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Exploring Sustainable Food Choices Factors and Purchasing Behavior in the Sustainable Development Goals Era in Spain

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Abstract: The aim of the present study was (1) to investigate what consumers include within the concept of food sustainability and its link with sustainable consumption, by identifying meaningful consumer typologies from the concept of food sustainability and food choice factors framed by SDG 12, and (2) to know how different farm systems attributes affecting purchase behavior are associated with such typologies. Consumers from two Spanish regions (n = 403) answered a paper questionnaire to know their degree of knowledge of sustainability, and beliefs, behavior, attitudes and preferences towards food sustainability, and the importance given to product characteristics and shopping practices. A principal component analysis was conducted to identify groups with similar answers, to average some of the questions before the final analysis of variance, which includes demographic classes as fixed effects. A cluster analysis using the most representative questions identified two clusters. cluster 1 (68.4%) responded to more sustainability-related attributes, and cluster 2 (31.5%) presented a less-expanded concept of sustainability. The origin of the product and quality certification (local, organic) was important for food purchase practices. The place of residence and gender differences of the consumers were the most influential factors. In the conjoint study, regarding the purchase of Iberian pork, cluster 1 remained unwilling to sacrifice outdoor systems and local breed at the expense of the price, in the case of the Iberian pig production. The most important demographic differentiator was the region of residence of the consumer. In conclusion, consumers are not aware of the wider aspects included in the sustainability concept. Moreover, the concept of sustainability elicits different meanings to the segments of the consumers identified.

Keywords: sustainability concept; consumer behavior; consumption patterns; sustainable consumption; pig production

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1. Introduction

The global food system is one of the main drivers of climate change, and its importance is progressively increasing with the world population growth [1,2]. Given that one of the most effective strategies to act on climate change is through modifying dietary habits, there is an urgent need to incorporate changes towards a more sustainable diet [1–3]. An example of the relevance that sustainable choices have acquired is their insertion in strategic plans and priority goals in the United Nations-led initiative 'Transforming our world: the 2030 Agenda for Sustainable Development' that sets out 17 Sustainable Development Goals (SDGs). Likewise, SDG goal 12 (SDG 12) includes a focus on promoting sustainable consumption and production patterns that guarantee economic growth [4], and SDG goal 2 (SDG2) consists of a target to end all forms of malnutrition (i.e., including overweight and obesity).

Meeting the grand challenges of the recent days requires societal transformation that starts from changes in production and consumption patterns [5], both linked to the sustainability concept. The agri-food sector, mainly animal production systems in its pursuit of sustainability, has to integrate several elements, such as environmental protection, food safety, animal welfare, and benefits to local producers that concern the consumer [5].

The change in mentality required, with respect to the food system, makes it necessary to include all the actors involved in the system, especially the consumer [6].

The differences in consumption habits can be significant, even within the same country. Noticeable differences exist not only at a national level, but also at a more regional/local level, in terms of food preferences, habits, food-related behavior, and attitudes in Europe [7]. Spain is a country with a great diversity of gastronomy, with traditional food habits, cultures and lifestyles. According to Jordana [8], Southern European countries have a more traditional food character. The Mediterranean diet and the Atlantic diet are examples of traditional diets in Spain, perceived by Spanish consumers as diverse enough [7]. Some studies have pointed out a shift from the above-mentioned dietary patterns with traditional food products to the consumption of ultra-processed food (higher fat, sugar and salt content) [9]. Meanwhile, other studies did not perceive an increase in the variety of food innovation in the Spanish consumer [10].

A shift toward sustainable farming connected to strong local and regional food systems has been made more apparent after the COVID-19 episode [11–14]. Urban consumers might be more prone to reconnect with their rural roots [15], while according to Weatherell, Tregear, and Allinson [16] in the UK, rural-based consumers tend to give a higher priority to "civic" issues in food choice, exhibiting higher levels of concern over food provisioning issues, and showing a greater interest in local foods. It remains to be determined to what extent these insights seen in other contexts apply to Spain.

The agri-food system in Spain, and meat production in particular, is immersed in a process of continuous change, motivated both by the structural factors of the production systems, which are closely associated with its internal socio-political forces, and by changes in the consumers' consumption patterns [17]. Spain has developed an export-oriented pork industry that is heavily concentrated (especially in Northeast Spain) and extremely reliant on the world markets. Yet, traditional pig farming in Spain still occurs (being the most important in quantity in the southwestern part of the country), despite the loss of pig farms that have been most acute in some regions [18], bringing severe damage to local rural economies and a loss of its widely diverse agro-ecological regions with different agrarian vocations [17]. Although negative images towards intensive production systems have been recorded in Europe [19,20], previous studies have found that what people think in their role as citizens related to today's pig production did not appear to significantly influence their pork consumption choices [19].

All these mentioned differences in food-related aspects are expressed by consumers, both in terms of food choice and consumption patterns. Different sustainability-related functions of types are seen to be fundamental lifestyle components and could be fulfilled by a variety of sustainable actions [21]. Related to the animal welfare perception of pork production by consumers, Spanish consumers prefer the conventional farm system, with animal welfare improvement and feeding supplementation with natural herbs in comparison to the conventional farming system and food [22]. Yet, there is a lack of empirical information regarding the consumer perceptions of sustainable consumption in Spain, which limits the extent to which the strategies for communication can be effectively theorized and developed.

Having a better understanding of what makes food choices more sustainable could help consumers to make more informed decisions. Consumers thus play a major role in the shift towards more sustainable foods and diets. This study addresses these gaps in the understanding of the concept of sustainable food by consumers. However, food consumption patterns in Spain and consumption practices are missing. Likewise, in the face of the increasing industrialization of the livestock sector, it is interesting to explore the

various dimensions of sustainability connected with responsible consumption, to advance research in the SDG era. Therefore, the objective of this study is two-fold, as follows: (i) to investigate what consumers include within the concept of food sustainability and its link with sustainable consumption, by identifying meaningful consumer typologies from the concept of food sustainability and food choice factors framed by SDG 12; and (ii) to know how different farm systems attributes affecting purchase behavior are associated with such typologies.

2. Materials and Methods

The present study has applied an integrative and interdisciplinary approach to gain knowledge of the openness of the concept of sustainability by Spanish consumers. Consumers' beliefs, behavior, importance of product characteristics and preference towards more sustainable behaviors have been analyzed, as the consumer is the main actor in the food system. As a means of achieving the two objectives of the study, data were collected in two steps, involving a paper questionnaire and a consumer ranking-based test (conjoint analysis). A hall test was performed, inviting consumers to a set location, date and time to participate in the trial. The study was carried out between January 2016 and November 2017.

2.1. Sample Characteristics

Four hundred and three food consumers participated in this study. The design aimed to preselect a balanced gender and age consumer sample according to the demographics of Spain [23]. The consumption of meat was a pre-requisite to be included in the sample. Half of the sample (n = 202) came from a region with traditional extensive Iberian pig and ruminant farming activity with medium-sized cities (Badajoz and Córdoba, Southwest (SW) Spain). The other half of the respondents (n = 201) lived in the most industrialized pig production region where the second biggest city in Spain is located (Barcelona, Northeast (NE) Spain). For trials performed in NE Spain, consumers were selected randomly from a big consumers' database from a company specialized in consumer studies, following the national distribution by gender and age. In SW region, consumers were selected by personal contacts trying to reproduce the national population. Age groups, gender, education level, and employment situation of the respondents were the sociodemographic characteristics analyzed.

2.2. Roadmap of the Session

Each survey round constitutes a session. A total of 15 sessions per region were performed with a minimum of 10 and a maximum of 30 consumers per session. The session comprised a questionnaire and a consumer ranking-based test (conjoint analysis). No additional information was previously given to the consumers before answering the questionnaire. The average time for completing the questionnaire and conjoint analysis per participant was 30 min.

2.3. Questionnaire

The questionnaire was structured in four main blocks (for more details see Supplementary Materials, Tables S1 and S2). The first block of six closed questions (yes/no/do not know) corresponded to consumers' level of knowledge about sustainability and its meaning related to food. The second block addressed consumers' beliefs (11 questions) related to food sustainability, product information, food traits related to human health, and food origin and brand. It also included behavioral characteristics (18 questions) considering aspects related to purchasing, consumption, and the production of food. Finally, this block evaluated the importance of several aspects regarding food product characteristics and quality (14 questions). Questions from the second block used a 5-point Likert scale ranging from 1 = completely disagree to 5 = fully agree. The third block corresponded to closed-form questions related to socio-demographic characteristics of the consumers (gender, age,

education level, and employment situation) and six questions related to shopping practices (for more details see Table S2).

The questionnaire was designed according to the research questions of this study and organized following the outline of previous studies [24–26]. To obtain the final questionnaire, personnel from different departments at the different research centers helped to perform a pilot testing. It improved the ease with which the responders were able to complete the questionnaire (readability and comprehensiveness), which in total reduced the necessary time to fill the questionnaire. A total of 403 respondents completed the questionnaire (19 missing values). Regarding the socio-demographic distributions (see Table 1), overall, the study sample was equitable by gender. The age group populations were in line with national statistics for 2017, except for the elderly subgroup that was slightly underrepresented [23]. Around 45% of the participants had a university education, a little higher compared to the official figures [23]. Thus, unemployed citizens were underrepresented in the SW subgroup of our study compared to national statistics [18] as the sessions were carried out at the university campus.

Table 1. Sociodemographic characteristics of the participant consumers by region and clusters obtained through non-hierarchical cluster analysis.

	Global (n = 403)	**NE (n = 201)**	**SW (n = 202)**	**Cluster 1 [1] (n = 276)**	**Cluster 2 [1] (n = 125)**
Area					
Northeast	50.62	-	-	55.43	38.40
Southwest	49.38	-	-	44.57	61.60
Age group					
<25	19.35	8.50	29.35	13.77	32.00
25–40	27.05	29.00	25.37	25.72	30.40
40–60	40.45	42.50	38.81	44.20	32.00
>60	13.15	20.00	6.47	16.30	5.60
Gender					
Men	49.38	47.76	50.99	47.83	53.60
Women	50.62	52.24	49.01	52.17	46.40
Education level					
Basic studies	26.87	29.50	17.41	27.64	25.60
University	44.28	33.50	61.19	42.18	48.80
Vocational education	28.86	37.00	21.39	30.18	25.60
Employment situation					
Student	22.33	9.95	34.65	17.39	33.60
Self-employed	4.96	6.47	3.47	5.43	4.00
Public official	24.32	5.47	43.07	23.55	25.60
Retired	9.43	15.42	3.47	11.96	3.20
Employee	34.49	55.22	13.86	37.32	28.80
Unemployed	4.47	7.46	1.49	4.35	4.80

[1] Two consumers were not considered in the clusters due to missing values in some of the segmentation questions.

2.4. Conjoint Analysis

A conjoint analysis (as a method for acquiring insights into the preferences for food products) was used to determine the relative importance of various farm attributes, with the focus on two different types of pig farms (extensive and intensive) in the context of purchasing pig meat in Spain, due to the current development of the pork industry.

The three farm systems attributes evaluated in this study were (1) breed with two levels (Iberian and white pig), (2) production system with two levels (extensive and intensive), and (3) meat price at two levels (€7 and €12). Consumers received eight labels (one of each was a combination of the three factors) on a complete design that were identified with a random code. Consumers were asked to rank the labels according to their purchasing preferences from the most preferred (1) to the least preferred (8). The two levels of the

production system were selected because Iberian pigs can be produced in both production systems [27]. The low price was the average price for pork from white pigs while the high price was the average price for pork from Iberian pigs. Farm attributes evaluated in this study were chosen because of their importance on Iberian pig production and pork consumption as reported in other studies [28,29].

2.5. Data Analysis

All the analyses were performed with SAS software (version 9.4, SAS Institute Inc., Cary, NC, USA).

Frequency calculations were performed using the FREQ procedure. Significant differences between clusters, obtained as detailed below, were determined by means of the Chi-square test two by two.

Factor procedure of SAS was used to carry out a principal component analysis (PCA) (with the purpose of reducing the numbers of variables and explaining the same amount of variance with fewer variables) for the following three sets of questions: beliefs, importance, and behavior. Questions that were placed close to the first two-dimensional subspaces of the principal component analysis were averaged. Table 2 shows the correlation of each variable with the first two principal components, the variance accounted for each principal component and the variables that have been averaged in the following analyses. Finally, eight items about beliefs, 14 items about behavior and nine items about importance were considered in the following analyses.

An analysis of variance was performed with the generalized linear model (GLM) procedure of SAS (the model allows for response variables with distributions other than the normal distribution. Since the distribution is unknown initially and the consumer behavior does not necessarily follow a normal distribution, the flexibility from a GLM is desirable). The model included region, age, gender, education level and employment situation as fixed effects. Significant differences were determined after applying Tukey's test at the level of 0.05. Because of the type of data, the non-parametric Kruskal–Wallis test was also applied by means of the NPAR1WAY procedure of SAS. Because the results of the two tests do not differ significantly, the analysis of variance was finally used since it provides more information [30].

To identify the existence of consumer profile segmentation, a hierarchical cluster analysis (Ward method and Euclidian distance) was applied to classify the consumers into homogeneous preference groups. The segmentation and the creation of the clusters was based on the answer given by consumers towards selected items of the questionnaire regarding the most distinctive important aspects related to sustainability (underlined variables in Table 2). As a result, a 2-cluster solution was chosen from the dendrogram (for more details see Figure S1). The selection of the final number of clusters was aimed at getting the simplest structure possible that still represents homogeneous groupings (parsimony rule). In addition, according to Hair et al. [31], a balance was made between defining the most basic structure (fewer clusters) that still achieves an acceptable level of heterogeneity between the clusters. GLM procedure, including cluster as fixed effect, was used to determine differences between clusters in the beliefs, importance, and behavioral items studied.

Nonmetric conjoint data were analyzed using the TRANSREG procedure of SAS. The model applied considered the monotonic transformation with the sum of all the part-worth utilities for each attribute equal to zero. This is a general and flexible model, usually used with qualitative data. Although the price is numeric, the objective was to include a low and a high price and thus, it has been considered as qualitative in the analysis. The relative importance of each factor and the utility values associated with each level were obtained. The analysis was performed for all the consumers together and for each cluster.

The survey had some shortcomings mainly due to the participants, since in SW regions younger consumers were overestimated and older consumers were underestimated. Moreover, since the survey was part of a wider study (see Garcia-Gudiño et al. [29]), questions were grouped by type in order to simplify the reading.

Table 2. First and second factors (PC1 and PC2) of the principal component analysis (PCA) by group (beliefs, importance and behaviour).

	PCA *	PC1	PC2
Beliefs		*21.7%*	*16.0%*
Sustainable food products are safer than conventional ones and of a higher quality	a	0.75	−0.05
Sustainable food products are higher quality	a	0.68	0.04
Information on sustainable food is poor	b	−0.08	0.90
Information on sustainable food is confusing	b	−0.09	0.88
GMOs are harmful to human health	c	0.75	0.04
Artificial flavours and additives are harmful to human health	c	0.71	0.02
Organic products are too expensive		0.07	0.26
Pesticide residues in fruits and vegetables are harmful to human health		0.44	0.26
I trust little brands in general		0.24	−0.02
I trust white labels		−0.19	0.05
Food from abroad is always better		−0.03	−0.30
Importance		*33.7%*	*12.2%*
When I deal with new products, the brand is important to me		0.22	0.55
The taste of meals is more important than the ingredients		−0.07	0.53
Food packaging is important to me		0.32	0.43
My diet and that of my family are very important to me		0.54	0.18
Given the choice of food products, is it important to you?			
Quality		0.56	0.24
Health care	d	0.64	0.08
Food safety	d	0.58	0.04
Origin in organic farming and livestock		0.63	0.20
Produced locally	e	0.59	0.33
Produced in your own country	e	0.44	0.45
Respect for the environment	f	0.79	−0.31
Recycling	f	0.72	−0.36
Preserving natural resources	f	0.74	−0.37
Environmentally sustainable production	f	0.75	−0.36
Behaviour		*23.1%*	*9.6%*
I generally do not buy products that include preservatives	g	0.62	−0.06
I prefer to buy organic products	g	0.64	0.03
When I deal with new products, I do not usually look at the list of ingredients		−0.32	0.28
I prefer to consume local products that are grown or produced near where I live		0.52	0.61
I usually buy some fair-trade products		0.57	0.20
I do not buy brands or products sold or supplied by companies that are not responsible with the environment and Society		0.56	−0.18
I participate in protests against brands that are not respectful of the environment		0.47	−0.15
I read the labels of the products carefully to know their ingredients, elaboration, contents, calories		0.52	−0.33
I eat organic food because it is a trend and they are fashionable		0.26	0.13
I try to follow a Mediterranean and traditional diet	h	0.52	−0.27
I try to avoid ultra-processed meals	h	0.46	−0.20
I invest more in my health than my look	i	0.52	−0.22
I do exercise regularly	i	0.34	−0.34
When it comes to food, I am always looking for something new		0.40	−0.09
Every time I eat less meat and side a more vegetarian diet		0.46	−0.24
I try to treat myself every day		0.29	0.09
I prefer food produced locally	j	0.55	0.65
I prefer food from our country	j	0.41	0.52

* Items with the same letter in the PCA column were averaged for the analysis. The % in italics below PC1 and PC2 is the variance accounted for each principal component. Underlined questions, averaged when they have the same letter in the PCA column, were used to segment consumers.

3. Results

3.1. Consumers' Knowledge about Sustainability

Most of the respondents (87.4%) indicated that they have heard about the term sustainability before (see Table 3). The major differences among the clusters were observed at the three main recognized sustainability, related to food consumption, attributes, as follows: 'life quality in daily consumption', 'animal health and welfare', and 'reduction in pesticides and antibiotics'. A higher awareness of the three topics is observed in consumers from cluster 1 compared to cluster 2. The consumers of cluster 1 will be named as consumers with a wide concept of sustainability, and the consumers from cluster 2 will be named as consumers with a restricted concept of sustainability. More than 21.4% of the respondents do not manage ('no' or 'do not know' responses) to establish an association of sustainability with animal welfare and/or a reduction in antibiotics in both of the clusters. Regarding demographic characteristics, the link of sustainability with the environment is lower in consumers with vocational studies (more 'do not know' answers) than those with a university education. To highlight, the lower percentage of young consumers (53%) than

older ones (79%) involved in this study, who agree that one component of sustainability is 'life quality in daily consumption'.

Table 3. Consumers' knowledge (in %) about sustainability by clusters and the global sample obtained through non-hierarchical cluster analysis *.

	Yes			No			Do Not Know		
	Global	**Cluster 1**	**Cluster 2**	**Global**	**Cluster 1**	**Cluster 2**	**Global**	**Cluster 1**	**Cluster 2**
Have you ever heard about sustainability?	87.44	86.80	88.70	4.27	4.80	3.20	8.29	8.50	8.10
What is the meaning for you of sustainability related to food?									
Integration of natural habitat conservation with the survival of the economic system	83.13	84.10	81.60	4.71	4.40	5.60	12.16	11.60	12.80
Be aware of the quality of life in daily consumption decisions	66.25	73.6 ^{a}	50.4 ^{b}	17.87	14.90	24.80	15.88	11.60 ^{b}	24.80 ^{a}
Ensure the health and welfare of animals	78.61	82.90	68.80	13.43	9.50 ^{b}	22.40 ^{a}	7.96	7.60	8.80
Conservation and protection of water resources	71.71	72.10	70.40	8.68	8.00	10.40	19.60	19.90	19.20
Reduction or elimination of pesticides and antibiotics in livestock and agriculture	78.16	82.30	68.80	9.43	6.90 ^{b}	15.2 ^{a}	12.41	10.90	16.00

* Different letters indicate statistically significant differences ($p < 0.05$) between clusters within each group of knowledge and item.

3.2. Consumer Beliefs in Food Products

The consumers from cluster 1 believe that sustainable food products are safer and of higher quality. Those from cluster 2 hold the same position, but with significantly less prominence. There is a greater belief by cluster 1 that GMO, artificial flavour, and additives are detrimental to human health, meanwhile the consumers from cluster 2 are less concerned with these risks. Both of the clusters strongly believe (highest scores of this block) that pesticide residues on food are harmful. Clusters 1 and 2 also believe that organic-certified products are too expensive. In addition, the cluster 1 consumers do not quite agree that foreign food products are better than national products (Table 4).

The most common beliefs are significantly influenced by demographic characteristics such as gender, the region of residence, and education level (presented in Table 5). Women and NE consumers are more aware of the health effects of GMO/artificial flavours and the price of organic products ($p < 0.05$). Women and SW consumers are more favourable for local products (than for foreign products), although this is a general agreement by all of the consumers. Consumers with vocational studies seem to be more satisfied with product label information. Actually, their concerns lie with GMO/artificial flavours compared to consumers with a university education. Concerns are generally outstanding for pesticides, with no demographic differences. Finally, the trust in white labels is not important for all of the consumers on this study, since the scores are close to neutrality.

3.3. Consumer Importance

The most important reasons to purchase sustainable products are family diet, food safety, food quality, and health care. These reasons are highly ranked by the consumers from cluster 1 compared to cluster 2 (see Tables 4 and 5). However, all of the reasons from both clusters exceed a score of four. Cluster 1 gives more importance to organic farming, and national and local products than cluster 2. Cluster 1 also places more importance on product development and product packaging than cluster 2.

The gender of the responders and the region (shown in Table 5) influence the consumer importance for buying sustainable products. Men rank product packaging higher than women. Organic products are highly appreciated in NE Spain, and local products in the SW region.

3.4. Consumer Behaviour

The increasing concerns of society towards the consumption of animal products, and how they have been produced, were also studied in this survey, by discriminating into product differentiation, as follows: new, local, fair trade, and environmentally friendly products (see Tables 4 and 6).

Table 4. Description of the clusters of consumers' beliefs, importance, and behaviour related to sustainable food production aspects and relative importance of each characteristic (five-point Likert agreement scales from 1: completely disagree to 5: strongly agree).

	Cluster 1 (n = 276)	Cluster 2 (n = 125)	RMSE	*p*-Value
Beliefs				
Sustainable food products are safer than conventional ones and of a higher quality	3.8	3.3	0.83	<0.0001
Information on sustainable food is poor and confusing	4.0	4.0	0.98	0.4200
GMOs, artificial flavors and additives are harmful to human health	3.9	2.9	0.99	<0.0001
Organic products are too expensive	4.2	3.9	0.96	0.0072
Pesticide residues in fruits and vegetables are harmful to human health	4.6	4.4	0.85	0.0161
I trust little brands in general	3.2	3.0	1.07	0.1226
I trust white labels	3.3	3.4	0.99	0.0946
Food from abroad is always better	1.7	1.5	0.80	0.0261
Importance				
When I deal with new products, the brand is important to me	3.6	3.0	1.17	<0.0001
The taste of meals is more important than the ingredients	2.6	2.4	1.21	0.1411
Food packaging is important to me	3.9	3.5	0.99	0.0004
My diet and that of my family are very important to me	4.8	4.3	0.57	<0.0001
Given the choice of food products, is it important to you?				
Quality	4.7	4.4	0.54	<0.0001
Health care and food safety	4.6	4.3	0.61	<0.0001
Origin in organic farming and livestock	3.8	2.8	0.99	<.0001
Produced locally or in your own country	4.3	3.3	0.82	<0.0001
Respect for the environment, recycling, preserving natural resources and sustainable production	4.5	4.0	0.65	<0.0001
Behaviour				
I generally do not buy products that include preservatives, preferring to buy organic food	3.3	2.4	0.86	<0.0001
When I deal with new products, I do not usually look at the list of ingredients	2.2	2.6	1.30	0.0037
I prefer to consume local products that are grown or produced near where I live	4.3	3.5	0.93	<0.0001
I usually buy some fair-trade products	3.5	2.4	1.09	<0.0001
I do not buy brands or products produced or manufactured by companies that are not responsible with the environment and society	3.3	2.3	1.08	<0.0001
I participate in protests against brands that are not respectful of the environment	2.2	1.7	1.11	<0.0001
I read the labels of the products carefully to know their ingredients, elaboration, contents, calories	3.8	3.3	1.16	<0.0001
I eat organic food because it is a trend and they are fashionable	2.0	1.5	0.95	<0.0001
I try to follow a Mediterranean and traditional diet, avoiding ultra-processed meals	4.3	3.5	0.76	<0.0001
I do exercise regularly investing more in my health than my look	3.9	3.3	0.80	<0.0001
When it comes to food, I am always looking for something new	3.4	2.9	1.10	<0.0001
Every time I eat less meat and I focus on a more vegetarian diet	3.0	2.1	1.28	<0.0001
I try to treat myself every day	3.0	2.6	1.16	0.0101
I prefer food produced locally or from our country	4.5	3.7	0.73	<0.0001

In our study, cluster 1 buys more products without preservatives and more organic products (Figure 1). Cluster 1 cares more about fair trade, local products and tries to follow a traditional Mediterranean diet, avoiding ultra-processed food. Cluster 1 also invests more in health, does exercise more regularly, consumes less meat, and focusses on vegetarian options.

Consumer behaviour is influenced by the region of residence, age group, and gender ($p < 0.05$) (see Table 6). The trust in food labels does not show significant differences by demographic characteristics. The education level and employment do not constitute any influence on consumer preference.

The other lifestyle brands and product packaging are scored differently, by region of residence, age, or gender ($p < 0.05$) (see Table 6). NE consumers rank investing in health, sport, and novel product seeking higher. Meanwhile, the respondents from the SW show a higher appreciation for local products (average score 4.3). In addition, the youth generation gives a significantly higher ranking ($p < 0.05$) of new products, and eats treats every day. Women give more importance to the Mediterranean diet and to a decreased consumption

of ultra-processed food. Consumers with a university education rank eating less meat and more plant-based foods higher ($p < 0.01$). On the contrary, the young consumers in this study, with basic studies, consider it more important to eat treats daily.

Table 5. Least squared mean value on consumers' beliefs and importance related to sustainable food production aspects and relative importance of each demographic characteristics.

	* Area		Gender		Education Level						
	NE	**SW**	**Men**	**Women**	**B.s.**	**Un**	**V**	**RMSE**	**Area**	**G**	**El**
Beliefs											
Sustainable food products are safer than conventional ones and of a higher quality	3.8	3.6	3.7	3.8	3.7	3.7	3.8	0.86	0.077	0.056	0.577
Information on sustainable food is poor and confusing	3.9	4.0	3.9	4.0	4.0 ^{ab}	4.1 ^{a}	3.7 ^{b}	0.98	0.385	0.186	0.028
GMOs and artificial flavors and additives are harmful to human health	3.8 ^{a}	3.5 ^{b}	3.5 ^{b}	3.8 ^{a}	3.8 ^{a}	3.4 ^{b}	3.7 ^{ab}	1.02	0.040	0.001	0.013
Organic products are too expensive	4.2 ^{a}	3.9 ^{b}	3.9 ^{b}	4.2 ^{a}	4.1	4.1	4.1	0.94	0.022	0.003	0.728
Pesticide residues in fruits and vegetables are harmful to human health	4.6	4.5	4.5	4.6	4.6	4.6	4.4	0.86	0.733	0.517	0.212
I trust little brands in general	3	3.2	3.1	3.1	3.2	3	3.2	1.08	0.164	0.904	0.217
I trust white labels	3.3	3.3	3.2	3.3	3.3	3.3	3.1	0.98	0.940	0.160	0.252
Food from abroad is always better	1.9 ^{a}	1.5 ^{b}	1.8 ^{a}	1.6 ^{b}	1.7	1.6	1.8	0.77	0.0002	0.008	0.252
Importance											
When I deal with new products, the brand is important to me	3.7	3.4	3.6	3.4	3.4	3.5	3.6	1.15	0.053	0.089	0.185
The taste of meals is more important than the ingredients	2.7	2.6	2.7	2.6	2.7	2.4	2.8	1.18	0.356	0.413	0.607
Food packaging is important to me	3.7 ^{b}	4.0 ^{a}	4.0 ^{a}	3.7 ^{b}	4.0	3.8	3.9	1.00	0.024	0.023	0.509
My diet and that of my family are very important to me	4.7	4.6	4.6	4.7	4.6	4.6	4.7	0.60	0.232	0.351	0.255
Given the choice of food products, is it important to you?											
Quality	4.7	4.6	4.6	4.6	4.6	4.6	4.7	0.55	0.446	0.948	0.276
Health care and food safety	4.6	4.5	4.5 ^{b}	4.6 ^{a}	4.5	4.5	4.6	0.61	0.067	0.009	0.061
Origin in organic farming and livestock	3.8 ^{a}	3.4 ^{b}	3.6	3.6	3.5	3.5	3.7	1.09	0.011	0.591	0.925
Produced locally or in the country	3.9 ^{b}	4.1 ^{a}	4.0	4.0	3.9	4.0	4.1	0.93	0.043	0.525	0.150
Respect for the environment, recycling, preserving natural resources and sustainable production	4.4	4.4	4.0	4.0	4.3	4.4	4.4	0.68	0.678	0.093	0.937

* Area: NE: northeast; SW: southwest. Gender (G): M: men; W: women. Education level (El): B.s: basic studies; Un: university; V: vocational. Employment (Em): St: student; S: self-employment; P: public official; R: retired; E: employee; U: unemployed. *p*-values for educational level and employment situation were >0.05 for all the items. RMSE: root mean squared error. Different letters indicate statistically significant differences ($p < 0.05$) within each demographic characteristic and item.

3.5. Grocery Shopping Patterns

The shopping place is the most important difference in the analyzed buying habits between the clusters (for more details see Table S2). The consumers from cluster 1 buy more in the food market (as a general practice) and in the local butchers, and avoid (plastic) packaging, in comparison with those from cluster 2. There is a slight difference in the consumption of pork meat or meat products between the clusters. In this sense, occasional Iberian pork eating was declared significantly ($p < 0.10$) higher by the consumers from cluster 2. Also, pork product consumption was significantly ($p < 0.10$) higher in the consumers from cluster 1. For processed Iberian pork, no significant differences were found between the clusters. Besides, cluster 1 gives greater importance to purchase choice and, more specifically, to what they perceive as a more sustainable choice (less packaging, more local trade, and local markets).

Table 6. Least squared mean value [1] rates of the behaviour related to sustainable food production aspects by demographic characteristics of the participant consumers.

	Area *		Age Group **				Gender		El			Employment											
	NE	SW	1	2	3	4	M	W	B.s.	Un	V	St	S	P	R	E	U	RMSE	Area	Ag	G	El	Em
I generally do not buy products that include preservatives, preferring to buy organic food	3.2	2.9	2.7	3.2	3.1	3.2	3.0	3.1	3.1	3.0	3.0	3.0	2.9	3.0	3.2	2.9	3.3	0.93	0.065	0.120	0.208	0.511	0.567
When I deal with new products, I do not usually look at the information on the label	2.2 ^{b}	2.6 ^{a}	2.7	2.1	2.4	2.3	2.6 ^{a}	2.2 ^{b}	2.4	2.4	2.4	2.1	2.3	2.0	2.7	2.6	2.6	1.30	0.014	0.165	0.004	0.956	0.088
I prefer to consume local products that are grown or produced near where I live	3.9 ^{b}	4.3 ^{a}	3.8	4.0	4.2	4.4	4.1	4.1	4.1	4.2	4.1	4.3	4.3	4.1	3.9	4.0	4.1	1.00	0.013	0.336	0.863	0.700	0.761
I usually buy some fair-trade products	3.2	3.1	2.6 ^{b}	3.3 ^{a}	3.1 ^{ab}	3.6 ^{a}	3.1	3.2	3.2	3.1	3.2	3.5	3.2	3.2	2.8	3.1	3.3	1.18	0.272	0.004	0.734	0.663	0.559
I do not buy brands or products produced or manufactured by companies that are not responsible with the environment and society	3.1	2.9	2.5 ^{b}	3.0 ^{ab}	3.3 ^{a}	3.2 ^{ab}	2.9 ^{b}	3.1 ^{a}	3.1	2.9	3.0	3.0	2.5	2.9	3.2	2.9	3.4	1.13	0.318	0.048	0.045	0.473	0.236
I participate in protests against brands that are not respectful of the environment	2.3	2.1	2.3	2.1	2.1	2.1	2.1	2.2	2.0	2.3	2.2	1.7	1.9	2.1	2.3	2.1	2.8	1.14	0.181	0.826	0.603	0.268	0.078
I read the labels of the products carefully to know their ingredients, elaboration, contents, calories . . .	3.7	3.6	3.3	3.8	3.7	3.8	3.6	3.7	3.8	3.6	3.6	3.8	3.5	3.7	3.9	3.5	3.5	1.18	0.524	0.210	0.199	0.352	0.525
I eat organic food because it is a trend and they are fashionable	2.0	1.8	1.6	2.0	2.1	1.9	1.9	1.9	1.8	1.9	2.0	1.7	2.3	1.7	1.8	1.8	2.1	0.94	0.167	0.223	0.481	0.516	0.088
I try to follow a Mediterranean and traditional diet, avoiding ultra-processed meals	4.1	4.0	3.8	4.0	4.2	4.3	3.9 ^{b}	4.2 ^{a}	4.1	4.1	4.0	3.9	4.0	4.1	4.2	4.0	4.0	0.81	0.146	0.086	0.010	0.502	0.936
I do more exercise for my health than for my look	3.8 ^{a}	3.2 ^{b}	3.0	3.5	3.5	3.9	3.6	3.4	3.3	3.6	3.6	4.1 ^{a}	3.1 ^{b}	3.8 ^{ab}	3.2 ^{ab}	3.4 ^{ab}	3.4 ^{ab}	1.14	0.0004	0.089	0.266	0.102	0.029
When it comes to food, I am always looking for something new	3.4 ^{a}	3.1 ^{b}	3.5 ^{ab}	3.6 ^{a}	3.2 ^{b}	2.8 ^{b}	3.3	3.3	3.3	3.2	3.2	3.2	3.1	3.2	3.3	3.2	3.5	1.10	0.025	0.007	0.799	0.802	0.887
Every time I eat less meat and I focus on a more vegetarian diet	2.8	2.9	2.6	2.6	2.9	3.2	2.7	2.9	2.8 ^{b}	3.2 ^{a}	2.6 ^{b}	2.3	3.2	2.6	3.1	2.7	3.1	1.27	0.612	0.194	0.086	0.001	0.129
I try to treat myself every day	3.0	2.8	2.6 ^{b}	3.2 ^{a}	2.9 ^{ab}	2.9 ^{ab}	2.9	2.9	3.1 ^{a}	2.7 ^{b}	2.9 ^{ab}	3.1	2.7	2.8	2.8	2.8	3.0	1.15	0.227	0.013	0.561	0.037	0.874
I prefer food produced locally or from our country	4.2 ^{b}	4.6 ^{a}	4.2	4.4	4.5	4.6	4.3	4.5	4.4	4.3	4.4	4.4	4.5	4.2	4.5	4.5	4.4	0.86	0.003	0.586	0.064	0.684	0.726

[1] Likert scales from 1: completely disagree to 5: fully agree. * Area: NE: northeast; SW: southwest. ** Ages were grouped: (1) <25 years; (2) 25–40 years; (3) 40–60 years; and (4) >60 years. Gender (G): M: men W: women. Education level (El): B.s: basic studies; Un: university; V: vocational. Employment (Em): St: student; S: self-employment; P: public official; R: retired; E: employee; U: unemployed. RMSE: root mean squared error. Different letters indicate statistically significant differences ($p < 0.05$) within each demographic characteristic and item.

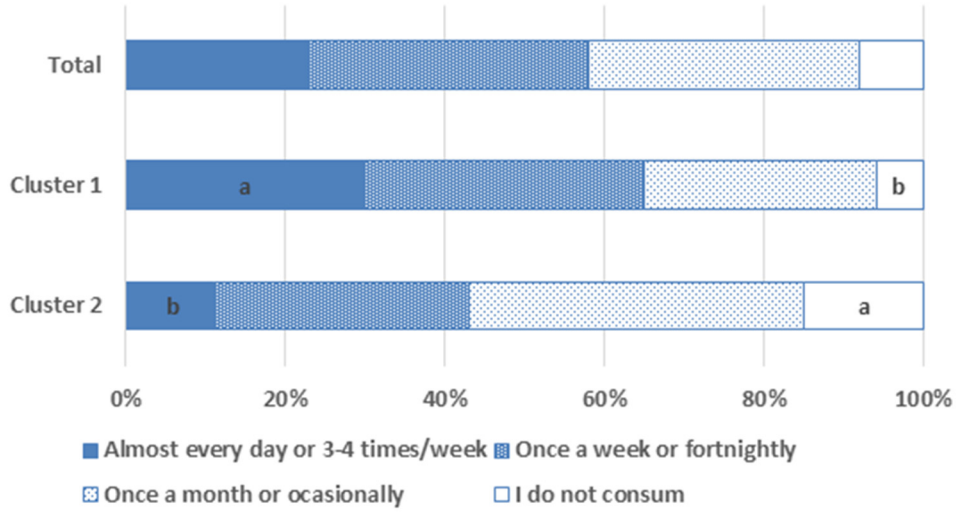

Figure 1. Frequency of consumption of organic food by cluster and overall sample of participant consumers. Different letters between clusters and frequencies indicate significant differences ($p < 0.05$).

3.6. Consumer Preference

The conjoint analysis shows that the preferences from the utilities differ by clusters (see Table 7). The breed type and production system are the most preferred attributes, and they differ significantly with price in cluster 1. The difference among the attributes in cluster 2 is less remarkable. The price is most important for cluster 2, giving lower importance to the production system compared to cluster 1.

Table 7. Relative importance and utility values of each factor of the conjoint analysis for Spanish consumers in the global sample and by cluster obtained through non-hierarchical cluster analysis.

		Clusters	
	Global n = 401	**1 n = 276**	**2 n = 125**
Intercept	4.50	4.50	4.50
Breed			
White pig	−1.18	−1.17	−1.20
Iberian pig	1.18	1.17	1.20
Relative importance (%)	42.61	43.63	40.12
Production System			
Outdoor	1.09	1.14	0.99
Indoor	−1.09	−1.14	−0.99
Relative importance (%)	39.34	42.49	33.04
Price			
€7/kg	0.50	0.37	0.81
€12/kg	−0.50	−0.37	−0.81
Relative importance (%)	18.05	13.88	26.84
RMSE	1.55	1.56	1.48
R^2	0.54	0.54	0.59

4. Discussion

4.1. Consumers' Knowledge about Sustainability

Most of the consumers stated that they do not fully understand the concept of sustainability, and find it confusing. In this study, addressing this topic in Spanish consumers for the first time, although more than 85% of the consumers have heard about sustainability, the meaning of sustainability, related to food, is heterogeneous. Our results are consistent

with the results of other studies [25], which indicate that the concept of sustainability keeps confusing people, as they lack an understanding of the idea of sustainable consumption [32,33]. Yet, sustainability should be better integrated into the Spanish dietary guidelines, to promote citizens' awareness [33].

The components of sustainability that were considered most relevant by consumers (natural habitat conservation, assuring animal health and welfare, and reduction in pesticides and antibiotics) are frequently mentioned in European surveys. Spanish consumers' concerns about farm animal welfare can prevent them from buying some products from intensive systems, but their perceptions and concerns to make more informed decisions to improve their sustainability is pending [33]. Environmental concerns are increasingly on the top of the mind for consumers, as well as the willingness to pay for environmentally friendly products [34,35]. Consumers perceive that the welfare of farmed animals should be better protected [36], despite the fact (at the same time) that they lack knowledge of intensive farming practices, and understanding of welfare problems in intensive production, including Spain [19,37]. The present results show that a substantial percentage of consumers do not know or do not consider the quality of life in daily consumption decisions, and less on animal welfare, as a part of sustainability, with these proportions being higher in cluster 2 (consumers with a restricted concept of sustainability). The last Eurobarometer [38] highlighted the misuse of antibiotics, hormones, and steroids in farm animals, pesticide residues in food, and food additives. Safe warding of antibiotics paves the way to reduce the threat of AMR, which critically affects the ability to achieve the SDGs agenda. According to Jørgensen et al. [39], the efforts to curb antibiotic and pesticide resistance are particularly linked to SDG 3 (good health and well-being) and SDG 12. The highest global antimicrobial consumption takes place in the food production animal sector in countries such as China, India, the USA, Brazil, and some European countries, including Spain, where antimicrobial consumption in pork production is largely concentrated in the NE region of Spain [40]. Therefore, it is important to assess the sustainability of antimicrobial use in animal agriculture, and regulate it on a global and regional scale, for the sake of both human and animal health [41].

4.2. Main Finding on Sustainable Food Consumption

The work is novel, since little is known about how consumers' understanding of sustainability is manifested in their consumption decisions. Such segmentation provides a relevant reflection of the actual state of mind of the Spanish consumers, which has been undescribed up to date. It might help to find approaches to consumers through information, co-educational plans, and effective marketing strategies.

In some previous studies on consumer segments, extrinsic factors, such as product origin, and other related aspects, such as the production system or the environmental impact of manufacturing processes, were relevant elements in consumer purchasing decisions [42–45]. In the present study, product origin was one of the most relevant drivers (which also contributes to differentiating the two clusters) influencing purchasing decisions. The consumer of this study, more significantly from cluster 1, does not perceive food products that come from abroad as better products. At the same time, the consumer valued local and/or national products positively. Preferences on product origin have been widely related to perceived quality [46], food security [47], and decreased environmental impacts [48]. Therefore, it is seen as an important determinant of quality and as a way to support local producers [45]. A differentiated pattern is observed in the two regions under study in the present work. The SW consumers are more supportive of local products, which could be associated with a greater understanding and familiarity with the livestock activity (more popular in this region), or the sense of localness compared to the consumers from NE Spain. This sociodemographic differentiator has been shown to impact risk perceptions, benefits, and farm animal welfare elsewhere [20], and it is especially linked to SDG 2 (use local products) and SDG 12 (responsible consumption and production).

In general, the consumers of this study have an environmental sensitivity to the issues of production and responsible consumption, showing foremost importance in factors such as the environment, recycling, and the conservation of natural resources at the promotion of sustainable production. These results are in line with the Spanish society's awareness of the detrimental effects of intensive livestock systems [36]. Many respondents agree with the statement that sustainable food products are safer and of better quality than conventional ones. The results showed a consumer in charge of the family diet, with high awareness of the health impacts of pesticides, use of GMOs, flavorings, and artificial additives. This is a consumer who tries to follow a Mediterranean diet, avoiding ultra-processed food products. There is a reluctance to the price of organic products that continues to be a barrier to shopping these products. López-Galán et al. [49] indicated that neither social norms nor consumers' concerns on health and the environment affect the intention to purchase organic food in Spain, but the price does have an impact. In fact, the greater explanatory power of the purchase intention for organic products on previous studies is to be the price. High prices are perceived as the biggest barrier for more than 40% of European respondents in other studies [50,51]. The consumers with a deeper concept of sustainability (cluster 1) seem to be less affected by meat price, as can be seen in the results of the conjoint analysis (Table 7) and shopping practices (Figure 1). Previous studies argued that a segment of potential consumers of organic food could be expanded if it is possible to increase the level of consumer's knowledge about these products [52]. However, in the Spanish context, there are more factors influencing purchasing decisions, such as income, education level, and consumers' environmental consciousness [49].

It is clear that branding is an essential factor in consumers' purchasing decisions [51]. The brand name has a strong influence on the perceived quality and consumer buying behavior in the organic food market [53]. In this sense, the consumption of fair-trade products has been gaining acceptance, due to the growing interest in business ethics [51]. Tools that reduce the negative impact of food companies on labor, social and environmental rights, stimulate producers and consumers to produce and consume more sustainably, respectively [54]. However, on the basis of the results of the present study, fair-trade products are not yet well known by consumers. There is a high percentage of consumers who punish food companies for not investing in corporate social responsibility or claiming environmentally friendly procedures [55]. Although the figures for this study show that the youth can lead the way to sustainable consumption, the adoption of ethical consumption by Spanish consumers remains low [55].

In the conjoint analysis, the equal importance given to the breed (siding local breeds) and production system (pro-extensive system preference) of cluster 1 lines up with more sustainable production. The production of traditional food products is often closely related to less-intensive production systems that typically rely on local resources, and, as such, play important roles in the conservation of agroecosystems, including local livestock breeds [45]. In fact, by putting the two frequencies together, the consumers from cluster 1 have a good image of the Iberian pig, as elsewhere reported [56,57]. The influence of the information on the local production on consumer expectations was also reported by Vitale et al. [45]. Cluster 2 gives greater importance to the breed (Iberian) than to the production system. This difference in cluster 2 suggests that the predilection towards Iberian products is based on the quality of these products (extra sensorial and nutritional qualities), as suggested by other researchers [58], and less arguably by the traditional husbandry [59,60]. In general, price is the least important attribute assigned by the consumers in the study. Thus, the consumption of pork products in these groups (shopping practices) agrees with the results of the conjoint analysis. While there are no differences in consumption between the clusters when it comes to meat or pork generic products (cheaper products), it is, however, observed in those from Iberian pigs. Economic factors, more than food sustainability characteristics, are commonly considered by the population. The consumers from cluster 1 are consuming expensive products more often. Although the consumers from both of the clusters prefer cheaper prices, cluster 1 gives less importance to the price, consuming more

Iberian products. It is also worth noting that the majority of the population has in mind that Iberian products are "more sustainable" because they have the image of the pig in the pasture [56], when, in fact, most of the Iberian production is intensive (65%) and only one-third is reared under extensive management [61].

The ever-changing perspectives on how consumers shop and embrace social causes in alignment with their personal values are the reason to combine consumer preference and shopping practices in this study. The results were the most coherent possible, by accounting for their preference in the analysis of the shopping practices of the animal products in this study. The consumers from cluster 1 are adopting more sustainable practices, by going to the local butchers and markets and escaping from packaged food. They often buy Iberian pork products and, less often, pork products. However, it is also true that cluster 2 is built up with consumers with a less-expanded concept of sustainability. Consumers concerned about ethical, environmental, and health issues, and with a "local" orientation in the food market, are more likely to buy organic food [62], as observed in this study. These social considerations may provide a basis for identifying common goals to further develop the organic food system.

By analyzing the influence of demographic characteristics in this study, the place of residence has brought the most remarkable differences that might require the strengthening of food system urban–rural linkages. Thus, cultural diversity and the urban model of citizens (more specifically in the NE region) should be considered by policymakers, since it can be relevant when developing marketing strategies. Second, the age of the consumers requires special attention (and consequently the implications on educative programs). The research focused on analyzing the attitudes and behaviors of this segment is still extremely limited, especially in Spain. Nevertheless, the findings are of great importance for all of the agents (NGOs, companies, and public powers) who are interested in promoting ethical consumption. The young consumers were chosen as they are more sensitive to the current trends, as well as the fact that they are the foundation for future market development. Efforts should, therefore, be taken to transfer knowledge in the next generations, creating conscious and ethical consumers. Regarding the significance of treats every day on young people in this study, consumers are now driven by "micro-needs" that reveal their desires for specific products or attributes that conform what they consider important or valuable. Third, women show a more pro-healthy diet and safe product behavior in their consumption decisions. Although significant differences were only observed in some behaviors, it is important to mention that in Spain, still today, women are in charge of most of the food shopping [63] and cooking at home. Finally, the lack of heterogeneity (significant associations), in terms of education level throughout the different outcomes explored, is quite astonishing. Even though current societies are the most developed and informed, there is still uncertainty about what specific dietary recommendations should be followed [63]. González-García et al. [64] claimed the incorporation not only of health, but also of environmental indicators, on dietary options in the Spanish national dietary guidelines, to promote their adhesion to balance and sustainable dietary habits.

4.3. Research Limitations and Further Studies

This study has two main limitations, detailed in Garcia-Gudiño et al. [29], since they are part of the same study. In brief, the primary limitation is a bias in the sample of the participant consumers, especially in the SW region. As explained before, the young consumers were over-represented and this could have biased the results, since age has been significant in some questions. Biases in other consumers' characteristics, such as the high number of consumers with a high educational level, the high number of public employees, and the low percentage of unemployed consumers, might also affect the results, to a lower degree, since they have less importance in the responses. Larger studies should be executed, because the sample of respondents in this study was small, while identifying typologies requires research on representative samples.

Another shortcoming is related to the layout of the questionnaire. Because the questionnaire was part of a wider study, the questions were grouped by blocks to simplify the reading and, consequently, reduce the fatigue in answering the questionnaire.

Further studies are needed, to include a less biased and higher number of consumers. Moreover, it would have been of interest to know the attitudes of the consumers towards sustainability when information is provided, in order to perform an integrated understanding of livestock activity, and therefore of the individual awareness of the ethical and ecological implications. Thus, based on the results of this study, it would be beneficial to study the main barriers that are preventing the transition of sustainability values into actions.

5. Conclusions

In the context of the present study, it is possible to conclude that, although most of the consumers have heard about sustainability, they are not aware of how broad the concept is. The awareness of those terms is a necessary condition for changes in consumers' behaviors and consumption models. Several factors limit the transformation progress of the consumer into sustainable diet purchase decisions and practice. The main barriers preventing the transition of sustainability values into actions seem to be education and information. The framework of the Iberian pig production still manifests a low knowledge of the farm system attributes that are drivers to make it more sustainable. In this pork case study, policy makers play, or should play, a key role as mediators and in defining quality standards in favor of social sustainability (in particular, fairness and transparency in the production chain (regarding the veracity of the production and feeding system in the final life of the animal) and clarity for the consumer.

It is noteworthy to highlight the influence of the education level on the knowledge (concepts and components) of sustainability. Information campaigns and a greater focus on education can raise awareness about the concept of sustainability among consumers, which will influence sustainable food purchases. Educational strategies (information campaigns and nutritional education programs among citizens) should be considered, to involve more consumers in taking care of sustainability. A better understanding of livestock practices and linkages with ethical and ecological implications (and not only on nutritional aspects and better-tasting) is required.

For the sake of the creation of a social environment that makes it easier to choose healthy and sustainable diets as part of the sustainable food consumption of SDG 12, it is advisable to provide information to make sustainable choices, and demonstrate specific behaviors that can be easily adopted and integrated into consumer daily habits. It is also important to empower consumers towards responsible consumption, and, more specifically, to the youth generation.

Further research is needed, to explore deeper into the study of the dimensions of sustainability and its relation to different aspects of production systems, in order to understand individual awareness of the ethical and ecological implications of consumer choices.

Supplementary Materials: The following are available online at https://www.mdpi.com/article/10.3390/su13137397/s1, Table S1. questionnaire and selected questions to perform the cluster analysis; Table S2: characteristics of consumption habitude; Figure S1: dendrogram of the cluster analysis.

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