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CERTIFICATION AS A STRATEGIC TOOL: EVIDENCES OF A QUASI-EXPERIMENT

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Abstract

Objective: To highlight how certifications influence the behavior and decision-making of consumers of agro-industrialized products by a cooperative organization.
Methods: the study, through an almost experiment, was carried out in 02 supermarkets the "experimental unit" and the "control unit". We defined 10 products that comprised the experimental sample, and 07 products had certificates. After the period of analysis of sales reports, dissemination strategies were carried out as intervention activities with consumers. For statistical analysis, the parametric test "t" and non-parametric "Friedman test" was applied, with significance at the level of 10% and reliability of 95%.
Originality/Relevance: This study demonstrates relevance by seeking evidence of the influences of certifications on consumer behavior and purchasing decision.
Results: it was possible to measure that the presence of disclosure strategies on the certifications that the cooperative has, influenced the consumer impacting in purchasing decision, because there was an increase in sales volume during the intervention period in relation to the observation period in store 01, the experimental unit compared to store 02, the control unit.
Theoretical contributions: the study contributes to the theory by exploring in a quasi-experimental way that certification influences the behavior and decision of consumer purchases. It was verified that interventionist activities can help increase sales of their products, so that these interventions clearly and objectively show the information about the products and their processes of industrialization and distribution, especially with regard to the adoption of certifications.

Key-words: Agribusiness, Consumer Behavior, Purchase Decision, Sustainability.

A CERTIFICAÇÃO COMO FERRAMENTA ESTRATÉGICA: EVIDÊNCIAS DE UM QUASE-EXPERIMENTO

Resumo

Objetivo: evidenciar o quanto as certificações influenciam no comportamento e na tomada decisão de compra dos consumidores de produtos agroindustrializados por uma organização cooperativa.
Métodos: o estudo, por meio de um quase experimento, foi realizado em 02 supermercados a "unidade experimental" e a "unidade de controle". Foram definidos 10 produtos que compunham a amostra experimental, sendo que 07 produtos possuíam certificados. Após o período de análise dos relatórios de vendas, foram realizadas estratégias de divulgação como atividades de intervenção com os consumidores. Para a análise estatística foi realizado a aplicação do teste paramétrico "Teste t" e não paramétrico "Friedman test", com significância ao nível de 10% e confiabilidade de 95%.
Originalidade/relevância: este estudo demonstra relevância por buscar evidências das influências das certificações no comportamento e na decisão de compras dos consumidores.
Resultados: foi possível mensurar que a presença de estratégias de divulgação sobre as certificações que a cooperativa possui, influenciaram o consumidor impactando em decisão de compras, pois houve aumento do volume de vendas durante o período de intervenção em relação ao período de observação na loja 01, a unidade experimental em comparação a loja 02, a unidade de controle.
Contribuições teóricas: o estudo contribui com a teoria por explorar de forma quase-experimental que a certificação influencia no comportamento e na decisão de compras do consumidor. Foi verificado que as atividades intervencionistas, pode auxiliar no aumento de vendas de seus produtos, de forma que essas intervenções evidenciam de forma clara e objetiva as informações acerca dos produtos e seus processos de industrialização e distribuição, principalmente no que diz respeito a adoção de certificações.

Palavras-chave: Agroindústrias, Comportamento do Consumidor, Decisão de Compra, Sustentabilidade.

LA CERTIFICACIÓN COMO HERRAMIENTA ESTRATÉGICA: EVIDENCIA A TRAVÉS DE UN CUASI-EXPERIMENTO

Resumen

Objetivo: mostrar cuánto influyen las certificaciones en el comportamiento y decisión de compra de los consumidores de productos agroindustrializados por parte de una organización cooperativa.
Métodos: el estudio, a través de un cuasi-experimento, se realizó en 02 supermercados la "unidad experimental" y la "unidad de control". Se definieron 10 productos que conformaron la muestra experimental, y 07 productos contaron con certificados. Luego del período de análisis de los informes de ventas, se realizaron estrategias de difusión como actividades de intervención con los consumidores. Para el análisis estadístico se aplicó la prueba paramétrica "Test" y la no paramétrica "Test de Friedman", con un nivel de significancia del 10% y una confiabilidad del 95%.
Originalidad/relevancia: este estudio demuestra relevancia al buscar evidencia de las influencias de las certificaciones en el comportamiento del consumidor y las decisiones de compra.
Resultados: se pudo medir que la presencia de estrategias de divulgación sobre las certificaciones que posee la cooperativa, influyeron en el consumidor, impactando en las decisiones de compra, ya que hubo un incremento en el volumen de ventas durante el período de intervención en relación a el período de observación en la tienda 01, la unidad experimental en comparación con la tienda 02, la unidad de control.
Aportes teóricos: el estudio contribuye a la teoría al explorar de manera cuasi-experimental que la certificación influye en el comportamiento del consumidor y en las decisiones de compra. Se encontró que las actividades intervencionistas pueden ayudar a incrementar las ventas de sus productos, por lo que estas intervenciones muestran de forma clara y objetiva la información sobre los productos y sus procesos de industrialización y distribución, especialmente en lo que se refiere a la adopción de certificaciones.

Palabras clave: Agroindustrias, Comportamiento del Consumidor, Decisión de Compra, Sostenibilidad.

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1 Introduction

Product packaging can be considered strategic by companies, as according to Van Herpen, Immink and Van dem Putellaar (2016) can influence consumers' purchasing decision, that is, they can awaken emotional responses in the consumer. They may also induce consumers to purchase certain products (Liao, Corsi, Chrysochou & Lockshin, 2015). The literature shows that consumers are cautious about the impact of their consumption on the environment (Severo, Lima, Anjos, Almeida, Santos & Albuquerque, 2021) and which give preference to labeling that is paramount for sustainability (Grunert, Hieke & Wills, 2014). While labeling information and certification become crucial for changing consumer behavior (Lombardi, Berni & Rocchi, 2017; Emberger-Klein & Menrad, 2018).

Certifications such as ISO, for example requires organizations to ensure the minimum quality requirements required, thus ensuring among the impacts the reduction of anthropogenic actions (Scalco, 2019). For some scholars, it is still necessary that new research be carried out to provide broader empirical facts that show how certifications affect the financial performance of these organizations (He & Shen, 2019).

In this aspect Labelling and certification shows itself as an important strategic tool, by securely and objectively transmitting to consumers information on the processes of product management and quality (Martinelli, Pigatto & Machado, 2015). Like contemporary consumers, organizations are concerned with the conquest of new spaces in the market, as well as ensuring their continuity (Battistella, Grohmann & Radons, 2014). By adopting measures to mitigate anthropogenic actions, these organizations ensured visibility and recognition by their consumers (Both & Fischer, 2017).

Experimental studies can help understand consumer behavior and what influence them in their purchasing decision (Hartmann, Hieke, Taper & Siegrist, 2018). Experimental research can provide the researcher with opportunities to develop some skills, including manipulation, whose ability is to perform experiments, that is, formulate and recognize a problem, plan a procedure, collect, record and analyze the data and formulate and present conclusions (Trowbridge & Bybee, 1990; Duda & Susilo, 2018).

Therefore, experimental studies are shown as important strategy mechanisms to help promote sales and achieve goals(Huitink, Poelman, Van den Eynde, Seidell & Dijkstra, 2020). Whereas the quasi-experimental studies are thus called for not presenting all the characteristics of an experiment, because sometimes it is not possible to maintain a control, especially regarding randomization and the performance of the intervention activity (Dutra & dos Reis, 2016).

The present study seeks to understand how certifications can influence and impact on the behavior and decision of purchases of consumers and associates of an agro-industrial cooperative. The previous studies already bring evidence that intervention activities, as well as certification, is a useful tool for achieving these objectives, however this study intends to quantify this through the realization of a quasi-experiment. Therefore it is questioned: What is the influence of certifications on behavior change and consumer purchase decision of agro-industrial products?

The present study seeks to understand how certifications can influence and impact on the behavior and decision of purchases of consumers and associates of an organization

This quasi-experiment was carried out inside a supermarket integrated to an agro-industrial cooperative, which has certifications in its processes of quality management and food safety of its products, the present study showed that marketing and environmental awareness works can be done directly to the public associated with the cooperative, since these are the main interested in the results of the enterprise, such as its board of directors and its administrators.

2 Referential

2.1 The change of behavior of the Society

The demand of contemporary society increasingly highlights the change in consumer behavior regarding social environmental concerns (da Silva & Melo, 2012). This demand has currently been growing due to concern for health, well-being and the environment itself (Toni, Milan, Larentis, Eberle & Procópio, 2020). In the search for a sustainable balance, experts believe that sustainable production and consumption are the main alternatives (Veiga, Costa, Silva, El-Aouar & Dantas, 2019).

It is known that there is still a lot to be done, but many efforts have been made to boost the practices of sustainable production and consumption (de Oliveira Júnior, da Silva, Veiga Neto, de Castro & Lima, 2020). Still in 1975, in a study on human behavior, the seminal Fishbein and Ajzen, concluded that it is common for people to confuse behavior and result, because they are singular actions, and trying to explain this situation developed the theory of planned behavior (TPB).

This theory is currently widely explored by scholars and is often distinguished in studies on healthy foods and organic consumption (Scalco, Noventa, Sartori, & Ceschi, 2017; Branco, de Morais Watanabe & Alfinito, 2019). This concept of consumer behavior change is capable of influencing the decision to purchase environmentally correct products (Han & Stoel, 2017; Iwaya & Steil, 2020).

Whose behavior can also be measured in cooperative organizations, where there are differences among the decision-making processes in cooperative organizations, because sometimes the cooperative little participates in business decisions because it does not feel as being one of the owners of the enterprise (da Silva Carpes & da Cunha, 2018; Penteado, Benini, do Nascimento, Petean & Nemirovsky, 2020).

For Hearne and Volcan (2002) labeling is important in changing behavior and in the decision-making process of consumer purchases, and that consumers value the adoption of environmental management actions that result in improving product quality, in this way information labeling is valued by the consumer who, in turn, is willing to pay for it.

Kardes, Fennis, Hirt, Tormala & Bullington (2007), show that the product presentation and the information of its certifications are capable of causing consumers to be led to the act of purchase, thus positively influencing the volume of sales.

For Perino, Panzone and Swanson (2014) the intervention related to information labeling on the benefits in the production and industrialization of products, such as "reducing greenhouse gas emissions", is well accepted by consumers, and when this information is linked to the buying stimulus by price change, acceptance is even higher. The study also concluded that the type of information made available through the label can induce the consumer to make a decision when buying a particular product.

Several studies can be found in the literature on product packaging, for Van Herpen et al. (2016), the way in which a product can be packaged can influence the consumers' purchasing decision. Idea also shared by Becker, van Rompay, Schifferstein and Galetzka (2011)as they can still awaken emotional responses in the consumer. For Liao et al. (2015) packaging induces consumers to purchase certain products. Van Herpen et al. (2016), describe that the packaging is related to three main aspects, the first is the containment that has the function of keeping the products together, thus facilitating the handling and transport.

The second function is related to the ability of the packaging to protect the product and preserve them from external influences such as a kind of physical barrier, against crushing or exposure to moisture and biological influences (Rundh, 2005). A third strand is linked to information, as it may contain relevant information about the product, as a form of consumption, and information of risk or even health and well-being issues, as well as information of labeling, and chemical compositions of manufacture (Wells, 2007).And it is in this last question that this study is focused, the labeling and environmental certification, of products whose information, are capable of arousing consumer interest, generating and or aggregating income to these products, as well as revenues to organizations that industrialize them.

Perino et al. (2014), describe that labeling contributes significantly to changes in purchasing decisions for healthier products. Grunert et al. (2014), say that the more the final consumer demands and values the certifications, the more manufacturers or industrialists will give importance and invest resources. Thus, the labeling information and certification become crucial for changing consumer behavior (Lombardi et al., 2017; Emberger-Klein & Menrad, 2018).

2.2 *Research Hypotheses*

When organizations begin to pay more attention to environmental issues, there is a possibility of increasing revenue, environmental damage decreases, and this makes the vision of the organization toward its consumers more positive (Barbieri, 2017). In a recent study, 62.4% reported giving preference to certified products and 92% proposed paying more for this type of product (Blanc, Massaglia, Borra, Mosso & Merlino, 2020). Certification and labeling are instruments that ensure socio-environmental production practices, and also add value to products and services (Scalco, 2019).

Still in 2013, a study conducted by researchers, Miranda-de la Lama, Sepúlveda, Villarroel and María, already showed that consumers were willing to pay better, pay a premium, or a differentiated

price for products that ensure higher quality and food safety and preserves the environment. However, it is essential that the consumer is aware of the specifications of products as species, mode of production, form of process, among other aspects (Bronnmann & Hoffmann, 2018).

Therefore , considering the pre-existing literature, the first hypothesis of the present study can be formulated, which seeks to affirm that certification causes positive influences on the consumer's purchasing behavior, being thus presented.

H1 – The certifications, positively influence the behavior and decision of consumer purchases.

The confirmation of this hypothesis could bring relevant information about the importance that consumers give to certified products, as well as raising the awareness of consumers to prefer certified products.

These are factors that influence consumer behavior, sociodemographic characteristics, needs, motivations and personalities, as well as social class, values among others (Valent, Vieira, Bruzza, Rodrigues, Polidori & Celia, 2014). For these authors, there are a considerable number of consumers who still do not know what certification is, and it is necessary to present to them this tool and its benefits, which can be presented through certifications and marketing and awareness campaigns.

Therefore, "marketing" campaigns can be directed to the presentation of these benefits to the target audience, the "associates". Therefore, the perception of product quality differs from individual to individual and may vary according to cultural influences, characteristics and socioeconomic aspects (Sanguinet & da Silva, 2019). In a study conducted in 2016, Kabeu and Byron concluded that consumption behavior can be determined by consumer perception. So, the present study seeks to verify from the realization of intervention activities, whether there is also evidence in the behavior change and in the decision of purchases of the associated consumer.

However, it does not find evidence that this consumer can be more influenced than the others. So, to respond to this gap, it is possible to formulate the second hypothesis, that certification influences more consumers associated with an organization, than non-associated consumers, that being said, this may be a contribution of the present study, and therefore, the present hypothesis is thus formulated.

H2 – The certifications influence more for the associated consumer than for the non-associated consumer.

The confirmation of the present hypothesis could add value or benefits to the product such as consumer confidence, when the perception of the adoption of measures and mitigation of anthropic actions. Since, the literature shows that all attributes end up impacting in some way in the choices and behavior of consumers (Valent, Vieira, Bruzza, Rodrigues, Polidori & Celia, 2014). Because while consumers may be concerned about "environmental" ethical issues, they also end up neglecting some

issues and prioritizing others, and see in purchasing decision, a strategy to manage and justify their choices (Borelli, Hemais & Dias, 2012).

3 Methodology

For the accomplishment of this study the methodology called quasi-experimental research was used, which is described by Jung (2003), as being, the obtaining of results through experiments of new systems, products or processes such as Circuits, Software, among others. It was also sought a theoretical basis of experimental or quasi-experimental studies carried out in supermarkets and aimed to understand the role of certification in the influence of behavior and in the decision of consumer purchases.

The study object, dependent and independent variables capable of influencing the result, as well as the ways of control and observation of the effects that the variable would produce were defined. The dependent variable was "Sales Made", measured by sales volume, based on studies by Dey, Rabbani, Singh, e Engle (2014) e Kaneko, Miyazaki, e Yada (2017). The independent variable was "Marketing of the Certifications of Cooperative Products", measured by the presence and absence of marketing on the certifications, based on the studies of Gamboa-Gamboa, Blanco-Metzler, Vandevijvere, Ramirez-Zea, e Kroker-Lobos (2019); Haughton, Hua, Jin, Lin, Wei, e Zhang (2014) e Kort, Taboubi, and Zaccour (2020).

The internal and external threats were also identified, as well as the limitations of the present study, whose focus was to analyze the behavior of consumers through perception measures. In this study the measurement variable is understood as a moderating variable, that is, the intervention to be performed is capable of influencing "reducing or increasing" the result and magnitude of the experiment, either the direction of effect of one or more "independent" predictor variables on the "dependent variable" response variable (Marôco, 2014).

This study, presents itself as *Within-participants*, that is, it aims to understand the differences in behavior through the experimental conditions in relation to the same group of participants, because each of the participants will be exposed to all experimental conditions in an equal way. So that all participants were subjected to the same interventions, "product exposure, pamphlet and personal approach", and so each participant can be considered as their own experimental control, which consequently led to the present study requiring a smaller number of participants (Aguiar, 2017).

It should be noted that, it was previously aligned with the administration of the supermarket that the products, selected to compose the sample of the present study would not be placed in promotions and exposed in pamphlets, or something similar, not to put in check the actions implemented for the accomplishment of the present study.

Population and sample: it was adopted as a population for the almost experiment all consumers who entered the supermarkets of the city of Cafelândia-PR "experimental unit" and the city of Goioerê-PR "control unit". As a sample, there were 07 certified products, 05 from poultry farming and 02 from fish farming and 03 non-certified products.

Certifications: It was identified that the organization had 05 certifications; HACCP, BAP, BRCGS, HALAL and ISO 9001, although Halal certification is not object of study because it is directed to specific public of the international market.

Execution and data collection The present study was carried out over 62 days, between July and August 2020, and July was subdivided into 03 periods of approximately 10 days, which were called for the purpose of analysis of the reports as periods "01, 02 and 03", and also the month of August, whose periods were called "04, 05 and 06", however, during the month of August, these products were exposed the intervention activities, under *the know-how* of information coming from the marketing department, that is, the exhibition of products, distribution of leaflets, banner fixing, and personal approach.

Techniques for Data Analysis: For this purpose, the software called *Statistical Package for the Social Sciences*(SPSS) was used, the data of the administrative reports were submitted to descriptive and statistical analyzes, with which it was possible to apply parametric techniques called "T Test", followed by the non-parametric test called *Friedman Test*. However, when analyzing the output data of the SPSS system, the system presents these results as being of a bilateral analysis, however, the present study is unilateral, and in this case it is necessary that the result of significance be divided by 02 (Marôco, 2014).

4 Analysis of Results

Selected the 10 products, of which 07 are certified and the 03 are not certified, whose products are industrialized in the cooperative or carry their brand, which were previously defined with the administration of the supermarket, "experiment unit", which judged which products would be observed for convenience. After the identification of these products, it was also identified which types of certification each product had, as well as its origin, representativeness and the need for this certification for the cooperative.

All media "Pamphlets and Banner" was also prepared in advance, as well as the qualification of the professional "promoter" to promote products, information and certifications of management and quality processes. That is, to act as a promoter, whose fundamental role is to present these certifications as well as the products industrialized by the cooperative organization, even those who are not part of the sample of this study, since both are subject to a set of standards and rules imposed by the certifiers in order to ensure the quality of management, products and processes.

Table 01 presents the sales data of the 10 products of the sample, in both stores 01 "Experimental Unit" and 02 "Control Unit", whose data were generated from management reports, without the control unit or even its clients being subjected to any intervention activity.

Table 01

Compilation of Sample Data from the present study and both Stores 01 and 02

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	V.T	M
L1_p1	08	301	56	06	42	40	04	56	19	48	580	58.00
L1_p4	08	403	237	15	42	48	02	22	32	110	919	91.90
Var (%)	00	33	323	150	00	20	- 50	- 61	68	129	58	58
L1_p2	03	338	220	07	49	78	05	13	35	53	801	80.10
L1_p5	18	287	185	16	69	55	02	35	35	27	729	72.9
Var (%)	500	- 15	- 16	129	41	- 29	- 60	169	00	- 49	- 9	-8.9
L1_p3	00	352	243	12	49	77	02	25	35	62	857	85.70
L1_p6	06	419	202	11	41	51	02	53	36	90	911	91.10
Var (%)	600	19	- 17	- 8	- 16	- 34	00	112	3	45	6.30	6.30
L2_p1	03	546	33	11	82	72	02	26	23	22	820	82.00
L2_p4	05	524	72	03	53	70	03	17	26	70	843	84.30
Var (%)	67	- 04	118	- 73	- 35	-3	50	- 35	13	218	03	0.32
L2_p2	07	327	62	08	61	118	02	25	40	45	695	69.5
L2_p5	01	160	48	03	110	33	02	12	11	11	391	39.10
Var (%)	- 86	- 51	- 23	- 63	80	- 72	00	- 52	- 73	- 76	- 43	- 0.43
L2_p3	05	479	90	06	99	63	05	25	28	22	822	82.20
L2_p6	03	351	65	04	68	62	00	23	25	42	643	64.30
Var (%)	- 40	- 27	- 28	- 33	- 31	- 2	- 100	- 8	- 11	91	- 22	- 0.21

Note. L1: Store 01 – L2: Store 02- Var (%): Percentage variation – P1 to P10: 01 products to products 10 – p1 to p6: Period 01 to period 06 – S.P.P: Sum of products by period – D. Q: Standard deviation – M: Average.

Source: Research.

Table 01 presents in a compiled way the data of sales reports of all 10 sample products in both "experimental" and "control" supermarkets throughout July and August, which were subdivided into periods of approximately 10 days as described in the methodology, as well as their respective variations in sales volume. It also shows the total sales volume per period (V.T), as well as the average sales of products in respective groups (M). This table is presented with a color palette only to facilitate the visualization and understanding of information.

But when analyzing the sales data of Table 01 by products in the respective comparison periods, we evidenced that there are expressive variations, so it is necessary to analyze the column of the total sales volume (V.T) per period of the experimental unit. The increase in the total sales volume between the periods 01 and 04 was 339 products, representing a variation of 58%, between the periods 02 and 05 there was a reduction in the sales volume of 72 products a negative variation of (-9) %, and between periods 03 and 06 an increase of 54 products and a variation of 6.30%.

Analyzing the total sales volume (V.T) per period of the control unit, an increase in the total sales volume between the periods 01 and 04 was observed in the order of 23 products, which represents a variation of 2.8%. Between the periods 02 and 05 there was a reduction in sales volume of 304 products, a negative variation of 43.7%, and between the periods 03 and 06 a reduction of 179 products and a negative variation of 22%.

4.1 Description of the Statistical Data of the Present Study

When analyzing the results of statistical analyzes from the SPSS output data, we obtained statistical information generated using parametric techniques called "t test", which were submitted to the Kolmogorov -*Smirnov* - *KS* normality test, as the assumption of the technique, so that the data presented the expected normality in the data distribution. Therefore, it is evident that the study proposal finds technical and statistical foundations as it can be observed from the data presented in Table 02, called paired sample statistics and in the other subsequent tables.

Table 02

Paired Sample Statistics

		Average	N	Standard Deviation	E. P. Average
Pair 01	L1_VT_7 -L1_VT_8	223.50	10	307.432	97.219
		255.90	10	347.737	109.964

Note. L1: Store 01 – VT: Total Sale – 7: Month 07 "July" – 8: Month 08 "August" – N: Sample

Source: Research.

When analyzing Table 02, it is observed that the average sales volume in the experimental unit during the month 07 "July" was sold an average of 223.50 products, and when the average sales volume of the month 08 "August" was observed, the average sales volume is 255.90 products, which shows a significant increase in the average sales volume during the intervention activity, this represents an average increase of 14.50%.

Table 03, in turn, aims to show if there is a positive correlation between the sales volume during the full period of the intervention activity, that is, between July and August.

Table 03

Paired Sample Correlations

		N	Correlation	Significance
Pair 01	L1_VT_7 - L1_VT_8	10	0.996	0.000

Note. L1: Store 01 – VT: Total Sale – 7: Month 07 "July" – 8: Month 08 "August".

Source: Research.

When analyzing Table 03, it is observed that when analyzing sales volumes between July and August, it is evident that there is a positive correlation (0.996) and it also presents statistical significance at the level of 1%, where the (*p.value* < 0.000) among these sales volume indices, it can be stated that the samples have correlation between them. The number 04 table shows the output data, called paired samples.

Table 04

Paired Sample Test

		Paired Differences					T	DF	Significance
		Avg.	S. Deviation	E. P. Average	95% confidence interval				
					Lower	Upper			
Pair 01	L1_VT_7-L1_VT_8	32.40	49.686	15.712	67.943	3.143	2.062	9	0.035

Note. L1: Store 01 – VT: Total Sale – 7: Month 07 "July" – 8: Month 08 "August" – E. P: Standard Error.

Source: Research.

Table 04 shows that the sales volume of August, when compared to July, had an average increase of 32.40 products. In addition, the t test for paired samples was statistically significant (t = 2.062); and (*p.value* = 0.035) significant at the level of 5% with standard deviation of 49.68 and confidence interval of 95%. A complementary analysis can be observed in tables number 05 and 06 where the statistical parametric data are presented, which were subdivided into smaller periods whose periods are greater (>) or equal (=) to 10 days.

Table 05

Paired Sample Statistics

		Average	N	Standard Deviation	E. P. Average
Pair 01	VL1_P1	58.00	10	87.79901	27.76449
	VL1_P4	91.90	10	129.99611	41.10838
Pair 02	VL1_P2	80.10	10	111.18298	35.15915
	VL1_P5	72.90	10	91.28642	28.86730
Pair 03	VL1_P3	85.70	10	117.22727	37.07052
	VL1_P6	91.10	10	129.10844	40.82767

Note. L1: Store 01 – VT: Total Sale – 7: Month 07 "July" – 8: Month 08 "August".

Source: Research.

Table number 05 shows the average sales volume for shorter periods, as defined, this is justified by the fact that the periods for 01 and 02 are equal to 10 days, whereas the periods for 03 are 11 days, given the months of July and August have respectively 31 days each. Therefore, the pair 01 refers to the period 01 and 04, it is observed that the period 01 sold on average 58.00 products and the period 04 sold

on average 91.90 products. While pair 02 refers to sales between days 11 and 20 of each month, so that period 02, there was an average sales volume of 80.10 products and 72.90 products in the period 05.

Finally, it observes is the average sales volume data of the pair 03 whose periods have a total of 11 days each, that is, respectively between the 21 and 31 days of each month. It can be noted that in the period 03 the average sales volume was 85.70 products, and in the period 06, the average sales volume was 91.10 products. And it is concluded that between the period 01 and 04 there was a positive average variation in the sales volume of 33 products, which also happened with the periods 03 and 06 whose average variation was positive in 5.40 products, while between periods 02 and 05 the variation was negative in the value of 7.20 products, these values are best presented in Table 06 which aims to show the average value of increase in the total sales volume in the respective periods.

Table 06

Paired Sample Test

		Paired Differences					T	D F	Significance
		Avg.	S. Deviation	E. P. Average	95% Confidence Interval				
					Lower	Upper			
Pair 01	VL1_P1 VL1_P4	33.90	64.11	20.27	-79.76	11.96	(1.67)	9	0.065
Pair 02	VL1_P2 VL1_P5	-7.20	25.19	7.96	10.80	25.22	0.90	9	0.195
Pair 03	VL1_P3 VL1_P6	5.40	30.22	9.55	27.02	16.22	0.56	9	0.293

Note. L1: Store 01 – VT: Total Sale – 7: Month 07 “July” – 8: Month 08 “August”.

Source: Research.

Observing Table 06, it is concluded that the increase in the average sales volume for shorter periods previously defined, represented a greater influence in the periods 01 and 04, whose increase was of an average of 33.90 products, that is, a 58.44% increase in total sales volume during the intervention activity. Table 06 also presents the statistical significance for period, however, it is emphasized that SPSS generates the result as a bilateral analysis, but the present study is characterized as a unilateral analysis, being necessary in this case the division of the significance result (*p.value*) by 2. Therefore the statistical significance of the pair 01 can be described as (*p.value* = 0.129/2) thus, (p.*value* = 0.065), pair 02 (p.value = 0.390/2) thus, (*p.value* = 0.195) and pair 03 (*p.value* = 0.586/2) therefore (*p.value* = 0.293). Seeking greater confirmation and security of the information derived from the statistical analyzes of the parametric test “Test t”, which, as a robust test, is recommended in studies and analyzes with characteristics similar to the present study, could already validate the present study, accepting or refuting the proposed hypotheses. However, it was also applied the non-parametric test called *Friedman Test*, or, Friedman test, whose output data are presented in Table 07.

Table 07

Summary of Hypothesis Test

	Null Hypothesis	Test	Significance	Decision
Pair 01	The distributions of L1_VT_7 and L1_VT_8 are the same	Friedman double analysis of variance of samples Related by positions	0.058	Reject the null hypothesis
Asymptotic meanings are displayed		The significance level is 10.		

Note. L1: Store 01 – VT: Total Sale – 7: Month 07 "July" – 8: Month 08 "August"

Source: Research.

Friedman's non-parametric test is generally used to carry out studies with small population samples "N", as in the case of the present study. Table 07 shows that this test also presented a result with significance at the level of 10%, this proves that there is a difference between the data and sales groups of the present study, although the recommended is statistical results lower than or equal to 5%, where *p.value* is equal (=) or lower (<) than 0.050. Therefore, it is possible to affirm that the intervention activities carried out in the month of August in the experimental unit, resulted in the increase in the sales volume of the products object of the present study.

In other words, it can be affirmed based on the data from the Friedman test that, the certifications have positively influenced the behavior and decision making of consumer purchases. Which resulted in the increase in the sales volume of the products observed, this result tends to confirm the hypothesis presented as "H1". "H2" proposes that certifications influence the associated consumer more than the non-associated consumer, for this purpose the same statistical tools were applied. However, when analyzing sales data of the intervention period, the T test showed that in both supermarkets, the sales volume for associated consumers was lower than sales for non-associated consumers compared to sales for non-associated consumers.

Thus, the statistical analysis data resulted in values that have statistical significance at the level of 10% and reliability of 95%. Table 08 shows the parametric statistic data of such data.

Table 08

Paired Sample Statistics

		Average	N	S. Deviation	E. P. Average
Pair 01	L1_VT_7_NA	196.80	10	227.042	87.292
	L1_VT_8_NA	228.20	10	319.156	100.926
Pair 02	L1_VT_7_A	26.70	10	32.014	10.124
	L1_VT_8_A	27.60	10	38.248	12.095
Pair 03	L1_VT_7_NA	196.80	10	276.042	87.292
	L1_VT_7_A	26.70	10	32.014	10.124
Pair 04	L1_VT_8_NA	228.20	10	319.156	319.156
	L1_VT_8_A	27.60	10	38.248	38.248

Note. L1: Store 01 – VT: Total Sale – 7: Month 07 "July" – 8: Month 08 "August" – E. P: Standard Error.

Source: Research.

Table 08 shows from the t test, the sales averages for associated and non-associated consumers, whose data refer specifically to the experimental unit data. The sales data of pair 01, made for non-associated consumers in July, shows an average sale of 196.80 products, and August, average sale of 228.20 products, a positive variation of 15.95%. Therefore, the sales of pair 02 analyzes sales to associated consumers and sold in July an average of 26.70 products and in August this average sales was 27.60 products, positive variation of 3.37%.

Whereas pair 03 compares the average sales volume for non-associated consumers in the month of July compared to the average sales for the associated consumer in the same period, and it shows that the average sales volume for the non-associated consumer is considerably higher than the sales for the associated consumer whose average sales volume is 196.80 products for the non-associated consumers and 26.70 products for the associated consumers, a negative variation of 86.43%.

Finally, pair 04 compares the same data of pair 03, however during the month of August, the "intervention period" evidences that the average sales volume for the non-associated consumer is considerably higher than the sales for the associated consumer whose average sales volume is 228.20 products for the non-associated consumers and 27.60 products for the associated consumers, a negative variation of 87.90%. Table 09 aims to show whether there is a correlation between the total sales volume of these periods in the experimental unit.

Table 09

Paired Sample Correlations

		N	Correlation	Significance
Pair 01	L1_VT_7_NA – L1_VT_8_NA	10	0.997	0.000
Pair 02	L1_VT_7_A – L1_VT_8_A	10	0.753	0.012
Pair 03	L1_VT_7_NA – L1_VT_7_A	10	0.978	0.000
Pair 04	L1_VT_8_NA – L1_VT_8_A	10	0.723	0.018

Note. L1: Store 01 – VT: Total Sale – 7: Month 07 "July" – 8: Month 08 "August".

Source: Research.

Table 09 shows that when analyzing the total sales volume between 07 "July" and 08 "August" for non-associated consumers, there is a positive correlation (0.997) and statistical significance at the level of 1%, where *p.value* = 0.000 and that the samples have correlation with each other. When analyzing the total sales volume in July and August, for the associated consumers there is a positive correlation (0.753) and statistical significance at the level of 1%, where (p.*value* = 0.012), it is soon possible to affirm that the samples have correlation between themselves.

When analyzing the total sales volume only for July, that is, the observation period, where there is no intervention activities, and comparing with the total sales for non-associated consumers in relation to the total sales volume for associated consumers, it is evident that there is a positive correlation (0.978) and statistical significance at the level of 1%, where (*p.value* = 0.000).

This allows us to affirm that there is a statistical correlation among the samples. Therefore, when analyzing the total sales volume of August, that is, the period of intervention, it shows that there is a positive correlation (0.723) and statistical significance also at the level of 1%, where (*p.value* = 0.018) among the sales volume indices, it is concluded that the data of the said sample have statistical correlation among them. Table 10 shows the paired sample test data from the parametric test "t".

Table 10

Paired Sample Test

		Paired Differences					T	DF	Significance
		Avg.	S. Deviation	E. P. Average	95% confidence interval				
					Lower	Upper			
Pair 01	L1_VT_7_NA-L1_VT_8_NA	31.40	49.50	15.65	-66.81	4.01	-0.00	9	0.038
Pair 02	L1_VT_7_A-L1_VT_8_A	0.90	25.37	8.024	-19.05	17.25	-0.11	9	0.457
Pair 03	L1_VT_7_NA-L1_VT_7_A	(170.1)	244.81	77.414	-5.02	345.22	2.19	9	0.028
Pair 04	L1_VT_8_NA-L1_VT_8_A	(200.6)	292.69	92.558	-8.78	409.81	2.16	9	0.029

Note. L1: Store 01 – VT: Total Sale – 7: Month 07 "July" – 8: Month 08 "August".

Source: Research.

Table 10 aims to highlight the average difference in the total sales volume in the respective periods under analysis, and among the groups. Data from the respective table are also analyzed based on Marôco's understanding (2014), that since it is a unilateral study, *p.value* should be divided by 02. Then the analysis of sales in July and August for non-associated consumers had an average increase in sales volume of 31.40 products, with standard deviation of 49.505 and significance of at the level of 10% where the (*p.value* = 0.038) and 95% confidence interval, which represents a positive variation of 15.95%.

Analyzing the total sales made to the associated consumers in the respective period, a slight change was observed, with an average of 0.90 products with a standard deviation of 25.375 and significance at a level of 10% where (*p.value* = 0.457), with a 95% confidence interval, this represents a 3.37% increase in sales volume. When analyzing the sales averages for non-associated consumers in July, in relation to sales made in the same period, for the associated consumers there is a negative average volume of (170.10) products, whose standard deviation is 244.814 and significance at the level of 10%, where the (*p.value* = 0.028) and 95% confidence interval, these data show a sales reduction of 86.43%. When the average sales volume was observed in August, for the non-associated public in relation to sales to the associated public, we have a negative average reduction of (200.60) products, with standard deviation of 292.695 and significance at the level of 10%, where the (*p.value* = 0.058) divided by 02, the (*p.value = 0.029)* with 95% confidence interval, a sales reduction of 87.90%.

Based on these data, it is not possible to confirm hypothesis 02, it is evident that the total sales volume for non-associated consumers is slightly higher than the sales volume for associated consumers in both periods of analysis. With this result it is possible to reject the proposed hypothesis as "H2". Table 11 presents the non-parametric data for complementary analysis of the information, from the application of *the Friedman test*.

Table 11

Summary of Hypothesis Test

	Null Hypothesis	Test	Significance	Decision
01	The distribution of L1_VT_7_NA, L1_VT_7_A, L1_VT_8_NA e L1_VT_8_A are the same	Friedman double analysis of variance of samples Related by positions	0.000	Reject the null hypothesis
	Asymptotic meanings are displayed	The significance level is 0.05.		

Note. L1: Store 01 – VT: Total Sale – A: Associated – NA: Non-Associated – 7: Month 07 "July" – 8: Month 08 "August".

Source: Research.

The data from the Friedman non-parametric test , presented in Table 11, showed expected values with a level of 5%. The above results point to refute the alternative hypothesis presented as H2, showing that the significance is lower than or equal to 0.050 that is, the (*p.value* = 0.000). Table 12 shows the data of the pair comparison, from the output data of the *Friedman test application*.

Table 12

Friedman Test Pair Comparison

Sample 1 x Sample 02	Test Statistics	Standard Error	Standard Test Statistics	Significance	Adjusted Significance
L1_VT_7_A-L1_VT_7_NA	1.650	0.577	2.858	0.004	0.026
L1_VT_8_A-L1_VT_8_NA	2.450	0.577	4.244	0.000	0.000
L1_VT_7_A-L1_VT_8_NA	-1.950	0.577	-3.377	0.001	0.004

Note. L1: Store 01 – VT: Total Sale – A: Associated – NA: Non-Associated – 7: Month 07 "July" – 8: Month 08 "August".

Source: Research.

The statistical analysis in Table 12 shows that the total sales volume of the experimental unit, in the observation period in relation to the total sales volume for non-associated consumers, *p.value* is significant at the level of 5% where (*p.value* = 0.026). The total sales volume in the experimental unit, in the intervention period for associated consumers in relation to the total volume for non-associated consumers, has a *significant p.value* at the level of 5% where (*p.value* = 0.000).

And, when we analyzed the total sales volume of the experimental unit, in the observation period for the associated consumer in relation to the total sales volume for non-associated consumers, the *p.value* is significant at the level of 5% where (*p.value* = 0.004). Then from this non-parametric statistical data, "H2" is rejected, because the Friedman test corroborates the conclusions based on the analyzes based on the parametrical test "t test".

5 Discussion of Results

The present study evidenced through the survey of theoretical bases, 13 articles together the Ebsco, *Scopus* and *Web of Science bases,* which refer to experimental or quasi-experimental studies, carried out in supermarkets, in order to experiment the use of certification as an information tool to influence the change in consumer behavior.

In this aspect, the present study is in line with the research of Hearne and Volcan (2002) who used the approach as a method of application of the experiment and concluded that the information can generate gains for the organizations. Conclusion also presented by other studies (Thøgersen & Nielsen, 2016; Waterlander, Blakely, Nghiem, Cleghorn, Eyles, Genc & Mhurchu, 2016; Waterlander, Steenhuis, de Boer, Schuit & Seidell, 2013; e Kardes et al., 2007), which corroborate with the findings of this research because they showed that sales results can be impacted by personal approaches, product presentation, information and certifications, influencing them in their purchasing decisions.

The correlation between the present study and that of Perino et al. (2014), is the fact that the information is shown through the intervention activity, which can be associated with the use of labels or certifications. The studies of Van Loo, Caputo, Nayga Jr. and Verbeke (2014) and Emberger-Klein and Menrad (2018) also corroborate , which were based on the use of electronic means, and used questionnaires as an intervention tool, and validated the use of labels to inform the consumers.

Wijk, Maaskant, Polet, Holthuysen, Van Kleef e Vingerhoeds (2016) conducted their experiment in two supermarkets with the exhibition of products as an intervention activity. This methodology was also used by Moran, Khandpur, Polacsek, Thorndike, Franckle, Boulos, Sampson, Greene, Blue and Rimm (2019), the results of both studies were not as expressive as that of the present research, however, showed that interventionist activities positively influenced the behavior and decision of consumers purchases.

The study carried out in 2016, by Van Herpen et al., analyzed the use of packaging to transmit relevant information to consumers, the present study advances in the possibility of using the own packaging of industrialized products by the cooperative, to inform consumers about their certifications and processes. Our study is in line with the research of Lombart, Millan, Normand, Verhulst, Labbe-Pinlon e Moreau (2016), which also analyzed the behavior and perception of the consumer in relation to their purchase decision, and concluded that certification and packaging can be important strategic tools to be used by organizations.

The experiment of Ejlerskov, Sharp, Stead, Adamson, White and Adams (2018) used nine stores to perform the intervention activities, six of them being used as an experimental unit and three of them as control units. This finding is similar to the situation applied to the present study, whose objectives were to test the importance of certification and information as influencers to the consumer in their purchasing decision. In general, all these studies showed some correlation, with the present study, some more and others less relevant. However, the studies have added somehow, to give basis and theoretical basis to the present study.

After the descriptive analysis and statistics of the data of the present study, it was identified that there was an increase in the overall sales volume of the sample products during the intervention in the experimental unit, whose actions were put into practice as planned and authorized by the organization. Considering the dependent variable (sales made), it was possible to measure that the strategies of disclosure of the certifications that the cooperative has, positively influenced the consumer behavior, impacting in purchasing decision, showing the increase in sales volume during the intervention period in relation to the observation period, when compared to the sales of the experimental and control unit.

The present study, advances in relation to the others by exploring in a quasi-experimental way the universe of cooperative organizations, and also to show that specific actions aimed at its members can be developed in order to inform and raise awareness about the actions of mitigation of anthropic actions and better quality of life of these. The study shows that intervention strategies can result in the achievement of the proposed objectives, even impacting the behavior and decision of consumer purchases. Such actions will result in the increase in the sales volume of the said organization and consequently in the maximization of its financial results.

6 Final Considerations

The present study showed through descriptive and statistical analyzes that certification influences consumer behavior and purchasing decision. This influence has greater relevance to the non-associated consumer than to the associated consumer, so that being so, we can accept and affirm as true the hypothesis of number 01, the “H1”, that certification influences the behavior and decision purchases of the consumer, and thus, refuting the hypothesis of number 02, the “H2”, that certification influences the associated consumer more than the non-associated consumer.

And, based on the conclusion of the two hypotheses, we can answer the research question as follows, certification positively influences consumer behavior and purchasing decision, making this directly impact the result of the organization’s turnover. This study presents an important contribution both to the organization and to the consumer, since the statistical data showed that certification influences the change of consumer behavior interfering in the decision to purchase products produced by agro-industrial cooperatives.

So that the present study is timely for the development of strategies for both the organization object of study and for other organizations of the cooperative agro-industrial segment. For these

organizations it is evident that the implementation of interventionist activities can help in the increase of sales of their products, so that these interventions clearly and objectively show the information about the products and their processes of industrialization and distribution, especially with regard to the adoption of certifications, which can be demonstrated through the use of labels and packaging, or through the exposure of these products, followed by personal approaches by duly qualified and prepared persons.

New studies can be elaborated and applied in order to explore the formulation of business strategies using sustainability indicators, aiming to increase the transparency of the organization regarding its anthropic actions, add or even co-create values to its products or the organization itself, increase or simply preserve its "*Goodwill*", that is, the value of the brand and reputation of the organization taking into account all *the know-how* it has.

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