

Profiles of sustainable food consumption: Consumer behavior toward organic food in southern region of Brazil



Alexandre André Feil^a, Carlos Cândido da Silva Cyrne^a,
Fernanda Cristina Wiebusch Sindelar^b, Júlia Elisabete Barden^c, Marlon Dalmoro^{a,*}

^a Sustainable Environmental Systems Postgraduate Program, University of Vale do Taquari – Univates, 171 Avelino Tallini St., Universitário, 95900-000, Lajeado, RS, Brazil

^b Organizational Management Center, University of Vale do Taquari – Univates, 171 Avelino Tallini St., Universitário, 95900-000, Lajeado, RS, Brazil

^c Environment and Development Postgraduate Program, University of Vale do Taquari – Univates, 171 Avelino Tallini St., Universitário, 95900-000, Lajeado, RS, Brazil

ARTICLE INFO

Article history:

Received 13 July 2018

Received in revised form

17 February 2020

Accepted 18 February 2020

Available online 21 February 2020

Handling Editor: Baoshan Huang

Keywords:

Organic food
Consumer behavior
Consumer profile
Sustainable food consumption
Southern Brazilian consumers
Survey

ABSTRACT

Although the consumption of organic food is increasing around the world, the drivers are still not fully understood, especially in peripheral regions where sustainable food production and consumption systems are under development. Inconsistencies are found mainly in the differences in how people perceive organic food, what motivates people to buy and their attitudinal behavior while buying organic food. This study aims to analyze the relation between the socioeconomic and demographic profiles of organic food consumers and their motivations, perceptions and attitudes. We adopted a quantitative approach, and surveyed 1997 consumers of organic foods, who reside in the southern Brazilian state of Rio Grande do Sul. Results describe a complex perspective about consumer motivations, perceptions and attitudes towards organic food, in which the consumer profile is interrelated with an amalgam of intentional and attitudinal behavioral aspects despite of specific socioeconomic and demographic feature. Considering organic food as a mechanism to get a more sustainable food production and consumption system, theoretical implications highlight the importance to evaluate more sustainable consumption forms in line with consumer profile particularities. In managerial terms, the results indicate the necessity to act building a more homogeneous consumer perception, motivation and attitude towards organics food, as a form to improve a concrete sustainable food consumption mechanism in peripheral regions.

© 2020 Elsevier Ltd. All rights reserved.

1. Introduction

Consumer behavior is a key indicator of the development of green and sustainable production systems (Tseng et al., 2013). This notion derives from the fact that sustainable consumption is part of a complex and interactive system that encompasses simultaneous consumption and production processes (Reisch and Thøgersen, 2015). The significant and active role of the consumer in cleaner production is reflected in both academic and practical international agendas. One example is the recently United Nations Sustainable Development Goals (SDGs), in which the international entity

mandated consumption as a complement to sustainable production patterns (Lukman et al., 2016). In academic terms, recent studies also included sustainable consumption analysis as a complement to the previous focus on the production side (Hankammer et al., 2019).

Although many scholars provide frameworks for incorporating consumption in cleaner production domains (Tukker et al., 2008), and supply guidelines for public policies and initiatives (Tseng et al., 2013), unsustainable consumption behaviors and inefficient production activities by manufacturers indicate that the previous efforts are not enough (Wang et al., 2018). Following these authors, understanding consumer behavior towards more sustainable consumption patterns is a mechanism to orient more assertive product development. Consumer-centered perspectives on cleaner production studies can help extend sustainability from corporate or government discourse to understand how it is incorporated in consumers' behaviors and attitudes (Hankammer et al., 2019).

In these efforts, food consumption is the major sustainability

* Corresponding author.

E-mail addresses: afeil@univates.br (A.A. Feil), cyrne@univates.br (C.C.S. Cyrne), fernanda@univates.br (F.C.W. Sindelar), jbarden@univates.br (J.E. Barden), marlon.dalmoro@univates.br (M. Dalmoro).

issue, due to the impact on individual and public health, natural resources, social cohesion and the economy (Reisch et al., 2013). As Sala et al. (2017) pointed out, food supply chains are associated with environmental and socioeconomic impacts, resulting from increasing consumer need and changes in consumption models, reinforcing the notion that cleaner food production modes involve also sustainable food consumption. Thus, over the last 15 years, the search for more sustainable food production and consumption has identified in organics one of the main research context. Per example, Pérez et al. (2019) evokes the organic food production as a viable solution to diminish the negative environmental impact of conventional agriculture. Reganold and Wachter (2016) also recognize organic food as a more environmentally friendly mode of food production, compared to conventional agriculture. This affirmation is supported by the notion that organic food provides a sustainable balance in economic gains, food security, cleaner agricultural production and global ecosystem preservation (Schutter, 2011). In line with the growth in organic food production around the world, increasing organic food consumption is a global trend in developed (Meas et al., 2014) and developing countries (Pestek et al., 2018).

In this sense, previous studies focused on organic food consumption as an appropriated context to understand how sustainable consumption take forms and contributes to stimulate the organic food as a cleaner production system (Annunziata et al., 2019). The capacity of these studies supports the comprehension of sustainability concerns and the search for more sustainable consumers' lifestyles resides in the fact that organics food is understood to be more sustainable than conventional ones (Gustavsen and Hegnes, 2019). In face this, Szavar et al. (2018) pointed that sustainable food and organic food become closely interrelated and may sometimes be used alternatively. It is justified by the fact that organics involves the philosophy to support human health, ecosystem, and the soil, embodying the concept and philosophy of cleaner production (Chekima et al., 2017).

In theoretical terms, previous studies also focus on organic food consumption as a more sustainable consumption form (Thøgersen et al., 2015; Annunziata et al., 2019; Gustavsen and Hegnes, 2019). These efforts involve mainly understanding consumers behaviors towards organic food as a form to reveal nuances of sustainable consumption, detailing the 'consumer side' on sustainable food systems. However, previous studies capacity to describe consumers' claims and behavior is relatively low (Chekima et al., 2017). Perhaps the inconsistency in previous studies is due to the difference between what people express through attitudes (Thøgersen et al., 2015), their motivations for changing their consumption patterns (Yadav and Pathak, 2016) and how they perceive organic food as a more sustainable offer (Lee and Yun, 2015), creating a gap between consumers' intentions and attitudes (Vermeir and Verbeke, 2006). Previous studies called for further research to address this gap monitoring elements of sustainable consumer behavior, by considering perceptions and actions on organic food consumption (Chekima et al., 2017). Scholars in the field of cleaner production also claim that a deeper understanding of consumers' behavior and their buying motives will lead to better understanding of the sustainability attributes of organic food (Schäufele and Hamm, 2017).

Sustainable food consumption claims and actions comprehension has become more complex because of variations in consumer profiles (Vittersø and Tangeland, 2015). Consumers' profiles may present nuances regarding understanding of organic food and real consumption of organic foods. For example, although scholars in the United States context have identified distinctions in income and ethnic origin among those consuming organic foods (Dettmann and Dimitri, 2009), in Europe, researchers identified distinctions based

on age and gender (Grubor and Djokic, 2016). One explanation for these contradictions is that each country or region has different levels of access to organic food, which may influence the consumption profile and perceptions of those who seek this category of food (Dimitri and Dettmann, 2012). Another explanation is the inability of studies to capture and elucidate the attributes that guide consumers' choices. Socioeconomic and demographic features can be interrelated with behavioral aspects of organic food consumption, especially in emerging countries—rarely described in previous studies—such as Brazil, given its continental dimensions and sociocultural distinctions in different regions.

Following this assumption, this study aims to analyze the relation between the socioeconomic and demographic profile of organic food consumers and their consumption motivations, perceptions and attitudes. The state of Rio Grande do Sul in Brazil was taken as a specific context, because, as a region, it is one of the main consumers of organic food in Brazil (Organis, 2017). From a theoretical point of view, this study addresses a more complex view about the relation between socioeconomic and demographic profiles and intentional and attitudinal-behavior nuances of sustainable food consumption. The results provide information about consumers' claims and actions—previously requested as the main issue in organic food consumption (Chekima et al., 2017)—in relation to consumers' age, gender, education, income and family status.

Our results reveal a complex amalgam of motivations, perceptions and attitudes towards organic food, in which the consumer profile is interrelated. In doing that, we reinforce the importance about to understand intentional and attitudinal sustainable consumption behaviors – like organic food consumptions – in line with socioeconomic and demographic feature. These results support and guide producers and public managers in the development of sustainable food production methods aligned with consumers' claims and actions. As Lee and Yun (2015) emphasized, growth of the organic food market depends on identification of aspects of consumer behavior, which allow effective development and promotion of organic as a more sustainable food system. The tendency to use "words of production" to study consumption (Goodman and Dupuis, 2002) must be overcome, providing an effective and broad description of the sustainable food system from the consumption perspective. In doing that, organic food consumption comprehension has potential to provide a solid indicator to describe the real assimilation of products recognized as more sustainable by consumers. Findings, more than describing the consumer profile and behavior, work as claim for systemic comprehension of sustainable production and consumption dynamic, considering the consumer profile and behavior toward sustainable consumption as a complex amalgam configured and reconfigured constantly, despite singular, stable and universal patterns commonly claimed in previous literature. In the following sections, we detail these initial reflections in theoretical and empirical terms.

2. Theoretical background

2.1. Toward sustainability in organic food consumption behavior

The organic system for agricultural production consists of specific methods, such as cultural, biological and mechanical processes of production, processing, storage, distribution and commercialization, and protection of the environment (IFOAM, 2015). For Reganold and Wachter (2016), the centrality of organic agriculture lies in the systematics of crop rotation and diversity, soil improvements through the application of natural fertilizers (animals and plants), and pest management without the use of synthetic pesticides. In this way, organic agriculture can be characterized,

from a practical point of view, as a productive system that aims to sustain the health of soils, ecosystems and people, through coexistence with the natural system, minimizing pollution and environmental damage (Altieri, 2018).

For sustainability in food production, organic produce allows a reduction in the environmental impact of business processes and products when compared with conventional food production (Tuomisto et al., 2012). Previous studies described the organic food system from a production perspective (Altieri, 2018). However, the consolidation of an organic food system depends on consumers incorporating the products in their consumption habits (Sala et al., 2017). Evidence of the interrelation between the evolution of consumption and production over time can be observed when we compare organic food consumption and production expansion. Fig. 1 presents the evolution of the global area destined for organic production and global consumption of organic foods, demonstrating an interrelation between consumption and production growth.

Organic food production and consumption dynamics follow the assumption identified in the search for sustainable food, in which the production of sustainable food is directly connected to consumers' awareness of this kind of product and consumption improvement (Vittersø and Tangeland, 2015). This dialectic relation occurs because the construction of a product category recognized as sustainable depends on consumers' ability to distinguish the features of food—such as being organic—when compared with conventional foods in general (Migliorini and Wezel, 2017).

Given that the constitution of this category of product, called "organic foods," occurs through symbolic distinctions in relation to "conventional foods" (Thompson and Coskuner-Balli, 2007), incorporation of sustainability meanings into consumer choices depends on changes in consumer behavior regarding this new category. The future of organic produce depends on consumers' motivations and action to become 'organic consumers', and their perception of these foods as distinct from conventional produce, and more sustainable.

2.2. Consumer behavior toward organic food

The first studies on attributes of organic food consumption date from the 1980s. These studies sought to map attributes in the consumption of organic foods, and consumers' unique characteristics (Jolly et al., 1989). Pioneering studies indicated that in the U.S. context, organic food gives consumers an alternative means of expressing their concerns about the environment (Davies et al., 1995). These researchers reported, surprisingly, that the American

consumers surveyed did not report clear, health-related motivations for consuming organic foods. During the early 1990s, there was an international outcry about environmental issues, stimulating forms of consumption recognized as more ethical and environmentally oriented (Fotopoulos and Krystallis, 2002). Differently, in the European context, a series of food scandals, such as salmonella contamination of food, epidemics in cattle herds and concerns about the safety of new cooking techniques, led to reduced confidence in manufactured foods, and increasing recognition of the healthy appeal of organic food (Davies et al., 1995). Consumption of organic foods in Europe is also associated with a concern for health (Zakowska-Biemans, 2011).

Some of these variations can be explained by differing approaches for measuring consumer behavior. In the case of sustainable consumption behaviors (such as the choice of organic food), theories have followed mainly two approaches to investigate consumer behavioral outcomes: intentional and attitudinal (Vermeir and Verbeke, 2006). Following Miniero et al. (2014), the description of sustainable consumption requires recognition of the intentional aspects toward a product. This means recognizing that people's intentional behavior (like perception and knowledge) can effectively explain their action in choosing a sustainable product (Yadav and Pathak, 2016). Intentional behavior mainly involves establishing comparative motivations regarding the reasons for such purchases (Yadav and Pathak, 2016) and personal values that guide this consumption (Thøgersen et al., 2015). Thøgersen et al. (2015) identified that Brazilians, Chinese, Europeans and Americans present similar personal values related to organic products. This conclusion corroborates other studies in different contexts, reinforcing that organic consumers share values such as safety, hedonism, universalism, benevolence, self-control and compliance (Aertsens et al., 2009). Buying motivations also involve the desire to obtain benefits because of the consumption. Yadav and Pathak (2016) identified that consumers recognize healthier properties and product features as benefits of consuming organic food.

Rational perceptions about the benefits of consuming organic food can work as a lens through which consumers evaluate a product, and judge whether it can be useful for fulfilling their needs, and justify the efforts to consume the product. Following Lockie et al. (2002), organic foods involve images of wholesomeness and non-industrialized production methods. Another key aspect of organic food is the recognition that it is free of agrochemicals, pesticides and transgenics (Hughner et al., 2007), once chemicals from conventional agriculture indicate negative effects on climate change and human health (Sazvar et al., 2018). The word "organic" is associated with a wide variety of images and features, indicating widespread confusion regarding product recognition (Hartman Group, 2006). Following these previous studies, we observe two sides of consumer perception of organic foods: the "free" side (free of agrochemicals and free of transgenic, among others) and the "better" side (healthy and tasty, among others) of organic food.

In addition, attitudinal behavior toward organic food consumption aims to detail what consumers actually consume, and not what they consider consuming or evaluate (Chekima et al., 2017). Hjelmar (2011) highlighted that consumer attitudes to buying organic food can be explained by (a) convenience behavior, which is characteristic of pragmatic organic food consumers (influenced by the kind of products available in local markets and price) and reflected in the frequency with which they buy food, and (b) reflective practices, involving consumers' personal selection criteria when choosing food. The sensory attributes of organic food (nutrition aspects, freshness and appearance) tend to be recognized in products like fruits, vegetables and greens (Chekima et al., 2017). Lee and Yun (2015) found that nutritional content, ecological welfare and price sensitivity have strong effects on utilitarian and

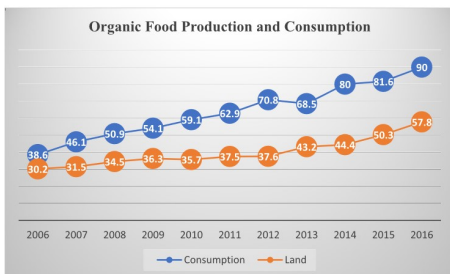


Fig. 1. Historical evolution of organic food production and consumption.

Source: adapted from Statista (2019); Willer and Lernoud (2018).

Note: Land is expressed in millions of hectares. Consumption is expressed in billions of U.S. dollars.

hedonic attitudes. Attitudes toward organic food involve environmental-oriented actions, as well as also personal orientations toward health and shopping conditions (Lee and Yun, 2015).

In Table 1, we summarize the three key behavioral aspects affecting organic food consumption identified in the literature. In addition, we detail the drivers and actions (variables) that help measure consumer behavior variations, and the impact on organic buying.

2.3. Consumer profile of organic food consumption

The organic consumer profile identified by surveys conducted around the world is characterized by numerous contradictions. These variations occur essentially in relation to consumers' socio-economic and demographic characteristics (Grubor and Djokic, 2016). For example, Fotopoulos and Krystallis (2002) found that Greek consumers are women with higher incomes and education levels. In Australia, Lockie et al. (2002) also found that organic consumers are mainly women, but the authors found no variation in income and education levels. In Germany, Janssen et al. (2009) did not find differences concerning income, gender or educational levels. These results demonstrate that there is no consensus on the profile of consumers of organic food, at the global level, regarding demographic and socioeconomic factors.

These variations may occur because each region has differing income, lifestyle, family configuration and product availability attributes, among others, and macrosocial and cultural variables, which can predict access to organic food (Hughner et al., 2007). Previous studies have found one of the key sociodemographic factors is gender. Examining the southern Brazilian context, we propose the following hypothesis:

H1. The behavior of consumers of organic foods differs according to the consumer's gender.

Hughner et al. (2007) identified age as an important predictor of organic consumer behavior, finding that younger consumers have favorable attitudes toward purchasing this kind of food. In Serbia (Grubor and Djokic, 2016) and Taiwan (Rong-Da Liang, 2014), organic food consumers seem to be mainly middle-aged individuals. Thus, we propose:

H2. The behavior of organic food consumers differs according to age.

High educational level is a socioeconomic aspect recognized as a predictor of organic food consumption (Nasir and Karakaya, 2014).

Table 1
Consumer behavior in relation to organic food consumption.

Behavioral aspects	Drivers and actions	Impact on purchase of organic food	Some previous studies
Motivation	Reasons for buying	Consumers have similar reasons for buying organic and sustainable food in general, which are mainly related to personal or family health and environmental concerns that motivate consumers to look for products without pesticides and fewer dyes and preservatives.	Annunziata et al. (2019); Yadav and Pathak (2016); Basha and Lal (2019)
	Values	Personal values can be an antecedent of behavior, work as a motivation for purchasing organic food.	Thøgersen et al. (2015); Aertsens et al. (2009)
	Consequences	Consumers are motivated mainly by consequences of organic food consumption, involving improvements of health and quality and the flavor of the product.	Husic-Mehmedovic et al. (2017); Asiole et al. (2018)
Perception	Image	See in organic food a food alternative that is safer, and healthier and more natural than conventional food.	Zakowska-Biemans (2011); Davies et al. (1995); Chekima et al. (2017)
	Characteristics	Trust that organic foods are free of agrochemicals, pesticides and transgenics; recognize a better flavor (sensorial appeal) in organic food.	Vittersø and Tangeland (2015); Hughner et al. (2007)
Attitude	Selection criteria	Consumers choose organic products based on the quality of the smell, taste and freshness. Consumers are less sensitive to the price.	Aprile et al. (2012); Lee and Yun (2015)
	Type of food	Organic consumers tend to choose low-fat and non-processed dairy products, like fruits, vegetables and greens.	Wadolowska et al. (2008); Vermeir and Verbeke (2006)
	Frequency	The inclusion of organic food in the shopping basket tends to grow over time, and gets more relevance in the total ratio of food shopping.	Juhl et al. (2017)

Although most previous studies indicate the predominance of a higher education level among organic consumers, Peštek et al. (2018) showed that education level does not affect the behavior of organic food consumers in Bosnia. Thus, we propose:

H3. The behavior of organic consumers differs according to their level of education.

Because organic food usually has a higher price than conventional produce (Aprile et al., 2012), one of the key socioeconomic factors associated with consumption of organic food is income. In Australia, Sultan et al. (2018) showed income level is a predictor in organic food purchasing decisions. As important as identifying the income level is identifying how many people are dependent on the income. Purchasing power is related not only to family income but also to the number of people living on that income. Thus, we propose the following:

H4a. The behavior of organic consumers differs according to income.

H4b. The behavior of organic consumers differs according to the number of family members who depend on the same income.

In the impact of family structure on organic food consumption, previous studies indicated that marital status and children are predictors of organic buying behavior. Taiwanese organic food consumers are mainly married with children (Rong-Da Liang, 2014). In the main capital cities of Europe, the existence of children at home has a considerable influence on the purchase organic products (Nasir and Karakaya, 2014). Thus, we propose the following:

H5a. The behavior of organic food consumers differs according to the number of children.

H5b. The behavior of organic food consumers differs according to marital status.

Following identification of the five hypotheses related to consumer socioeconomic and demographic profiles for organic food consumption behavior, we present a theoretical model (Fig. 2) for the seven profile elements in relation to the three levels of consumer behavior: motivation, perception and attitudes.

3. Method

We defined the locus of the study as the southern region of Brazil, the Rio Grande do Sul (RS) state. Fifteen percent of the population nationwide consume organic products; whereas in Rio

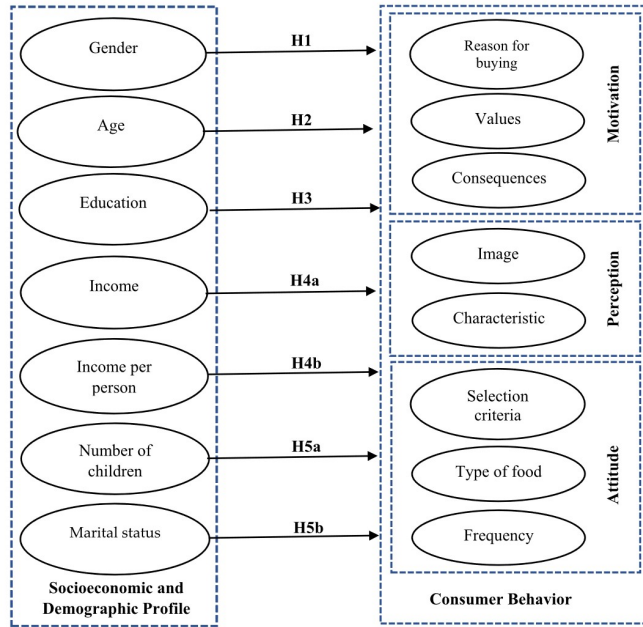


Fig. 2. Theoretical model.

Grande do Sul, this percentage is 34% (Organis, 2017). The population of Rio Grande do Sul was 11.3 million in 2017, distributed in 497 municipalities (IBGE, 2017). According to estimates by Organis (2017), this region has 3.8 million consumers of organic foods, who comprised the study population. From these consumers, 2693 answered the questionnaire. After the data collection, 696 questionnaires were excluded, because the respondents did not consume organic foods. The resulting sample was composed of 1997 respondents from 80 cities.

The number of respondents is statistically significant with a margin of error of 2.89% and a reliability of 99%. Specifically, following the characteristics of convenience sampling, the researchers selected consumers who were able to answer, without a filter. To access consumers, the research team went to places with a significant flow of people, e.g., universities and companies where respondents could fill out the questionnaires while at work or during class breaks.

The questionnaire was developed using an instrument called the Barometer – perception and consumption of organic foods (Graega, 2018), involving 27 questions about characteristics of organic food consumption, consumers' intentions and attitudes toward organic food, as well as measuring respondents' social, economic and demographic profiles. To check consistency and mistakes in the questionnaire, a pre-test was conducted with seven respondents.

For data collection, the printed questionnaires were applied from August to October of 2016, and involved a pool of 10 researchers. The research team offered the printed form to consumers at their place of work or university with an average

response time of 8 min. The reliability of the responses was based on Cronbach's α , and $\alpha = 0.823$ indicates that the internal consistency of the questionnaire was almost perfect, according to Field, (2013) classification. Statistical tests were performed using IBM SPSS Statistics 23 software.

Data analysis involved descriptive statistics, a correction test and a variance test of the means. The Kolmogorov-Smirnov and Shapiro-Wilk homogeneity tests suggested the most appropriate type of statistic based on the characteristics of the collected data, indicating that $p < 0.01$, assuming an asymmetric distribution. This result indicates the use of non-parametric statistics, such as the Spearman correlation test and the Jonckheere-Terpstra test. Spearman's correlation measures the strength and direction of the relation between two variables, and can be classified as low correlation (between 0.20 and 0.39), moderate (between 0.40 and 0.59) or strong (above 0.59; Mitra and Lankford, 1999). We analyzed whether there is a statistically significant correlation between sociodemographic variables, and the choices and inclinations of organic food consumers. The Jonckheere-Terpstra test analyzes whether the means had statistically significant differences ($p < 0.05$). Results of the data analysis are presented in the next section.

4. Results

The sociodemographic profiles of the respondents indicate that most consumers of organic foods who participated in this study have the following characteristics: are female (59.3%), are unmarried (54.3%), do not have children (64.6%), have a monthly income

between R\$1200.00 (about US\$300.00; 42.6%) and R\$4100.00 (about US\$1050.00) (51.3%), live in a family unit of two or three people (52.9%) and are aged 21–30 years (44.5%). Compared with previous studies involving organic consumers in Brazil (Hoppe et al., 2013), this sample demonstrated similar prevalence of women and income range. Marital status and household configuration differed: We found a prevalence of unmarried consumers who did not have children.

The respondents had consumed organic foods for more than five years (38%). Around 1%–10% of their weekly purchases are related to organic foods, and the criteria on which the consumers' purchasing decisions are based included the freshness of the food (62.8%). These results agree with those of other previous studies in Brazil (Maciel et al., 2015), and demonstrate that – even all the respondents are organic food consumers – organic food consumption is sporadic, and accounts for a limited portion of the total food shopping basket.

To better explore consumers' interaction with organic food, we analyzed their knowledge of and access to and belief in organic food more deeply. Organic food consumers tend to dedicate more effort to accessing this kind of product, stimulated by health and sustainability benefits (Yadav and Pathak, 2016). Results indicated that individual concerns about health (mean 7.54) and socio-environmental responsibilities (mean 7.39) are the main drivers in organic food consumption. Complementary, external influences (mean 5.05) had lower means. The present results showed that aspects such as knowledge about organic products and product availability had higher variation among the sample.

4.1. Correlation and variance analysis

Following the Hartman model (2018), the organic consumer profile varies widely in intensity and meanings. This data set also showed variations in consumer knowledge, access and beliefs. Looking for correlational elements that can explain this variation, we applied the Spearman test (r_s) to test possible correlations between socioeconomic and demographic variables. Gender, age, marital status, education, family and personal income, and number of children had no statistically significant correlation ($r_s < 0.200$). In line with previous studies in the United States (Sridhar et al., 2012) and Germany (Janssen et al., 2009), these findings help us understand that variations in organic food consumption patterns are not explained only by socioeconomic and demographic variances.

Demirtas (2018) explained that a high variance in organic food consumer profiles could be due to behavioral elements. Applying the Jonckheere-Terpstra test, we found that several socioeconomic and demographic profiles had statistically significant mean differences ($p < 0.05$), when compared to consumer behavior variables described in the present research model (see Fig. 2). In Table 2, we show the difference in the means for the profile and consumer motivation to consume organic food.

The results revealed statistically significant mean differences ($p < 0.05$) in specific variables of each construct, without a homogeneous pattern that explains the relation between all the constructs. Regarding the reasons for purchase, results showed differences in the means ($p < 0.05$) in relation to gender (H1), age (H2), education (H3) and family income (H4a). The construct involving personal values indicated statistically significant mean differences in family income (H4a). The construct measuring the consequences of organic food consumption did not have mean differences, but certain variables had statistically significant results. The motivations for health benefits varied according to gender (H1), age (H2), number of persons reliant on income (H4b), number of children (H5a) and marital status (H5b).

In the following, we present the means difference in the profiles

and consumer perception of organic food consumption (Table 3).

For consumer perception, the Jonckheere-Terpstra test revealed that almost all variables of organic food characteristics and image perception have mean differences ($p < 0.05$) in gender (H1), except for the perception of organic as being "natural." For specific variables, there were statistically significant mean differences ($p < 0.05$) in relation to perceptions that organic products are free from pesticides. Although part of the consumers demonstrated clarity about this point, another part did not. Although all organic food is free of pesticides (Reganold and Wachter, 2016), consumer perceptions are not yet homogeneous in relation to this basic feature. This variation in consumer perception helps explain the heterogeneity patterns in knowledge and beliefs about organic food. Finally, we move beyond intentional behavioral aspects to explore the means difference among attitudinal behaviors and consumer profiles (Table 4).

While recognizing that organic food consumer profiles are partially explained by specific behavioral elements (Demirtas, 2018), we tested the correlation between profile and attitudinal actions toward buying organic food. Results indicated there were statistically significant mean differences ($p < 0.05$) in the freshness selection criteria in all socioeconomic and demographic profiles, except for "income per person." Statistically significant mean differences ($p < 0.05$) were also found in vegetables and greens as the most consumed type of food. This result suggests that organic food consumption can vary, following food choice preferences and access to organic products aligned with personal preferences. In the next section, we discuss these results in line with previous literature and hypotheses.

5. Discussion of findings

In a general analysis, the results show that intentional and attitudinal consumer behavior dimensions are related to specific aspects of socioeconomic and demographic profiles, despite of a typical archetype. One of the explanations resides in the fact that we tested multiples consumer behavior constructs – motivation, perception and attitudes. Previous studies (Grubor and Djokic, 2016; Peštek et al., 2018; among others) usually analyzed focus on attitudinal or intentional behaviors. Our findings reveal that intention and attitudes does not follow the same patten in relation to organic food consumers profile. Different from the expectations in the theoretical model, our empirical analysis supported partially or not supported our hypotheses. We detail the hypotheses results in Table 5.

Looking in specific for H1, we observe that the three consumer behavior constructs (attitudes, motivation and perception) differ in some way in terms of consumer gender, but not within all the variables of each construct. In this sense, while in previous studies gender was describe as a predictor of organic food consumption (Hughner et al., 2007), we observe that this assumption is supported in our sample only in terms of some specific variables. One reason can be that fact that organic food consumption is mainly an autonomous choice driven by some specific aspects, like sustainability concerns and health lifestyles (Teis et al., 2017). These elements are generally more associated with woman behavior towards organics (Vermeir and Verbeke, 2006), but indicate a homogeneous behavior among woman. In this sense, H1 results need to be interpreted in association with the Brazilian context particularities, where the construction of a homogenous perception of the features of organic foods remains a challenge (Dalmoro, 2015).

The relation between organic food consumption behavior and age was also partially supported. Differently from previous studies that found similar relation in terms of attitudes (Grubor and Djokic, 2016), we found that motivations to buy organic can varies

Table 2
Jonckheere-Terpstra test of socioeconomic and demographic profiles and consumer motivation..

Motivations vs. socioeconomic and demographic profile	Reason for buying			Values			Consequences		
	Without pesticides	No dyes and preservatives	Healthy	Longevity	Life quality	Enjoy life	Health benefits	Product quality	Flavor
H1 (Gender)	0.040	0.021	0.000	0.072	0.893	0.908	0.000	0.846	0.479
H2 (Age)	0.028	0.081	0.019	0.000	0.145	0.616	0.000	0.862	0.112
H3 (Education)	0.000	0.007	0.000	0.000	0.145	0.114	0.804	0.000	0.074
H4a (Family income)	0.000	0.000	0.000	0.000	0.000	0.005	0.176	0.000	0.000
H4b (Income per person)	0.299	0.497	0.867	0.317	0.658	0.006	0.000	0.084	0.708
H5a (Number of children)	0.046	0.113	0.225	0.237	0.240	0.978	0.000	0.100	0.334
H5b (Marital status)	0.865	0.199	0.840	0.050	0.479	0.268	0.000	0.604	0.469

Note: Mean differences are statistically significant when $p < 0.05$.

Table 3
Jonckheere-Terpstra test of socioeconomic and demographic profiles and consumer perceptions..

Perception vs. socioeconomic and demographic profile	Organic food characteristics				Image	
	Natural	Free from transgenics	Free from pesticides	Better flavor	Healthier	Eco-friendly
H1 (Gender)	0.868	0.001	0.000	0.000	0.018	0.008
H2 (Age)	0.011	0.284	0.000	0.007	0.636	0.348
H3 (Education)	0.419	0.000	0.008	0.002	0.995	0.000
H4a (Family income)	0.438	0.000	0.000	0.000	0.355	0.036
H4b (Income per person)	0.000	0.551	0.000	0.220	0.417	0.000
H5a (Number of children)	0.428	0.118	0.000	0.605	0.676	0.356
H5b (Marital status)	0.077	0.195	0.064	0.579	0.384	0.073

Note: Mean differences are statistically significant when $p < 0.05$.

according to age. One explanation for this can be explained by the increase in sustainability and awareness of health among young adults around the world (Nielsen, 2015). Youngers could be more motivated to adopt organic food, even that it cannot be yet totally incorporate it in their consumption attitudes, representing a gradually process of changing in consumption behavior.

In relation to H3, we found support to specific variable on the three constructs. It reinforces previous studies that indicates a directly effect between level of education and positive behavior towards organic (Nasir and Karakaya, 2014). We observe that higher educational level is generally associated with access to information in peripheral countries like Brazil and become an important predictor for motivational and attitudinal behavior towards organic food. Nevertheless, perception about organic food does not change following the education level. Corroborating with previous results (Dalmoro, 2015) which identify that key characteristics of organic foods – free of agrochemicals, pesticides and transgenics (Hughner et al., 2007) and reduction of impacts on environmental and human health (Sazvar et al., 2018) – are not totally assimilated by the population as a whole.

Income is related with consumers motivations towards organics (H4a). The explanation can reside in the fact that usually organics are more expensive than conventional products (Aprile et al., 2012), impacting in the way as consumers are motivated to pay or not the premium price associated with organics. Corroborating previous works (Lee and Yun, 2015), personal orientations towards health and sustainability associated with shopping condition work as motivational drives to buy organics. However, even with higher price, consumers with different income levels perceive the organic characteristics equally and have a positive attitude towards it. This interpretation is corroborated with rejection of H4b. Number of people living with the same income does not impact on attitudinal or intentional organic food consumer behavior. We understand that organic shopping basket does seem to impact on family budget (Lee and Yun, 2015) and consumers who fell motivate to buy organic food will do independently of the number of members in the family.

Finally, testing H5a, we observe that number of children impacts on attitudes towards organic food. The explanation for these results can be found in the fact that organic food is associated with health

Table 4
Jonckheere-Terpstra test of socioeconomic and demographic profiles and consumer attitudes.

Attitudes vs. socioeconomic and demographic profile	Selection criteria		Type of food most frequently consumed			Purchasing and consumption frequency	
	Quality	Price	Freshness	Fruit	Vegetables and greens	% of weekly food shopping	Consumption history
H1 (Gender)	0.413	0.114	0.002	0.001	0.000	0.025	0.415
H2 (Age)	0.925	0.000	0.000	0.660	0.000	0.013	0.246
H3 (Education)	0.028	0.015	0.000	0.071	0.001	0.010	0.135
H4a (Family income)	0.000	0.607	0.000	0.209	0.000	0.602	0.695
H4b (Income per person)	0.068	0.005	0.236	0.674	0.000	0.002	0.149
H5a (Number of children)	0.304	0.181	0.004	0.006	0.107	0.000	0.000
H5b (Marital status)	0.544	0.001	0.049	0.418	0.000	0.455	0.014

Note: Mean differences are statistically significant when $p < 0.05$.

Table 5
Hypothesis tests.

Hypothesis	Result
H1: The behavior of consumers of organic foods differs according to the consumer's gender.	Partially supported; reasons for buying (motivations), image (perception) and type of food most consumed (attitudes) differ according to gender.
H2: The behavior of organic food consumers differs according to age.	Partially supported; the reasons for buying (motivations) differ according to age.
H3: The behavior of organic consumers differs according to the level of education.	Partially supported; reasons for buying (motivations), type of food most consumed (attitudes) and selection criteria (attitudes) differ according to the level of education.
H4a: The behavior of organic consumers differs according to income.	Partially supported; personal values (motivations) differ according to income.
H4b: The behavior of organic consumers differs according to the number of family members who depend on the same income.	Not supported.
H5a: The behavior of organic food consumers differs according to the number of children.	Partially supported; the frequency with which organic food is bought and consumed (attitude) differs according to the number of children.
H5b: The behavior of organic food consumers differs according to marital status.	Not supported.

benefits (Yadav and Pathak, 2016) and people with children tend to be proactive to incorporate these benefits to their and their children diet (Nasir and Karakaya, 2014). Interesting to note that this attitudinal variation is not associated with marital status (H5b), reinforcing that positive attitudes towards organics are associated with the children presence at home independently of the marital status.

In shedding light on the relation between the socioeconomic and demographic profiles of consumers of organic food and their motivations, perceptions and attitudes toward this kind of products, the results revealed the complex task of understanding sustainable consumption patterns. In the last two decades, we have been seen an increasingly well-theorized challenge to understand the sustainable production and consumption system (Vitterso and Tangeland, 2015). Although the debate over whether, and how, to integrate consumption in the system continues to be important (Tseng et al., 2013), the dimension "consumption" in a sustainable and cleaner production system cannot be reduced to a simple construction. It is necessary to recognize a multidimensional relation, involving socioeconomic and demographic patterns that dictate the consumer profile, but also intentional and attitudinal behavior that will guide action toward sustainable products.

Considering the specific market of organic products as a more sustainable alternative to market food, the most critical point is that regulation, production, distribution and retailing are changing

dramatically, following consumer demand (Lockie et al., 2002). Most of this change is not supported by a thorough description of patterns and relations of organic food consumption. The main contribution of this study to literature on sustainability is detailing the relation between intentional and attitudinal behaviors and the variation in organic food consumer profiles as a result of multiple variables that are related, and explain organic food consumption as a complex amalgam that is configured and reconfigured constantly. Variations in the profile found in different regions can be explained not only by the socioeconomic and demographic differences of each region (Dimitri and Dettmann, 2012) but also by behavioral features of consumers following the cultural attributes of each region, psychological features of the consumers and their buying attitudes. Recognizing that these behavioral aspects make identification of the profile of organic consumers even more complex, this study provides a useful tool for describing sustainable food consumption patterns in different regions, considering not only the profile but also its intersection with three different facets of consumer behavior.

5.1. Theoretical implications

First, we contribute to the organic food consumer profile description by detailing that, in general, consumers are a mix of sustainability- and health-seekers. In a counterpoint to previous

studies, in which consumers were shown to claim organic food is a more environmentally oriented and healthy alternative (Lockie et al., 2002), the present results showed that although consumers look for sustainability and health benefits, they do not recognize these features in organic food homogeneously. Although some were motivated to buy organic food because of health benefits, others were not. The explanation can be partially found in the fact that environmental concerns and health and lifestyle affect organic purchase (Basha and Lal, 2019). The present results help in extending the explanation power for this variation in explaining the impact of socioeconomic and demographic variables on it. For example, gender affects the image of organic food as healthy, and in the recognition of organic food as free of pesticides, and consequently, more sustainable. Organic food consumers are not equally healthy and sustainability-oriented consumers. They manifest a healthy and sustainable orientation depending on their consumer profile. Some profiles look for the environmental externality of organic food, such as food free of agrochemicals and free of transgenics, among other elements recognized by the literature as more sustainable (Reganold and Wachter, 2016), while other profiles look for personal benefits, such as health and taste, among other food features recognized in organic food (Lee and Yun, 2015).

Second, in revealing nuances of the consumer profiles, we also extend previous studies in describing the behavioral elements that impact the profiles. Annunziata et al. (2019) described that economic patterns and a high level of education increase the likelihood of consuming organic foods. This immediate profile impact on consumption was partially confirmed in this study, but depends on what dimension of organic food consumption behavior is being tested. Testing motivation, perception and attitudes can show, for example, that in family economic patterns, the reasons for buying can vary (Yadav and Pathak, 2016) and values (Thøgersen et al., 2015), but not in the perceptions of the consequences of buying organic food. This extends the studies that analyzed organic food consumption from a profile perspective (Vittersø and Tangeland, 2015), as well as from a behavioral perspective (Chekima et al., 2017). We observed that the consumption of organic food does not follow specific socioeconomic and demographic features, but is in a complex relation involving specific features and behaviors.

Third, the theoretical model allows to overcome the inconsistency of previous studies in considering the gap between intentions and attitudes toward organic food (Chekima et al., 2017). This model tested three different nuances of consumer behavior: motivation and perception (both allow measurement of intention; Yadav and Pathak, 2016) and attitudes. The results confirmed the differences between claims and actions when the claims vary, following mainly health benefits and no use of pesticides, while attitudes vary according to the type of product and freshness. Vittersø and Tangeland (2015) found changes in perceptions toward purchasing organic food, in which consumers see fewer benefits in consuming organic food. The present results contribute to this reflection in explaining that once consumers change their food routines, they reduce the necessity of endorsing the perception about the food, and incorporate it in their routine (Plessz et al., 2016), by considering shopping preferences, such as taste preference (e.g., variation in eating more or fewer greens and vegetables) and freshness.

5.2. Managerial implications

In managerial terms, managers should tailor their actions toward a more homogeneous perception and motivation to consume organic food in all consumer profiles. As Lee and Yun (2015) emphasized, growth of the organic food market is based on identification of consumption attributes, which allow the effective

development and promotion of organic food. For example, gender differences in organic perceptions limit the popularization of organic food. Following the southern Brazilian scenario, manager can enrich the positive perception by better informing consumers that organic foods are free from pesticide products. In the Brazilian context, managers also need to enlarge the product offer beyond greens and vegetables. Some consumers have many options; other have difficulty finding organic products. Homogenizing the offer, and focusing on taste and individual preferences, would increase consumption of organic foods in Brazil.

For managerial and public policy actions, the results indicate the necessity to improve the level of knowledge about health and environmental benefits on organic production and consumption. This point is important to public policy makers, because clarifying this misunderstanding about organic food is not only a marketing task but also a public health and sustainability question. In a context like Brazil, where consumers are looking for a more “green” and “healthy” consumer lifestyle (Thøgersen et al., 2015), public policy should stimulate a production reorientation toward this lifestyle, despite the privilege of conventional food regimes. The high concern about environmental and health impacts of food choices can spearhead the transition to a more sustainable food system. Governments have an important role in influencing and setting the agenda for public debate, to minimize the variations in perception, motivations and attitudes toward organic food. Filling in these gaps can stimulate the demand for organic food, and consequently, transition to more sustainable food production models. The future of organic food will depend considerably on consumers’ motivations (Lockie et al., 2002). Consumption must be at the center of food system analyses, and consumer reflexive intentions and attitudes can be a key agent for change toward a more sustainable food system, which will ultimately encourage and trigger more sustainable food production.

6. Conclusions

The present research offers a contribution to the literature on sustainable food consumption, by investigating the variation in consumption motivations, perceptions and attitudes in the socioeconomic and demographic profiles of organic food consumers. We conclude that the variation on organic food consumer profile resides in distinct behavioral aspects toward organic food: perceptions, attitudes and motivations. Our results reveal that organic food consumer profile in the southern region of Brazil is interrelated with an amalgam of intentional and attitudinal behavioral aspects, despite of specific socioeconomic and demographic feature.

Nonetheless, this conclusion must be interpreted in line with the study limitations. In particular, the convenience and non-probabilistic sample limits generalization of the results, which explain the behavior and profile of inhabitants of Rio Grande do Sul in Brazil only. The study model should be applied to other regions, aiming to explore how regional characteristics affect the correlation and variance between organic profiles and consumer behavior. In addition, this study could be replicated over different periods of time, following the logic of longitudinal panels previously adopted, to understand variations in organic consumer behavior.

Further studies could explore our framework involving the relation between perceptions, attitudes and motivations and socioeconomic and demographic feature to develop indicators for sustainable food consumption prediction. Additionally, intentional and attitudinal behaviors of consumers in response to organic producers’ and retailers’ practices also can be investigated as a complement to object-centric perspective adopted in this study. Incorporating these behaviors on further studies would provide a more complete scenario about the importance of consumption in

stimulating actions of cleaner production and allow to overcome production-centered frameworks still preeminent in sustainability studies.

Declaration of competing interest

Author has not research grants or honorarium from companies for this research and declares that have no conflict of interest, including other parts illustrations and copyright works.

CRedit authorship contribution statement

Alexandre André Feil: Conceptualization, Methodology, Formal analysis, Writing - original draft, Writing - review & editing. **Carlos Candido da Silva Cyrne:** Conceptualization, Data curation, Writing - original draft. **Fernanda Cristina Wiebusch Sindelar:** Conceptualization, Formal analysis, Writing - original draft. **Júlia Elisabete Barden:** Conceptualization, Data curation, Writing - original draft. **Marlon Dalmoro:** Conceptualization, Data curation, Writing - original draft, Writing - review & editing.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jclepro.2020.120690>.

References

- Aertsens, J., Verbeke, W., Mondelaers, K., Van Huylenbroeck, G., 2009. Personal determinants of organic food consumption: a review. *Br. Food J.* 111, 1140–1167.
- Altieri, M.A., 2018. *Agroecology: the Science of Sustainable Agriculture*. CRC Press, Boca Raton, FL.
- Annunziata, A., Agovino, M., Mariani, A., 2019. Sustainability of Italian families' food practices: mediterranean diet adherence combined with organic and local food consumption. *J. Clean. Prod.* 206, 86–96.
- Aprile, M.C., Caputo, V., Nayga, R.M., 2012. Consumers' valuation of food quality labels: the case of the European geographic indication and organic farming labels. *Int. J. Consum. Stud.* 36, 158–165.
- Asioli, D., Wongprawns, R., Pignatti, E., Canavari, M., 2018. Can information affect sensory perceptions? Evidence from a survey on Italian organic food consumers. *AIMS Agric. Food* 3, 327–344.
- Basha, M.B., Lal, D., 2019. Indian consumers' attitudes towards purchasing organically produced foods: an empirical study. *J. Clean. Prod.* 215, 99–111.
- Chekima, B., Igau, A., Wafa, S.A.W.S.K., Chekima, K., 2017. Narrowing the gap: factors driving organic food consumption. *J. Clean. Prod.* 166, 1438–1447.
- Dalmoro, M., 2015. Cultural meanings construction: an analysis of the organic grape juice market. *REMark* 14 (1), 97–109.
- Davies, A., Titterton, A.J., Cochrane, C., 1995. Who buys organic food?: a profile of the purchasers of organic food in Northern Ireland. *Br. Food J.* 97 (10), 17–23.
- Demirtas, B., 2018. Assessment of the impacts of the consumers' awareness of organic food on consumption behavior. *Food Sci. Technol.* forthcoming.
- Dettmann, R.L., Dimitri, C., 2009. Who's buying organic vegetables? Demographic characteristics of U.S. consumers. *J. Food Prod. Market.* 16 (1), 79–91.
- Dimitri, C., Dettmann, R.L., 2012. Organic food consumers: what do we really know about them? *Br. Food J.* 114 (8), 1157–1183.
- Field, A., 2013. *Discovering Statistics Using IBM SPSS Statistics*. Sage, London.
- Fotopoulos, C., Krystallis, A., 2002. Purchasing motives and profile of the Greek organic consumer: a countrywide survey. *Br. Food J.* 104 (9), 730–765.
- Goodman, D., Dupuis, E.M., 2002. Knowing food and growing food: beyond the production–consumption debate in the sociology of agriculture. *Sociol. Rural.* 42, 5–22.
- Graega, 2018. *Barómetro 2017: Percepción e consumo de alimentos ecológicos en Galicia*. <https://www.craega.es/wp-content/uploads/2019/03/Barometro-2017.pdf>. accessed 21 March 2018.
- Grubor, A., Djokic, N., 2016. Organic food consumer profile in the Republic of Serbia. *Br. Food J.* 118, 164–182.
- Gustavsen, G.W., Hegnes, A.W., 2019. Individuals' personality and consumption of organic food. *J. Clean. Prod.* 1–9.
- Hankammer, S., Brenk, S., Fabry, H., Nordemann, A., Piller, F.T., 2019. Towards circular business models: identifying consumer needs based on the jobs-to-be-done theory. *J. Clean. Prod.* 231, 341–358.
- Hartman Group, 2006. *Organic2006: Consumer Attitudes & Behavior Five Years Later & into the Future*. Hartman Group, Bellevue, WA.
- Hjelmar, U., 2011. Consumers' purchase of organic food products. A matter of convenience and reflexive practices. *Appetite* 56, 336–344.
- Hoppe, A., Vieira, L.M., Barcellos, M.D., 2013. Consumer behavior towards organic food in Porto Alegre: an application of the theory of planned behavior. *Rev. Econ. e Soc. Rural* 51, 69–90.
- Hughner, R.S., McDonagh, P., Prothero, A., Shultz II, C.J., Stanton, J., 2007. Who are organic food consumers? A compilation and review of why people purchase organic food. *J. Consumer Behav.* 6 (2–3), 94–110.
- Husic-Mehmedovic, M., Arslanagic-Kalajdzic, M., Kadic-Magljalic, S., Vajnberger, Z., 2017. Live, Eat, Love: life equilibrium as a driver of organic food purchase. *Br. Food J.* 119, 1410–1422.
- IBGE. Rio Grande do Sul, 2017. *Dados*. <https://ww2.ibge.gov.br/estadosat/perfil.php?sigla=rs> accessed 21 March 2018.
- IFOAM – International Federation of Organic Agriculture Movements, 2015. *Principles of Organic Agriculture Preamble*. IFOAM, Bonn.
- Janssen, M., Heid, A., Hamm, U., 2009. Is there a promising market 'in between' organic and conventional food? Analysis of consumer preferences. *Renew. Agric. Food Syst.* 24, 205–213.
- Jolly, D.A., Schutz, H.G., Diaz-Knauf, K.V., Johal, J., 1989. Organic foods: consumer attitudes and use. *Food Technol.* 43 (11), 60–66.
- Juhl, H.J., Fenger, M.H., Thøgersen, J., 2017. Will the consistent organic food consumer step forward? An empirical analysis. *J. Consum. Res.* 44, 519–535.
- Lee, H.J., Yun, Z.S., 2015. Consumers' perceptions of organic food attributes and cognitive and affective attitudes as determinants of their purchase intentions toward organic food. *Food Qual. Prefer.* 39, 259–267.
- Lockie, S., Lyons, K., Lawrence, G., Mummary, K., 2002. Eating 'green': motivations behind organic food consumption in Australia. *Sociol. Rural.* 42, 23–40.
- Lukman, R.K., Glavic, P., Carpenter, A., Vrtič, P., 2016. Sustainable consumption and production—Research, experience, and development—The Europe we want. *J. Clean. Prod.* 138, 139–147.
- Maciel, W.R.E., Oliveira, D.M., Sanches, A.C., Lima-Filho, D.O., 2015. Segmentação dos consumidores a respeito dos produtos orgânicos. *Revista Capital Científico-Eletrônica* 13, 76–92.
- Meas, T., Hu, W., Batte, M.T., Woods, T.A., Ernst, S., 2014. Substitutes or complements? Consumer preference for local and organic food attributes. *Am. J. Agric. Econ.* 97 (4), 1044–1071.
- Migliorini, P., Wezel, A., 2017. Converging and diverging principles and practices of organic agriculture regulations and agroecology: a review. *Agron. Sustain. Dev.* 37 (6), 63.
- Miniero, G., Codini, A., Bonera, M., Corvi, E., Bertoli, G., 2014. Being green: from attitude to actual consumption. *Int. J. Consum. Stud.* 38, 521–528.
- Mitra, A., Lankford, S., 1999. *Methods of Data Collection in Leisure Research*. Sagamore, Champaign, IL.
- Nasir, V.A., Karakaya, F., 2014. Consumer segments in organic foods market. *J. Consum. Market.* 34, 263–277.
- Nielsen, 2015. *Green Generation: Millennials Say Sustainability Is a Shopping Priority*. <https://www.nielsen.com/tw/en/insights/news/2015/green-generation-millennials-say-sustainability-is-a-shopping-priority.html>. accessed 21 March 2018.
- Organis, 2017. *Qual o tamanho do mercado de orgânicos no Brasil?* <http://organis.org.br/qual-o-tamanho-do-mercado-de-orgânicos-no-brasil/>. accessed 21 March 2018.
- Pérez, I.A.V., Toral, J.N., Vázquez, A.T.P., Hernández, F.G., Ferrer, G.J., Cano, D.G., 2019. Potential for organic conversion and energy efficiency of conventional livestock production in a humid tropical region of Mexico. *J. Clean. Prod.* 241, 1–17.
- Peštek, A., Agić, E., Činžarević, M., 2018. Segmentation or organic food buyers: an emergent market perspective. *Br. Food J.* 120, 269–289.
- Plessz, M., Dubuisson-Quellier, S., Gojard, S., Barrey, S., 2016. How consumption prescriptions affect food practices: assessing the roles of household resources and life-course events. *J. Consum. Cult.* 16, 101–123.
- Reisch, L.A., Thøgersen, J., 2015. *Handbook of Research on Sustainable Consumption*. Edward Elgar Publishing, Massachusetts.
- Reganold, J.P., Wachter, J.M., 2016. Organic agriculture in the twenty-first century. *Nat. Plants* 2, 01.
- Reisch, L., Eberle, U., Lorek, S., 2013. Sustainable food consumption: an overview of contemporary issues and policies. *Sustain. Sci. Pract. Pol.* 9, 7–25.
- Rong-Da Liang, A., 2014. Enthusiastically consuming organic food: an analysis of the online organic food purchasing behaviors of consumers with different food-related lifestyles. *Internet Res.* 24, 587–607.
- Sala, S., McLaren, S.J., Notarnicola, B., Saouter, E., Sonesson, U., 2017. In quest of reducing the environmental impacts of food production and consumption. *J. Clean. Prod.* 140, 387–398.
- Sazvar, Z., Rahmani, M., Govindan, K., 2018. A sustainable supply chain for organic, conventional agro-food products: the role of demand substitution, climate change and public health. *J. Clean. Prod.* 194, 564–583.
- Schäufele, I., Hamm, U., 2017. Consumers' perceptions, preferences and willingness-to-pay for wine with sustainability characteristics: a review. *J. Clean. Prod.* 147, 379–394.
- Schutter, O., 2011. Report Submitted by the Special Rapporteur on the Right to Food. United Nations, Geneva.
- Sridhar, K., Bezawada, R., Trivedi, M., 2012. Investigating the drivers of consumer cross-category learning for new products using multiple data sets. *Market. Sci.* 31 (4), 668–688.
- Statista, 2019. *Worldwide Sales of Organic Food from 1999 to 2016*. <https://www.statista.com/statistics/273090/worldwide-sales-of-organic-foods-since-1999/>. accessed January 15th, 2019.
- Sultan, P., Wong, H.Y., Sigala, M., 2018. Segmenting the Australian organic food consumer market. *Asia Pac. J. Market. Logist.* 30 (1), 163–181.

- Thøgersen, J., de Barcellos, M.D., Perin, M.G., Zhou, Y., 2015. Consumer buying motives and attitudes towards organic food in two emerging markets: China and Brazil. *Int. Market. Rev.* 32 (3), 389–413.
- Thompson, C.J., Coskuner-Balli, G., 2007. Countervailing market responses to corporate co-optation and the ideological recruitment of consumption communities. *J. Consum. Res.* 34 (2), 135–152.
- Tleis, M., Callieris, R., Roma, R., 2017. Segmenting the organic food market in Lebanon: an application of k-means cluster analysis. *Br. Food J.* 119 (7), 1423–1441.
- Tseng, M.-L., Chiu, S.F., Tan, R.R., Siriban-Manalang, A.B., 2013. Sustainable consumption and production for Asia: sustainability through green design and practice. *J. Clean. Prod.* 40, 1–5.
- Tukker, A., et al., 2008. Fostering change to sustainable consumption and production: an evidence based view. *J. Clean. Prod.* 16, 1218–1225.
- Tuomisto, H.L., Hodge, I.D., Riordan, P., Macdonald, D.W., 2012. Does organic farming reduce environmental impacts? – a meta-analysis of European research. *J. Environ. Manag.* 112, 309–320.
- Vermeir, I., Verbeke, W., 2006. Sustainable food consumption: exploring the consumer “attitude–behavioral intention” gap. *J. Agric. Environ. Ethics* 19, 169–194.
- Vittersø, G., Tangeland, T., 2015. The role of consumers in transitions towards sustainable food consumption: the case of organic food in Norway. *J. Clean. Prod.* 92, 91–99.
- Wadolowska, L., Babicz-Zielinska, E., Czarnocinska, J., 2008. Food choice models and their relation with food preferences and eating frequency in the Polish population. *Food Pol.* 33 (2), 122–134.
- Wang, C., Ghadimi, P., Lim, M.K., Tseng, M.L., 2018. A literature review of sustainable consumption and production: a comparative analysis in developed and developing economies. *J. Clean. Prod.* 206, 741–754.
- Willer, H., Lernoud, J., 2018. *The World of Organic Agriculture. Statistics and Emerging Trends 2018*. IFOAM, Bonn.
- Yadav, R., Pathak, G.S., 2016. Intention to purchase organic food among young consumers: evidences from a developing nation. *Appetite* 96, 122–128.
- Żakowska-Biemans, S., 2011. Polish consumer food choices and beliefs about organic food. *Br. Food J.* 113 (1), 122–137.