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Exploratory Insights into Consumption and Commercialization of Organic Products during Covid-19 Pandemic †

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Abstract: A questionnaire survey was designed to investigate the consumption habits and commercialization of organic products in Portugal, under Covid-19 restrictions. Results showed that most participants are familiar with organic farming and have consumed organic foods, mostly fruits and vegetables, and less meat or dairy products. Reasons to consume organic products include: environmental concern, help local producers and eliminate harmful substances like pesticides from diet. Although the majority have consumed organic foods, there is still a small percentage of consumers who do not, and for those it is because of the high prices of organic when compared to conventional food.

Keywords: sustainable agriculture; organic farming; food consumption; environmental concern; commercialization

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1. Introduction

For decades, the intensification of agricultural systems has sought to respond to society's growing consumption, globalization, population growth and the fight against hunger, particularly in emerging countries. This intensification is mainly characterized by the excessive use of natural resources, fertilizers and agrochemicals to maximize production. These abusive practices, in turn, lead to widespread pollution and to global warming [1–4]. In this context, organic farming (OF) is often presented as a solution to mitigate the negative impacts that conventional farming causes on the environment [5–7]. This is an agricultural system that aims to produce food, causing minimal impacts on animal and human ecosystems [2,5,8]. Instead of using synthetically produced raw materials (fertilizers, pesticides), organic management practices benefit from adjusting crop to biological cycles, well-defined choices regarding the seeding or planting timesoil preparation and weed control, and the use of biological control and natural pesticides [6,9,10]. This system aims to achieve balanced relationship along the natural food chain, as well as enhancing the health of soils and the quality of water, contributing to biological diversity, respecting the cycles of nature and contributing to the responsible use of natural resources [11]. Organic agriculture encompasses environmental, economic and social aspects, contributing to reduce poverty and to ensure food in good conditions to be consumed [12,13]. The study by Boone et al. [17] aimed to compare the environmental impact of biological and conventional food systems. The authors concluded that OF has clear environmental benefits compared to conventional farming methods. However, transition might need some support from governmental organizations. The study by Markuszewska and Kubacka [18] showed that increase OF in Poland depends mainly on financial support, that encourages

farmers to carry out this more environmentally friendly cultivation practice and abandon conventional cultivation.

OF has been growing all over the world, namely because in the last few years consumers have demonstrated a favorable attitude towards products from OF. The reasons for this preference are varied and include consumers' belief that these products are healthier and less harmful to the environment than conventional agricultural products, and also because consumers are concerned about animal welfare and food safety [14–16]. Although interest in organic products and their purchase has increased, with several scientific studies revealing a preference for these products, and that consumers are more willing to pay a premium for organic foods, it is a fact that conventional products still dominates the food market. The major barriers associated with the purchase of organic food are related to the cultural and social factors and the price of these products, as they are more expensive compared to those of conventional agriculture [13].

The existing literature related to the consumption and commercialization of organic products is not extensive nowadays, and there are few studies for Portugal. The reason why there is this lack of information might be related to the fact that this type of agriculture is still not widely practiced by Portuguese farmers and consumers might eventually still not value the products or simply do not buy due to the high prices. Hence, this study aims to assess eating habits regarding OF by Portuguese consumers, as well as perceive their knowledge concerning this type of production system and its implications.

2. Materials and Methods

2.1. Questionnaire Survey

This research was conducted through a questionnaire survey, applied online between July and August 2020. The research was approved by an Ethics Committee for adult citizens only and who consented to participate after being informed of all their rights, including anonymity of their answers. The questionnaire was designed purposely for this study and recruitment was made through email and social networks, using a convenience sample. For data treatment was used Excel 2016.

2.2. Sample Characterization

The sample included mostly female participants (84%), and who completed the secondary school (39%) or a university degree (50%). Regarding living environment about half reside in urban (49%) and the rest in rural areas. The average age was 35 ± 13 years. A high fraction of the participants was employed (39%) or studying (33%). In what concerns the monthly income, 13% gained less than 500€, 26% gained 501–1000€, also 26% for the range 1001–1500€, 21% received 1501–2000€ and 15% received more than 2000€ per month.

3. Results and Discussion

3.1. Consumption and Commercialization

Concerning the knowledge about and the consumption of OF, 93% of the respondents were "familiar with the concept of organic farming, which aims to use safe techniques without harming natural resources and without using chemicals" and 85% have consumed foods produced in organic farming.

From those who have consumed OF products, 13% consume them in one meal/week, 44% consume in 2–3 meals/w, 30% consume in 4–7 meals/w and 13% consume OF products in all the meals along the week. It has been shown that perceived consumption values are related with the consumption frequency, varying between regular, occasional, and non-buyers of organic food [19].

Table 1 shows by product/category the food consumption of the participants, according to the agricultural production system. The food products most consumed in OF option are vegetables, such as lettuce (68%) or pumpkin (65%).

Table 1. Consumption of food products according to the agricultural production system—represented as percentage (%) of positive answers.

Vegetables	OF[1]	CA [2]	Both	Fruits	OF [1]	CA [2]	Both	Meat & Eggs	OLP [3]	CLP [4]	Both
Chickpea	31	39	1	Apple	22	34	3	Rabbit	31	30	1
Peas	26	43	4	Orange	37	26	12	Pig	20	49	3
Broad beans	38	21	1	Pear	32	36	6	Chicken	38	29	9
Beans	52	20	3	Banana	12	62	1	Turkey	13	57	3
Lentils	13	42	0	Blueberry	43	21	4	Goat	29	33	3
Pumpkin	65	9	3	Raspberry	43	21	3	Wild Boar	14	28	0
Eggplant	36	24	2	Strawberry	51	16	10	Piglet	8	47	2
Broccoli	35	31	9	Pineapple	2	70	1	Sheep	25	24	3
Tomato	63	6	7	Persimmon	46	17	3	Cow	12	47	4
Lettuce	68	4	6	Plum	33	21	10	Eggs	49	10	9
Pepper	53	13	3								
Cucumber	51	8	7								
Potato	58	15	4								
Parsley	61	9	4	**Fish**	**AC [5]**	**WC [6]**	**Both**	**Dairy products**	**OF[1]**	**CA[2]**	**Both**
Cabbage	62	11	3	Sea bass	41	20	6	Milk	5	64	4
Onion	60	8	8	Sardine	25	36	5	Cheese	14	62	0
Chuchu	28	33	3	Hake	40	27	4	Fresh cheese	16	54	0
Turnip	39	20	5	Gilt-head bream	38	24	10	Butter	8	63	0
Cauliflower	27	35	4	Tuna	39	27	4	Cream	9	59	0
Spinach	45	20	6	Codfish	35	34	4	Yogurt	12	61	1
Asparagus	11	42	1								
Watercress	35	25	2								
Beetroot	30	26	2								
Carrot	30	26	2								
Arugula	22	34	3								

[1] OF = Organic Farming (% yes), [2] CA = Conventional Agriculture (% yes), [3] OLP = Organic livestock production, [4] CLP = Conventional livestock production, [5] AC = aquaculture (% yes), [6] WC = wild capture (% yes).

The reasons for consuming food products from OF were evaluated on a scale from 1 (much important) to 6 (not at all important), and they are presented as mean scores (MS), in decreasing order of importance:

- They originate less environmental pollution (MS = 1.69).
- Buying OF products can help local farmers (MS = 1.73).
- Their production avoids pesticides (MS = 1.79).
- They are more nutritious (MS = 1.93).
- They are more appealing in terms of flavor and aroma (MS = 2.16).
- They can bring benefits to human health (MS = 2.34).

Hence, people buy OF products mainly for being more environmentally friendly, to help local farmers and minimize the use of pesticides. A study conducted in Switzerland revealed that the determinants of purchases of organic fruits and vegetables were higher knowledge and more information as well as having more money, thus allowing them to make healthier food choices [20]. Truong et al. [19] found that trust and distrust in the food system is a determinant of organic food choice.

The reasons for not consuming products from OF are shown in Table 2 and they reveal that the high price is the most important factor that leads consumers to opt for CA instead of OF products. It has been shown that people who have consumed organic foods in the past are more prone to buy again organic food, although some attitudes and personal traits also significantly influence food organic buying intentions [21,22].

Most participants believe that there are few places that sell OF products (87%). They buy them mostly directly form the producer (n = 50), from supermarkets (n = 33), from local food stores (n = 25) and from specialized OF stores (n = 19). The on-line shopping for this type of product is still rare (n = 9).

Table 2. Reasons for not consuming products from OF.

Reasons for NOT Consuming OF Food Products	Number of Positive Answers
The price of OF food products are generally higher than CA food products.	11
They are the same as those produced in a conventional way.	2
They are not for sale near where I live.	5
They are not for sale near where I work.	1
There is not information about sustainable products.	2
OF food products look less beautiful.	0
I'm afraid they don't meet all the food safety standards.	2

Regarding the price difference, 37% are willing to pay a premium of until 1€ more for OF as compared with CA products, 55% are willing to pay extra 1–2€ and only 8% accept to pay a premium higher than 2€ for OF products. It was reported that organic food prices follow a different pattern than conventional food prices, varying significantly depending on the food groups and among sales points (supermarkets included) [23]. Marian et al. [16] in a study conducted in Denmark, have shown that, although consumers purchase more repeatedly organic foods as compared with conventional products, a high price generates lower repeat purchase of organic food products than a low or a medium price in all food product categories. When consuming organic foods in restaurants, the acceptable price premium percentage level was found to be around 12% for casual dining restaurants and 10% for fine dining restaurants [24].

Regarding the changes induced by Covid-19 pandemic and the lockdown, 78% of the participants think that society started to give more value to local products and products from OF as a result of the pandemic, and 40% believe that the consumption of OF products increased due to Covid-19. Li et al. [25] studied the influence of COVID-19 lockdown in Chinese consumers' sustainable behavior in food purchasing and consumption and observed that food security as well as the perceptions of financial and health risk constitute major determinants of consumers' behavior towards more sustainable food choices.

3.2. Knowledge

Figure 1 shows the perceptions about some factors related to OF, and it reveals that 79% (61% + 18%) are aware that OF is better for the environment, 71% (52% + 19%) know that OF contributes to reduce the ecological footprint of the food products and 82% (68% + 14%) know that pesticides contribute to environmental pollution. The items where higher % of indifferent were registered for "Product from OF are valued by society" (36%) and "OF is underdeveloped in Portugal" (35%). The level of information and degree of knowledge available for consumers are crucial to help them make more sustainable food choices. Schmidt [26] identified a critical challenge in global climate protection as being the way to promote more sustainable food consumption in high-income countries. Hence, he proposes simple guideline-provision as a promising and easy-to-use tool for interventions that improve consumers' ability to identify the more sustainable foods in their daily life. A review by Kushwah et al. [27] identifies the determinants as well as the barriers to organic food purchase and consumption, highlighting the role of the societal value as a promotor of adoption of organic food. The work by Kushwah et al. [28] showed that ethical consumption is positively associated with the intention to purchase organic food and influences food choice.

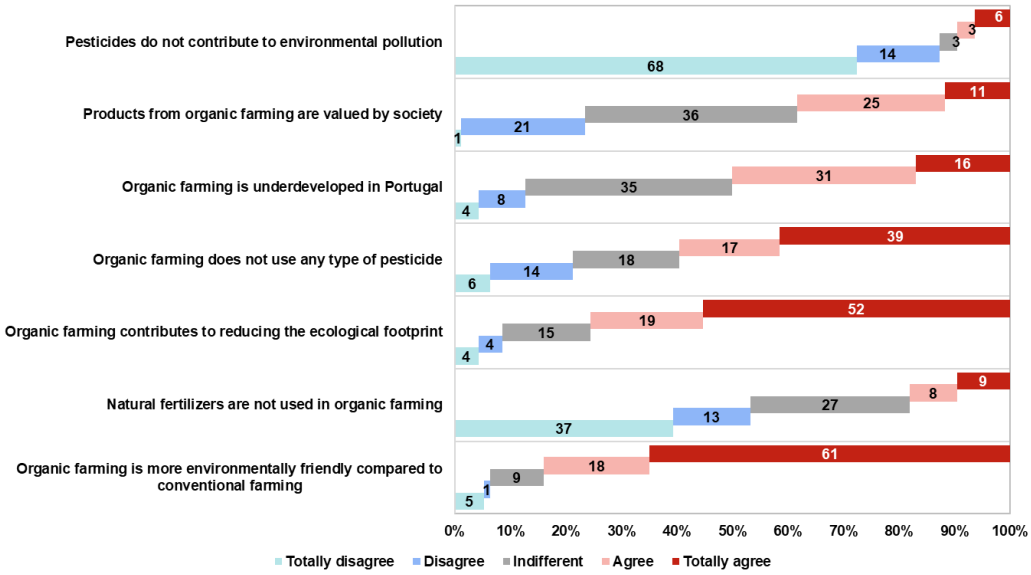

Figure 1. Level of agreement with the statements used to assess knowledge about OF.

4. Conclusions

This study revealed that the OF food products most consumed are in the category vegetables and fruits, with dairy products from OF being the least consumed.

Most respondents are informed about what is organic farming and perceive the benefits it brings to the environment as well as to human health, for avoiding the possibility of ingesting pesticides residues. The main motivations to consume OF food products are to preserve the environment, help local farmers and reduce the use of pesticides, while the factor that most hinders the choice OF food products is price.

In was a general opinion that the Covid-19 pandemic changed how the local and OF products are perceived by consumers and as a consequence their consumption increased.

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