

Article

Characterization and Analysis of Comprehensive Management in Buyer and Supplier Service Quality in the Tilapia Chain in the Federal District - Brazil

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ABSTRACT

Within agribusiness, Brazil ranks among the world's largest producers of tilapia. Given the significant importance of this species and the potential consumer market for fish, this research aims to analyze the buyer-supplier relationship in the quality management of tilapia consumed in the Federal District. This investigation is characterized as applied and descriptive and makes use of qualitative research resources; 12 semi-structured interviews were conducted in fishmongers and restaurants in the Federal District, followed by triangulation between the interview data and the data from non-participant observation scripts. The results indicate that a successful partnership, from the buyers' point of view, is highly influenced when there is trust, commitment, and communication, making buyers satisfied with the relationship and willing to maintain a long-term relationship with their main tilapia supplier in the Federal District in Brazil.

Keywords: buyer-supplier; tilapia; Federal District.

RESUMO

Dentro do agronegócio, o Brasil alcança uma relevância no ranking mundial dos maiores produtores de tilápia, assim, devido à significativa importância da espécie e ao potencial mercado consumidor de pescado, esta pesquisa tem por objetivo analisar a relação comprador-fornecedor na gestão da qualidade da tilápia consumida no Distrito Federal. Esta investigação caracteriza-se como aplicada e descritiva e faz uso de recursos de pesquisa qualitativa; aplicou-se 12 entrevistas semiestruturadas em peixarias e restaurantes no Distrito Federal, em seguida promoveu-se a triangulação entre os dados das entrevistas e os dados dos roteiros de observação não participante de caráter presencial. Os resultados indicam que uma parceria bem-sucedida, do ponto de vista dos compradores, é altamente influenciada quando existe confiança, compromisso e comunicação, fazendo com que os compradores se tornem satisfeitos com a relação e queiram manter um relacionamento a longo prazo com o seu principal fornecedor de tilápia no Distrito Federal no Brasil.

Palavras-chave: comprador-fornecedor; tilápia; Distrito Federal.

Introduction

Within agribusiness, agriculture stands out due to the significant results in meat production and consumption. Thus, agribusiness projections made by the Ministry of Agriculture, Livestock, and Supply (MAPA) indicate that meat production (beef, pork, and poultry) between 2020/21 and 2030/31 is expected to



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increase by 6.6 million tons, corresponding to an increase of 24.1%; chicken and pork meats are expected to show the highest growth in the coming years, with 27.7% and 25.8% respectively (MAPA, 2021). Beef production is expected to grow by 17.0% between the base year and the end of the projections. These percentages may be higher, given the increase in demand for animal protein (MAPA, 2021).

According to Kubitzka (2015), although Brazil is a major producer of poultry, cattle, and pork, aquaculture shows promising growth in the scenario, as it was the meat sector that grew the most in production in the period from 2004 to 2014, with approximately 8%, versus 5.1% for cattle, 4.1% for chicken, and 2.9% for pigs. Data from 2019 from the Municipal Livestock Production (PPM) of the Brazilian Institute of Geography and Statistics (IBGE) show that Brazilian fish farming grew by 1.7%, cattle production grew by 0.4%, pork production fell by 1.6%, and poultry production grew by 0.1% compared to 2018 (IBGE, 2019).

Pedroza et al. (2020) state that Brazilian fish farming has been gaining ground in recent years, with significant advances in increasing production and professionalizing the chain; this growth is directly related to domestic market demand, given that of the total 579,000 tons produced in 2019 by fish farming, only 1.13% were destined for export. Thus, with strong consumer demand and continuous investments, the tilapia farming sector is becoming increasingly important in the segment, accounting for 61.1% of the total amount of fish produced in 2019, an increase of 3.5% over the previous year (IBGE, 2019).

The trend is for tilapia to gain even more space in national production, through the pursuit of the domestic market and exports to the foreign market, due to its attractive characteristics, such as firm and tasty white fillets (Schulter; Vieira Filho, 2017; Barroso *et al.*, 2018). Therefore, building good relationships with supply chain partners is essential for companies to become competitive, since the development of partnerships between buyers and suppliers is already recognized as a competitive advantage in manufacturing companies, as it allows access to information and better visibility of the chain (Yu; Huo, 2018; Revilla; Saenz, 2017).

In this sense, purchasing companies in the food sector increasingly recognize the need to cultivate relationships with their suppliers, since a successful relationship consists of selecting suppliers who are also committed to achieving positive performance results (Gelderman et al., 2020; Kataike et al., 2019). Given the above, the Federal District has a high demand for fish, at approximately 14 kg/inhabitant/year, while the national average is 9 kg/inhabitant/year. However, with low production of approximately 2,050 tons in 2021, of which 1,800 tons are tilapia, local demand is heavily supplied by fish from other states (IBGE, 2020). In the specific case of tilapia, a species widely consumed in the region, fillets and whole fresh tilapia are particularly popular, and sales are mainly through restaurants, fairs, fishmongers, and retail markets (Schulter, 2018). The retail market segment accounts for 46.84% of distribution, while the restaurant and fishmonger segments account for 27.16% and 11.57%, respectively (Borges, 2010).

Finally, with increased competition and diversification in product offerings, consumers are more attentive to quality, demanding a higher standard of fish quality. This fact corroborates the fact that restaurants and fishmongers seek higher quality products at competitive prices to meet the demands of consumers who are more demanding in terms of quality. Therefore, this research sought to evaluate the relationship factors and quality management practices of suppliers from the perspective of buyers in the tilapia trade in the Federal District, answering the question: which relationship factors and quality management practices are prioritized by suppliers, from the perspective of buyers, in the tilapia trade in the Federal District?



Theoretical Framework

Supply Chain Quality Management (SCQM)

For Robinson and Malhotra (2005, p. 319), traditional quality management emphasizes the control and improvement of internal processes, integrating other sectors of the company, such as marketing, purchasing, and manufacturing. Thus, they define quality management in the supply chain as:

[...] the formal and integrated coordination of business processes involving all partner organizations in the supply channel to measure, analyze, and continuously improve products, services, and processes in order to add value and achieve the satisfaction of intermediate and end customers in the market.

On the other hand, Ross (1998) states that it can be defined as the involvement of all actors in the supply chain, beyond the boundaries of individual companies, in improving processes, products, and services, seeking competitive advantage and providing value to the customer. Therefore, in general, SQM promotes the use of quality management in all upstream and downstream activities in the supply chain, involving relationships between companies, suppliers, and customers.

Supply Chain Quality Management Practices (SCQMP)

For Zeng, Anh, and Matsui (2013), these practices should be represented by a multidimensional concept involving three groups: internal quality management practices, quality interaction with suppliers, and quality interaction with customers. The authors grouped characteristics associated with each of these three groups: (i) internal quality management practices (leadership management, strategic planning, quality data analysis, process management, people management, product design and development process); (ii) quality interaction with suppliers (long-term relationships, involvement in product development, quality improvement, focus on quality in supplier selection rather than price, and supplier certification); and (iii) quality interaction with customers (frequent meetings with customers, visits to customers, encouragement of customer *feedback* on quality, customer involvement in product design, and customer needs research).

On the other hand, Talib, Rahman, and Qureshi (2011), when conducting a bibliographic survey on total quality management and supply chain management practices, concluded that the main TQM practices found in the literature are: senior management commitment, customer focus, training and education, continuous improvement and innovation, supplier management, and employee involvement. For the purposes of this study, we will focus more closely on the practices of continuous improvement and compliance with specifications in TQM. Table 1 summarizes these practices in the supply chain in general terms.

For Toledo *et al.* (2014, p. 53), continuous improvement can be defined as:

(...) adding value to the customer through the development and improvement of new or existing products and processes, seeking to reduce variability, reduce the number of defects, and increase productivity. (...) Continuous improvement is a philosophy that considers the challenge of improving products, processes, and services to be a never-ending process permeated by small achievements.



Finally, Bhuiyan and Baghel (2005) define it as a culture of sustainable improvement that seeks to eliminate losses in all systems and processes of an organization.

Table 1 – GQCS Practices

Practices	Definition	Authors
Continuous Improvement	Consists of a process of continuous long-term improvements aimed at achieving competitive advantage.	Toledo <i>et al.</i> (2014); Bhuiyan and Baghel (2005); Davison, Gordon, and Robison (2005); Zhang <i>et al.</i> (2011); Zhang, Waszink, and Wijngaard (2000); Johnston and Clark (2002).
Compliance with Specifications	This consists of the process of continuously and effectively verifying customer requirements and requests.	Zhang <i>et al.</i> (2011); Kotler (2000); Sadikoglu and Olcay (2014).

Source: Authors.

Development of the Buyer-Supplier Relationship

According to Song, Liu, and Wang (2012), suppliers should develop and maintain the best possible quality relationship with their buyers, seeking to create a harmonious relationship environment through communication and conflict resolution, committing to achieving increasing adaptation in the relationship.

The buyer-supplier relationship factor variables chosen to compose this study are: trust, interorganizational communication, dependence, relationship satisfaction, commitment, and long-term relationship. Thus, the main definitions or characteristics of the relationship variables with their main authors are discussed below. Table 2 summarizes these variables between buyer and supplier in the supply chain.

Research Methods and Techniques

Considering that research is developed through several structured and organized stages, the research approach is qualitative in nature.

Characterization of research participants

The study was conducted in the Federal District, which is divided into 33 Administrative Regions where the population of the Federal District reached 3 million and 94 thousand inhabitants, according to IBGE estimates (2021) with a reference date of July 1, 2021. The study indicates that Brasília is currently the third most populous city in Brazil, alongside São Paulo and Rio de Janeiro. In addition to being the political center of Brazil, the Federal District is also an important economic center, as it has the eighth largest gross domestic product (GDP) among the states and the highest GDP per capita in Brazil. In terms of income, the Federal District has the eighth highest Human Development Index (HDI) among Brazilian municipalities (CODEPLAN, 2020).

Traditional fishmongers (specialized and permanent markets) and *à la carte* restaurants specializing in tilapia dishes or that have tilapia on their menu were selected as participants in this study.



Table 2 – Buyer-supplier relationship variables

Variables	Definition	Authors
Trust	Consists of the supplier's performance in delivering the requested components to the right place, within the agreed time frame, in the required conditions and packaging, and in the requested quantity.	Anderson and Narus (1990); Khan <i>et al.</i> (2015); Morgan and Hunt (1994); Aji (2016); Jiang, Henneberg, and Naudé (2012); Hoetker (2005); Kuei and Madu (2001).
Interorganizational communication	This consists of the exchange and/or sharing of information/goals between parties, seeking to achieve better coordination of these activities.	Anderson and Narus (1990); Holland (1995); Fynes, Voss, and de Búrca (2005); Joshi <i>et al.</i> (2017); Ambrose <i>et al.</i> (2008); Aji (2016).
Dependency	This consists of the need to maintain the relationship with the partner in order to achieve one's goals.	Emerson (1962); Vijayasathy (2010); Huo <i>et al.</i> (2019); Buchanan (1992); Shi and Liao (2015).
Relationship satisfaction	This is the factor that contributes positively to the relationship, helping to develop a long-term relationship.	Hunt and Nevin (1974); Song, Liu, and Wang (2012); Jiang, Henneberg, and Naudé (2012); Aji (2016); Mellat-Parast (2013).
Commitment to the relationship	This consists of actions motivated by behavior to strive to achieve goals and improve performance.	Morgan and Hunt (1994); Ryu, Soh, and Koo (2009), Aji (2016); Vijayasathy (2010).
Long-term relationship	This consists of satisfaction in buyer-supplier actions aimed at achieving mutual goals and obtaining competitive advantage.	Yang and Zhang (2017); Nagati and Rebolledo (2013); Joshi <i>et al.</i> (2017); Morgan and Hunt (1994); Song, Liu, and Wang (2012), Yawar and Seuring (2020); Aji (2016).

Source: Authors

According to the study conducted by Borges (2010), fishmongers in the Federal District can be classified into three categories: specialized fishmongers, represented by traditional establishments and those that sell differentiated products and cuts, known as fish boutiques; permanent market fishmongers, represented by establishments that occupy specific spaces in permanent markets; and open-air market fishmongers, which are represented by fish stalls in temporary markets, which take place in parking lots, squares, and public roads previously authorized for this purpose.

For restaurants, *à la carte* establishments were selected, where the choice of dish is made by presenting the menu, which lists all the options of dishes prepared by the establishment. In this sense, Table 1 shows the distribution of the number of fishmongers and restaurants by Administrative Regions.



Table 1 - Distribution of fishmongers and restaurants by Administrative Regions

Administrative Regions (RA)	No.
RA I - Plano Piloto	0
AR III - Taguatinga	0
RA XVI - South Lake	01
RA XX - Águas Claras	01
RA XXII - Southwest/Octogonal	01
RA XXIX - SIA	01
RA XXX - Vicente Pires	02
Total	12

Source: Authors

When selecting the sample, it was found that some fishmongers and restaurants had more than one outlet, so only the main ones (head offices) were selected for data collection. Thus, a total of 12 participants, including 6 fishmongers and 6 restaurants, were sufficient for this study, following the assumption of the theoretical data saturation technique, since the discourses obtained through the semi-structured interviews were repeated, demonstrating little clarification for the object studied.

Data Collection Technique and Procedures

A semi-structured interview was applied, which allows the interviewer to construct information and address topics relevant to the research object (Minayo, 2010). In addition to the semi-structured interview script, non-participant observation was also adopted in this research, where the researcher acted only as a spectator in both face-to-face observation (fishmongers and restaurants). It should be noted that in June and July 2022, 15 visits were made to fishmongers and restaurants, of which only 12 resulted in effective participation in the study. After the collection procedure, the data obtained from the observation was triangulated.

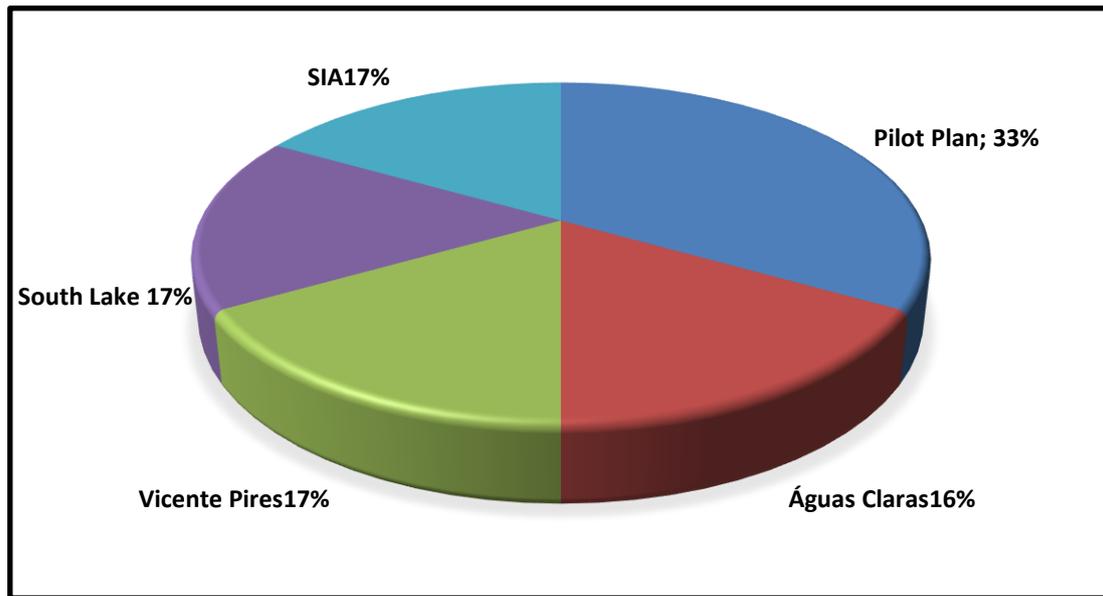
Data Analysis

The content analysis technique proposed by Bardin (1977) was used, which presents three phases for analysis: (1) pre-analysis; (2) exploration of the material; and (3) treatment of results, inference, and interpretation (see Table 3).

Results and Analysis

Fishmongers

Regarding the location of the fishmongers studied in this research, Graph 1 shows the division by administrative regions in the Federal District.



Graph 1 – Location of fishmongers by administrative regions of the Federal District. Source: Research data.

Table 3 – A priori and a posteriori thematic categorization of content analysis and final interpretations

Categories	Subcategories
I- Identification and characterization of fishmongers and restaurants that sell tilapia	a) Classification of the company b) Company location c) Characterization of tilapia
II- Characterization of the service operations of fishmongers and restaurants with their customers	a) Customer relations
III- Identification of relational factors between fishmongers and restaurants and their main tilapia supplier	a) Trust b) Commitment c) Communication d) Dependence e) Long-term relationship f) Relationship satisfaction
IV- Identification of quality management practices carried out by the main tilapia supplier	a) Continuous improvement b) Compliance with specifications

Source: Authors

The graph shows that fishmongers are distributed across different Administrative Regions of the Federal District, but the Plano Piloto region has the highest representation (33%), corresponding to fishmongers A and B respondents. In addition, the roadmap reported that all establishments are centrally located and easily accessible.

According to the Brazilian Micro and Small Business Support Service - Sebrae (2018), the location of a fish market should take into account the flow of people and ease of access to the establishment, since people buy fish and seafood where it is most convenient, close, and accessible.

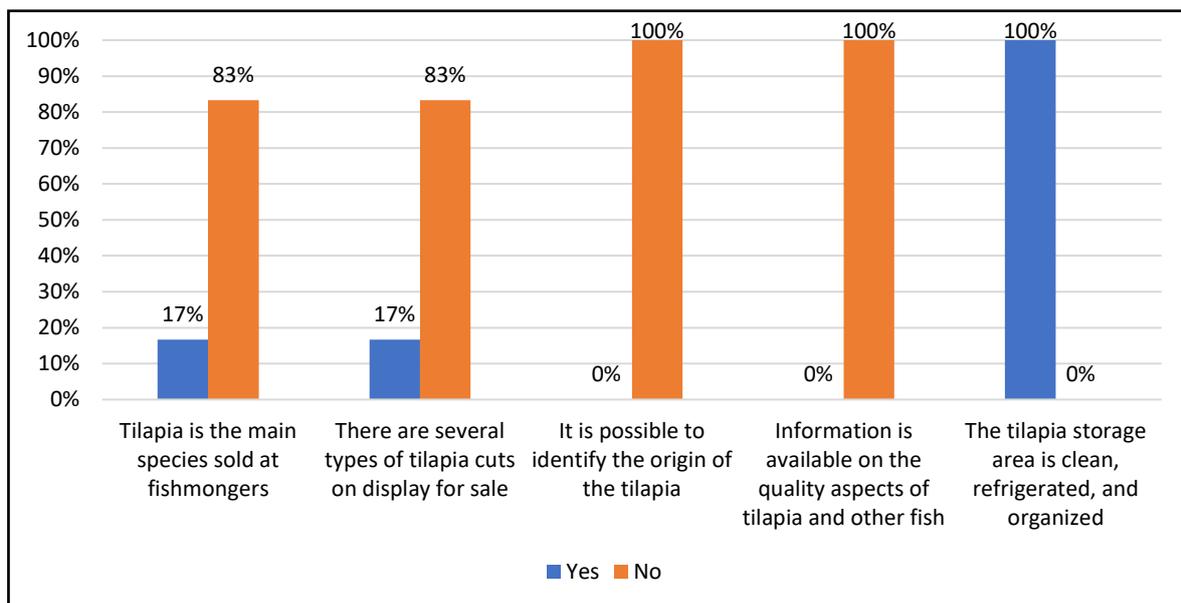
Regarding the classification of the company, the survey reveals that only 33% of establishments sell only fish, and 67% of them also sell other products, such as spices, condiments, and beverages.



Category II: Characterization of the Presentation of Tilapia

Regarding the form of tilapia marketing in fishmongers, it was observed in criterion 1 that in all establishments the species was being displayed for sale in fresh/chilled and frozen forms, with a preference for marketing in fresh/chilled form. This finding corroborates the study by Borges (2010), in which fresh (54.5%) and frozen (40.3%) fish were the main forms of presentation in fishmongers/markets in the Federal District.

Still on the characterization of tilapia sold in fishmongers, the following criteria were considered: (2) tilapia is the main species in the fishmonger; (3) there are several types of tilapia cuts displayed for sale; (4) it is possible to identify the origin of the tilapia; (5) there is information about the quality aspects of tilapia or other fish; and (6) the tilapia storage area is clean, refrigerated, and organized.

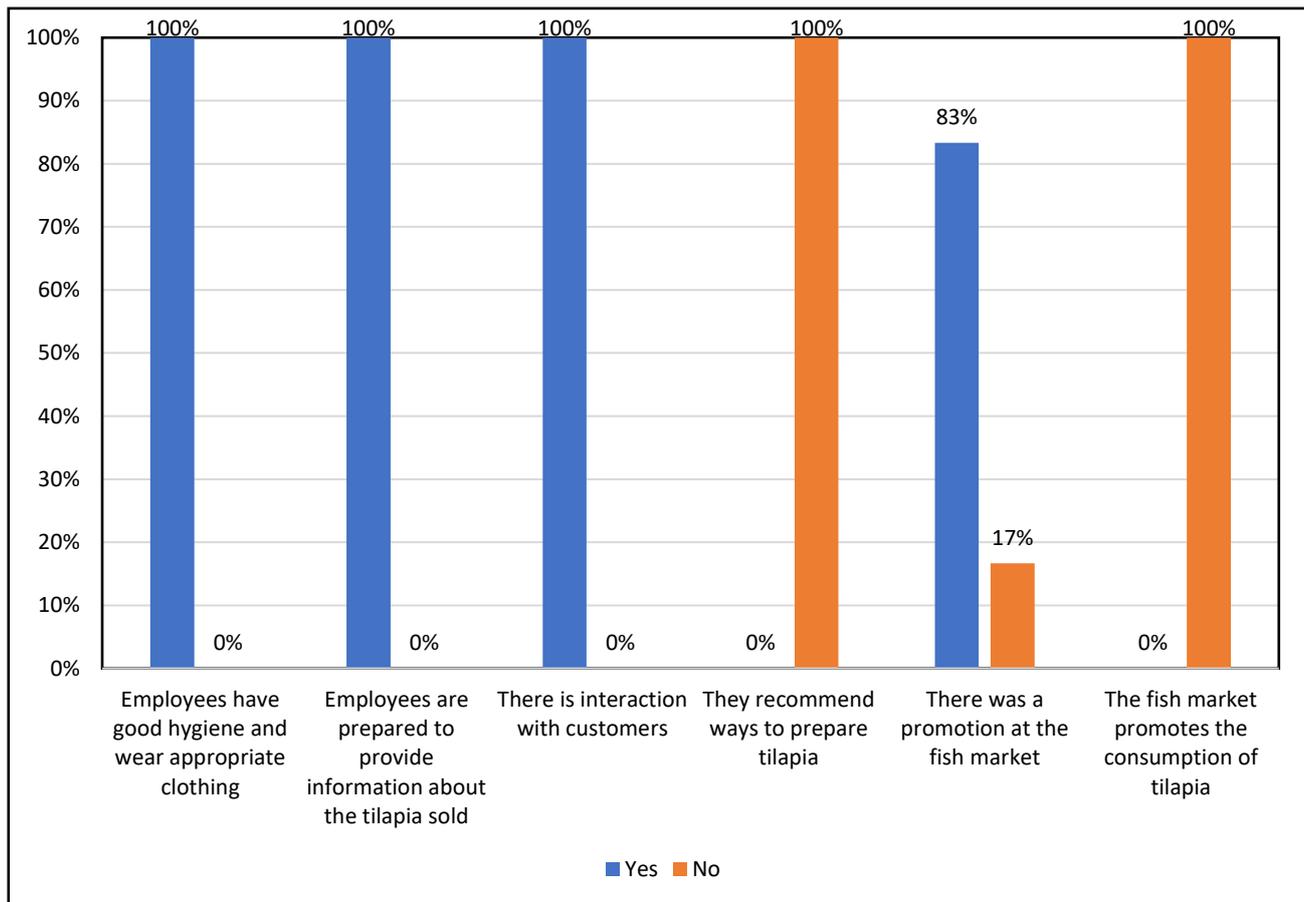


Graph 2 – Criteria for characterizing tilapia in fishmongers as a percentage (%). Source: Research data

As shown in Graph 2, criterion 2 indicates that tilapia is not the main species sold by most of the fishmongers observed, representing 83% of the total. Regarding criterion 3, it is observed that most do not have a variety of tilapia cuts on display for sale, such as fillets, steaks, and pieces, but it was noted that employees were willing to cut tilapia when requested by the customer.

Category III: Characterization of Fish Market Service Operations

This section presents the characterization of fish market service operations, focusing on customer relations. To this end, criteria related to hygiene, employee training, customer interaction, preparation recommendations, promotions, and encouragement of tilapia consumption were considered. Graph 3 presents this characterization in percentage terms.



Graph 3 – Criteria for characterizing customer relations in fishmongers. Source: Research data

The survey reveals that during the application of the script, it was observed that 100% of fishmongers have employees with adequate hygiene and clothing for handling fish, thus complying with the legal requirements related to hygiene routines for food handlers, as provided for in Normative Instruction No. 16 of May 23, 2017. Furthermore, it was observed that they are able to convey information related to the tilapia being sold and interact with the customer by asking what they want to buy or even mentioning which fish is on offer that day.

In-Person Categories

Category I: Characterization of Participants

It is possible to identify that most respondents are owners of the establishments and responsible for purchasing fish (67% are fish market owners and 33% hold management positions), mainly based on business expertise acquired over the years through negotiation and dialogue with their suppliers. In addition, they have longer working hours, mainly because the fishmongers have been operating in the market for a long time.

Category II: Company Characteristics

Regarding the number of employees the company has, the interview script classified them as: fewer than 5 employees, 5 to 10 employees, 11 to 15 employees, 16 to 20 employees, more than 20 employees, and more than 100 employees. It was found that two (33%) fishmongers have fewer than 5 employees on their staff, two (33%) have 5 to 10 employees, one (17%) has 11 to 15 employees, and one (17%) has more than 20



employees. therefore, it can be inferred that, in terms of the classification of the size of commercial and service companies, these are micro and small companies (SEBRAE, 2013).

Parente and Barki (2014) understand that choosing the right location for a store is one of the biggest challenges facing retailers, since an inappropriate location will jeopardize performance, and possibly the future of the company. Therefore, maximum dedication, investment, and attention on the part of the retailer in selecting a commercial location means a huge competitive advantage in the market.

Category III: Relationship Factors and Quality Practices

Trust:

Most fishmongers reported that they adopt informal agreements, made only verbally with their main tilapia supplier, with the expectation that their partners will comply with these agreements. It was found that only fishmonger A has a contractual agreement with its main supplier. On the other hand, according to the interviews and excerpts from some of them, it is clear that most fishmongers do not adopt a formal agreement, with contracts with their main supplier, but it was possible to identify in their statements that there is a relationship of trust, even though there is no guarantee that the verbal agreement will be fulfilled by that supplier.

Commitment:

All participants indicated that there is a close relationship with their main tilapia supplier, as described in the following excerpts.

-I have a good relationship with my supplier. I have been buying from him for over 20 years, so it is a long-standing relationship. (Fishmonger B).

-It's one hundred percent (...). We always have a good relationship. (Fish Market C).

-Our relationship is based on a high level of trust in terms of delivery times and product quality. (Fish Market F).

From the point of view of most participants, suppliers are committed to maintaining a continuous supply, ensuring that there are no shortages of the product and seeking to maintain the quality of the fish.

He already has a connection with us, he already has the characteristic of working without letting the merchandise run out or lose quality (...). (Fish Market E).

-Prompt service in meeting needs, payment terms, and product delivery. (Fish Market F).

Regarding the frequency of tilapia supply, participants reported that it depends greatly on demand, but generally supply occurs two to three times a week, as described below.

-It depends a lot on demand. Today I get it three times a week (Monday, Wednesday, and Saturday), but it also depends a lot on sales demand (...). (Fish Market B).



-This supply occurs twice a week, depending on our sales demand (...). (Fish Market D).

Given this, suppliers seek to maintain their commitment to fishmongers through a closer and more reliable relationship, demonstrating motivation and effort to meet objectives, such as pre-established delivery times, quality fish, offering the products necessary to meet buyer demand, and maintaining previously agreed prices.

Communication

Regarding communication with their main tilapia supplier, participants reported that they always maintain contact with the supplier and when there is an unforeseen event that could affect the supply of fish, the fish market is promptly notified, as described in the following excerpts.

-We communicate by phone. Just today I had a setback because I placed an order and he didn't have a car available to bring my goods, so I had to use my car to pick up the fish. (Fish Market B).

-(...) we use the phone a lot to communicate. When a producer (supplier) fails to deliver, we have other suppliers. If there is a problem, the fish market is never left uncovered, because I will have another producer to cover any supply failure. (Fish Market D).

-As I am in daily contact with him (...), he calls me to let me know if something unexpected has happened, to give me information about product quality, or if the truck has broken down and won't be able to get here. He tells me everything, every day. (Fishmonger E).

The survey also found that the exchange of information with suppliers occurs frequently and informally, as described in some of the excerpts below.

-We talk directly (...). When new merchandise is arriving, he lets me know, and I always talk to him on the phone. Once a month I visit the company, and when I don't go, he comes here to the fish market. So we have frequent and informal conversations. (Fish Market C).

The fishmongers reported that the main channels of communication used in their relationship with their main tilapia supplier are phone calls and WhatsApp. In addition, the main information shared through these communication channels is related to prices, supply, and fish quality.

-The supplier tells me everything about the fish. If it arrived in good quality (...), he tells me all the details, such as the weight, the quality since it was caught, whether we want the fish with or without guts. We are always exchanging ideas on how we can serve our customers, as each one has a different standard (...). (Fish Market E).



According to the excerpts referring to the communication factor in the relationship, the research identified that fishmongers maintain active interaction with their suppliers through quick, , and frequent exchanges of information regarding the supply of fish during the week, aspects related to quality, and possible reductions in the price of fish.

Dependency:

Regarding the dependency factor in the relationship between fishmongers and the main tilapia suppliers, all reported that there had never been any cases of discontinuity in supply, but if there were, it would not be a major problem, since they all have more than one tilapia supplier. Thus, if necessary, they can resort to a second supplier so that they do not run out of stock, as evidenced in the following excerpts.

(...) I am not dependent on this supplier, as there are other suppliers. We give priority to the fact that the company is serving you with excellence, but from the moment it no longer serves me with the same excellence, I look for other suppliers, and there are plenty in Brasília. (Fish Market B).

-As the relationship is already based on trust, if, by any chance, they can no longer supply me, they will certainly let me know in advance so that I have time to look for another supplier (Fish Market E).

In this context, it can be inferred that there is a low degree of dependence in the relationship between fishmongers and their main tilapia supplier, as there are other fish suppliers serving the region.

Long-term relationship

For the fishmongers interviewed, the importance of maintaining a long-term relationship with their main tilapia supplier is related to the trust they have in the supplier, the quality of the fish purchased, and the commitment to delivery, as shown in the following transcripts.

-For the quality. If you have a product to offer me, you deliver it on the right day and at the right time, there are no delays, and you have a quality standard to meet my needs, then there is no reason for me to leave you to buy from someone else. (Fish Market B).

The fishmongers were also asked if they would like to increase their turnover with their main tilapia supplier by what percentage. The vast majority indicated an increase of at least 50%, but said that it depends greatly on the demand for fish in the market, as shown in the excerpts transcribed below.

-I believe 50% or even 100%. We need to open up the market. (...) we want to stay with this main supplier because they have potential, commitment, and quality. (Fish Market D).

In view of the excerpts, it is clear that fishmongers intend to continue their long-term relationship with their main tilapia supplier because they understand that extending the relationship will bring benefits and s in



terms of increasing mutual trust, maintaining standardization, and continuously improving quality and commitment to fish delivery on the part of their supplier.

Relationship satisfaction

Regarding relationship satisfaction, the fishmongers described themselves as very satisfied with the relationship/agreement established with their main tilapia supplier, given that there is a commitment from both parties to maintain the consolidated relationship. In addition, the fishmongers reported that they intend to continue negotiating with their main tilapia supplier in the long term, as has been the case, according to the following excerpts.

-I intend to work with him in the long term, as has been the case for many years. As long as we are in the segment, I intend to work with him. (Fish Market E).

Therefore, according to the survey, fishmongers stated that they were satisfied with the relationship, had active interaction, and in some cases a closer relationship with their main tilapia supplier, which they classify as friendship. They intend to continue the long-term relationship because, for them, suppliers have complied with agreements and strived to offer quality products and services.

Continuous Improvement

Regarding the factor related to quality management practices, fishmongers were asked to report whether their suppliers have been collaborating over time to improve the quality of the fish and the services provided, and how they have observed this improvement, as described in the following excerpt.

-Over the years, the quality has improved a lot (...). Today, he (the supplier) works with fish that is no more than 3 to 5 days old, so that the quality is maintained and the fish is as fresh as possible. He always keeps the fish on ice, well stored, so I see that he has greatly improved the quality and is improving more every day. (Fish Market E).

The survey revealed that, from the fishmongers' point of view, their main suppliers are, over time, improving both the quality of the tilapia supplied and the services provided, through the correct packaging of the fish in ice, punctual delivery, improved packaging during transport, and the possibility of supplying different sizes and cuts of tilapia.

Compliance with specifications

Fishmongers described their perception of the quality attributes of the tilapia received in their latest purchases and their degree of satisfaction. The following excerpts describe the fishmongers' point of view.

-I am very satisfied. The tilapia is of high quality, especially in terms of size, weight, and quality. Here in Brasília, I have not yet found a supplier like him. Delivery is 100% (...). (Fish Market C).

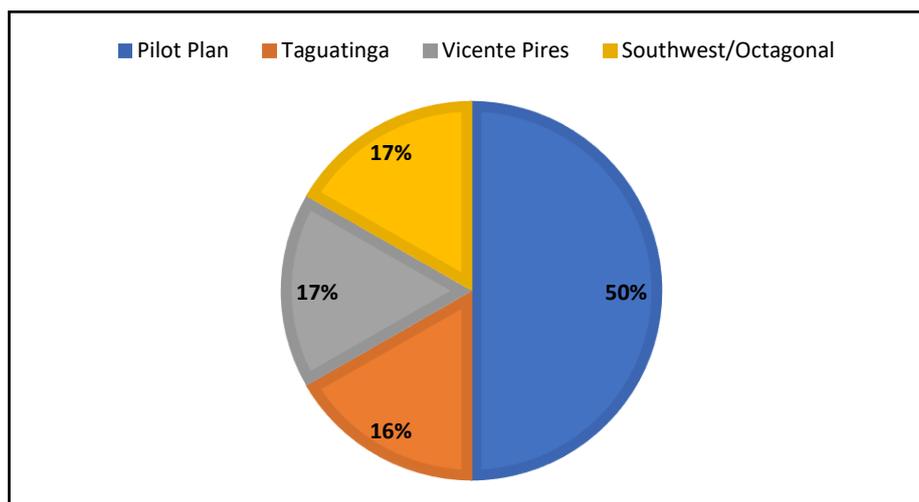


-He has been delivering very good tilapia, both small and large, but standardized and of high quality, as I check all the characteristics of fresh fish (...). The tilapia he sends is always well preserved. (Fish Market E).

Finally, still in relation to compliance with specifications, when asked to describe the conditions and delivery times of their suppliers and their degree of satisfaction with these services, all fishmongers stated that their suppliers comply with delivery times, observing the day and time previously agreed by phone or WhatsApp, and said they were satisfied with the services provided by them. In this regard, regarding the factor of compliance with specifications in quality management, the survey revealed that buyers tend to focus on tilapia suppliers who are able to deliver the product within the previously agreed specifications and quality, supplying sufficient volume to meet purchase demand, storage and transportation conditions, and meeting delivery deadlines.

Restaurants

Regarding the location of the restaurants studied in this research, Graph 4 shows the division by administrative regions in the Federal District.



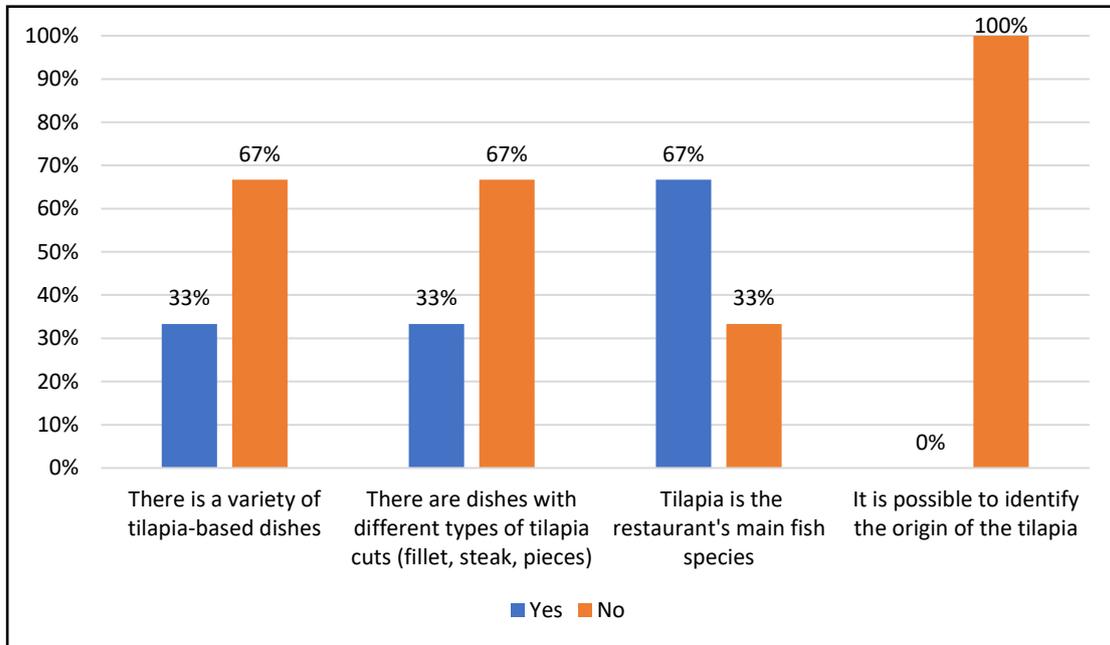
Graph 4 – Location of restaurants by administrative regions of the Federal District. Source: Survey data

The research reveals (Graph 4) that the restaurants observed are concentrated more in the central region of the Federal District, with the Plano Piloto having the highest representation at 50%, corresponding to restaurants B, C, and D. In addition, the itinerary reported that all establishments are centrally located and easily accessible. Regarding the classification of the company, in response to the question of whether the restaurant has a menu specializing in tilapia-based dishes, it is possible to identify that only 33% of the establishments observed answered yes, with the species as the “flagship” on the restaurant menus. However, it was observed that the vast majority (67%) of establishments have an average of two tilapia-based dishes on their menus.



Category II: Characterization of the Presentation of Tilapia Dishes

Regarding the characterization of the presentation of tilapia dishes in the restaurants observed, the following subcategory is considered: i. Characterization of tilapia, based on the following criteria: (1) There is a variety of tilapia-based dishes; (2) There are dishes with different types of tilapia cuts (fillet, steak, pieces); (3) Tilapia is the main fish species served at the restaurant; and (4) The origin of the tilapia can be identified.



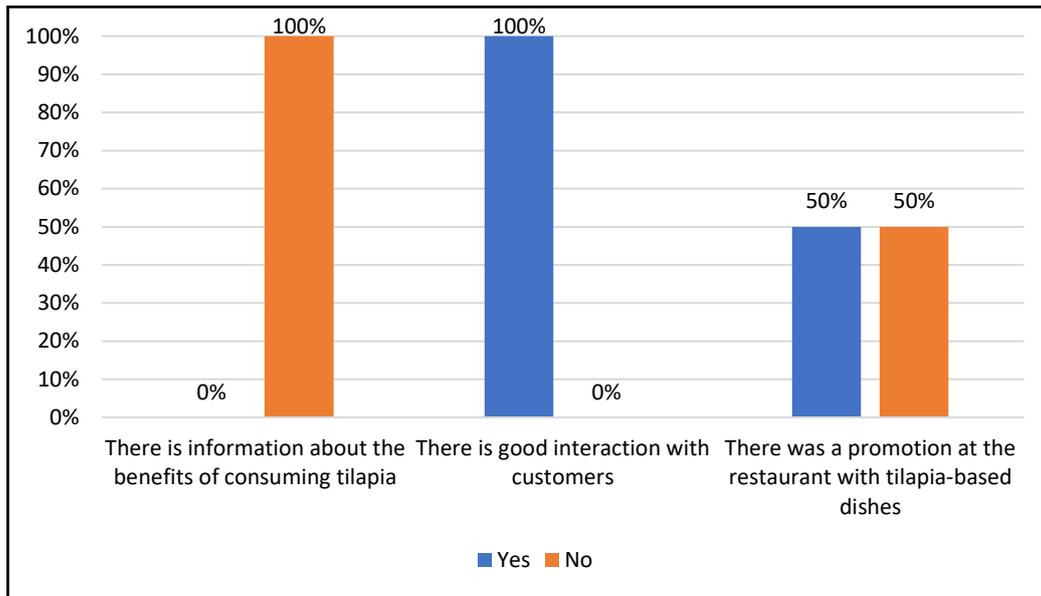
Graph 5 – Criteria for characterizing the presentation of tilapia-based dishes. Source: Research data

Graph 5 shows that among the restaurants observed, only 33% offer a variety of tilapia dishes with different types of cuts (fillet, steak, chunks) on their menu. but it was observed that the vast majority (67%) of restaurants have an average of two tilapia-based recipes on their menu, using fillets as the main type of cut.

Although most of the restaurants observed do not have a significant number of dishes made with tilapia, it was found that it is the main species used among other fish and seafood in restaurants, corresponding to 67%. Finally, it was not possible to identify the origin of the tilapia being consumed in any of the establishments observed, as there was no information available to encourage conscious consumption by consumers.

Category III: Characterization of Restaurant Service Operations

To characterize restaurant service operations, the following subcategory was considered: i. Characterization of customer relations, based on the following criteria: (1) Information is available on the benefits of consuming tilapia or other fish; (2) There is interaction with customers; (3) There were promotions for tilapia-based dishes at the restaurant.



Graph 6 – Criteria for characterizing restaurant service operations. Source: Research data

According to Graph 6, regarding the relationship between restaurants and customers, it is noted that among the six restaurants observed, none of them offered information about the benefits of tilapia consumption for human health. Furthermore, it was possible to identify that 100% have good interaction with customers, providing quality service, and only 50% of the restaurants observed seek to promote fish consumption, with promotions of tilapia-based dishes on their menus.

Considering the results presented in this category, it was indicated that restaurants seek to provide effective customer service because they understand that service is extremely important for building customer loyalty, which confirms Moutella's (2004) understanding that every customer expects to receive satisfactory service.

Face-to-Face Categories

This survey was divided into: less than 1 year, 1 to 2 years, 2 to 4 years, 4 to 6 years, over 6 years, and over 10 years. Therefore, the survey revealed that 33% of respondents have worked at the company for 1 to 2 years, 17% have worked for 2 to 4 years, 33% have worked for more than 6 years, and 17% have worked for more than 10 years. Regarding the position held, the survey revealed that the majority, 67% of respondents, are owners and 33% hold managerial positions in restaurants.

Category II: Company Characteristics

The survey revealed that only one establishment is part of a chain of restaurants with franchises specializing in tilapia-based dishes in the Federal District. Regarding the number of employees the company has, the interview script classified them as: fewer than 5 employees, 5 to 10 employees, 11 to 15 employees, 16 to 20 employees, more than 20 employees, and more than 100 employees. It was found that two (33%) restaurants have 5 to 10 employees on their staff, two (33%) have 11 to 15 employees, one (17%) restaurant has over 20 employees, and one (17%) has over 100 employees. Therefore, it can be inferred from the size classification for commercial and service companies that most establishments are classified as micro and



small, but one company is classified as a large company, as it is a restaurant chain in the Federal District and has more than 100 employees on its staff (SEBRAE, 2013).

Category III: Relationship Factors and Quality Practices

Trust

All the restaurants interviewed stated that they adopt an informal agreement in their relationship with their main tilapia supplier, based on the trust that their business partner will comply with the agreement signed. Some excerpts from the interviews described below support this statement.

-The agreements are verbal. We carry out the entire supplier selection process, pass on a technical data sheet approving the product, and then a verbal agreement is made with the selected supplier, in which we tell them how many kilos we are going to order and how it will be done in each of the thirteen franchises in Brasília. (Restaurant B).

-The agreement I make is verbal. (Restaurant F).

According to the interviews conducted and excerpts taken from some of them, it was found that restaurants do not adopt a formal contractual agreement with their main tilapia supplier. However, through their statements, it was possible to identify that the agreement is based on the buyer's trust in their supplier, since there is no guarantee that this "verbal agreement" will be fulfilled.

Commitment

The restaurants indicated that they have a close and loyal relationship, as described in the following excerpts.

-It's a very smooth relationship (...). It's a relationship based on trust. Twice a week, the supplier contacts the 14 stores in the chain. They ask how many kilos we will need on Monday and Thursday and deliver on Tuesday and Friday (...). (Restaurant B).

-We have a very good relationship with two distributors in the region, who supply both tilapia and other fish. We have had a partnership with them for many years, with seven years of loyalty. (Restaurant D).

In addition, the survey also revealed that restaurants look for certain characteristics in their main tilapia supplier to decide whether or not to consider them a partner of the company. Thus, it was observed that maintaining the quality of the fish, guaranteeing the agreed price, and meeting the delivery deadline are the main characteristics adopted by suppliers to fulfill their commitment, as shown in the following excerpts.

-Trust comes from him fulfilling everything he promised, such as maintaining the price for a period (...), commitment to delivery, which is very important to us, especially since tilapia is our flagship product (Restaurant B).



-The quality of the product, the form of payment, and especially the delivery, which is super fast. (Restaurant F).

Another point raised in relation to commitment was the way in which the tilapia supplier is committed to maintaining a continuous supply relationship with the restaurant. Thus, from the point of view of most participants, suppliers are committed to the regular delivery of tilapia, ensuring product stock and seeking to maintain the quality of this fish.

-(...) has been committed to regular deliveries for over two years to all stores in the chain. It complies with the quality parameters requested by the restaurant in the primary process (Restaurant B).

-Ensuring product stock. (Restaurant F).

In this sense, it can be concluded that suppliers maintain a close relationship with restaurants and seek to honor their commitments, complying with the pre-established deadline for product delivery, with quality parameters and maintenance of fish prices, and supplying the demand for tilapia in restaurants.

Communication

Regarding communication with their main tilapia supplier, most participants claimed that there was prior communication about any event that could affect the supply of fish, as described in the following excerpts.

-First, the supplier contacts the restaurant industry and then sends an email to all franchises and also a WhatsApp message to the group of managers about any unforeseen events that may occur (...). (Restaurant B).

-The supplier notifies me immediately if there will be any supply problems that week, but problems rarely occur (...) (Restaurant E).

The survey also found that for most restaurants, the exchange of information with their supplier occurs frequently and informally, as described in the following excerpts.

-Frequently and informally. They are always in contact. (Restaurant A).

-Communication is informal and frequent. (Restaurant B).

-It occurs informally once or twice a week (Restaurant D).

It was also found that the main channels of communication used in the buyer-supplier relationship for tilapia are phone calls and WhatsApp, and in some cases face-to-face conversations. When asked about the main information shared through these communication channels, restaurants reported that topics related to price and quantity of fish are the most frequent in their communication with suppliers.

In addition, it was found that rapid and effective communication occurs, via telephone call or WhatsApp, about any incidents that may occur and jeopardize the supply of fish on a given day or week.



Dependency

Regarding the dependency factor in the buyer-supplier relationship, restaurants were asked to describe the consequences of a possible discontinuity in the supply of tilapia by their main supplier. Most participants reported that a discontinuity in supply would not be a major problem, as they all have more than one supplier. Thus, if necessary, they could turn to a second supplier to avoid running out of stock. However, restaurants A and F reported that they did not have more than one supplier and claimed that they would have potential problems in the event of a supply failure. Some excerpts are described below.

-I believe that there will be no disruption in supply, because I have been working with him for eight years, and if it happened, I would not have another supplier to serve me at the moment. (Restaurant A).

-I would have to buy from the market or wholesale, where the price is higher than my supplier. (Restaurant F).

In this context, it can be inferred that most restaurants have a low degree of dependence on their main tilapia supplier, as there are other fish suppliers serving the region.

Long-term relationship

For the restaurants interviewed, the importance of maintaining a long-term relationship with their main tilapia supplier is related to the trust that exists in the relationship, the quality standard of the fish purchased, and the commitment to delivery, as shown in the following transcripts.

-Friendship and trust. As we have been friends for a long time, I always trust him and he trusts me. (Restaurant E).

-It's because a bond is created, which makes it easier to negotiate prices, terms, and discounts. (Restaurant F).

The restaurants were also asked if they would like to increase their business volume with their main tilapia supplier by a certain percentage. The participants' responses varied between 15% and 50%, but they reported that the percentage depends greatly on consumer demand in restaurants, as shown in the excerpts below.

-Around 40%. (Restaurant A); Around 50%. (Restaurant D); At least 25%. (Restaurant F).

-I would like to increase it as much as possible. We know today which months will have a higher or lower percentage of sales, so we pass on the months when we sell more to the supplier so that they can plan accordingly. An increase of 15 to 20% would already be very good. (Restaurant B).

It should be noted that restaurants seek to maintain continuity in their relationship with their main tilapia supplier, as they understand that extending the relationship will bring benefits in terms of increased mutual



trust, maintenance of standardization, and continuous improvement in quality and commitment to fish delivery on the part of their supplier.

Relationship satisfaction

Regarding relationship satisfaction, restaurants were asked to describe their satisfaction with the relationships/agreements established with their tilapia supplier, in which they indicated that they were very satisfied, as there is a commitment from both parties to maintain the consolidated relationship, as described in the excerpts below.

-Overall, I am 100% satisfied. When I place an order, I am well served, also in terms of payment terms. There is flexibility on the part of the supplier, taking into account the trust. (Restaurant D).

-I am very satisfied with my supplier. Although it is not the cheapest, it is one of the best products. (Restaurant F).

Furthermore, the restaurants reported that they intend to continue negotiating in the long term with their main tilapia supplier, as has been the case, as explained in the following excerpts:

"If it depends on us, it will be long-term (...). (Restaurant B); -In the long term. Unless he lets the quality of the product drop. (Restaurant C) and -In the long term, because I already trust him. (Restaurant E).

Thus, the restaurants reported that they are satisfied with their relationship with their main tilapia supplier and that they intend to continue the partnership in the long term, because, for them, their partners maintain a close relationship, trust, and commitment to fulfilling the agreements signed and are committed to making regular deliveries throughout the year.

Continuous Improvement

Regarding the factor related to quality management practices, restaurants were asked to report whether their suppliers are, over time, collaborating to improve the quality of the fish and services provided, and how they have observed this improvement.

-The supplier is always improving, and it is very difficult for their quality to decline. I always observe both the quality of the fish and the prices, and the fish is always fresh. (Restaurant A).

-Yes, because they have maintained a standard for a long time. Our expectations are met in terms of product presentation and the services provided. (Restaurant D).

The survey revealed that, from the restaurants' point of view, their main suppliers are, over time, improving the quality of tilapia, providing fresher fish, and providing quality service both in delivery and in commercial agreements.



Compliance with specifications

It is clear that restaurants need to describe their perception of the quality attributes of the tilapia received in their latest purchases and their degree of satisfaction. Thus, some of the following excerpts describe the restaurants' point of view.

-The fillet is very pink, fresh, and vacuum-packed. The whole fish always comes in the size I ask for and is very plump. The quality has improved a lot in recent years. (Restaurant A).

-Tilapia comes drained, with no weight loss, so satisfaction is very high. (Restaurant F).

Furthermore, when restaurants were asked whether their main supplier had the necessary volume of tilapia to meet their current purchasing demand, all stated that they did and that they had always been able to obtain normal supplies from their supplier. Finally, when asked to describe the supplier's delivery conditions and deadlines and their level of satisfaction with these services, the restaurants stated that delivery deadlines were met on the day and time previously agreed upon by phone or WhatsApp and that they were satisfied with the services provided by their suppliers.

Conclusions

Most establishments are located in the central region of Brasília and are easily accessible. This region offers a variety of gastronomic and tourist attractions, with a large flow of people, thus contributing to an increase in the promotion of tilapia consumption in both fishmongers and restaurants.

Fishmongers and restaurants serve their customers, but it is necessary to establish a closer and more informative relationship in order to identify customer needs and offer products and services that exceed the detected demand, mainly by encouraging customers to purchase and consume tilapia, because, as demonstrated, few establishments offer promotions or deals on tilapia or tilapia-based dishes in their facilities on a daily basis, and there is no information about its consumption benefits or even its origin.

As for the relationship between fishmongers and restaurants with their main tilapia supplier, there is a successful, collaborative, and lasting partnership, which is reliable and established for mutual benefit. As demonstrated, buyers seek to maintain a close and continuous relationship with suppliers who promote quality, contribute to competitive advantage, and do not cause disruption in the supply chain.

The results indicate that the adoption of quality management practices by tilapia suppliers, such as continuous improvement and compliance with specifications, is essential to promote quality and a beneficial and satisfactory relationship with their buyers. Thus, tilapia suppliers strive to maintain partnerships and differentiate themselves from the competition based on the services they offer and the quality of the tilapia delivered to fishmongers and restaurants, as they understand that satisfactory quality and service must be pursued on a daily basis through regular and timely delivery, volume, price, supply of fish that meets minimum quality standards, and added value, among other factors.

Finally, it is necessary to prepare a new diagnosis of fish consumption and the fish market in the Federal District, so that the federal and Federal District governments have updated data on actual demand and how the trade in tilapia and other species works in the various administrative regions of the Federal District, with a view to developing appropriate and necessary public policies for the development of tilapia farming in the region.



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