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Local Fresh Food Products and Plant-Based Diets: An Analysis of the Relation Between Them

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Abstract: Goal number 12 of the United Nations Sustainable Development Goals proposes attaining sustainable production and consumption. Public administrations, firms, and organizations must be involved in this achievement, as well as citizens as consumers. In our case, we focus on consumers and on two food-related decisions: the buying and consumption of local products, specifically vegetables and fruits, and the decision to follow a plant-based diet, concretely vegans and vegetarians. The aim is to check if there exists a relation between the two questions. We carried out empirical research in a South European city, and we found that a significant relation between these behaviors does not exist. It is necessary to increase consumer perception about the advantages of consuming local products, reducing the limitations that they come across, and transmitting clear information from administrations and industries. Greater involvement from consumers in sustainable food practices will contribute to sustainability.

Keywords: local products; sustainable development goals; plant-based diets

1. Introduction

Among the Sustainable Development Goals (SDG) presented by the United Nations in Agenda 2030 [1] is goal number 12, which proposes reaching sustainable production and consumption. To achieve this, the producers have to be involved in the choice of production processes that respect the environment, conducting civil society toward responsible consumption models. By responsible consumption we mean a change in people's consumption habits, balancing their real needs with the planet's sustainability. This would lead to choices of products and services according to their quality, prices, and environmental and social impacts [2].

Food is the single strongest lever to optimize human health and environmental sustainability on Earth [3]. The aim of responsible consumption can be analyzed from different points of view: producers, distributors, stakeholders, etc. This work has been done from the perspective of the behavior of the consumer. From this viewpoint, the main ways of developing a sustainable diet are: on the one hand, acquiring local products as an example of responsible consumption, given that it involves shopping behavior that is ethical, sustainable, and respects the environment [4,5]. On the other hand, the option of plant-based diets influences sustainability through reduction in pollution and less use of soil and pesticides, meaning ten times less water consumption [6,7].

The interest in buying local products has recently increased [8,9] and its development has received attention from public institutions. Hence, the European Union, through its community policies (Common Agricultural Policy (CAP)), establishes standards, thereon, and carries out studies about the opinions of European consumers. In this vein, Special Eurobarometer 416 [10] shows that only 35%

of Europeans choose local products to protect the environment, preferring to select other measures, such as recycling or reducing energy consumption, so only 22% consider that buying local products must be a priority for the environment. Recently, Special Eurobarometer 473 [11] indicated that more than 75% of the respondents recognize that, when buying food products, they consider important aspects, such as local traditions and knowledge about products of a specific geographical zone. On the other hand, about 88% of respondents think that it is important to strengthen the role of food producers in the supply chain.

However, the definition of what is considered a local product is ambiguous [12]. From the marketing point of view, at both academic and managerial levels, it is interesting to know what the attributes are that identify local products, as they can be used to influence consumer decisions about both food products and the establishments that commercialize them [13,14].

Parallel to the phenomenon of local products, and considered as another expression of concern for the sustainability of the planet, a transformation in the food habits of numerous people is taking place in western countries: people are going from meat-based diets to diets based on vegetables and fruits. For example, this is one of the groups of greater growth in the last decade in the United States [15]. The Economist even baptized 2019 as “The year of the vegan” [16]. Vegans and vegetarians are found within this type of diet [17] as they do not consume animal origin products. While vegans do not consume items produced by animals, such as eggs or dairy products, vegetarians can opt to be ovo vegetarians (which allows for the consumption of eggs), lacto vegetarians (allows for milk and its derivatives), or api vegetarians (allows for honey). To include both vegan and vegetarian diets, some authors use the term “veg*an” [17,18], which will be used in this work, to refer to consumers who follow vegetarian or vegan diets.

In spite of the interest in these two food trends, we have not found works that relate local products with consumers who follow special diets. That is why this work intends to go thoroughly into the study of local foods (specifically the consumption of fruits and vegetables, as they are local products most commonly purchased [9]), as well as the consumers who follow some type of diet included in the veg*an diet. The main aim of the work is to discover the relation between veg*an consumers and fresh local fruits and vegetables. With this goal in mind, we establish two sub-objectives. Firstly, and with an eminently descriptive character, to go deeply into how local products are perceived by the general population, discovering aspects, such as arguments for their consumption, the barriers to their purchase, and so forth. Secondly, and with an explanatory character, to analyze if there exist differences between veg*an consumers and consumers who do not follow these diets, concerning the perceived characteristics of fresh, local fruits and vegetables.

This work continues with a review of the two topics addressed, local products, and veg*an consumers. Later, the research methodology is provided, presenting the items analyzed in the questionnaire and the sample used. After, the results are shown and we conclude with the study's implications and conclusions.

1.1. Local Products

There is a lack of unanimity about the concept of local products. For the United States, their definition refers to the locality or region in which the final product is commercialized, where the total distance in which the item covers is less than 400 miles (643.7 km.), or else local products are those from the state in which they are produced. For the European Union, and following Kneafsey et al. [19], a local food system is that in which the food is produced, processed, and sold within a specific geographic area, ranging between 20 and 100 km. Recently, the European Union [20] defined a short supply chain as that which involves a limited number of economic operations, committed to cooperation, local economic development, and social and geographic relations between producers, intermediaries, and consumers. From an academic point of view, Lang et al. [13] compiled from previous research the characteristics of local products: (1) they are products from near to where the

consumer lives or buys; (2) they are defined according to the distance or traveling time of the state or other political frontiers, and (3) they are products in the closest community.

The results of some research about the distance admitted for a local product and about its geopolitical frontiers establish a maximum of 117 miles, although the distance is less for the majority (70 and 75%, respectively) of those surveyed by Onozaka et al. [21] and by Byrd et al. [22], who define local within a radius of 50 miles (80.46 km.). With respect to the geopolitical frontier, the state in which the person resides is established as a maximum [8,13,23].

Irrespective of this definition, Schönhart et al. [24] have developed an interesting review of the effects of local products, drawing the conclusion that they help sustainability for four reasons: economic, ecological, social, and human welfare. These elements are the base of the arguments that support the consumption of local food products [13,23]:

- economic: they strengthen local economies, generating employment and permitting the maintaining of small businesses of farmers and commercial establishments [8,21,24,25];
- social: they favor contacts between producers and consumers, which influences greater information and knowledge of what is consumed and enables developing a feeling of community. This can mean changes in shopping and consumption habits [8,21,24–26];
- gastronomic: they allow accessing healthier diets, and fresher and tastier products [8,21,25];
- concern for the health of the family: considering that local products are of better quality and are healthier [8,21,24,25];
- environmental: producing and consuming nearby products reduces contamination due to transport [8,21,24,25].

In spite of these reasons and of, in general, society's involvement with environmental problems, consumers will only buy local food products when the costs of doing so are not significant [27], there being an imbalance between what consumers declare about socially desirable behaviors and what they really do [14].

Hence, some of the barriers indicated about local products are their lack of availability, the scant variety of products, the lack of information (producers, advantages, identification, etc.), or their high price. With respect to the price, some consumers are prepared to pay more for these types of products, up to 20% according to Carpio et al. [28], or 23% in Lang et al. [13], and there exists a positive relation between a greater involvement with the environment and supporting the local economy with a willingness to pay a premium for local products [29]. Yet, Feldmann and Hamm [14] found in a review of 73 articles that local foods are not perceived as more expensive.

Nevertheless, these barriers are not generalized, as differences exist among consumers concerning their motivation, attitude, and behavior about local products.

Regarding motivation, Birch et al. [30] find that egoistic motivations (health, food safety) influence consumption decisions more than altruistic motivations (ecological, ethical). As to attitudes, Zepeda and Deal [25] have discovered that the most committed consumers reinforce their attitudes, increasing the behavior of shopping for local products. In any case, and as Feldman and Hamm [14] underline, it is necessary to increase consumer information and knowledge to develop positive attitudes toward local products, which leads to the behavior desired.

As to consumer behaviors with respect to local products, these depend on the products that are analyzed, as well as the consumer profiles. Firstly, Feldmann and Hamm [14] find that consumers of local products are prepared to pay more, although this depends on the products in question. Secondly, and regarding the consumer profiles, Zepeda and Deal [25] note that one of the few sociodemographic variables related with the purchase of local products is one's education level, as this is connected with a search for information and a greater knowledge. However, economic level does not influence the purchase of local products. In their review, Feldmann and Hamm [14] observe that older consumers, who live in rural areas and are more concerned with their health, are those who support local products more, due to having stronger roots in their region, and as a reaction to the preference of young people

who typically opt for ready meals. Likewise, women are more inclined to buy local products, though men are more willing to pay more for them. Lang et al. [13] observe that the major buyers of local food consider its definition to be more complex, considering aspects such as small, family properties of the producers of these items, and that they are products that are unique to the region. Furthermore, consumers create a set of establishments and categories in which to obtain these products, so that the value in which they confer to local products depend on the attributes of creditability that these offer.

Other factors have been analyzed to explain the greater disposition to acquiring local products, such as a stronger involvement with the family, with cooking, and with food. Hence, Miroso and Lawson [31] discover that the buyers of local products value time and activities with their families, and they make more effort when shopping. Various research works [32–34] reveal that a greater involvement with preparing meals is a predictor of the purchase of local products, as is enjoying cooking [35].

Nonetheless, more than discovering a specific profile of consumers of local products, other authors have proposed different segments, given that this market is heterogeneous. Kumar and Smith [9] analyze how attitudes influence the motivations of consumers when buying local products and find, via the Theory of Planned Behavior [36], four groups of consumers. These groups are differentiated with respect to awareness of health and concerning the local economy and community, considering subjective norms, the frequency of shopping and the relation between attitude and local product shopping intention as well. For their part, Witzling and Shaw [37] find five segments of consumers, according to the lifestyle related with food and the consumption of local products. The “adventurers” and the “traditional” show a greater interest in local products, and are prepared to pay a premium for them, while the “rational” are not ready to pay more for these products. The segments of the “non-involved” and of “convenience” buy these products less frequently and, if they do so, it is a question of products that require a minimum of preparation.

1.2. Plant-Based Diets

The changes in the food diet, eliminating products of animal origin, respond to numerous justifications and arguments [6]:

- health: it has been demonstrated that a plant-based diet contains a low number of calories and is rich in products of plant origin [38], which permits reducing the likelihood of chronic diseases (i.e., Alzheimer, Parkinson) and an increase of life expectancy [39]. A plant-based diet fits these health recommendations better than other diets, especially a meat-based diet;
- sustainability: plant-based diets positively influence a reduction of pollution, climate change, less use of soil and pesticides, and ten times less consumption of water [6];
- moral conditioners: we find three reasons; (1) sustainability, understood as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” [40] means a moral reason for public administrations. (2) The concern for equity and justice in more developed countries causes a plant-based diet to allow a greater availability of food in poorer countries. Finally, (3) animal welfare rights [6], which highlights the cruelty of factory farming, the rights of animals, and the development of scientific knowledge about the awareness and emotions of animals. A plant-based diet fulfills these moral conditions better than other diets, especially a meat-based diet;
- identity: to eat meat is seen as a cornerstone of natural human behavior [15], and is related with ideas of power, control, wellbeing, and masculinity. On the contrary, diets that eliminate meat and are plant based correspond to ideas of weakness, poverty, and femininity. A plant-based diet can, in some cases, be understood as a means of reaffirming one’s own personality. To eat is a social act, which hinders the changes to plant-based diets, especially for men [6]. When people self-characterize themselves as vegetarians, they are giving special importance to a particular attribute, not eating meat, as a defining part of their social identities [6,15]. This can be an

especially important factor, not only at the beginning of these types of diets, but particularly in maintaining them over time;

- institutional factors: there exists strong support from governments toward the meat sector, given that many developed countries are large exporters of its products. However, governments of countries that have diets based on plant products defend that they produce less costs for the health system, increase labor productivity (due to the reduction of chronic diseases and illnesses associated with the production and consumption of animal proteins), and generate lower levels of rubbish [6].

Among these arguments, we find the concern for the environment and its consequential behaviors in vegetarians, in Fox and Ward's [41] study, as well as the ethical aspects and a greater concern for health in the works of de Boer et al. [42] and Graça et al. [18].

Regardless of the reasons that underlie the choice of diet, the literature points out that consumers of vegan and vegetarian diets behave differently from meat consumers.

Hoek et al. [43] demonstrate that vegetarianism positively affects attitudes toward behaviors of ecological consumption, and find differences, such as vegetarians considering the information included with the product to be more important, seeking specialized shops more, and giving greater importance to health and less to price than non-vegetarians. They also more frequently think that cooking is not uniquely a task for women and more commonly find that meals are a social act. Likewise, vegetarians enhance novelty in recipes and products, supporting ecological products. In this vein, [44] find that the attitudes of vegetarians are more conducive toward alternative food systems.

The profile that Hoek et al. [43] notes is of vegetarians being predominantly women, with high education levels, with small families, and residing in urban zones. This profile has been maintained in recent years, as the results of Pohjolainen et al. [45] and Lantern [46] show, in which the profile of the consumer of a plant-based diet is a woman, millennial, urban, who lives in a small household (made up of one or two people), has university studies, and some other vegetarian among her group of family and acquaintances.

Based on the literature review, we propose the following hypotheses:

Hypotheses 1 (H1): *there are significant differences in the perceived characteristics of local products between consumers who follow plant-based diets and consumers who do not follow those diets.*

Hypotheses 2 (H2): *there is a positive relationship between consumers who follow plant-based diets and the frequency of purchase of local products.*

2. Methodology

2.1. Measurement Scales and Questionnaire

To attain the aims proposed, empirical research was designed using a questionnaire about the perceptions of consumers concerning local food products. We consider as perceptions the interpretation or meaning that people give to the sensorial stimuli, which they perceive and the opinions that they create through their perceptions of the world that surrounds them, and that are different to those of other people. Specifically, about local products, different authors analyze the perceptions of the characteristics of local products, their advantages and their drawbacks, their perceived quality, their price, and so on [14,47–49].

The questionnaire gathers sociodemographic information about the consumer-sex, age, marital status, size of the family unit and about their perception of their economic situation with respect to the Spanish society and to friends and family [50]. Likewise, they were asked about their shopping behavior for fresh fruit and vegetables to do with the purchasing frequency (never, once/month, twice/month, once/week, 2–3 times/week, 4 or more times/week) in distinct commercial formats [51], and their perception of a greater or lesser consumption of fruits and vegetables in their households, with respect to the Spanish average (half a kilo, which is equivalent to three medium pieces a day).

We focused on local fresh fruits and vegetables, given that these are the foods with a greater volume of consumption per capita [52].

A question was included, concerning if there was a person in the family unit who followed a plant-based diet (vegetarian, vegan, etc.). It is important to highlight that the respondent is the main person in charge of shopping for food products for his/her family. The behavior, knowledge, attitudes, and perceptions of this person, who is the one who decides in the sales point, is decisive regarding the buying of individual products and the final shopping basket. Previous studies [53,54] have employed this process as well in the case of a plant-based diet [55].

Regarding local products, following Lang et al. [13], they were asked about their concepts of them, as well as their benefits and the barriers that they found for acquiring them. To help in the defining of local products they were asked their opinions about geographic limits (up to 25, 50, 75, 100 km or more) and the geopolitical limits (municipal, provincial, regional, or national) that they would admit for local products. In this case, we followed Lang et al. [13], but adapted the answers to the Spanish reality. We also asked about the premium that they would be willing to pay for local food products (setting out from two euros per kilo, we proposed up to 0.5, 1, 1.5, 2, and 2.5 euros more), adapting the scale of Lang et al. [13]. Finally, we included the frequency of shopping for local fresh fruits and vegetables in the last month, following the previous scale of the frequency.

T-point Likert scales were used for all measurements about perceptions.

2.2. Sample and Data Collection

The study population was consumers of fresh food products. To select the sample, we opted for an intermediate city in the south of Europe, Córdoba, due to it being considered a representative model of food distribution typical of a Mediterranean city (for its location and population size). Due to its location, it represents a cultural model based on street life and a layout of dense, urban sections in which shops are integrated as part of the landscape. Given its population size (320,000 inhabitants), there exists a critical mass of consumers sufficient for the trends that we study in this work to be present.

Córdoba is one of the 160 cities worldwide that signed the Milan Urban Food Policy Pact [56]. Currently, less than 10% of the local products are of their own production or are acquired directly from the producers. The great majority are obtained by consumers through large distribution channels or through local businesses [57].

The data collection work was done by technicians of Mercacórdoba via a convenience sample, through age quotas, with consumers of the city of Córdoba. The data sample was collected via personal interviews. Routes were designed for each of the districts. The technicians of Mercacórdoba followed these routes to seek consumers willing to take part in our research. As we have said before, the questionnaire was done by the person in charge of food shopping within the family.

The sample was made up of 600 consumers, 55.4% of whom were women. Regarding age, 12.4% were between 18 and 29 years old, 18.4% between 30 and 41, 31.2% between 42 and 54, 28.2% between 55 and 72, and 9.8% were over 72 years old.

A total of 71% were married or living with a partner; 74.5% of the sample had a family unit size of more than two members, although only 31.2% of the sample had minors in the household. Concerning education level, 7.3% had university studies and 45.6% had secondary studies or similar.

As to the socioeconomic situation, 43.2% considered that, in comparison with the Spanish society in general, their situation was the same, while 40.4% considered that their situation was better. In comparison with their close core units (friends, family), 61.4% considered that their economic situation was the same, while 38.6% considered that it was better.

With respect to the purchase of fresh fruits and vegetables, this most often takes place in supermarkets (more than once a week), followed by hypermarkets (once a week), while traditional shops obtain a lower frequency (twice a month).

For 62.4% of the sample, the quantity consumed of fresh fruits and vegetables is higher than that of other families in their environment, while 25.4% consider that their consumption is similar.

Regarding categories of products with a local character, they are purchased more than once a week, whether fruits or vegetables, although more than 40% state that they buy local products more than two or three times a week.

Finally, 20.1% of respondents indicate that some member of their family follows a vegan or vegetarian diet. In Spain, the proportion of plant-based diets is around 10% [46]. This segment is oversized in the sample, with the aim of carrying out statistically significant comparisons.

2.3. Statistical Tools

Data treatment was done via IBM SPSS 26. To achieve the first sub-objective, we employed descriptive statistics and correlations. A *t*-test was used for the second sub-objective. Moreover, a *t*-test was utilized for the main goal, which deals with discovering the relation between families with veg*an members and fresh local fruits and vegetables. Moreover, we conducted a (Partial Least Squares) PLS analysis to analyze the causality relation between motivations, limiters, and the consumption of these local products. Lastly, we carried out an Multigroup Analysis (MGA-PLS) to analyze the differences of the two groups compared to the relations considered.

3. Results

The first sub-objective of this work was to go deeply into how local products are perceived by the population in general, discovering aspects, such as the arguments for their consumption, the barriers to their purchase, and so on.

The sample reflects a high knowledge of what is meant by local products. When defining them, consumers mainly consider that they are products coming from their province or region, and that they are seasonal, rather than being products produced by small independent firms (Table 1).

Table 1. Conception of local products.

	Average	Deviation
There has to be little distance (in km) from where they are produced to where they are sold	5.56	1.60
They are seasonal products	5.65	1.52
They are products of small independent firms	5.50	1.64
They are products of firms of their province or region	5.66	1.68
They are traditional products of their province or region	5.59	1.62

Local products mean different advantages (Table 2), a concern for health and gastronomic reasons—better taste, quality, etc., —being those that are more important for the respondents.

Table 2. Importance given to the advantages or benefits of local products.

	Average	Deviation
Ecological (less environmental impact)	5.50	1.74
Concern for the health of my family	5.95	1.56
Gastronomic (better taste, quality, fresher)	5.84	1.55
Economic (support of the local economy)	5.78	1.60
Social (greater information, origin of the products, fair trade, etc.)	5.72	1.63

The factor that most hinders the purchasing of fresh local fruits and vegetables is high price, followed by the lack of information on whether it is a local product or not, and its availability, as they are not found in their usual shops (Table 3).

Table 3. Limitations or barriers to purchasing local products.

	Average	Deviation
Lack of knowledge of the advantages of these type of products	4.77	1.95
Disinterest in these types of products	4.60	2.02
Price is high	5.01	1.97
Mistrust in the certification process	4.74	2.11
They are not found in my usual shops	4.88	2.09
The quality is similar to other, conventional products	4.76	2.15
Lack of information to know if the product is local or not	4.92	2.17

In spite of the perceived price being higher, and with respect to a base price of two euros per kg, 37% would be prepared to pay a 0.5 € (euro) premium, 26.4% one euro more, and 22.7% would pay 1.5 euro more per kg of fresh local fruits and vegetables (Table 4).

Table 4. For a kilo of fruits or vegetables that costs 2 euros, how much would you be willing to pay more if it was a local product?

	Frequency	Percentage
Up to 0.5 €	221	37%
Up to 1 €	158	26.4%
Up to 1.5 €	136	22.7%
Up to 2 €	64	10.7%
Up to 2.5 €	8	1.3%
Up to 3 €	2	0.3%
Up to 3.5 €	9	1.5%

Regarding geographic limits, 45.4% of the sample think it is acceptable to be considered as local if the product is provincial, while 23% are stricter, considering the municipality as the limit, and only 16.2% would accept the region as the limit (Table 5). By distance, the limit is 25 km for 22.2% of the sample, 50 km for 30.2% of the sample, and 75 km for 30.7% of the sample (Table 6).

Table 5. What would be the limit that you would consider appropriate for local products?

	Frequency	Percentage
Municipal	138	23%
Provincial	272	45.3%
Regional	97	16.2%
National	77	12.8%
European	11	1.8%

Table 6. What would be the distance that you consider acceptable, from the production to the sale to the customer, to be considered a local product?

	Frequency	Percentage
Up to 25 km	133	22.2%
Up to 50 km	181	30.2%
Up to 75 km	184	30.7%
Up to 100 km	88	14.7%
Up to 150 km	12	2%
More than 150 km	2	0.3%

To sum up, with respect to our first sub-objective, we find a broad knowledge of the characteristics that define local products. Regarding the advantages or motivations that the consumers surveyed point out, those due to the family health and gastronomy are greater. The price is the main limitation,

although a high percentage of the sample would be willing to pay a premium. The geographic limitations to consider a product as local are mainly provincial.

With respect to the second sub-objective, we have developed two hypotheses. To test the first hypothesis, we now analyze if there exist differences between families with a veg*an member and those who do not follow these diets, concerning the perception of fresh local fruits and vegetables.

To do so, we performed different *t*-tests, using the factor of a family member following a veg*an diet or not. Firstly, we check if there exist differences in their sociodemographic characteristics, with the result that vegan/vegetarian families have a greater number of members in the home. They also perceive their economic statuses to be higher than the Spanish average and higher than that of their immediate environments, in a statistically significant manner (Table 7). Likewise, there exists an association between families with a veg*an member and their education level (Chi squared = 22.316, Signification-sign. 0.001).

Table 7. Characteristics non-veg*ans vs. veg*ans (*t*-test non-veg*ans vs. veg*ans).

	<i>t</i> -Test for Independent Samples	Sign.	Non-veg*ans		veg*ans	
			Average	Deviation	Average	Deviation
Family size	−3.751 *	0.000	3.18	1.146	3.61	0.98
Econom-Spain	−4.273 *	0.000	3.21	0.874	3.59	1.01
Econom-close	−4.696 *	0.000	3.25	0.763	3.64	1.01
Supermarkets	2.050	0.041	4.04	1.304	4.31	1.29
Self-service	−3.028 *	0.004	3.05	1.733	3.55	1.59
Traditional shops	−0.035	0.003	2.97	1.758	3.21	1.72
Consumption Fruit & Veg.	−4.772 *	0.000	0.88	1.461	4.04	0.79

* Equal variances are assumed.

As to shopping behavior, they have a greater shopping frequency in establishments such as supermarkets, self-service shops, and traditional shops than non-veg*an families. Likewise, they have a significantly greater daily consumption of fruits and vegetables, as seems obvious due to their diets (Table 7).

With regard to fresh local fruits and vegetables, and concerning the characteristics that define them, there only exists one statistically significant difference: that families with a veg*an member think that these products are produced by small independent firms (Table 8).

Table 8. Characteristics of local products (*t*-test non-veg*ans vs. veg*ans).

	<i>t</i> -Test for Independent Samples	Sign.	Non-veg*ans		veg*ans	
			Average	Deviation	Average	Deviation
Produced by small firms	4.093	0.044	5.43	1.64	5.77	1.59

There do not exist significant differences regarding the advantages of consuming these local products (Table 9). However, as to the limitations for buying them, the families with a veg*an member present significant differences in that they consider that there are less barriers for their purchases (Table 10).

To test the second hypothesis, to discover the relation between the families with a veg*an member and the shopping frequency of fresh local fruits and vegetables, the results (Table 11) indicate that there does not exist a significant relation, and even that the average of the frequency of shopping for local products is higher for non-veg*an families. Therefore, we find that the relation is not met between a greater frequency of shopping for local products and families with a veg*an member.

Table 9. Advantages of local products (*t*-test non-veg*ans vs. veg*ans).

	<i>t</i> -Test for Independent Samples	Sign.	Non-veg*ans		veg*ans	
			Average	Deviation	Average	Deviation
Ecological	0.278	0.598	5.48	1.73	5.58	1.79
Family health	1.597	0.207	5.99	1.52	5.78	1.73
Gastronomic	0.053	0.818	5.84	1.49	5.80	1.75
Economic	0.067	0.796	5.78	1.55	5.74	1.78
Social	1.179	0.278	5.68	1.59	5.86	1.76

Table 10. Barriers of local products (*t*-test non-veg * ans vs. veg * ans).

	<i>t</i> -Test for Independent Samples	Sign.	Non-veg*ans		veg*ans	
			Average	Deviation	Average	Deviation
Lack of knowledge	3.866	0.000	4.92	1.90	4.13	2.02
Disinterest	3.370	0.001	4.74	1.99	4.04	2.02
High price	5.442 *	0.000	5.22	1.85	4.14	2.20
Mistrust	2.860 *	0.004	4.86	2.04	4.24	2.32
Not found in their usual shops	3.174 *	0.002	5.01	2.00	4.33	2.37
Similar quality	3.355 *	0.001	4.91	2.07	4.18	2.36
Lack of information	3.668 *	0.000	5.08	2.08	4.28	2.38

* Equal variances are assumed.

Table 11. Shopping frequency of local products (*t*-test non-veg*ans vs. veg*ans).

	<i>t</i> -Test for Independent Samples	Sign.	Non-veg*ans		veg*ans	
			Average	Deviation	Average	Deviation
Shopping frequency of local vegetables	1.758	0.087	4	1.46	3.75	1.40
Shopping frequency of local fruits	1.111	0.270	4.06	1.50	3.89	1.48

With respect to the second sub-objective, in which we seek to analyze the significant differences between the families with a veg*an member and non-veg*an families, we find a different sociodemographic profile, a higher frequency of shopping in supermarkets, self-service stores and traditional shops, and, logically, a greater daily consumption of fruits and vegetables in the home. Although there do not exist significant differences between the advantages granted to local products, the families with a veg*an member present less purchase limitations or barriers than non-veg*an families. The highest frequency of purchases of fresh local vegetables and fruits occurs in those families who do not follow plant-based diets. This result is surprising, as we will comment on in the discussion section.

To finish with the second sub-objective, we have analyzed the relation between the motivators and the limitations of fresh local fruits and vegetables and their consumption. To do so, we have used a multigroup analysis with structural equations (MGA-PLS). This analysis has various phases:

Firstly, we have ensured the reliability and validity of the measurement scales (Table 12). The results of the reliability of the items, of the constructs (with the Cronbach alpha, CA, and composite reliability, CR), convergent validity (via Average Variance Extracted, AVE), and discriminant validity (Heterotrait-to-Monotrait, HTMT, and Fornell and Larker) are appropriate for the recommendations of the literature [58].

Table 12. Reliability and validity (Loadings, Average Variance Extracted, Composite Reliability, Cronbach's Alpha).

		Global	non-veg*ans.	veg*ans
Motivations	AVE	0.698	0.691	0.566
	CR	0.942	0.939	0.901
	Cronbach's Alpha	0.928	0.928	0.873
Ecological (less environmental impact)		0.851	0.905	0.814
Concern for the health of my family		0.805	0.886	0.897
Gastronomic (tastier, quality, fresher)		0.834	0.886	0.931
Economic (support of the local economy)		0.892	0.768	0.873
Social (better information, origin of the products, fair trade, etc.)		0.918	0.679	0.841
Limitations	AVE	0.761	0.759	0.688
	CR	0.942	0.940	0.916
	Cronbach's Alpha	0.922	0.921	0.888
Lack of knowledge of the advantages of this kind of products		0.816	0.787	0.852
Disinterest in this kind of products		0.809	0.822	0.837
Their price is high		0.804	0.769	0.827
Mistrust in the certification process		0.805	0.756	0.839
They are not found in my normal shops		0.756	0.751	0.809
The quality is similar to other, conventional products		0.854	0.659	0.862
Lack of information to know if a product is local or not		0.848	0.713	0.823
Consumption	AVE	0.926	0.856	0.777
	CR	0.935	0.947	0.912
	Cronbach's Alpha	0.920	0.916	0.855
Vegetables		0.965	0.892	0.941
Fruits		0.960	0.931	0.953

Secondly, the structural model is analyzed. To do so, an analysis is done of the path coefficients, the levels of variance explained (R^2), and the fit of the Standardized Root Mean Square Residual (SRMR) model. The levels of SRMR (0.065) and of R^2 (0.103) are appropriate for those which the literature establishes [58]. Bootstrapping with 5000 sub-samples has been done. The results indicate a causality relation between the motivators and the consumption of local products.

However, beyond these global results, addressing our objective, we are interested in performing a multigroup analysis (MGA-PLS), distinguishing between families with a veg*an member and non-veg*an families. This is the third step of our analysis. We have set out from a measurement invariance of composite models (MICOM-PLS) analysis to ensure the metric invariance [59]. In this analysis, we have obtained a partial measurement invariance [60], which ensures the reliability of the MGA-PLS analysis. The results by groups are different from the results concerning the global sample (Table 12). The shopping motives of local products lead to the consumption of them for both kind of families. There do not exist differences between the two groups. However, in the limitations, we surprisingly find that there exists a strong negative and significant relation among the families with a veg*an member. This was as predicted. On the other hand, among the non-veg*an families, there exists a positive and significant relation between the limitations and the consumption of these local products. The non-parametric MGA test indicates that the difference between the two groups is

statistically significant (Table 13). We must also point out that the levels of the R^2 are greater in each group (veg*ans 0.171; non-veg*ans: 0.116) than in the complete sample (0.103). This highlights the idea of differentiated behaviors between the groups.

Table 13. Paths and MGA-PLS analysis.

	Global	veg*ans	Non-veg*ans.	Dif (MGA test)
Motivations -> Consumption	0.319 **	0.220 *	0.318 **	n.s.
Limitations -> Consumption	n.s.	-0.309 **	0.110 **	0.419 **

* $p < 0.005$; ** $p < 0.001$; n.s. non-significant.

To sum up, the analyses indicate different behaviors between families with a veg*an member and non-veg*an families, with respect to the consumption of local products.

4. Discussion

The main goal of this research was to check the relation between vegetarian and vegan consumers and their behaviors regarding fresh, local fruits and vegetables. We have verified that there exist significant differences between families with a veg*an member and non-veg*an families in their behavior concerning fresh local fruits and vegetables.

From the point of view of sustainability, to follow a vegan or vegetarian diet and to purchase local foods contribute doubly, with respect to the environment, so it is relevant to achieve both behaviors.

With regard to the first sub-objective, we verify how the respondents know the main characteristics of local products. Though there is not a widely accepted definition of this, intuition probably means that consumers are able to understand its concept.

Concerning the advantages of these products, egoistical motivations are underlined [30,61], compared to altruistic motivations, such as the economic and social benefits of their zone or those that are ecological. In this vein, Bir et al. [8] also find that environmental impact is the advantage considered as least important. As to the limitations, they obtain medium to high values, almost close to the perceived advantages. This means a challenge, given that the difference between the perception of benefits and inconveniences should be increased to positively affect the attitudes of consumers about local products. It is worth indicating the importance of the high price, in spite of many consumers being prepared to pay a premium and that Feldmann and Hamm [14] note that local foods are not perceived as more expensive. This result is in line with those obtained in other research works in economically developed countries [61].

The distance admitted for local products is, for 83.1% of the sample, 75 km from the place of production to that of consumption. This value is similar to that of 50 miles (80.46 km) found by other research works [24,25], despite the different extension of the United States compared to Spain. As to the geopolitical limits, 68.4% of the sample indicates they would accept these as being the municipal frontier.

Regarding the second sub-objective, we have developed two hypotheses. To test the first hypothesis, we analyze if there exist differences between families with a veg*an member and non-veg*an families concerning the perception of fresh local fruits and vegetables. We observe that the former are characterized by a better economic situation and a higher educational level, the same as previous research works [43,45,62] find. Moreover, they buy vegetables and fruit more frequently, as is to be expected, and they do so more in smaller establishments than in hypermarkets. In this sense, Hoek et al. [43] note a greater trend in vegetarians toward specialized food shops.

As other research shows, and we find in this work too, there exists a relation between the sociodemographic characteristics and the perception of local products, regardless of there being a veg*an member in the families: nonetheless, our intention is to find out if this decision about the diet to follow influences the perceptions of fresh local fruits and vegetables. That is to say, we are interested in this work to analyze veg*ans as a segment, beyond the characteristics that they have. This is why a

specific is included in the questionnaire about veg*an members in the families, as we consider that the choice of diet is a lifestyle, which is one of the psychographic criteria employed to segment the market.

As to the advantages and the barriers of local products, the families with a veg*an member do not give greater importance to the former, but they do give less value to the barriers. On the other hand, the MGA-PLS analysis confirms this difference in the relations of causality between limiters, motivators, and the consumption of local products. There do not exist differences in the relation between motivators and the consumption of fresh local fruits and vegetables between the two groups. However, in the case of the limitations, there do appear differences in the relations between the two groups. A strong negative relation exists in the case of families with a veg*an member. That is to say, the more the limitations increase, the more the consumption of local products decrease. On the other hand, in the case of non-veg*an families, there surprisingly exists a positive relation between limitations and the consumption of fresh local fruits and vegetables. This difference in the sign of the relation can be related to the greater knowledge, involvement, and level of demands shown by families with a veg*an member.

In general, these results are in line with those of Van Loo et al. [7]. They find that a plant-based diet is not tastier, cheaper, more easily available, easier to prepare, and more nutritious than other diets.

Regarding the second hypothesis, we do not find a greater shopping frequency of fresh local fruits and vegetables in the consumers who follow vegetarian or vegan diets. Nevertheless, we believe that vegans and vegetarians can become an especially interesting population segment to achieve the development and success of local products, as other research works [43,44] note. Moreover, differences have been observed within the group of veg*ans in the consumers who have a better economic situation, as they buy more local products, are more concerned with altruistic motivations [43], and grant more importance to limitations when purchasing them. Our results confirm that the decision to adopt a plant-based diet is more related with health reasons than economic reasons [63].

The interest in the development of local products is relatively recent. Their benefits are numerous and the support that they receive from public institutions is well-known. In this sense, standards are being developed that support these kind of products, and that ensure a greater recognition of them via special labels, as well as communication campaigns to inform and convince about their benefits to society.

Implications for society. The development of local products can promote local economies, both at the employment and the income level, collaborating in the survival of small local firms, whether producers or intermediaries. Moreover, a greater sensation of food safety is transmitted to the citizens, they are products for tastier, fresher, and healthier diets, which contribute to better health and less health costs. Last, but not least, there is a positive effect on the environment and a contribution to the planet's sustainability. Notwithstanding, with respect to consumer motivations, the egoists predominate over the altruists, so it is necessary to reinforce in the mind of the consumer that a respect for local products and self-seeking behavior (by taking care of themselves) can positively affect the planet's sustainability [61].

Implications for industry. The perception of the citizens concerning the advantages of the consumption of local products must be increased, reducing the limitations found, such as mistrust, disinterest or lack of information. Likewise, one must try to influence the modification of food habits, aiming at a greater consumption of fresh fruits and vegetables in diets.

However, it is not only a question of trying to convince the citizens. The maximum information possible must be sought for all the members of the supply chain. This would lead to a greater trust in the certification systems and creating labels recognized by all. One of the barriers found is the non-availability of local products in the usual establishments. It is likely that they are commercialized, but not publicized. Therefore, the intermediaries must be trained and involved for them to inform and suggest local products to their customers. Hence, not only a list of local and seasonal products could be periodically communicated, but also a list of establishments that sell local products and that are

installed in the Mercasa network, in the case of Spain. In this sense, our proposal is in line with the campaign #DeAquíYDeAhora, proposed by the Spanish Ministry of Agriculture, Fishing and Food.

Moreover, according to [30], the health and safety aspects of local food products should be emphasized to positively influence the beliefs about and attitudes toward these products and their purchase frequency. Nor must it be forgotten that, as there are different segments of consumers concerning these products, the messages must be adapted according to the goal that is sought [37]. Perhaps, for the general public or for specific segments, it is necessary to at first transmit information to later bring about their consumption. In this sense (as the prices of the local products are considered to be a limitation to their purchase), monetary and especially hedonic promotions could be used to attract consumers.

Regarding veg*ans, they are a particularly interesting segment for local products, as they are consumers who have a better economic situation and a higher consumption of fruit and vegetables. However, they are still not sufficiently involved in buying local products more frequently. One of their characteristics is their higher education levels compared to non-veg*ans, so it is a segment that will possibly demand more information and involvement from public bodies and firms. This will lead to greater knowledge about these products. Veg*ans can even become innovators and early adopters [45] and prescribers of these products. Moreover, veg*ans reflect a different behavior in the choice of establishments, favoring more specialized formats, such as traditional local shops. Likewise, they assume that local products are produced by small independent firms close to their place of purchase or consumption. This would imply short supply chains of food products.

Nevertheless, to increase the frequency of purchasing local foods, the ability, the opportunity, and the motivation must be improved [18]. Hence, measures, such as making known cooking recipes with local products, facilitating the availability of these products in traditional establishments, and enjoying their taste, are necessary to affect future behavior.

Interest for academics. This work presents the relation existing between local products and consumers of vegan and vegetarian diets. Beverland [6] shows that the role of marketing is critical in these moments of developing local products due to there being a lack of research about how to modify food-related behaviors, differentiating between segments of the population. There are few marketing studies that encourage the population to change their diets, although the literature increasingly, more often, demands more information about local products and the acceptance and consumption of them. In this sense, we consider that this work goes deeply into the knowledge of local products, broadening the geographic area to a country of the south of Europe, where the Mediterranean culture and gastronomy are based on the consumption of fresh fruits and vegetables. On the other hand, though plant-based diets are a trend, especially in western countries, we do not find works that relate this topic with local products.

5. Conclusions

The concern for the planet's sustainability is not a trend, it is currently an obligation. The aims of sustainable development proposed by the United Nations (UN) involve governments, firms, and of course citizens. Society must be actively involved and in fact many actions, such as recycling, saving water, reducing car use in favor of urban transport, and so on, have become part of our routines. The moment has come to change food habits and some people have already started. This work has analyzed two consumer behaviors, buying local products and plant-based diets, which contribute to sustainability.

In relation to fresh, local fruits and vegetables, it was proved in this study that the consumers of a Mediterranean city know the characteristics and the benefits of local products and express the barriers found in buying them. With respect to the consumers who follow plant-based diets, we find that they perceive less barriers in the purchase of fresh, local fruits and vegetables, which indicates them as a target segment for the success of local products. What is more, in the current situation, after the effects of SARS-CoV (COVID-19) on the slowing down of international business, as well as the concern for

food safety, a greater demand for local products is expected, which means an opportunity for local producers and distributors.

As to the limitations of this research, we point out the fact that the sample comes from only one city. Nonetheless, the city chosen is representative of many intermediate-sized cities. Likewise, the study is transversal, and it would be very interesting to perform longitudinal studies to analyze the evolution of society concerning food diets and shopping habits.

Finally, while the work is fundamentally exploratory, we propose as future research lines to analyze—via causal models of behavior—the variables and their relations that affect shopping and the consumption of local products. Likewise, it would be interesting to analyze the reality of local intermediaries and producers to understand the local products supply chain as a whole.

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