



CONSUMERS OF ORGANIC PRODUCTS IN THE CIRCULAR ECONOMY

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ABSTRACT

Purpose: To identify drivers and barriers perceived by consumers of organic products regarding their actions supporting circularity.

Theoretical framework: Circular Economy (CE) is seen as solution for food crisis and environmental pollution. It also contributes to growing awareness of social responsibility and sustainability, which increases the interest in organic products.

Method/design/approach: Qualitatively, twelve consumers of organic products were interviewed through in-depth online interviews.

Results and conclusion: Consumers identified several drivers that encourage them to be part of CE, such as less packaging at farmer's markets, the opportunity to compost at home, and government policies that support waste sorting for recycling. However, the failure of suppliers to provide initiatives to reuse packaging, bags and to return glass containers, the restrictions on home composting, lack of room to separate and dispose of recyclable waste efficiently, not used to reusing vegetable waste, and not used to returning packaging to suppliers, were identified as barriers to CE.

Research implications: This study contributes to the development of CE, promotion of sustainability and establishment of CE as an element of organic production.

Originality/value: Studies address CE with focus on the industry. Contemplate the importance of the consumer for the development of circularity, this study advances with a look at the consumer, foment to the comprehensive, until then not investigated, of the perception of consumers of organic products regarding their actions supporting circularity.

Keywords: Consumer behavior; Organic products; Circular economy; Disposal; Brazil.



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CONSUMIDORES DE PRODUTOS ORGÂNICOS NA ECONOMIA CIRCULAR

RESUMO

Objetivo: Identificar drivers e barreiras percebidos pelos consumidores de produtos orgânicos em relação às suas ações em prol da circularidade.

Referencial teórico: A economia circular (EC) é vista como solução para crise alimentar e poluição ambiental. Também contribui para crescente conscientização sobre responsabilidade social e sustentabilidade, enquanto aumenta o interesse por produtos orgânicos.

Método: De forma qualitativa, doze consumidores de produtos orgânicos foram entrevistados por meio de entrevistas em profundidade on-line.

Resultados e conclusão: Os consumidores identificaram uma série de drivers que os incentivam a fazer parte da EC, como diminuição do uso de embalagens nas feiras, oportunidade de fazer compostagem em casa e políticas governamentais que apoiam a coleta seletiva de resíduos para reciclagem. No entanto, a falha dos fornecedores em oferecer iniciativas de reutilização de embalagens, sacolas e de devolução de recipientes de vidro, restrições à compostagem domiciliar, falta de espaço para separar e descartar resíduos recicláveis de forma eficiente, não ter como reutilizar resíduos vegetais, e a não devolução de embalagens aos fornecedores, foram identificados como barreiras à EC.

Implicações da pesquisa: Este estudo contribui para o desenvolvimento da EC, promoção da sustentabilidade e, estabelecimento da EC como elemento da produção orgânica.

Originalidade/valor: Estudos tratam da EC com um foco maior para a indústria. Considerando a significativa importância do consumidor para o desenvolvimento da circularidade, este estudo avança com olhar para o consumidor, contribuindo para o entendimento, até então não investigados, da percepção dos consumidores de produtos orgânicos em relação às suas ações em prol da circularidade.

Palavras-chave: Comportamento do consumidor; Produtos orgânicos; Economia circular; Descarte; Brasil.

1 INTRODUCTION

Organic food has been part of diets in many countries for decades. According to data from the Research Institute of Organic Agriculture - FIBL and International Federation of Organic Agriculture Movements - IFOAM (2018), the global organic food market increased by 10% in 2016. According to the latest worldwide data on organic farming, 2018 was also a good year for organic farming worldwide: the cultivated area for organic products increased by 2.9% worldwide (FIBL & IFOAM, 2021). All regions reported growth; however, while more than 90% of the world's organic production is concentrated in Asia, Europe and Africa, Brazil is still under-committed compared to other regions (FIBL & IFOAM, 2021). The demand for organic products has increased in Brazil and worldwide every year, motivated by people's concerns about eating healthier food, caring for the environment, and the safety and quality of products (FIBL & IFOAM, 2021; Organics, 2020). According to the Brazilian Ministry of Agriculture, Brazilian organic production increased by over 50% from 2016 to 2019, with 40% produced in the southern region (Organics, 2020). Despite the growth of the organic products market, this sector is still assumed small compared to traditional products; it has considerable potential for growth (Molinillo, Vidal-Branco & Japutra, 2020). As a result, many studies have looked into the consumption of organic products (Rana & Paul, 2017; Rao, Mogili & Nagaraj, 2020), including in Brazil (De Melo Moura, Pires, Madeira & Macedo, 2020; De Moraes Watanabe, Alfinito, Curvelo & Hamza, 2020).

There are many aspects to be considered when looking at the part consumer behavior plays in the purchase decision-making process, including the fact that after the decision, the consumer is faced with how to dispose of it, which is a subject of increasing interest to



researchers due to growing concerns over the environment (FIBL & IFOAM, 2018). In addition, the decline of non-renewable resources, together with the continuous increase in the global population, has forced scholars and people in business to look for new approaches to production and consumption (Lakatos, Dan, Cioca, Bacali & Ciobanu, 2016). As a result, one way that has been identified to solve the issue is to adopt a circular economy (CE).

According to Ellen MacArthur Foundation (2019), the CE to take into account on three principles: (1) Designing out waste and pollution, (2) keeping products and materials in use, and (3) regenerating natural systems. The development of organic agriculture links to the third principle of the CE since working without the use of chemical pesticides maintains the health of the soil. Ensuring organic waste and product packaging disposed correctly, links to the first objective of the CE, while the possibility of reusing the packaging of organic products, such as glass containers, is linked to the second principle of the CE.

A series of studies refer to the drivers and barriers to adopting a CE (Farooque, Zhang & Liu, 2019; Gue, Ubando, Promentilla & Tan, 2019; Jia, Yin, Chen & Chen, 2020). In this study, the drivers are regard the incentives to consumers of organic products to play an active part in ensuring the circularity of the process. Barriers are contemplated aspects that make it difficult for consumers of organic products to play an active part in the CE.

The CE makes it possible to reduce the consumption of raw materials, improve brand image, encourage more demand for new services and new potential markets, reduce the costs and risk related to emissions, waste and environmental legislation and be more attractive to new investors (Korhonen, Honkasalo & Seppälä, 2018). Adopting a CE tends to mean more interaction with consumers (Korhonen et al., 2018), and there must be engagement with consumers to ensure the circular process is successful (Kuah & Wang, 2020).

The consumer plays a significant role in the CE because it requires them to play an active part (Sijtsema, Snoek, Van Haaster-de Winter & Dagevos, 2020). According to Ellen MacArthur Foundation (2013), the circular process affects the industry and the customers, the reason of studies has examined consumer behavior in the context of the CE (Lakatos et al., 2016; Kuah & Wang, 2020; Sijtsema et al., 2020), but the research in this area is still limited. There is a lack of research on consumer behavior regarding the CE, according to Ellen MacArthur Foundation (2013). Consumer awareness, interest, and involvement in the CE are still low, according to Sijtsema et al. (2020). In addition, it was highlighted in the Agenda 2030 (2021) that there was a need to change consumption patterns and encourage consumers to support sustainable consumption. It can be said, based on the study by Camacho-Otero, Boks e Pettersen (2018), that consumption in the context of the CE and circular solutions is an area of increasing research interest. Considering this context, it is questioned which are the drivers and barriers perceived by consumers of organic products regarding their actions supporting circularity? Therefore, this study aimed to identify drivers and barriers perceived by consumers of organic products regarding their actions supporting circularity. This study's results will contribute to developing the CE process, promote sustainability, and contribute to establishing the CE as an element of organic production.

2 THEORETICAL BASIS

This literature review introduces and discusses the consumption of organic products and the consumer in the CE context.



2.1 Organic Products Consumption

The consumption of organic products has attracted widespread attention over the last few decades from scholars, policymakers, and consumers (Rana & Paul, 2017). Consumers' search for a healthier lifestyle with sustainable impacts reinforces organic cultivation (Ashaolu & Ashaolu, 2020). Organic products take into account more beneficial to the environment, healthier and tastier than conventional products (Gottschalk & Leistner, 2013). Therefore, the motivation for healthier food and environmentally friendly, safe, and good quality products leads to an increase in the consumption of organic products (FIBL & IFOAM, 2021; Organics, 2020).

The studies by Wier, Jensen, Andersen and Millock (2008) and Mondelaers, Verbeke and Huylenbroeck (2009) carried out with consumers of organic products classify these consumers into different levels. Wier et al. (2008) divided consumers into four groups according to the percentage of their food budget spent on organic products, where heavy users were consumers who spent more than 10%, medium users those who spent a percentage between 2.5% and 10%, light users spent less than 2.5% and non-users, who were consumers who did not buy any organic products. Mondelaers et al. (2009) also classified consumers into these four groups; however, they only based it on their purchase of organic vegetables.

2.2 Consumer in the Circular Economy Context

The cultivation of organic products is part of the CE context meeting the principles on which CE is based (Ellen MacArthur Foundation, 2019). Transitioning from a Linear Economy to a CE is extremely relevant to sustainable development (Testa, Lovino & Iraldo, 2020). The CE has the ability in this situation to provide a solution to issues such as the decline of non-renewable resources and the continuous increase in the global population by designing out waste and pollution, making use of products and materials and regenerating natural systems (Ellen MacArthur Foundation, 2019).

It makes sense to extract resources from nature to transform them into a product or service that can be used not only once but often, thereby reducing the need for virgin extraction and waste production (Korhonen et al., 2018). By 2030, substantially reducing waste generation through prevention, reduction, recycling and reuse, and achieving sustainable management and efficient use of natural resources are some goals of the 12th sustainable development goal addressed in the Agenda 2030 (2021).

CE seems to be a promising concept as it has attracted the business community to sustainable development work (Korhonen et al., 2018). Thus, the concept of CE has been gaining strength to move towards sustainable, low-carbon, resource-efficient and competitive economies (García-Quevedo, Jové-Llopis & Martínez-Ros, 2020), meeting Agenda 2030 mobilized by the United Nations. Ensuring sustainable production and consumption patterns is part of the 12th sustainable development objective addressed in Agenda 2030 (2021).

The CE approach is, therefore, a vital element in restructuring the take-make-dispose model by actively involving everyone in the supply chain (Borrello, Caracciolo, Lombardi, Pascucci & Cembalo, 2017). All the stakeholders have a role to play when a CE is created, and all the main actors need to play their part, working together collaboratively (Ellen MacArthur Foundation, 2019). Similarly, the European Commission (2015) also talks about the need for close cooperation between all stakeholders to transition to a CE.

Although the specific role of consumers in the CE has been little researched (Maitre-Ekern & Dalhammar, 2019), and we do not know much about the willingness of consumers to be involved in it (Borrello et al., 2017), the fact that circular practices and related topics were



still considered new by consumers who took part in the research of Sijtsema et al. (2020), the end consumer or the end-user has a critical role to play in the CE and the waste management process (Kuah & Wang, 2020; Sijtsema et al., 2020).

Maitre-Ekern and Dalhammar (2019) considered consumers to be at the center of the value chain. They are the main target of the product's supply chain and the starting point of the reverse supply chain. Consumers are increasingly important in the CE (Sijtsema et al., 2020), and it is paramount that they are engaged for the circularity process to be successful (Kuah & Wang, 2020). It is not possible to achieve CE goals without their involvement (Maitre-Ekern & Dalhammar, 2019). Testa et al. (2020) also add that consumer understanding and engagement are needed to direct them to more environmentally conscious purchases.

Therefore, the consumer must have a more active role (Sijtsema et al., 2020). Consumption behavior must be changed to encourage consumers to continue sustainable consumption (Agenda 2030, 2021). Customers and the industry benefit significantly from the circular process (Ellen MacArthur Foundation, 2013). Consumers can have different roles, not just as users and consumers, but also in co-creation (Sijtsema et al., 2020).

According to Maitre-Ekern and Dalhammar (2019), it is hoped that the CE can bring far-reaching consumer changes. According to the European Commission (2015), awareness campaigns are needed to change behavior. Maitre-Ekern and Dalhammar (2019) suggest that policy and legislation are required to encourage consumers and make them feel more confident about making more sustainable choices. The European Commission (2015) has recommended legislating for new provisions to boost activities that facilitate reuse. Although current behavior on consumption results from the Industrial Revolution, there is no reason why this paradigm cannot be changed to encourage more qualitative and sustainable habits (Maitre-Ekern & Dalhammar, 2019).

Alternatively, consumers are not viewed as influential market players. They are considered the weakest part of the contract by legislators and volatile and complex (Maitre-Ekern & Dalhammar, 2019). Recent studies have found many barriers to consumers being able to support the CE Govindan and Hasanagic (2018) and Mangla, Luthra, Mishra, Singh, Rana, Dora & Dwivedi (2018) discussed barriers from the perspective of the consumer in the supply chain and identified the following: consumer knowledge and awareness about reform, consumers' having a poor perception of the components that are reused, an unemotional connection with the change, ownership issues when it comes to making the most of reusing CE resources in the supply chain, limited availability of reusable products and a lack of consumer awareness and participation in the CE. Farooque et al. (2019) also covered barriers to circularity in the supply chain. They mention weak environmental regulation and inspection, a lack of market preference or pressure and the organizational culture and management as barriers. De Jesus & Mendonça (2018) mention the inflexibility of consumer behavior and company routines as barriers, and there is a lack of interest, agreement to or awareness of the CE (Mangla et al., 2018; Farooque et al., 2019).

In this respect consumers do have roles to play in the CE as purchasers, supporters, repairers, sellers, sharers, collaborators, and waste disposers. Therefore, they can contribute significantly to the circular process by purchasing more durable goods, willing to repair items and disposing of waste properly (Maitre-Ekern & Dalhammar, 2019). For example, there is a circular food system that encompasses the entire value chain of food production for human consumption, starting with agricultural production or other means, through to handling, transport, storage, processing, distribution, and consumption, as well as waste management and disposal and the reintroduction into productive use (looping) (Ellen MacArthur Foundation, 2019). Food waste occurs throughout the value chain: during production and



distribution, in stores, in restaurants, in establishments that supply prepared food and even at home (European Commission, 2015).

Therefore, we come back to the importance of waste management and disposal, and its reintroduction into the production process, which can be carried out in several sustainable ways. Lakatos et al. (2016) cover waste separation and sorting for recycling in their study. Maitre-Ekern and Dalhammar (2019) highlight the importance of sending items for reuse and avoiding putting items that can be reused in the trash. The European Commission (2015) also identified a legal issue around the reuse of waste. In the study by Sijtsema et al. (2020), consumers avoided buying plastic bags by taking their reusable bags to shop. In the Borrello et al. (2017) survey, many respondents were positively positioned to return organic waste for composting on farms and feeding animals. Also, according to San Martin, Ramos and Zufía (2016), plant residue is considered nutritional and healthy enough for use in animal feed. The Ellen MacArthur Foundation (2019) points out that a role for consumers in the circular process is to prevent food waste by using "ugly" products as ingredients. The study by Sijtsema et al. (2020) also points out that new items can be made from food that would go to waste, such as unwanted tomato, pepper, mushroom and potato, in producing soup or sauce for pizza and pasta. The study also showed that some interviewees preferred more convenient options that were easier to use every day, such as buying circular food products at the supermarkets they usually buy (Sijtsema et al., 2020).

The literature also identifies a series of drivers for the consumer which encourage the adoption of a CE: consumers' environmental awareness (Govindan & Hasanagic, 2018; Barbaritano, Bravi & Savelli, 2019), consumers' awareness of green initiatives (Jia et al., 2020) and consumers' preference and demand for circular products (Gue et al., 2019), which, in turn, end up putting pressure on organizations to develop CE (Govindan & Hasanagic, 2018).

That way adopting CE allows companies to improve their relationship with their customers and create customer loyalty (Agyemang, Kusi-Sarpong, Khan, Mani, Rehman & Kusi-Sarpong, 2019). It also increases consumer satisfaction (Gusmerotti, Testa, Corsini, Pretner & Iraldo, 2019), works with consumers on environmental matters (Jia et al., 2020), and increases their sales, especially among consumers who are aware of sustainability (Barbaritano et al., 2019).

However, it is still essential to examine the drivers behind consumer choice regarding their genuine commitment to closed loops (Borrello et al., 2017). Convincing the consumer to get involved seems to be the biggest challenge to developing the CE (Sijtsema et al., 2020). With this in mind, the study results from Borrello et al. (2017) show how consumers could be involved in closed loops inspired by CE principles.

3 METHODOLOGY

A qualitative approach was used to achieve the research objective. Consumers of organic products from Rio Grande do Sul State (Brazil) were defined as the unit of analysis for this study. In-depth, individual, semi-structured interviews were used to collect the data for this research. Twelve consumers were selected by convenience and identified from numbers 1 to 12 listed in Table 1. The number of interviews was defined by the theoretical data saturation approach, which determines the repetition of data among interviews indicates the collect process is enough (Glaser & Strauss, 1967).



Table 1 - Study Interviewees

#	Gender	Age	City	Marital Status	Profession
1	Female	40 years old	Santa Maria	Married	University professor
2	Male	37 years old	Porto Alegre	Single	University professor
3	Female	49 years old	Porto Alegre	Married	Civil servant
4	Female	28 years old	Porto Alegre	Single	Company Manager
5	Female	51 years old	Porto Alegre	Married	Photographer
6	Female	41 years old	Porto Alegre	Married	Engineering
7	Female	62 years old	Porto Alegre	Divorced	Lawyer
8	Female	39 years old	Porto Alegre	Married	Company Manager
9	Female	45 years old	Porto Alegre	Married	Veterinary
10	Male	37 years old	Porto Alegre	Married	Lawyer
11	Female	59 years old	Porto Alegre	Married	Advertising Executive
12	Female	44 years old	Passo Fundo	Separated	University professor

Source: Produced by the authors (2021)

A Semi-structured script was designed by the authors to collect the data, featuring open questions directly related to the objective of this study. The script had the following structure: a) initial questions to identify the interviewees' characteristics and to understand their food habits; b) questions related to the objective of the study (waste disposal and sustainable activities). The content of the script was checked by two doctoral professors who are specialists in the field.

The interviews were conducted through Web Meetings. Contact was initially made with each of the interviewees to confirm that they were consumers of organic products and see if they were available to be part of the sample for this study. All interviewees who were contacted were highly interested in taking part in the study. The interviews took place between August 17-20, 2020 and lasted around 50 minutes each. All interviews were recorded with the interviewees' prior consent and were later transcribed for analysis.

As the information was taken during the COVID-19 Pandemic, there were some notable differences in their behavior towards organic consumption, as well as the way they disposed of their waste due to the need to isolate socially and the risk of contagion (Abiral & Atalan-Helicke, 2020; Grashuis, Skevas & Segovia, 2020). This trend will be noted in the results of the study, where applicable.

The data were analyzed by content analysis from the perspective of the theoretical basis (Bardin, 2011), using a descriptive pattern initially. Four categories were created to analyze and present the results of drivers and barriers: supplier of organic products, farmer's market of organic products, consumers of organic products and the government. Then, data interpretation was compared with the literature to try to establish nomological validity.

4 DATA ANALYSIS

In this chapter, the data collected from the interviews will be described, analyzed and interpreted.

Within the context of the CE for food, the Ellen MacArthur Foundation (2019) points out that one of the consumers' roles is to prioritize the consumption of regenerative food, in other words, food types that help to improve the environment and the natural ecosystem. One of these types of food is organic products, and therefore this study tried to identify the number of organic products that the interviewees consumed and how regularly they bought them. To do this, in line with the studies by Wier et al. (2008) and Mondelaers et al. (2009) on consumers of organic products, the interviewees in this study were grouped into three levels



of users: (1) heavy users, interviewees were considered to have a high level of consumption when they consumed organic products every day and prioritized organic consumption; (2) medium users, interviewees were considered to have a medium level of consumption if they consumed organic products three times a week on average; and (3) light users, interviewees were considered to have a low level of consumption if they bought and consumed organic products sporadically.

Based on these criteria, Interviewees 2, 4, 5, 6, 7, 8, and 11 had a high level of consumption of organic products and were considered heavy users. "During the pandemic, I have been shopping properly once a week (home delivery), before I did not go to the market every week" (Interviewee 2). "Because of the pandemic, we got together with friends to arrange for things to be delivered from the market, and so we managed to create a weekly shopping routine that we did not have before" (Interviewee 8). Interviewee 8 stopped eating out - meals that had not always been organic (she did so reluctantly, because of a lack of time) (Cranfield, 2020) and started to cook all her meals at home, which were organic. "We have managed to make all our food at home; we have even managed to make it better by eating more salad" (Interviewee 8) (Cranfield, 2020). Interviewee 4 stopped dining in restaurants with non-organic food and started to eat more organic food at home and to order from a vegan restaurant (delivery). Interviewee 5 had more access to organic products because a new way to buy and get home deliveries started up, and Interviewee 7 started to eat only organic products almost entirely. Interviewee 7 believed that she was at risk from respiratory problems, so she decided to eat only organic products to strengthen her immune system. The data gathered supports the observation of Stanciu, Radu, Sapira, Bratoveanu e Florea (2020) regarding proactive behavior during a pandemic, whereby individuals try to improve their immune systems and general health, and Chauhan (2020, p.7234) who states: "With the news reporting new cases almost daily from the spread of the coronavirus, consumers are becoming more inclined to look after their well-being." "The consumption of organics during the pandemic has considerably increased because we are more concerned with our health, and we are eating at home more" (Interviewee 11). Therefore for many of the interviewees, their consumption of organic products increased during the Pandemic (OTA, 2020) because they cooked at home more often (interviewees 1, 2, 8 and 11) (Attwood & Hajat, 2020), they wanted to support small producers during the Pandemic (interviewee 3) (Chauhan, 2020; Silva & Da Silva Barbosa, 2020) they did not eat in restaurants (interviewee 4) (Cranfield, 2020), because they had more access to organic products through new home delivery initiatives (interviewee 5) (Sheth, 2020) or they chose only to eat organic products because they are healthier (interviewee 7) (Da Silva Lima & Soares, 2020).

Interviewees 1, 3 and 10 were identified as having a medium level of consumption of organic products and therefore were considered medium users. "I buy bread 2-3 times a week to support the small producer, I get bread from several suppliers, and I rotate" (Interviewee 3) (Chauhan, 2020; Silva & Da Silva Barbosa, 2020). Interviewees 9 and 12 consume few organic products, and therefore they have a low level of consumption and were considered light users. "I buy what is cheap; I do not stick to organic food. I do not go to the market to buy organic. I buy affordable vegetables. We eat many bananas, and sometimes I go to Zaffari⁴ and the only banana that is ready to eat is organic, so I buy it" (Interviewee 9). Interviewee 12 also stated that she eats few organic products.

No non-users, those who did not use any organic products, were identified in this study, as being a consumer of organic products was a criterion for the research sample.

⁴ Zaffari is a regional supermarket located in the south of Brazil.



It is worth noting here the increase in the consumption of organic products observed during the pandemic period. Once the COVID-19 Pandemic is over, this behavior and the level of consumption of organic products and how regularly they are bought may change.

The other aspect of analysis in the study was how much they were involved in disposal, in other words, what the consumer did when it came to disposing of organic products and packaging. When it comes to the CE of the organic food chain, it is considered vital for the circular process to be successful when consumers dispose of waste. According to Maitre-Ekern and Dalhammar (2019), one of the three ways in which consumers can make an essential contribution to the CE is by properly disposing of waste.

In this study, the interviewees were grouped into three groups, based on the analysis of their degree of commitment to the disposal process, and grouped as follows: (1) low level: separate and recycle garbage according to government policy; (2) medium level: separate and recycle garbage according to government policy and reuse packaging or sends it to third parties and (3) high level: separate and recycle garbage according to government policy, reuse packaging or send it to third parties and compost. Interviewees 2, 5 and 8 had a high degree of commitment to the disposal process, Interviewees 1, 3, 4, 6, 7, 10 and 11 had a medium commitment and Interviewees 9 and 12, a low commitment to the disposal process.

Table 2 shows the interviewees listed according to their level of organic consumption and their degree of commitment to the disposal process.

Table 2 – Levels of consumption of organics and commitment to disposal

Interviewee	Level of Consumption of Organics	Level of Commitment to Disposal
1	Medium	Medium
2	High	High
3	Medium	Medium
4	High	Medium
5	High	High
6	High	Medium
7	High	Medium
8	High	High
9	Low	Low
10	Medium	Medium
11	High	Medium
12	Low	Low

Source: Produced by the authors (2021)

This study looked at the actions and behaviors that supported the CE. All the interviewees contributed to circularity (Lakatos et al., 2016; Sijtsema et al., 2020), even though Interviewees 9 and 12 did no more than sorting waste for recycling. All interviewees carried out this task, which confirms the study by Lakatos et al. (2016), which identified that 74% of interviewees were in complete agreement that sorting, and recycling should be used to create new products and that 96% of the interviewees considered sorting and recycling as an important way to prevent non-renewable natural resources. "We sort recyclable from organic waste" (Interviewee 3). "We are lucky to have sorting bins for waste and recycling here in the building" (Interviewee 6). Interviewee 10 separates organic waste from recyclables and glass: "I sort the garbage into these three main groups."

Interviewees 2, 5, and 8 had adopted composting to dispose of food waste in their homes, in line with Borrello et al. (2017).

Another activity that was mentioned by Interviewees 1, 2, 4, 6, 10, and 11 was the use of either reusable bags or shopping carts to make their purchases (Sijtsema et al., 2020). "I always take reusable bags to the market; it is much better, it reduces the amount of plastic, and it is better for carrying products in" (Interviewee 2). Interviewee 6 uses returnable bags



only at the market. Even though some sellers have plastic bags. "I always carry three reusable bags in my purse. When I make any purchase, I have one ready" (Interviewee 7).

The other activities and behaviors that the interviewees referred to were separating glass for more specific uses (Interviewees 1 and 10), such as donation (Interviewees 7, 8 and 11) or reuse (Interviewee 8), and reusing plastic packaging (Interviewees 3, 4, 5 and 10) and paper (Interviewees 4 and 8), as mentioned in the meeting of the European Commission (2015) and the study by Jia et al. (2020). Maitre-Ekern and Dalhammar (2019) comment on some of these activities when discussing sending items for reuse and avoiding putting items that can be reused in the trash. The interviewees referred to and commented on some actions mentioned above: "We reuse all the plastic packaging. We have a cupboard just for pots" (Interviewee 3); "The ready-made food from the vegan restaurant comes in excellent containers, it is very good plastic. I keep these containers to use again. The container comes in a paper package, and I keep that too." (Interviewee 4). Eventually, interviewee 4 ordered some other food, which came in plastic packaging that was not as good as that of the vegan restaurant, but she made it clear that she preferred to order from the vegan restaurant because it was good quality and could be reused. Interviewee 2 did not like to buy organic food at the supermarket because it usually came in plastic packaging. "The packaging is another reason to buy at the market, rather than the supermarket" (Interviewee 2). Similarly, Beharrell and MacFie (1991) found that almost 20% of interviewees believed that not having packaged products as a reason for buying organic, in line with the CE.

There were also comments from interviewees on the use and their concerns about peels, rinds and vegetable waste. "I sort recyclable and organic waste and dispose of it properly. It is one thing that concerns me. I wish I could do something with the peelings and vegetable waste from cooking" (Interviewee 7). In other respect, Interviewee 5 uses many leaves and stems to make dishes, such as soup. Ellen MacArthur Foundation (2019) suggests using "ugly" products as ingredients. Similarly, the study from Sijtsema et al. (2020) also refers to making new items from food that would go to waste. According to San Martin et al. (2016), plant waste can be in animal feed; however, this was not observed on the study interviewees. The interviewees also did not mention sending organic waste to animal feed (Borrello et al., 2017).

Although grocery shopping is an essential activity, because of the COVID-19 Pandemic and the need to socially distance, buying in-store has been discouraged (Grashuis et al., 2020). That is why many interviewees changed their habits and adopted ones that made them feel safer and were more comfortable within this exceptional situation (Abiral & Atalan-Helicke, 2020). They began buying organic products using WhatsApp or the internet to order home delivery (Silva & Da Silva Barbosa, 2020; Stanciu et al., 2020). In the same way, we could see that many of the interviewees adopted correct disposal processes because of the new packaging they received, which helped establish new activities and behaviors that supported the CE. Interviewee 2 received at home the organic products ordered in strong bags inside the cardboard boxes. He asked the supplier to use just the cardboard box, and he would return the box in the next delivery. Interviewee 11 also receives organic products at home. The products are delivered in bags, but Interviewee 11 transfers all products to the cart to take them up to their apartment, so they do not even take the supplier's packaging. Before the Pandemic, Interviewee 11 used a shopping cart or reusable bags when she attended the market. Interviewee 7 has products delivered to her home in recycled paper bags. During the Pandemic, the products were delivered to Interviewee 8's house in paper bags or cardboard boxes: "I would like to return them, but I do not because of the chance of contamination. So, I keep the boxes to use to pack up recyclables for disposal" (Interviewee 8).



The final aspect relevant to a CE mentioned in the survey is biodegradable bags to store organic waste (Interviewee 6).

Regarding the sustainable activities, reusing packaging, composting, and using vegetable waste, the study by Lakatos et al. (2016) said that at least 50% of the people they interviewed agreed that it was important to create a zero-waste future economy (CE) in which all goods are reused or recycled.

From the data collection and identifying actions and behaviors in favor of the circularity observed in the study respondents, some incentives (drivers) and barriers to circularity were identified.

The drivers identified are those aspects that encourage consumers of organic products to play an active part in the circularity process. Other drivers such as incentivize the return and reuse of packaging from organic products suppliers; the use of recyclable packaging, providing products with less packaging at markets, incentivize the use of reusable bags at markets, consumer's desire to dispose of food waste at home through composting, and the existence of government policy for selective garbage collection also play a role. Table 3 summarizes the drivers identified in this study and the evidence obtained from the data collected. In addition, drivers are grouped into four categories: suppliers of organic products, markets for organic products, consumers of organic products and the government.

Table 3 – Drivers for a Circular Economy

Category	Drivers	Evidence
Suppliers of organic products	Incentivize the return and reuse of packaging	Returning cardboard boxes or reusable bags (Interviewee 2). Use of Tupperware, avoiding the need to use the disposable containers provided by restaurants (Interviewee 2). “When you use packaging to take food and send it back, that creates loyalty” (Interviewee 2). The packaging can give a restaurant a competitive advantage. “The packaging affected my choice” (Interviewee 4)
	The use of recyclable packaging	Delivering products in brown paper packaging (Interviewee 3). During the Pandemic, Interviewee 7 had fresh products delivered by <i>Fresh Orgânicos</i> at home in recycled paper bags.
Farmer’s market of organic products	Providing products with less packaging	The products have more packaging when it comes from the supermarket (Interviewee 2).
	Incentivize the use of reusable bags	Market sellers encourage buyers to bring reusable bags (Interviewee 6).
Consumers of organic products	Desire to dispose of food waste at home through composting	“I would like to be able to make compost in my apartment, but I cannot yet” (Interviewee 4). “You could also make compost, but I do not” (Interviewee 7). “During the Pandemic, you think about these things more. I am at home more, so I thought about keeping the food waste to make fertilizer for my plants, as I have got room to do it. I have thought about it, but I have not done anything yet. As I eat a lot of salad, I usually prepare the vegetables for the whole week, wash everything, trim it, and see that my garbage is full of plant waste. I thought, I still have not done it” (Interviewee 12).
The Government	The existence of government policy for selective garbage collection	Interviewee 1 separates recyclables from non-recyclables, and sometimes, keeps the glass in a cardboard box to put out for the garbage. “I separate recyclables for recycling” (Interviewee 2). “We do a separate collection here; we separate recyclables from organic waste” (Interviewee 3). Interviewees 4, 8, 11 and 12 separate recyclables from organic waste. Interviewee 5 has a selective garbage collection system in their apartment block. “We are lucky here that you can separate the recyclables from the organic waste” (Interviewee 6). “I separate the recyclables from the organic waste and put it in the right place. I am careful about that” (Interviewee 7). Interviewee 9 separates recyclables and organic waste at home. Interviewee 10 separates the organic waste from the recyclables and the glass: “I separate things mainly into three”



Source: Produced by the authors (2021)

The barriers identified in this study related to the suppliers of organic products were the lack of initiatives from the supplier to reuse packaging or to ask customers to return the glass. The barriers related to the consumers of organic products were limitations on home composting, such as a lack of room and sawdust. Other barriers included the lack of room to separate and dispose of recyclable waste efficiently, not used to using reusable bags, not used to reusing peels, rinds and vegetable waste and the inability to be able to return packaging to suppliers because of the contamination risk of coronavirus. Table 4 summarizes the barriers to the CE and the evidence obtained from the data collected. In addition, barriers were grouped into two categories: suppliers of organic products and consumers of organic products.

Table 4 – Barriers to the Circular Economy

Category	Barriers	Evidence
Suppliers of organic products	Lack of initiatives from the supplier to reuse packaging	During the Pandemic, Interviewee 2 had organic products delivered at home in bags inside cardboard boxes. He asked the supplier to leave the products inside the box, only and returned the box on the next delivery.
	The supplier does not ask customers to return glass packaging	“The supplier does not ask for the glass back” (Interviewee 7)
Consumers of organic products	Lack of room for home composting	“I have thought about composting, but I do not have enough room in my apartment” (Interviewee 1). “I would like to have somewhere to make compost, but as I live in an apartment, I do not have any room to have one” (Interviewee 6).
	Lack of sawdust for home composting	They cannot do composting because they do not have sawdust (Interviewee 5).
	Lack of room to separate and dispose of recyclable waste efficiently	“I know I could do more, but I am not patient enough. I need room to be able to separate the recyclables better” (Interviewee 1).
	Not used to using reusable bags	Interviewee 3 has reusable bags from Zaffari1 but always uses plastic bags (not used to use them, convenience).
	Not used to reusing peels, rinds and vegetable waste	Interviewee 7 did not know what to do with the peelings and vegetable waste, leftover from cooking.
	Not used to returning packaging to food suppliers	“I would like to return the bags and cardboard boxes to the organic supplier, but I do not because of the risk of coronavirus contamination” (Interviewee 8).

Source: Produced by the authors (2021)

Table 5 displays a summary of the study results, summarizing the information obtained from the data collected. The activities and behavior that support circularity, the drivers and the barriers to circularity are grouped against the four consumer groups.

Table 5 – Summary of the results of the study

Group	Levels	Activities and Behavior in Support of the Circular Economy	Drivers for the Circular Economy	Barriers to the Circular Economy
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1	Level of Consumption of Organic Products: High Level of Commitment to Disposal: High	Takes reusable bags to the Market. Separates Recyclables and Non-Recyclables. Makes compost at home from food waste. Sorting Recyclable Packaging. Prefers to buy organic products from the Farmer's Market, rather than the supermarket, because of the packaging of the organic products. During the Pandemic, had organic products delivered to home in strong bags inside cardboard boxes; they asked for the delivery to be in the box only, and returned the box on the next delivery. Makes use of leftover vegetable trimmings. Reuses plastic packaging. Tries to get the maximum use out of the packaging, especially glass. Separates glass to donate. During the Pandemic, products were delivered in paper bags or cardboard boxes. Interviewees kept the boxes to store recyclables for disposal.	<ul style="list-style-type: none"> - The existence of government policy for sorting and recycling. - The encouragement of organic food suppliers to return and reuse packaging. - The option to buy products with less packaging at the market. 	<ul style="list-style-type: none"> - The supplier's lack of any initiative to reuse packaging. - The lack of sawdust for composting - The problem is when the consumer could not return the packaging to the organic food suppliers.
2	Level of Consumption of Organic Products: High Level of Commitment to Disposal: Medium	Takes reusable bags to the Market, will occasionally pick up packaging from the market. Separates Recyclables and Non-Recyclables. Reuses plastic containers from a vegan restaurant that delivers meals (prefers to use this restaurant because of the containers). Reuses paper packaging. Keeps plastic packaging and reuses it to give food to friends without them needing to return it. Uses biodegradable bags to hold organic waste. During the Pandemic, had organic products delivered by <i>Fresh Orgânicos</i> at home in recycled paper bags. Donates glass.	<ul style="list-style-type: none"> - The existence of government policy for selective garbage collection. - The encouragement of organic food suppliers to return and reuse packaging. - The consumer's desire to dispose of food waste at home through composting. - The supplier using recyclable packaging. - Incentives through the market to use reusable bags. 	<ul style="list-style-type: none"> - Lack of room at home to make compost. - Not used to reusing peels, rinds and vegetable waste. - The supplier does not ask customers to return glass containers
3	Level of Consumption of Organic Products: Medium Level of Commitment to Disposal: Medium	Takes reusable bags to the Market. Separates Recyclables and Non-Recyclables. Keeps glass in a cardboard box to put it out for disposal (eventually). Reuses plastic packaging. Their parents give them their paper and card to send for recycling. Separates the glass.	<ul style="list-style-type: none"> - The existence of government policy for sorting and recycling. - The supplier using recyclable packaging. 	<ul style="list-style-type: none"> - Lack of room to separate and dispose of recyclable waste efficiently. - Lack of room at home to make compost. - Not being used to reusable bags.
4	Level of Consumption of Organic Products: Low Level of Commitment to Disposal: Low	Separates Recyclables and Non-Recyclables. Reusing plastic containers (does not keep anymore).	<ul style="list-style-type: none"> - The existence of government policy for selective garbage collection. - The consumer's desire to dispose of food waste at home through composting 	

Source: Produced by the authors (2021)



The first group consists of those who consume organic products at a high level and are highly committed to disposal. These consumers take responsibility for most of the activities and behavior necessary for the CE, ranging from the basic task of sorting recyclables from organic waste to trying to reduce waste, paying great care and attention to packaging, and composting the waste from the products. Therefore, this group of consumers tends to be more willing to be active participants in the CE. We could see from the interviews that Circular Economic activities and behavior were regular and routine for this group, so we believe these consumers would be active participants. The drivers that this group of consumers identified included government policy around sorting and recycling. The organic food supplier encouraged customers to return and reuse packaging and buy products with less packaging at the market. This group of consumers identified the barriers: the supplier's lack of initiative to reuse packaging, the lack of sawdust for composting, and the problem when the consumer could not return the packaging to the organic food suppliers. To stimulate this group to keep committed to CE, it's advisable to promote knowledge among providers, encouraging them to take actions that enable facilitating resources for consumers to maintain CE initiatives. This can be done both by public authorities and by organizations focused on CE.

The second group consists of those who consume organic products at a high level and are moderately committed to disposal. These consumers' activities and behaviors demonstrated in support of the CE were sorting the recyclable and organic waste and paying care and attention to packaging. This group, however, identified more drivers for circularity in the study: the existence of government policy around sorting and recycling, organic food suppliers using recyclable packaging and encouraging the return and reuse of packaging, the consumer's desire to compost as a way of disposing of organic waste and the incentive of using reusable bags at the market. On the other hand, the barriers to the CE that this group mentioned were the lack of room at home to compost, not used to reusing peels, rinds and vegetable waste, and when the supplier does not ask for glass containers to be returned.

The third group consists of those who consume organic products at a medium level and show a similar commitment to disposal. Their activities and behaviors were similar to the second group, just to a lesser degree. The drivers identified by this group were: the existence of government policy around sorting and recycling and suppliers using recyclable packaging. The barriers to circularity that this group identified were not being used to reusable bags, the lack of room at home to separate and dispose of recyclable waste efficiently, or compost.

For both second and third groups, it was possible to understand that what makes difference is the level of CE initiatives, regardless of the level of consumption of organic products, so the maintenance of public and institutional stimuli for usage of recycling packages and bags and the generation of content about how to make use of the traditionally "non-consumable" parts of vegetables and fruits could be very interesting to increase the commitment of these groups.

Finally, the fourth group consists of those who consume organic products at a low level and show a similar commitment to disposal. When it comes to actions and behavior that support circularity, this group only separates the recyclable and non-recyclable waste. The drivers for this group of consumers were government policy for sorting and recycling and their interest in making compost to dispose of organic waste. Aside from the incentives, these consumers tended to show little interest in acting as active participants in the CE. This group did not identify any barriers. It was clear from the interviews that this group of consumers did not generally consider Circular Economic activities and behaviors worthwhile, suggesting that these consumers tend to be unlikely to become active participants in the circularity process. Therefore, basic actions as the maintenance of governmental actions regarding the sorting of



organic and recyclable waste are important to reinforce this group's behaviors that support CE.

5 CONCLUSIONS

This study aimed to identify drivers and barriers perceived by consumers of organic products regarding their actions supporting circularity. The drivers for consumers of organic products to play an active role in the circular process were organic food suppliers encouraging customers to return and reuse recyclable packaging, the option to buy products with less packaging at the farmer's market, incentives through the farmer's market to use reusable bags, the consumer's desire to dispose of food waste at home through composting, and the existence of government policy around selective garbage collection. The barriers to circular processes that were noted were: the supplier's lack of any initiative to reuse packaging and not asking customers to return glass containers, while for consumers there were barriers to composting at home, such as the lack of room and sawdust, as well as a lack of room to separate and dispose of recyclable waste efficiently, along with not being used to reusable bags and not used to reusing peels, rinds and vegetable waste. Also, the consumer cannot return the packaging to the organic food suppliers due to the risk of contamination by the coronavirus.

The activities consumers carried out were the sorting of recyclables and non-recyclables, composting, making use of reusable bags and market carts, separating glass for more specific uses - donation or reuse, reusing plastic and card packaging, using peelings and vegetable waste, as well as biodegradable bags for storing organic waste. As a result of the exceptional circumstances of the COVID-19 Pandemic (Abiral & Atalan-Helicke, 2020), many of the interviewees changed their disposal processes because they were now having home deliveries and took new steps which benefitted the CE.

The activities and behavior that supported the CE pointed to four groups of consumers, along with the drivers and barriers to circularity: (1) consumers of organic products with a high level of organic consumption and high commitment to disposal, (2) consumers of organic products with a high level of organic consumption and a medium commitment to disposal, (3) consumers of organic products with a medium level of organic consumption and a medium commitment to disposal and (4) consumers of organic products with a low level of organic consumption and low commitment to disposal.

Based on the data collected and analyzed in this study, we conclude that at one extreme, we have a group of consumers in group 1, who take responsibility for most of the activities and behavior needed for the CE to function and, at the other, consumers belong to group 4, who are mostly limited to the selective separation of recyclable waste. There is a gap between the sustainable behavior of these two groups and whether they become an active participant in the CE or not. Therefore, we can see that consumers who have a high level of consumption of organic products and commitment to their disposal (group 1) tend to be more willing to be active participants in the circularity process. In contrast, the opposite tends to be the case for consumers with a low level of consumption of organic products and little commitment to correct disposal (group 4). In other words, these consumers tend not to be active participants in the CE. Groups 2 and 3, meanwhile, are moderately likely to play an active part in supporting the CE.

Finally, in this study, we can also see that consumers with a high level of consumption of organic products were more committed to the disposal process, which means that these consumers tend to be more involved in sustainability. Consequently, they tend to be more willing to be active agents in the CE. Therefore, the data collected tells us that consumers of organic products tend to be more willing to be active participants in the circularity process.



Consumers can take on different roles, including co-creators (Sijtsema et al., 2020), making them active participants in the circular process. Regardless of this, because of the different behavior and attitudes of consumers towards disposal and sustainability, to be truly effective, a variety of strategies and approaches are needed (Haan et al., 2018) to direct the consumer to how they can be an active agent in the CE.

This study can help government and ONGs to implement public policies and actions helping a CE implementation in the city and in the countryside and, also to promote sustainability. The results can help all organic food chain, working together to implement new circular processes. Farmers can become more competitive and gain in resources efficiency. The authors proposed some initiatives regarding the consumer stimuli to CE.

Considering the importance of the consumer for the development of circularity, this study advances with a look at the consumer, contributing to the understanding, until then not investigated, of the perception of consumers of organic products regarding their actions supporting circularity.

The main limitations of this research refer to the number of interviewees and the small conclusive ordering power of importance of each driver and barrier found in the study. It is suggested in future studies the realization of a systematic literature review about this subject to support the results, as well as a survey to categorize the importance of drivers and barriers perceived by the consumers of organic products.

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