institutional space. The diversity of channels allows family farmers to exercise more freely, which affects the resilience of these actors and their social reproduction. Autonomy strengthens the agency of family farmers through insertion through freedom of choice and the construction of alternatives (Schneider, 2010; Deggerone & Schneider, 2022).

Regarding the behavior of prices as a function of supply, the correlation between index numbers for the items in the basket taken individually showed significant differences, even within the same group. Of the 26 items, 61.5% showed negligible or weak correlation between quantities supplied and prices; that is, regardless of the quantities supplied, prices were constant throughout the year. However, 38.5% of the items showed a moderate or strong correlation,

indicating a trend toward price variation as a function of supply. Of these, the negative correlation was significant only for the Galician lemon, 'Prata Mel' banana and coriander. Two products showed a moderate positive correlation (basil and sweet potato); i.e., with an increase in quantity supplied, there was also an increase in price.

These results indicated that in the FAF, the prices of most products did not change due to the seasonality of supply and are therefore more stable for producers and consumers. The FAF marketing calendar, in contrast to that of wholesale centrals, reflects information for the consumer to consume seasonal products, not at the lowest price but because of the greater quantity supplied and quality of the items in the basket. Moreover, for the fairground farmer, the highest revenue will accompany periods of greater supply and number of fairs, which was reinforced in this study by the high correlation between the quantities offered and traded.

This phenomenon is probably associated with the fact that production is owned and detached from conventional markets. In the FAF, although production is performed by individual farmers, supply is organized by ATER actions, prices are not factors of competitiveness, products are coordinated by the group, and the products have added value. In contrast, in TOMs, prices are more influenced by the interactions between supply and demand throughout the year, depending on the classification, packaging and logistics rules imposed by wholesalers and supermarket chains on price taker farmers. In these channels, price is a decision factor of considerable importance and intensifies competition among farmers (Mendes & Padilha, 2007; Araujo & Ribeiro, 2018).

Encouraging the creation of FAAs can facilitate the flow of production by family farmers, and a stable price contributes to reducing the market uncertainty associated with the risks of transactions involving vegetables and fruits, especially when price conditions are insufficient to cover costs of production, increase losses and force farmers to produce the same mix of products, generating supply in excess of demand and creating a vicious circle that further pressures downward remuneration (Santos et al., 2022; Rover & Darolt, 2021).

Based on the correlation between price indices and quantities traded, how prices affect sales of the items in the basket, that is, the consumer's response to purchases, was also investigated. For 76.9% of the items in the basket, the correlation between price indices and quantities traded was negligible or weak, showing that under the conditions of this study, the FAF consumer purchased the items regardless of price variation, not increasing purchases when the prices decreased or decreasing when prices increased. For only 23.1% of the items, the correlation was negative, moderate or strong, being significant only for the Galician lemon, the 'Prata Mel' banana and the coriander, which suggests that consumers bought a smaller quantity of these items in the FAF due to the price. Consumers can reduce their consumption or replace these items with others from the same group of products; for example, 'Prata Mel' banana can be replaced by 'D' água' banana and the Galician lemon by Tahiti. However, for sweet potatoes, the correlation between price and quantity traded was positive, meaning that sales followed supply, regardless of price.

These findings are related to factors such as consumer engagement in FAAs by placing values attributed to products at fair prices, aiming at satisfying their health and well-being needs and valuing agroecological production based on direct relationships with stallholders farmers (Cruz & Schneider, 2022; Renting et al., 2017; Souza, 2000). The prices of organic and agroecological products may restrict consumption to groups of people with higher levels of education and income. Nevertheless, in FAAs, prices are more affordable and, in some cases, can equal or be lower than the conventional prices in the vegetable and fruit markets (Gaia et al., 2022). For organic products, there is strong consumer loyalty, while the reversal of consumption habits is not common, even if prices are higher (Ferreira & Coelho, 2017). On the other hand, lower prices may induce an increase in acquisitions, but this response was not observed with increased sales in the present study.

Table 2 - Indices of quantities supplied and prices of the basket of products from the Family Agriculture Fair at UFRRJ in 2017, 2018 and 2019.

Item	Month									
	02_03	03_04	04_05	05_06	06_07	07_08	08_09	09_10	10_11	11_12
	----- Quantity supplied -----									
Lettuce	55.7	313.7	153.5	139.5	48.2	160.7	122.3	22.9	134.7	143.1
Bertalha	22.8	475.9	106.0	60.4	52.1	306.0	62.7	135.4	64.6	61.9
Kale	25.3	398.6	151.4	99.7	77.3	255.3	92.0	91.8	48.8	50.6
Mustard	151.4	83.3	124.3	73.6	43.8	201.7	77.9	56.8	72.0	77.0
Arugula	65.0	224.7	159.7	81.9	54.1	179.0	128.8	63.4	72.4	36.6
Tannia	49.0	193.2	113.4	78.3	50.0	234.9	81.8	76.9	89.2	72.3
Green onion	--	74.4	114.3	98.3	61.1	105.3	256.7	75.4	80.3	71.2
Parsley and green onion	23.3	695.0	44.0	128.8	85.5	154.7	78.0	98.8	61.3	30.5
Coriander	--	--	183.3	114.4	63.2	151.5	86.8	97.1	42.5	46.3
Basil	54.5	58.4	76.2	159.4	31.5	278.6	86.6	153.4	58.4	80.8
Cassava	153.8	86.1	123.2	94.4	81.7	125.2	96.6	73.6	94.4	64.2
Sweet potato	445.7	81.3	85.6	137.4	79.6	107.3	58.2	122.6	139.7	81.3
Beetroot	--	--	547.5	32.0	490.6	152.6	101.9	124.2	38.0	104.0
Carrot	22.6	488.7	198.7	139.8	58.4	170.6	87.4	98.3	30.0	78.0
Pumpkin	127.7	205.0	40.7	304.0	166.9	167.9	247.7	89.4	63.2	66.9
Jilo	--	185.5	508.0	13.1	232.2	1235.7	94.8	87.7	59.9	25.7
Green corn	986.5	111.1	102.6	155.1	111.6	115.7	54.5	82.7	266.2	76.5
Okra	156.9	90.3	103.2	115.2	56.8	213.5	84.5	89.7	119.5	51.7
Avocado	869.8	76.8	54.1	111.8	50.0	123.4	--	--	--	--
'D' água' banana	204.8	62.8	227.9	61.3	85.0	103.3	93.5	127.6	58.7	57.0
'Rio' banana	168.5	143.6	79.1	139.5	77.6	98.4	112.1	141.1	73.9	58.3
'Prata Mel' banana	287.9	56.7	131.0	122.3	48.5	188.2	137.3	100.9	74.4	35.5
Green coconut	87.2	42.9	219.3	117.0	39.0	266.3	105.4	48.9	128.1	40.4
Galician lemon	--	100.0	76.2	40.6	123.1	18.8	--	--	--	--
Tahitian lemon	--	50.0	220.6	63.9	35.4	--	--	--	--	--
Eggs	51.8	105.7	189.1	122.4	78.9	172.0	78.2	146.0	47.0	69.7
	----- Price -----									
Lettuce	71.3	94.7	106.1	91.2	103.5	99.7	94.2	99.2	104.3	100.5
Bertha	96.2	90.6	103.8	93.3	98.8	96.0	106.7	97.0	102.6	105.6
Kale	114.6	103.0	97.3	94.9	98.0	90.8	106.7	96.2	105.3	99.6
Mustard	100.0	100.0	108.3	96.2	108.0	98.2	97.0	98.0	95.2	100.0
Arugula	105.0	111.1	103.6	100.7	108.8	91.6	105.8	91.3	98.7	97.4
Tannia	122.0	99.0	90.6	100.0	104.0	94.6	103.4	101.0	100.0	101.2
Green onion	--	125.0	112.2	89.1	97.1	83.6	107.5	104.2	93.3	121.4
Parsley and green onion	112.5	97.8	120.5	86.4	104.8	102.5	102.7	92.3	97.0	110.5
Coriander	--	--	83.4	103.9	107.6	96.9	112.6	83.7	100.7	120.4
Basil	111.6	83.5	115.6	111.5	72.7	116.7	100.0	102.9	92.1	96.2
Cassava	95.6	100.9	101.8	101.3	101.2	99.2	96.9	97.0	103.0	107.0
Sweet potato	108.6	98.0	103.4	106.9	99.1	100.6	98.9	106.7	96.9	93.5
Beetroot	--	--	102.9	71.2	92.8	106.8	120.5	95.5	99.6	91.6
Carrot	119.9	95.9	86.4	77.7	90.2	96.9	94.7	104.4	121.3	86.2
Pumpkin	111.1	105.6	189.4	75.0	69.2	96.3	98.3	101.2	105.3	94.2
Jilo	--	100.0	100.0	100.0	100.0	100.0	92.4	115.9	96.5	112.9
Green corn	156.5	84.0	189.1	68.0	93.8	95.9	85.1	117.3	79.8	113.8
Okra	104.4	95.3	101.8	99.1	99.7	100.0	100.8	96.9	101.1	96.9
Avocado	82.5	79.2	89.3	119.4	91.0	126.3	--	--	--	--
'D' água' banana	105.5	93.3	90.9	101.7	100.7	100.6	101.7	102.6	100.9	93.3
'Rio' banana	92.4	97.3	106.9	90.3	93.4	103.6	108.2	102.6	100.7	123.4
'Prata Mel' banana	90.8	100.0	90.1	105.8	112.5	95.4	97.7	101.8	99.6	103.9
Green coconut	107.9	115.9	108.0	89.5	100.0	88.5	106.1	110.1	100.0	100.0
Galician lemon	--	85.4	86.6	112.6	80.0	93.8	--	--	--	--
Tahitian lemon	--	171.4	91.7	97.0	103.1	--	--	--	--	--
Eggs	97.2	120.0	81.5	98.8	96.1	115.3	92.8	100.7	102.2	100.6

(--) There was no supply. Source: The authors (2023).

Table 3 - Correlations between quantity supplied, quantity sold and price of items in the basket of the Family Agriculture Fair at UFRRJ in 2017, 2018 and 2019

Item	Quantity supplied x marketed (<i>r</i>)	Price x quantity supplied (<i>r</i>)	Price x quantity traded (<i>r</i>)
Leafy vegetables			
Bertha	0.98*	-0.58	-0.62
Tannia	0.92*	-0.54	-0.49
Kale	1.00*	-0.30	-0.29
Mustard	0.87*	-0.02	0.01
Lettuce	0.95*	0.15	0.10
Arugula	0.99*	0.25	0.26
Aromatic vegetables			
Coriander	0.93*	-0.66*	-0.70*
Parsley and green onion	1.00*	-0.31	-0.31
Green onion	0.98*	0.00	-0.01
Basil	0.99*	0.61	0.27
Fruit vegetables			
Pumpkin	0.81*	-0.56	-0.46
Jilo	0.99*	-0.17	-0.21
Green corn	0.99*	0.38	0.36
Okra	0.98*	0.45	0.50
Tuberous vegetables			
Cassava	0.90*	-0.52	-0.43
Carrot	1.00*	-0.31	-0.28
Beetroot	0.99*	0.13	0.18
Sweet potato	1.00*	0.60	0.62
Fruits			
Galician lemon	0.79*	-0.72	-0.63*
'Prata Mel' banana	0.99*	-0.69*	-0.70*
'Rio' banana	0.95*	-0.61	-0.55
Green coconut	0.99*	-0.46	-0.42
Tahiti lemon	1.00*	-0.43	-0.36
Avocado	1.00*	-0.30	-0.28
'D' água' banana	0.99*	-0.01	-0.02
Product of animal origin			
Eggs	0.90*	-0.05	0.09

(n=8; $r=0.6319$; *significant at the α level= 0.05). Source: The authors (2023).

Conclusions

This article constitutes an innovation in the academic literature on FAAs as marketing spaces, with an emphasis on marketing channels derived from specific economic contexts, such as the FAF. It is concluded that:

- Stallholders farmers do not constitute a homogeneous, atomistic whole and are not price takers;
- The income of fairground farmers is influenced by the seasonality of demand and supply;
- The effects of seasonality have an impact on supply and sales but are reduced with low price volatility;
- Supply exerts a positive influence on quantities sold; it is diversified, and the items have close substitutes within the same product category;
- The FAF articulates stallholders farmers with consumers who have responded to the appreciation of the products; and

- The marketing calendar indicates fluctuations in the supply of items in the basket to consumers and in the sales of farmers.

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