



Evaluation of food commercialization parameters in retail stores to support interventions in the food environment

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Interventions in retail food stores, focused on the consumer based on social marketing strategies and also focused on storeowners based on strategies to support establishments, have shown to be promising in changing consumer behavior and promoting healthy eating. For an appropriate intervention, a proper diagnosis of the stores is needed, identifying characteristics that may facilitate or hamper an intervention implementation. Thus, this study aims to evaluate the parameters of food commercialization in retail food stores. This is a cross-sectional study, in which 9 retail food stores of low-income regions were assessed, at Santos city. To evaluate such stores, an instrument with 48 questions was developed and validated. As a result, fruits and vegetables were more frequently acquired through the self-purchase mechanism, and whole foods were received via food distributors. Fruit acquisitions were more frequent (1-3 x/week) than wholegrain foods procurements (1-2 x/month), what can be explained by the food groups' distinct perishability. Regarding profitability degree, fruits and vegetables had smaller scores than those of whole foods. Evaluating commercialization parameters is useful for developing interventions to make retail food stores healthier, increasing exposure to healthy foods and, from there, contribute to changing consumer behavior. In addition, it can contribute to promoting public policies to strengthen retail food stores, which are important to the habits and food consumption in Brazil.

Keywords: Food supply; Commerce; Food environment.

Avaliação dos parâmetros de comercialização de alimentos em comércios de varejo para apoiar intervenções no ambiente alimentar

Intervenções realizadas em pequenos comércios de alimentos, focadas no consumidor a partir de estratégias de *marketing* social e também focadas nos proprietários de comércio por meio de estratégias de apoio ao estabelecimento, têm se mostrado promissoras na mudança de comportamento do consumidor e promoção de alimentação saudável. Para a realização de uma intervenção apropriada é necessário ter um adequado diagnóstico dos comércios, identificando características que podem facilitar ou dificultar a implementação de uma intervenção. Dessa forma o presente estudo tem como objetivo avaliar os parâmetros de comercialização de alimentos em comércios de varejo. O estudo tem delineamento transversal em que foram avaliados 9 comércios de varejo de alimentos em regiões de baixo nível socioeconômico. Para a realização da avaliação dos comércios foi desenvolvido e validado um instrumento, composto por 48 questões. Como resultados, frutas e hortaliças tiveram como

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mecanismo de aquisição mais frequente a auto aquisição e para alimentos integrais o recebimento via distribuidoras de alimentos. Encontrou-se maior frequência de aquisição para frutas (1-3x/semana) e menor frequência de aquisição para alimentos integrais (1-2x/mês), podendo ser explicado pela perecibilidade dos grupos de alimentos. Em relação ao grau de rentabilidade, as frutas e hortaliças tiveram menor escore quando comparado aos alimentos integrais. A avaliação dos parâmetros de comercialização é útil para o desenvolvimento de intervenções para tornar os comércios de alimentos mais saudáveis, aumentando a exposição à alimentos saudáveis e a partir daí, favorecer a mudança de comportamento do consumidor. Ainda, pode contribuir para a promoção de políticas públicas que apoiam o segmento de pequenos comércios de varejo de alimentos importante os hábitos de aquisição e consumo de alimentos no Brasil.

Palavras-chave: Abastecimento de alimentos; Comércio; Ambiente alimentar.

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INTRODUCTION

About food patterns, characteristics of the food environment, such as access and availability of healthy foods, have shown association with dietary behaviors and nutritional status of the population^[1].

The food environment is divided into four dimensions: community food environment; consumer food environment; organizational food environment and information environment^[2]. Consumer food environment characteristics are what consumers encounter within and around a retail food outlet, can include nutritional qualities, price, promotions, placement, range of choices, freshness, and nutritional information^[2].

In several countries, interventions developed in retail food stores have shown promise in increasing the availability of healthy foods and, consequently, contributing to changing consumer behavior and promoting healthy eating, to prevent and combat obesity and other non-communicable chronic diseases^[3,4].

Studies have shown these actions to increment the availability of healthy foods are effective in improving food commercialization parameters, leading to an increase in healthy foods' sales^[5], storeowners' self-efficacy for stocking healthy foods^[5] and merchants' profits^[6].

The role of retail stores/markets in the Brazilian diet must be emphasized. The consumer who frequent this type of establishment reduces the purchase of ultra-

processed foods, compared to supermarkets^[7], in addition have the advantage of geographical proximity, promoting a feasible higher frequency of food shopping in these locations^[8].

Scaciota *et al.*^[9] developed a booklet with strategies to transform the small food stores into a healthier environment in Brazil, highlighting: reduction of healthy food prices, promotion of healthy foods, interaction with consumers through tastings, trade organization to highlight the healthy foods on the shelves, among others. Concerning to support for owners: tax incentive for opening establishments, training human resources and creating shorter supply chains, avoiding middlemen.

For a culturally and economically appropriate intervention, a proper diagnosis of the stores is needed, identifying characteristics that may facilitate or make it difficult an intervention implementation^[10], as the way small store managers/owners stock their products, including selection of items, supply mechanisms and frequency of supply acquisition^[6].

In Brazil, despite have some studies about evaluation of retail food stores in advertising patterns^[11] and acquisition food patterns^[7], no were found studies about parameters of food commercialization, nor interventions on food environment and markets. Thus, this study aims to evaluate the parameters of food commercialization in retail stores at a low-income region of Santos – SP/Brazil, supporting for the development of intervention actions in the consumer food environment.

METHODS

This study is included in the program of intervention in the food environment to promote healthy eating, focusing on the food production^[12]. It has a cross-sectional design, and evaluated retail food stores in the northwestern of the city of Santos, a low-income region, with unequal access and availability to healthy food^[13].

For this study, data collected in the Baseline database (pre-intervention) were analyzed, assessing 9 stores; 4 of the control group, located in the Middle Zone of Santos, and 5 of the intervention group in the Northwest Region of the city.

These stores were identified in events held in the community during the formative research. After sweeping the study region, all store owners who fit the inclusion criteria were invited. The inclusion criteria included: small establishments (maximum of 2 cash registers), with owners who are/were inhabitants of the region, and operated for at least 6 months. Exclusion criteria were: stores located in areas whose access is restricted to people external to the local community.

For trades assessment and developing an appropriate intervention, the Questionnaire for evaluation of commercialization parameters in retail food stores (QCom) was used, an instrument developed and validated for Sanches *et al.*^[14].

Such tool consists of 4 parts, but in this study only the first two parts were used, A and B, with 48 essays' and multiple-choice questions. PART A covers the identification and characterization of the owner by Name, Age, Gender, Education, Race/Color; and store characterization by Name, Address, Contact Information, Time of Existence, Busiest Days and Times, Number of Employees, Number of Cash Registers, Community Relations. PART B, in turn, includes commercialization parameters, such as: Factors influencing the decision-making of purchasing a new food to sell; Food sourcing mechanisms; Food acquisition time; Sourcing frequency; Quantities acquired; Payment to suppliers; Request to suppliers; Profitability.

The types of food select for includes in the QCom were those promoted by the intervention, identified in focal groups and in-depth interviews conducted with the community during the formative research.

The questionnaire was applied by a trained interviewer, who stated the questions and presented response options through answer cards, so the interviewees could choose the option they considered to be adequate. The interviews were conducted between February and March 2015 and had an average duration of application of 23.1 minutes (ST: 8.2).

Data were analyzed through simple frequency, considering the categorical variables of the following domains: perception of changes in sales, sourcing frequency, sourcing mechanisms, and storage. To analyze each food profitability, mean scores were used, ranging from 1 (unprofitable) to 5 (very profitable). All the analyses were performed in the software Statistical Package for the Social Sciences® (SPSS), with a significance level of 0.05.

This project is approved by the Research Ethics Committee of Federal University of São Paulo (n° 2.967.895). All food storeowners involved signed the Informed Consent Form (ICF) for voluntary participation in the study.

RESULTS

The study included 9 retail food store owners, from which 55.6% (5) were male, 44.4% (4) declared to be white and 44.4% (4) black. The mean age of the retail stores' owners was 48.7 years old. All owners presented some level of education (55.6% completed high school), and all also reported a positive relationship with the community (66.7% answered "very good" and 33.3% "good").

Regarding the socioeconomic characteristics of the storeowners, it is highlighted that 55.6% (5) are male, 44.4% (4) declared to be white and 44.4% (4), black. All owners have some level of education, being more common the complete high school in 55.6% (5) among them. The mean age of the retail stores' owners was 48.7 years old. All storeowners reported a positive relationship with the community, being very

good for 66.7% (6) of the interviewees, and good for 33.3% (3).

About the stores' characterization, the mean of cash registers was 1.44 (ST: 0.52) – none of the trades had more than 2 of them, can be characterized as small trades^[15]. In 33.3% (3) of the stores, the number of employees was 3 or less, and 66.7% (6) stores had 4 or more employees. The mean time of store operation was 10.33 years (ST: 7.07), and the owner's mean time working in the food business was 19.67 years (ST: 12.85). Concerning the busiest days and times, the owner could indicate more than one answer option. The periods with greater movement of customers were Saturday and Sunday morning in 77.8% of the stores. In turn, the least busy periods were Monday morning and afternoon, in 100% and 66.7% of the stores, respectively.

As for commercialization parameters, 88.9% (8) of the storeowners regarded as the most important

factors to include a new food to sell in the store: supplier's delivery at the store; fridge/freezer availability; and customers' requests. On the other hand, the least crucial factors were: personal food preference and supplier's recommendation, with 44.4% (4) in both categories.

The process of fruits, vegetables, and wholegrain foods comprises request, reception, and product arrangement in the store. The found data showed a difference in procurement among fruits, vegetables, and whole foods. For fruits and vegetables, the most widely used procurement mechanism was the self-purchase, where the food is purchased by the owner in a centralized system such as a supermarket or wholesaler. For wholegrain foods, the most common was to purchase the products from a general distributor, which provides diverse types of foods (Table 1).

Table 1. Food commercialization parameters promoted by the program of intervention in retail trades (n = 9). Santos, 2015.

	Sourcing Mechanisms			Sourcing Frequency				Quantity Acquisition Mean (kg/week)	Mean Profitability Score ****
	Self-Purchase *	General Distributor **	Direct Delivery ***	4-7 x/ week	1-3 x/ week	1-2 x/ month	Does not sell	Mean (SD)	Mean (SD)
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)		
Papaya	6 (67)	0	1 (11)	2 (22)	5 (56)	0	2 (22)	98.7 (169.5)	3.14 (0.77)
Banana	3 (33)	0	4 (44)	3 (33)	4 (44)	0	2 (22)	112.4 (120.7)	3.14 (0.77)
Pineapple	6 (67)	0	1 (11)	1 (11)	6 (67)	0	2 (22)	30.8 (52.8)	3.33 (0.81)
Broccoli	6 (67)	4 (44)	2 (22)	1 (11)	5 (56)	0	3 (33)	9.1 (15.9)	3.15 (0.80)
Zucchini	6 (67)	0	1 (11)	2 (22)	5 (56)	0	2 (22)	15.5 (23.3)	3.20 (0.94)
Cauliflower	5 (56)	0	1 (11)	1 (11)	5 (56)	0	3 (33)	6.9 (9.8)	3.15 (0.80)
Maxixe	4 (44)	0	0	0	4 (44)	0	5 (56)	0,2 (0.9)	3.12 (1.02)
Aubergine	6 (67)	0	0	1 (11)	5 (56)	0	3 (33)	8.9 (12.8)	3.07 (0.82)
Brown Rice	1 (11)	2 (22)	2 (22)	0	3 (33)	2 (22)	4 (44)	15.9 (21.4)	4.02 (1.15)
Whole Wheat Bread	0	0	6 (67)	1 (11)	5 (56)	0	3 (33)	17.9 (29.2)	3.59 (1.12)
Whole-wheat flour	1 (11)	2 (22)	0	0	2 (22)	1 (11)	6 (67)	2.7 (6.8)	3.89 (1.16)
Oats	1 (11)	5 (56)	0	0	3 (33)	3 (33)	3 (33)	7.5 (10.9)	4.12 (1.20)

Source: Own elaboration based on the data obtained in the study.

* Self-purchase (food is purchased by the store owner in a centralized system such as a supermarket or wholesaler)

** General Distributor (supplier that provides several types of food)

*** Direct Delivery (a supplier of a brand or specific type of food)

**** The mean score ranges from 1 to 5. The higher the mean score, higher the food profitability.

The mean time spent in this process was 4.25 hours/week (ST: 3.84). The minimum time for the procurement process was 1 hour/week, and the maximum, 13 hours/week. A greater sourcing frequency was observed for fruits and vegetables when compared to whole foods (Table 1). Wholegrain foods were easier to pay, in the majority being installment payments (44.4%) or by consignment (22.2%), while most fruits and vegetables procurements must be paid in cash (66.7%).

Regarding the profitability degree of the store with the food sale, a smaller profit was observed for fruits and vegetables when compared to wholegrain foods. Oats is highlighted, with the higher score (4.12), and aubergine had the lowest score (3.07) (Table 1).

DISCUSSION

The Questionnaire for evaluation of commercialization parameters in retail food stores (QCom) proved to be capable of evaluating the main commercialization parameters of retail food stores, being able to serve as a diagnosis and monitoring of interventions in the consumer food environment. Understanding the dynamics of food acquisition by storeowners is important for changes in policy changes of support the retail food stores^[6].

A great variability can be observed in sourcing mechanisms of fruits and vegetables, featuring a complex distribution network. Factors such as the high perishability and smaller acquired volume of fresh foods in retail stores suggest the few distributors prioritize supplying for large establishments, where the purchase volume is higher^[6].

Thus, self-purchase is the most frequent mechanism, in which the very owner is responsible for acquiring this kind of food in a centralized network. The procurement mechanism influences directly the frequency of acquisition. Concerning self-purchase, the frequency of procurement tends to be greater since the owner acquires the goods on demand, which is also called *just-in-time* order^[17].

According to Coti-Zelati^[18], to determine the price of the products to be sold three factors should

be considered: acquisition costs, fixed costs, and profit margin. For fresh food, in addition to these three factors, a fourth one should be considered: the loss, as it is highly perishable food. Therefore, the strategy the retail store owners found to prevent exacerbation of fruit and vegetables' prices was to minimize the profit in the pricing process, to become minimally competitive, this may explain the lower mean profitability score of fruits and vegetables when compared to wholegrain foods.

Considering the complexity of this sector, some strategies are indicated to minimize obstacles related to the commercialization of healthy foods: a) provide tax incentives for healthy food retail stores; b) conciliate pre-existing public policies to encourage the commercialization of healthy foods c) create networks of food producers and local traders; and d) invest in training local store owners^[9,19].

The main limitations of the study are related to recall bias, due to the methods used to collect the data. In addition, the low sample number indicates a limitation related to generalization, both for other locations and for the type of trade.

CONCLUSION

Using the QCom instrument it was possible to evaluate the commercialization parameters and the characteristics of retail food stores and their respective owners, contributing to the planning intervention that will be carried out in these stores, aiming to improve the consumer food environment.

According to the commercialization parameters measured, there is greater complexity in the food supply related to the distribution of fruits and vegetables, compared to the commercialization of whole foods, as they have a degree of processing and are less perishable.

Furthermore, the diagnosis of retail food stores is useful for the formulation and monitoring of public policies to strengthen this segment, which is important both for the economy as for the habits of acquisition and food consumption in the country.

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CONFLICT OF INTEREST

The authors declared no potential conflicts of interest.

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FUNCTIONS OF AUTHORS

LDS and PAM worked on the conception and design of the study, data collection, analysis and interpretation and writing of the article. RFL worked on data collection, analysis and interpretation and writing of the article. MAO worked on the conception and design of the study and writing of the article.

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