

Linkage to the market of jalapeño pepper producers through supplier development in Quintana Roo

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ABSTRACT

Objective: To analyze the jalapeño pepper characteristics and demand of the restaurant sector in Quintana Roo, in order to identify the supply requirements of this sector.

Design/Methodology/Approach: A random sample of n=73 restaurants were surveyed online.

Results: Most of the restaurants (87.5%) have been in business for less than six years and —although most of them sell Mexican food— only 41.6% are interested in purchasing jalapeño peppers from the producers.

Study Limitations/Implications: Producers must invest their social capital in order to firmly establish a supply strategy.

Findings/Conclusions: The restaurants that purchase jalapeño pepper demand a constant delivery frequency, size, pungency level, and specific color.

Keywords: quality, commercialization, strategy, jalapeño.

Citation: Cuevas-Reyes, V., Sánchez-Toledano, B. I., Góngora-Pérez, R. D., Borja-Bravo, M., & Sánchez-Gómez, J. (2023). Linkage to the market of jalapeño pepper producers through supplier development in Quintana Roo. *Agro Productividad*. <https://doi.org/10.32854/agrop.v15i11.2351>

Academic Editors: Jorge Cadena Iñiguez and Libia Iris Trejo Téllez

Received: July 25, 2022.

Accepted: December 23, 2022.

Published on-line: February 03, 2023.

Agro Productividad, 16(1), January, 2023, pp: 13-21.

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INTRODUCTION

In Mexico, 8.7% of the producers meet the demands of 74.2% of the agricultural market, while 73% of the farmers (who engage in small family agriculture) only have a 7.5% of the market share (FAO-SAGARPA, 2012). Caicedo (2013) pointed out that the scarce bargaining power in the local market shows the high level of exposure of the rural community to market intervention processes carried out by external agents. Consequently, small fruits and vegetables producers face more difficulties finding established markets and, therefore, they usually develop marketing systems adapted to their particular situations (Dunn *et*



al., 2015). Small producers face different challenges regarding the commercialization of their harvests. According to Rodríguez and Riveros (2016), the major challenges are: the organization of producers, the differentiation of the products to be commercialized, the distance between the producer and the final consumer, and the quality of the relationship between the participants of the purchase-sale process, including the degree of formality of the agreements they establish.

Agricultural commercialization is understood as the process that takes the products from the agricultural exploitation to the consumer, while the market is the physical place where the transactions between sellers and buyers take place (Caldentey, 1992). The commercialization process requires that the products reach the market. Consequently, certain utilities—such as ownership, place, time, and form—must be added to this process (McCarthy and Perreault, 1994). Consequently, once they have been produced, several products require intermediation, in order to easily reach the consumers (Belleflamme and Peitz, 2010).

Rodríguez and Riveros (2016) have proposed some alternatives: short circuits, productive linkages, and commercial linkages of differentiated products. Recent studies about the commercialization process between the traditional and modern supply chains of fruits and vegetables point out that traditional chains—which include commercialization intermediaries and longer supply chains, as well as physical loss of the product and lack of integration between producers—are less efficient than short commercialization chains (Bisen *et al.*, 2018).

The development of a social network of small vegetables producers in Acatzingo is an example of a production chain. This strategy allowed them to diversify the commercialization of their products and enabled them to generate capital and innovation (Lugo-Morin, 2013). Another example is the development of local strategies of public procurement from family agriculture (FAO, 2016). A further example is the supply development strategy. However, this alternative requires information about the clients, their needs, their characteristics, and the products they require. Understanding that producers supply products and provide services to a wide clientele (Yacuzzi, 2012), the objective of this study is to identify the supply requirements of the sector, analyzing the characteristics and demand of jalapeño pepper among the restaurant sector in Quintana Roo. The hypothesis is that specific quality attributes determine which type of jalapeño pepper is sought.

MATERIALS AND METHODS

Study area location

The study was carried out in Quintana Roo. In 2020, this state had 1,857,985 inhabitants, which accounts for 1.5% of the total population of the country. Ninety percent of the population of Quintana Roo lives in urban areas, while the remaining 10% lives in rural areas. This state has 44,705.2 km², which accounts for 2.3% of the total area of the country. Regarding weather, a sub-humid warm climate with summer rains prevails in 98.91% of the state, while only 1.09% of the surface has a warm climate with abundant summer rains (21° 36' 20" N, 17° 53' 38" S, 86° 42' 37" E, and 89° 17' 48" W) (INEGI, 2018; 2020).

Sample selection

From September to November 2020, the Restaurants demand for Jalapeño pepper in the tourist sector of Quintana Roo survey was design and applied. As a consequence of the SARS-CoV-2 (COVID19) pandemic the survey was randomly applied using Google documents. Seventy-three restaurants answered the survey. The restaurants were located as follows: Bacalar (13), Chetumal (21), Playa del Carmen (17), and Tulum (22). According to the Directorio Estadístico Nacional de Unidades Económicas (DENUE) of the INEGI, 129 establishments engage in food processing, food production, and food sale (INEGI, 2021). Based on the data from April 2020, the sample accounts for 56.58% of the total of regional restaurants in business included in the DENUE (INEGI, 2021b).

Data source

The following data was obtained: characteristics of the restaurants (time they have been in business, number of employees, location, their menu, etc.); characteristics of the current jalapeño pepper demand (suppliers, purchase frequency, volume of the purchase); and the conditions required to establish a purchase arrangement with the producers (willingness to take part in the buying-and-selling process with jalapeño pepper producers of the state, supply and demand requirements).

Data analysis

Based on the applied surveys ($n=73$) and the variables already mentioned, a data base was developed. The descriptive statistic method was used to analyze these data, in order to characterize the restaurants' current demand and the feasible supply arrangements.

The minimum, maximum, and mean monthly demands were determined for each municipality and for all the municipalities. In order to estimate the monthly demand (kg), the minimum and maximum volume that the owners of each restaurant are willing to purchase per week were multiplied. Using this method, the potential consumption (minimum and maximum) per week was determined. Subsequently, the monthly consumption of each restaurant was also determined. The year has 52.143 weeks; this figure was divided by 12. The resulting number (4.34525) was multiplied by the weekly consumption. As a result, the potential, minimum, and maximum monthly and yearly consumption of each restaurant was determined.

RESULTS AND DISCUSSION

Characteristics of the restaurants

The restaurants are mainly located in Chetumal and Tulum; the remaining are located in Playa del Carmen and Bacalar (Table 1). In Playa del Carmen and Bacalar, the restaurants are brand new and 7.7% (Bacalar) have been in business from 3 to 6 years. The rest of the restaurants in these municipalities have not been in business for more than three years. Meanwhile, the restaurants in Tulum have been in business from 1 to 3 years and from 3 to 6 years ($\approx 50\%$ for both ranges). The restaurants in Chetumal have been in business for longer periods: up to 85.7% of them have been in business from 3 to 6 years. The restaurants in Bacalar and Chetumal are located in the main avenues of both

Table 1. Years that a restaurant has been in business and location of the restaurants (%).

Place	Restaurants	years				Beach	Hotel	Avenue major
		<1	1-3	3-6	>6			
Bacalar	13	38.5	53.8	7.7	0.0	100	0	0
Chetumal	21	0.0	0.0	85.7	14.3	100	0	0
Playa del Carmen	17	29.4	70.6	0.0	0.0	17.6	23.5	58.8
Tulum	22	0.0	54.5	45.5	0.0	40.9	18.2	40.9

Source: Own elaboration based on survey data.

municipalities, while in Playa del Carmen and Tulum, the restaurants are located both in the main avenues and in beach areas.

Another characteristic of the restaurants in Bacalar and Chetumal is that they are not partners with hotels or hotel chains. In fact, this type of partnerships was only recorded in Playa del Carmen and Tulum; however, less than 25% of the restaurants work in partnerships with hotels. In this study, the most popular food in Quintana Roo was Mexican cuisine, followed by international cuisine, and fish and seafood. In Bacalar, Chetumal, and Playa del Carmen, a small percentage of restaurants offers beef and, in Chetumal and Tulum, there are Italian cuisine restaurants (Figure 1).

Characteristics of the current demand of jalapeño pepper in restaurants

Out of the n=73 restaurants surveyed, only 44% included jalapeño pepper in their dishes (Table 2). The demand was characterized based only on the information provided by the 32 restaurants that used jalapeño pepper in their dishes.

Most restaurants in Bacalar and Chetumal prefer to buy jalapeño pepper in supermarkets, while restaurants in Playa del Carmen and Tulum prefer to buy in public markets. While some restaurants in other municipalities purchase peppers each week, restaurants in Playa del Carmen and Tulum purchase peppers on a fortnightly basis.

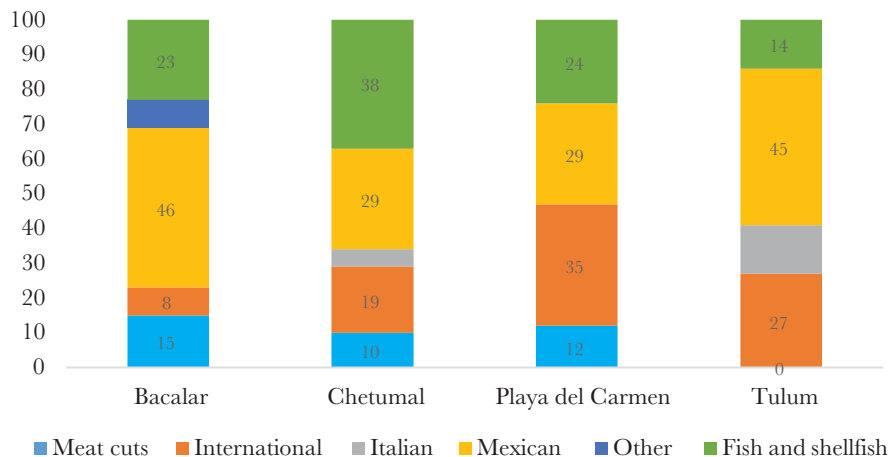


Figure 1. Type of cuisine that restaurants offer per municipality (%).

Source: Figure developed by the authors, based on data from the surveys.

Table 2. Restaurants that use jalapeño pepper in their dishes.

Municipality	Yes	Not
Bacalar	5	8
Chetumal	9	12
Playa del Carmen	9	8
Tulum	9	13
Total	32	41

Source: Table developed by the authors, based on data from the surveys.

Most restaurants consume 1 to 10 kg of jalapeño pepper per week. A restaurant from the municipality of Bacalar uses 11 to 25 kg of jalapeño pepper per week (Table 3). The volumes required per each municipality and all municipalities were estimated based on the volume purchased and the number of restaurants.

For example, to calculate the monthly demand (kg) for Bacalar, the number of restaurants (4) that fall within the weekly purchase range (1-10) was multiplied by the minimum value (1) of the weekly purchase range (1-10), obtaining a weekly demand of 4 kg. Subsequently, the number of restaurants in Bacalar (1) that fall within the weekly purchase range (11-25) was multiplied by the minimum value (11) of the weekly purchase range (11-25), obtaining a weekly demand of 11 kg. Subsequently, Bacalar's minimum values were added up, obtaining a weekly consumption of 15 kg. Multiplying that result by the number of weeks per month (4.34525), the result was 65.12 kg—the approximate monthly demand in Bacalar. Taking into consideration the minimum values, the maximum value was 282.44 kg (65 kg per week times 4.34525). The same calculation was performed for the maximum weekly purchase values for each municipality.

Therefore, the minimum, maximum, and average potential monthly demand was estimated in 182.45, 1,455.65, and 819.05 kg per month. The value of the sales of the restaurant was estimated based on the quantities demanded and the average rural price of jalapeño pepper in 2020. Consequently, the minimum and maximum demands can generate a net income of \$1,733.27 and \$13,828.67 pesos per month, respectively, based on an average rural price of \$9.5 per kg. These amounts can reach a minimum and maximum annual income of \$20,799.24 and \$165,944.10, respectively. However, these amounts may be higher, given the price escalation of 2022.

Table 3. Calculation of the demand of jalapeño pepper per restaurant.

Municipality	Weekly purchase (kg)		Estimated monthly demand (kg)		
	1 a 10	11 a 25	Minimum	Maximum	Average
Bacalar	4	1	65.12	282.44	173.78
Chetumal	9	0	39.11	391.07	215.09
Playa del Carmen	9	0	39.11	391.07	215.09
Tulum	9	0	39.11	391.07	215.09
Total	-	-	182.45	1,455.65	819.05

Source: table developed by the authors, based on data from the survey.

Therefore, restaurants' demand for jalapeño pepper reached a potential maximum demand of 1.5 tons per month and 18 tons per year. Consequently, at least 1.5 ha would be required each year for the staggered production of pepper. This situation provides an opportunity for jalapeño pepper producers, which are currently located in the municipalities of Bacalar and Othón P. Blanco.

Supply development

Determining the willingness of restaurants (consumers) to establish alliances with jalapeño pepper producers (producers) is important for the evaluation of the feasibility of establishing a supply arrangement among them.

Only two restaurants are unwilling to establish an alliance to buy directly from farmers. In contrast, 30 restaurants (93.75%) would agree to establish a supply agreement with local jalapeño pepper producers (Table 4).

Additionally, restaurants that wish to establish supply arrangements with jalapeño pepper producers set forth the requirements of this supply agreement. Restaurants demand the following items: price (21 restaurants), quality (19), and fulfilment of delivery dates (14). Figure 2 shows that Tulum is the municipality with more restaurants that demand quality (9), while most restaurants in Playa del Carmen demand price (9).

Although some requirements are more important for restaurants, the long-term survival of these linkages requires, at the very least, the complete fulfilment of the three major

Table 4. Willingness of restaurants to establish supply arrangements with producers.

Municipality	Yes	Nope
Bacalar	5	0
Chetumal	7	2
Playa del Carmen	9	0
Tulum	9	0
Totals	30	2

Source: table developed by the authors, based on data from the survey.

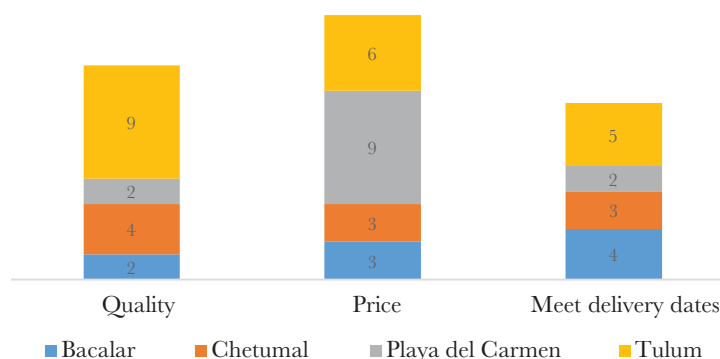


Figure 2. Number of restaurants and their requirements to establish arrangements with producers. Source: table developed by the authors, based on data from the survey.

requirements: price, quality, and delivery dates. Figure 3 shows the supply arrangements for restaurants that use jalapeño pepper. The results are shown per municipality and according to the four relevant headings required by corporate consumers (restaurants): medium-sized and big peppers, medium-level pungency, and emerald green skin. In this respect, the local supply level implies a differentiated and standardized product, as well as a constant supply.

The low association and branding level problems —the latter characterized by production and commercialization individuality— reduce the negotiating power of small producers in the market, turning them into agents that accept the lowest prices (Caicedo, 2013). Achieving a supplier development between producers and an industry or company (e.g., restaurants) could improve the commercialization, price, and profits of small rural producers. The income for the sale of jalapeño peppers recorded in this study takes into consideration the average rural price for 2020. However, negotiations could lead to better purchase prices and the satisfaction of the requirements made by the consumers: quality and delivery frequency.

Supplier development studies usually focus on the offer aimed at established industries —which demand a product with constant quantity and quality. For example, there are supplier development studies for the following established industries: vanilla (Barrera *et al.*, 2014), rubber (González-Ramírez *et al.*, 2019), and avocado (Espejel *et al.*, 2022). However, this study seems to be one the first of its kind that seeks to identify if direct consumers (in this case, restaurants) would be interested in a supplier development arrangement with local producers. This process could be described as a demand-based

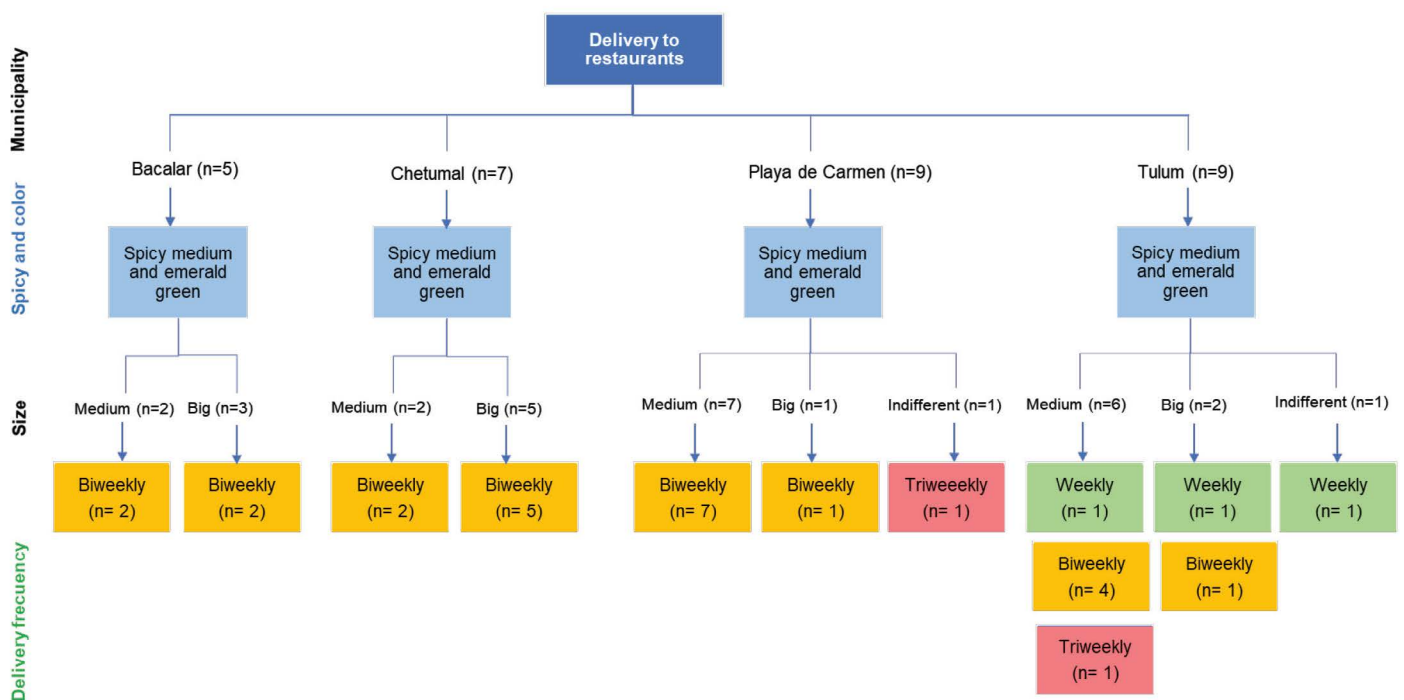


Figure 3: Supply arrangement for Quintana Roo’s restaurants. Source: table developed by the authors, based on data from the survey.

supplier development, whose priority would be the establishment of production- and consumption-focused economic relationships, based on solidarity and the common good (López, 2012).

Both cases (offer-based or demand-based supply) would fulfill the concept proposed by Castro *et al.* (2016): supplier development are all those activities that benefit both the purchasing company and the suppliers. Those activities strengthen their capacities, through trust relationships and the promotion of a joint development, making joint contributions, adding value to the supply chain, and improving performance. Likewise, the concept of short commercialization channels should be worked upon. According to López (2012), this concept is understood as an agri-food circulation system in which only one or no intermediary stands between production and consumption, and which provides an advantage in the search for fair prices between the offeror and the consumer.

The main requirements of the restaurants that pointed out that they intended to establish a supply development with local producers of jalapeño pepper are quality and fulfilment of delivery dates. Quality is one of the main attributes that companies require. Torres (2012) obtained similar results regarding the supply of macadamia (a gourmet product) to supermarkets and retailers: quality is guaranteed for this kind of products.

This study identified restaurants as a market niche for local jalapeño pepper producers. This is a first step towards a supply arrangement. Achieving ongoing contracts and arrangements requires social organization, institutional state support, technical assistance to obtain quality products, and the fulfilment of sale commitments. Reina-Usuga *et al.* (2018) add that changes in governance mechanisms in the territorial food system are also required.

According to Fernández and Natividad (2018), this situation would create a direct linkage between producers and consumers, invigorating local economy, increasing the income of small producers (men and women), and becoming a point of entry to other institutional local markets. Additionally, according to Mauleón (2012), this direct sale relationship between producers and consumers—which increases the direct contact between both groups— supports family farming, preserves rural employment, creates new entrepreneurial opportunities, and breaks the isolation of farmers. According to Connell *et al.* (2008), purchasing fresh product grown by local and known farmers would benefit consumers (*i.e.*, restaurant owners).

CONCLUSIONS

Only 44% of the surveyed restaurants use jalapeño pepper in their recipes. The restaurants that do use them are willing to establish supply links with producers. There is a potential demand among local restaurants for jalapeño peppers. However, achieving this kind of agreements requires a differentiated supply level in the local sphere—*i.e.*, satisfying the demand of local restaurants. This process would imply the development of a differentiated and standardized product and the overall fulfilment of three major points: price, quality, and delivery dates. Potential consumers require products with the following characteristics: medium-sized and big peppers, medium-level pungency, and an emerald green skin.

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