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Food consumption and the Covid-19 pandemic: The role of sustainability in purchasing choices

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1. Introduction

The unexpected Covid-19 outbreak has led to several changes in daily life, including a different approach to eating and spending habits [1,2]. As is well known [3,4], behaviours and choices have been affected differently in different historical phases:

1. “emergence and acquisition of awareness of the epidemiological problem”;
2. “period of restriction of free movement and widespread lockdown”;
3. ‘post-pandemic peak period, with management, control and coexistence of the infection’.

Thus, food purchases have progressively changed during the pandemic’s evolutionary phases. In particular, the restrictions imposed by the regulations enacted to protect public health and, above all, the lockdown prescribed by law triggered the rush to purchase foodstuffs such as pasta, UHT milk, rice, extra virgin olive oil, biscuits, etc., at first, only to slow down immediately afterwards. Thus, from a ‘convulsive’ consumer buying attitude, there has been a shift to a ‘reflective’ buying attitude, with an affirmation of moderate spending and no assault on the shelves [5,6].

Collective fragility has therefore raised awareness of individual responsibility in combating these problems, fuelling so-called “critical consumption”. This stems from a need to regain possession of compromised freedom and is expressed through responsible attitudes and behaviours that end up projecting toward consumption that respects the environment and its sustainability [7,8].

An interesting question for researchers is whether this phenomenon can be considered lasting and to what extent it will influence food purchasing behaviour in the future and also guide the activities of public and private stakeholders, including production companies. The problem of managing the consequences of the pandemic and especially the vulnerability of populations in terms of health and nutrition. This has prompted the world’s leading institutions dealing with these issues (FAO, OIE, UNEP and WHO) to set up a multidisciplinary group of experts to strengthen cross-sectoral collaboration called ‘One Health’. The aim is to create an integrative and systemic approach to health based on the understanding that human health is closely linked to the healthiness of food, animals and the environment and the healthy balance of their impact on ecosystems [9].

The Theory of Planned Behaviour (TPB), which is based on the idea that an individual’s behaviour and attitude are linked and has been the basis for countless studies in the field of social psychology and consumer behaviour, can help us to understand this phenomenon. Such studies aim to be able to predict the behaviour of the subject. However, sometimes attitude alone is not a good predictor of future action [10], and it is, therefore, necessary to study other factors that may be important in this context [11]. A close link between beliefs, attitudes, intentions, and

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behaviour has thus been affirmed using models capable of correctly capturing and measuring specific variables through which the links between attitude and action in food purchasing can be investigated [12–15].

Specifically, in TPB, behaviour is defined by intention, the latter in turn being influenced by three key factors: 1) the attitude to behaviour (which does not yet translate into behaviour itself); 2) subjective norms that correspond to the influence of the opinion of people important to the individual on his intention, which is internalized by the individual who, at a more or less conscious level, takes it into account in the formation of his intention; and 3) the so-called perceived behavioural control, i.e. the perception of making conscious decisions (a mental structure typical of the individual who claims, not to be influenced by the external environment in decisions).

In this general context, the following research questions were developed to contribute to the construction of a cognitive framework on the behavioural dynamics of food consumption in the post-Covid-19 era and on the related perspectives:

H1. consumption of organic products is likely to increase in the post-pandemic phase;

H2. Health-related factors will lead to an increase in ethical consumption (health, naturalness, safety, nutrition, tradition, origin, and fairness) in the post-pandemic phase

H3. labels and certifications are essential for choices because they provide transparency on the health content of the product in the post-pandemic phase

H4. Factors related to food access (price and convenience) will continue to dominate in the post-pandemic phase.

The empirical activities were carried out in Sicily, a region that suffered the consequences of the pandemic and that is characterized by belonging to the group of less developed Italian regions in economic transition whose future will depend significantly on the recovery and resilience initiatives supported by the European Union [16].

2. Some contributions from the valuable literature for defining research hypotheses

The Covid-19 pandemic has increased the fragility of individuals (concerning something global and beyond human control) and has called into question various aspects of behavioural, regulatory and control beliefs and, in turn, intentions and behaviour. There is thus a growing awareness of the environment, sustainability, and the balance of ecosystems and health in the wake of the institutional and media debate (solid beliefs matched by solid intentions), which can be adequately analyzed in the interests of stakeholders through the TPB.

There are, in fact, numerous works in which, through the TPB, an attempt has been made to explain consumer purchasing behaviour and to verify various inductive theories proposed by psychologists of human behaviour [17–22]. According to the theory, consumer behaviour is a function of intention to perform the behaviour under study; the intention is based on attitude, subjective norm, and perceived behavioural control over the behaviour; and these factors are determined by behavioural, normative and control beliefs respectively [23–27], as illustrated in Fig. 1.

This can be connected in the literature to what is observed in the analysis of market segments like GMOs, demonstrating that intention depends primarily on established attitudes because of the contentious social media debate and less on subjective norms or behavioural control because there are still a limited number of countries that permit the marketing of such products [28–31]. Similar considerations can be drawn in the study of the consumption of organic products to explain the purchase intention of such products and understand which moral considerations have the most significant influence [32,33]. In particular, purchasing organic products allows consumers to fulfil their moral obligations and behave in a way consistent with their perception of themselves [34].

In support of the second hypothesis, naturalness refers directly to the production method [37] and is an attribute closely related to health and

![Fig. 1. Theory of planned behaviour and food purchases.](image-url)
the environment [38]. The production method is sometimes indicated on labels but can also be linked to the source of the product. Customers typically don’t know the specifics in either situation, so judgments about naturalness are primarily based on trust [18,39] and production traditionality, implying low-input production and high naturalness value [40]. Another study shows that purchasing behaviour results from a combination of personal attitudes, perceived social influences, perceived consumer efficacy and perceived availability [41,42]. Furthermore, different levels of trust and value orientation produce different strengths of determinants in the case of dairy consumption [43-45].

Environmental concern and intention to buy green products underpin the work of Paul et al. (2016) [46], as well as global environmental sustainability [47,46] and the need to predict consumption patterns adapted to address the climate challenge [49,50]. Another study shows that consumers with an ethical conscience consider environmental protection when purchasing food, and among the motivations is the demand for safe and natural food ingredients [51]. Furthermore, regarding external influences, consumers tend to trust the information provided by broadcast media, experts, and word of mouth on the Internet [52-54].

TPB has been widely used as the basis of theoretical and empirical studies about the perception of nutrition labels and how they affect individuals’ consumption choices [55]. It is thus shown how purchase intention is influenced by the social pressures underlying the subjective norm. Brand image is perceived along dimensions often concerning product originality, familiarity, and healthiness [56,57].

TPB also demonstrates essential gender differences that should be considered in future health promotion interventions [58,59]. Information about processed products produces positive attitudes about related consumption [60-64].

Finally, price usually remains a crucial purchase criterion for purchasing behaviour, especially for certain types of food, where the emotional aspect and response are small, but price sensitivity is high [65,66]. The convenience attribute is often linked in the literature to the ease with which the product is accessed (so that purchases can be reconciled within daily schedules, often preferring the proximity of shopping points) and how it can be prepared and consumed [37]. This hypothesis is consistent with the pandemic’s economic and social issues, with the increased fragility of certain social classes and the demand for more sustainable and affordable food [67,68].

In this context, TPB was employed in a study of consumers of fast-food meals concerning three alternative/complementary expectations, such as ‘consideration of future consequences,’ ‘fear of negative evaluation’ and ‘self-identification scale as a healthy eater.’ General demand for tasty, satisfying, and convenient meals emerged. Therefore, factors that reflect immediate needs appear to ignore concerns about the long-term health risks associated with this consumption mode [69-71].

3. Materials and methods

3.1. Data acquisition and processing

The survey of purchasing behaviour before and after the Covid-19 pandemic, to capture emerging trends and predict future food consumption developments, was conducted through a specially designed questionnaire using the “Google Forms” tool. It was disseminated online through the leading social media channels between April 14, 2021 and May 9, 2021.

The opportunity to study the behaviour of those in charge of buying food purchases by overcoming the barriers to freedoms afforded by Covid-19 drove the choice to concentrate on social media. Social channels were chosen because they offer a large and varied pool of respondents.

Amongst other things, social channels also allow for the eventual profiling of the target according to, for example, place of residence and interests, thus defining an exact niche of consumers. This option was not used in this case. However, this does not impose some element of profiling. But we preferred to accept a random sample, leaving consumers free to answer the questionnaire.

Therefore, we accepted variable responsiveness that was very difficult to predict due to limited resources, relying on voluntary participation without incentives and maintaining a high quality of responses.

Within social media, we explored social groups between stakeholders in food shopping, exchanges of opinions between consumer communities, discussion groups, and relationship networks reassessing food and its role in promoting a healthy lifestyle. Groups governed by ‘health influencers’ were excluded in order not to obtain results influenced by opinion leaders.

The questionnaire was structured in four sections to explore socio-economic characteristics (gender, age, level of education, occupation, income, cohabiting members during the pandemic, etc.). Changes in agri-food habits during the pandemic period (location of purchase, frequency, purchases in quantity and quality, reasons supporting the choices, etc.), the degree of knowledge on the subject of sustainability (environment and its protection, knowledge of production techniques, interest in labelling and eco-sustainable packaging and recyclable; etc.) and, finally, the changes in purchases in the post-pandemic, concerning the perspective on the importance attributed to the issues of sustainability, health and well-being (return to regular attention to health, through the limitation of use of fats, sugars, salt, palm oil, interest in organic, local or in any case environmentally friendly products according to legislation and techniques aimed at the competition for safety and hygiene). In the first three sections, closed questions were asked, while in the fourth section, scaled questions were selected, i.e. questions containing 5-step Likert measurement scales.

Having completed the programming phase of the questionnaire and before launching the data collection, we moved on to the control and pilot testing phase. In this phase, the necessary checks were carried out to ensure that there were no programming errors (bugs or malfunctions) and that the questionnaire was computerized appropriately to achieve the research objectives set in the questionnaire design phase.

A total of 530 questionnaires were collected, 73%, during the first five days of the survey, as shown in Fig. 2.

Finally, the OLS (Ordinary Least Squares) econometric model was used to test the research questions using the Gretl software, in particular by correlating the data on the socio-economic variables of income and educational attainment (dependent variables) with the data on the variables in the fourth section of the questionnaire, i.e. the scale variables.

This regression model is estimated using the ordinary least squares method, which aims to minimize the residuals in calculating the coefficients. Therefore, the coefficients for each independent variable were considered to confirm and evaluate the significance of the correlations discovered through the model.

3.2. Determinants of the behaviour under consideration

In particular, the behavioural, normative and control beliefs, intentions and behaviours listed in Table 1 were tested.

Behavioural beliefs were selected based on their ability to positively affect the specific propensity to buy (how many and which are positive, negative and with what intensity), leaving room for possible conflicts (which are determined by validations of personal experience and which are based on non-validated sources) capable of generating cognitive dissonance in the consumer. Instead, normative beliefs (what we think others - people or groups such as wives, family, friends, colleagues, etc. - would like us to do or not do) - In contrast, normative beliefs (what we think others - people or groups such as wife, family, friends, colleagues, etc. - would like us to do or not do) in combination with motivations to adapt to the expectations of others, were considered in the context of the 'subjective norm'.
Finally, perceived behavioural control refers to the subject’s reflection on their ability to ‘perform’ a particular behaviour (control over events and one’s ability to act).

4. Results and discussion

4.1. Socio-economic characteristics of the sample surveyed

As Table 2 shows, it is possible to note that the gender most involved in daily shopping or concerned about food is predominantly female (55%), although not with a significant percentage compared to the male gender.

As far as the distribution of the sample by age is concerned (in generational classes of about twenty years each), it can be observed that the four groups are not well balanced between them; in fact, a clear majority of the two age groups between 20-40 years and 40-60 years can be noted, as subjects who pay more attention to food and daily food requirements.

Looking at the educational qualifications of those interviewed, almost 70% have a degree (master’s or three-year degree), while the remainder includes students and graduates.

The age distribution of the sample, in part, reflects the characteristics of the social media channels involved and the populations that turn to these social media channels, i.e., discussion groups with activating stories and posts mixed between scientific dissemination. Content-based on users’ interests, curiosity, and lived experiences, where the internet is used as a new medium to discuss aspects usually dealt with offline by experts such as dieticians, dieticians and nutritionists. So, ultimately, it is about communities between people who have gained awareness and expertise about nutrition.

Therefore, to confirm and assess the significance of the correlations found through the model, the coefficients for each independent variable were taken into account. However, food and sustainability are particularly felt among people engaged in work and study.

An attempt was then made to subdivide the sample according to the average family income and, thus, economic availability. Table 2 shows that the low and high-income categories are more sparsely represented, while the average income category accounts for half of the interviewees.

The last aspect of the section on socio-economic characteristics concerns the number of persons living in a dwelling during the Covid-19 emergency period. The answers analyzed show that more households with three or more people lived together during the pandemic.

It was found that the smallest percentage, 7%, lived alone. These data make it possible to deduce that the Covid-19 emergency probably entailed the need for several people to live together and cope with the emotional, social and even economic difficulties caused by this pandemic emergency.

4.2. Changes in eating habits during the Covid-19 period (lockdown phase)

The pandemic phenomenon brought about changes in the eating habits of populations, also determining specific types of behaviour and purchasing choices. Since there were restrictions on mobility during the first phase of the lockdown, there was a noticeable shift in consumption. People accumulated food items from the pantry out of fear that they wouldn’t have enough food reserves, but more importantly, to avoid leaving the house several times to go shopping. It was then noted that the population inevitably adapted to the new lifestyle by resuming traditional habits such as baking cakes or homemade bread, which many had given up because of the hectic pace of modern life [3,71,72].

The survey showed that supermarkets and hypermarkets were the most popular places to shop for food during the pandemic, despite crowding, waiting times and generally restrictive measures during the lockdown period (64%), as shown in Table 3.

It should be noted that this preference was also influenced by the wide selection of food products available in these locations, which additionally experimented with home delivery during the Covid-19 period, benefiting a sizable portion of consumers who were unable to go shopping. The attitude towards online shopping and using various e-commerce search engines is growing (13%).

The second question concerning the frequency of food shopping showed that the most significant number of subjects (50%) went shopping several times a week during the pandemic.

It is logical to assume that many of these people were motivated by this choice either because the forced lockdown burdened them or

Fig. 2. Daily consumer participation in the survey.
because they spent so much time at home experimenting with new dishes and thus reacting to this challenging time [73].

However, a large proportion of respondents (35%) went food shopping only once a week. It appears likely that these individuals belong to the group of those who have attempted to stay at home as much as possible out of fear of the virus or even to those who have cut back on their food intake as a result of the lockdown, choosing a healthier lifestyle and possibly devoting themselves to physical activities. The third question on the amount of food consumed during the pandemic showed that 54% of the respondents had not changed their eating habits. On the other hand, 27% declared that they had changed their relationship with food, having increased their consumption, undoubtedly due to boredom, anxiety and stress caused by the virus and the upheaval it had brought to everyone’s lives.

13% of the subjects replied that they had changed their eating habits because they had eaten less during the pandemic. Indeed, many people focused on physical well-being during this period, relying on daily exercise and detoxifying and slimming diets [74].

54% of respondents indicated that they had continued to pay attention to the quality of their food when asked the fourth question about it during the Covid-19 emergency. On the other hand, 26% stated that the quality of their food choices had deteriorated compared to the pre-Covid-19 period. Since 27% of subjects consumed more during the pandemic, it is clear from the analysis of the data from the previous question about consumption quantity that the quality has unquestionably declined in these instances as well. It is probably because of the period and the difficulties of dealing with it that the quality of the food consumed must have been poor and certainly not healthy for psychophysical well-being.

Finally, 20% answered that they had improved their diet during the Covid-19 emergency. Additionally, in this situation and concerning the previous question, it makes sense to say that these people have turned their focus to self-care and healthy eating in response to the discomfort brought on by the pandemic, possibly favouring fruit, vegetables, white meat, and fish. The last question in this section summarises the reasons that guided the respondents’ food purchasing choices. Respondents were allowed to enter at least three different answers out of the seven available.

The results from the previous questions showed that the respondents

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**Table 1**

| Determinants of agri-food purchasing behaviour in the post-pandemic phase by Covid-19 (*) |
|-----------------------------------------------|
| Express your opinion on the following topics |
| ATT  | Increasing consumption of organic food positively affects my health and that of my family members |
| ATT  | Increasing consumption of local foods improves the sustainability of production for my family members and me |
| ATT  | The population should reduce its consumption of salt, sugar, fat and palm oil to improve the health and sustainability of production |
| SN   | Major media outlets highlight the problems caused by Covid-19 and would like to see a reduction in the consumption of the planet’s resources |
| SN   | Most of the doctors I know and appreciate would approve of my choice to consume organic and healthy food products |
| SN   | Most of the family members I respect have increased their consumption of organic and healthy food products |
| PBC  | I choose shopping channels if they offer sustainable food to increase consumption |
| PBC  | I consider my current diet habits to be Adequate |
| PBC  | I do not think I have sufficient reasons to increase my consumption of sustainable food |
| INT  | I want to increase the consumption of organic food products in the following years |
| INT  | I am going to increase the consumption of organic food products in the following years |
| INT  | I will try to reduce the consumption of salt, sugar, fat and palm oil in the following years |
| PB   | In the last year, I have increased my consumption of sustainable products |

(*) ATT = attitude; SN = social norms; PBC = perceived control of behaviour; INT = intention; PB = past behaviour. The assessment should be expressed as follows: 1 – Not at all agreed; … …; 7 – Agreed.

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**Table 2**

| Variable Percentage | Variable Percentage |
|---------------------|---------------------|
| Gender              | Occupational activity |
| Man 55%             | Student 6%          |
| Woman 45%           | Private employee 26% |
| Public employee 35% |
| Age group           |                     |
| Up to 20 years 3%   | Freelancer 29%      |
| 20–40 years 47%     | Unemployed 4%       |
| 40–60 years 41%     |                     |
| Qualification       |                     |
| Up to upper secondary level 29% |   |
| Up to Bachelor’s degree 19% | Medium - Low 16% |
| Up to Master’s degree 19% | Medium 47% |
| Over 33%            | No. of people in the house during the pandemic |
| 1 Live alone 7%     |                     |
| 2                  |                     |
| 3                  |                     |
| >3                 |                     |

(*) Our processing.

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**Table 3**

| Main aspects of food purchasing behaviour following the Covid-19 pandemic. |
|-------------------------------|---------------------------|
| Variable Percentage | Variable Percentage |
| Places of purchase          | Amount of food consumption |
| Supermarket/ Hypermarket    | 64% Best 20%              |
| Shop                         | 14% Worse 26%             |
| Farmer’s market              | 9% Same as before 54%     |
| Internet                     | 13%                       |
| Frequency of purchase       | Reasons for Buying |
| Once a week 35%             | Label information 40%     |
| Also, several times a week  50% | Market price 47%       |
| Every 15 days 13%           | Nutritional value 43%     |
| Once a month 2%             | Local product 38%         |
| Quantity of food consumption | Hygienic packaging 34%    |
| More than 27%               | Availability close to home 38% |
| Less 13%                    | Home delivery 11%         |
| As before 54%               | Don’t know 6%             |

(*) Our processing.
did not notably change their eating habits and consumption during the pandemic period. But preferred to focus on the purchase price of products (247 preferences), the nutritional value of food (224), the information on labels (208), the purchase of local products (200), the availability of food in places close to home (199) and the choice of packaging that guarantees product hygiene (181).

On the other hand, the lowest figure was that (57) relating to home delivery, probably because of the mistrust that still exists concerning this service. Because of the cost of the service (in many cases to be paid by the purchaser) and the possibility of leaving one’s own home during the Covid-19 period and having this opportunity to make one’s life appear almost normal.

To sum up, according to the survey, consumers’ choice of food was predominantly based on savings, given the considerable economic difficulties, many families faced due to the Covid-19 emergency. However, an increasing trend in the attention paid to food information (nutritional values, information on labels, hygiene) was observed during this period.

This was probably because, during the Covid-19 emergency, the interviewees followed TV and online information with greater interest and continuity and explored numerous health-related topics, not most minor nutrition and food safety.

4.3. Analysis of purchasing changes in a post-pandemic perspective (post lockdown phase)

The pandemic accelerated the already existing trend towards the search for healthier, sustainable and organic food products but also considered safe because they were packaged in protective packaging. The first question aimed to determine if and how many respondents were projected to buy organic products after the Covid-19 emergency. From Fig. 2, we can see that the most significant figure is answer 3, with 46% representing the average respondents.

If, on the one hand, the pandemic has changed food choices, on the other hand, the data collected here show that there is undoubtedly more significant curiosity than before about organic products, even if the number of totally interested people is certainly not high.

There was more interest among those interviewed (18%) in the topic of provenance when it came to the attention given to the origin of food in purchases made after the pandemic compared to the previous question. In comparison, 25% are pretty oriented towards the origin of products. The most significant finding is still marked by assessment 3, which, on closer inspection, shows that, despite the Covid-19 virus, there are still people who, on average, pay attention to the origin requirement.

The following questions are aimed at verifying more significant purchases, after the pandemic, of local products and Km 0 products. The data collected showed that in both cases, more subjects showed absolute interest in these products (23% for local products and 20% for Km 0 products). For local products, there is a low percentage of respondents who say they are not interested in such purchases (3.6%) and those who show little interest in such foods (5.9%).

The same applies to 0 km products (7.6% in the first case and 10.1% in the second). But the most significant fact in both questions is the average number of respondents who compare local and 0 km products in a not entirely convincing way (34% for local products and 38% for 0 km products).

The body of the fourth section confirmed the interviewees’ behaviour toward the brand labels (certifications) on the products. In this case, 22% guaranteed attention to what was on the label when buying, preferring and looking for quality and safe products. The majority of the most critical information is also, in this case, determined by an average number of people who probably periodically check the quality and safety of products. At the same time, a tiny percentage do not read labels or do not show a particular interest in them (8% and 7%, respectively), and 27% say they pay enough attention to the presence of certifications (35.6%).

The world of packaging also became a crucial player in the wake of the Covid-19 emergency. With the advent of the pandemic, questions such as hygiene and the role of packaging in preserving products from contamination became priorities for us consumers. At the same time, the industry introduced a series of additional elements that could act as barriers against external agents and self-hygienists.

The result obtained for this theme, in general, and in the majority, indicates an average consumer awareness of this aspect (34%). Further reassuring data emerges since 24.5% and 24.1% of the interviewees say they are aware of the packaging issue. Only a tiny part of the respondents (8.6% and 9%) showed no interest in the subject.

Another topic concerns the attention paid by the interviewees to the nutritional values on the label of a food product. In particular, whether they are interested in buying products with less fat, salt and sugar after the current pandemic.

Particular circumstance represents the important datum for all the questions asked: most consumers do not constantly pay attention to the nutritional values on the label (35%). Therefore, the answers to the following questions consistently outline consumers who do not always direct their food purchases according to principles that protect their health. 31.4% declared that from time to time, they would buy products with a lower presence of fat; the same applies to the lower presence of sugar (31%) and salt (30%).

The survey also addressed the issue of palm oil-free food products and consequently asked respondents to check how true the statement was if they would switch their purchases to palm oil-free products after the pandemic.

The final result showed that the most significant number of respondents had no intention of buying products containing palm oil (33%). 17% said they were pretty oriented toward palm oil-free food products, and 27% were the ordinary, i.e. people who probably decided to use palm oil in alternating phases, while those who were not interested or not very interested in this issue remained at 12%.

Given that the topic of palm oil has been controversial for many years, it follows logically from the survey results that 33% of respondents made this decision long before the pandemic [75].

The final question was posed to assess the respondents’ comprehension level and response consistency concerning the entire questionnaire. The aim was to assess whether the answers aligned with the topics covered, such as environmental sustainability, health, hygiene, safety and correctness in feeding after the Covid-19 pandemic.

The result indicated a higher number of subjects who answered consistently with the topics covered in the questionnaire. When asked whether they would buy more GMO products after the current pandemic if they were cheaper, 49% of the subjects replied negatively.

The remaining percentages are low and indicate that the respondents probably ignored the real meaning of the question.

4.4. Behavioural variables and their weight

The pandemic certainly had a specific impact on changing eating habits, both positively and negatively. The results show a moderately positive attitude towards wellbeing (mean score of 4.07), a significantly positive social pressure (4.48), and relatively positive perceived control

| Indications          | Cronbach’s Alpha | Mean score | SD  |
|----------------------|------------------|------------|-----|
| Attitude             | 0.71             | 4.07       | 1.06|
| Subjective norms     | 0.79             | 4.48       | 1.15|
| PBC                  | 0.70             | 3.45       | 1.37|
| Intention            | 0.89             | 3.80       | 1.40|
| Behaviour*           | 0.21             | 0.42       |     |

(*) Our elaboration. a Values 0 – did not change his behaviour towards a more sustainable diet, and 1 = changed his behaviour towards a more sustainable diet.
(3.45) over increased consumption of products with a higher level of sustainability in the post-pandemic phase (Table 4).

Overall, respondents reported a favourable intention to buy organic, local products with higher health content (less salt, less fat, less sugar, palm oil free) (3.80). The internal consistency of the scales (Cronbach’s alpha), ranging from 0.70 (perceived control) to 0.89 (intention), suggests that they are homogeneous. Additionally, 21% of the sample (111 respondents), who changed their purchases of these products in the post-pandemic period, carried out the behaviour. It should be noted that the media attention in following the health situation and the collective participation in the various consequences expressed by the pandemic generated a significant impact on the perception and behaviour of individuals. Thus, consumers’ new demand for safe and healthy food in the post-pandemic era can be seen in Table 5. It also illustrates the connection between various behavioural patterns and the sensitivity of the consumer’s cultural level, which has increased due to the knowledge gained during the pandemic period.

Several behavioural beliefs are statistically significant, including the belief that eating a sustainable, healthy and local product positively affects environmental protection and the resilience of food production systems. Consumers are positioned to find a possible response to the vulnerability, violence, rapidity and spread of Covid-19 manifested by the pandemic. Several correlation coefficients between normative beliefs and direct measurement of subjective norm and intention are statistically significant. In particular, average and, to a lesser extent, advice from doctors, specialists, and the opinions of parents and friends are positively correlated with both subjective norms and intention. None of the control factors correlated with PBC, whereas the three factors correlated negatively with intention. This means that the main barriers to increased consumption of sustainable, healthy and local products are spending capacity, compatibility with local food culture and availability of products in the supermarket.

The model results align with what has been observed in the literature [13,29,52].

The Covid-19 crisis thus makes it possible to revive traditional products linked to the territory and history, but above all, to make mainly traceable and seasonal purchases. For many, these habits introduced because of the pandemic seem to be the new guidelines for future food choices.

5. Conclusions

The research, albeit with limitations deriving from the size and representativeness of the sample, made it possible to identify several points of interest for the stakeholders, hinting at some possible strategic and policy implications.

Meanwhile, regarding the methodological approach, it is noted that the Theory of Planned Behaviour (PBC) once again proved to be a solid choice for interpreting consumer behaviour. This happens when simple intentions (to start/maintain/increase a healthy and sustainable diet in response to an extreme event that represents the fragility of social and environmental systems) are not sufficient to determine the actual implementation of purchasing behaviour.

Between ‘attitude’, ‘subjective norms’ and ‘perceived self-control’, it emerged that intention is mainly supported by subjective norms, i.e. all beliefs that enable adaptation to specific expectations. In this case, the behaviour of the interviewees was strongly influenced by information from the external environment (TV, social media, newspaper articles, advertising campaigns, etc.). But also by what they perceived through the advice of specific reference figures (medical specialists, relatives, etc.), which, during the pandemic, had much space for discussion within the mass media.

The consumers who were surveyed claimed that they gave the production method (environmentally friendly, organic label, etc.), the origin and supply chain (local production and link with the territory, the origin of raw materials, etc.), and the health/benefit effects of the diet an increasing relative weight when making food purchasing decisions (less salt, less fat, less sugar, no palm oil).

This results from a combination of factors, including the consolidation of a rising demand trend for these products and the influence of subjective norms, as was already mentioned. The task of research, also in the future, will be to understand to what extent this trend may consolidate and become a constant in the food purchasing process, given that the effects of the pandemic are not yet wholly overcome and that the environmental agenda seems to be becoming central in political choices [76].

In any case, these food choices in some way direct stakeholders towards the opportunity to support more sustainable local economies that are more attentive to biodiversity, the reduction of pressures on natural resources and the improvement of ecosystems, also counter the effects of climate change, according to a holistic and multidisciplinary approach to enhance the results of the crisis generated by Covid-19.

Author contributions

Conceptualization, G.T.; methodology, G.T.; software, G.C.; formal analysis, G.T. and G.C.; data curation, G.C.; writing—original draft preparation, G.T. and G.C.; writing—review and editing, G.T.; supervision, G.T. All authors have read and agreed to the published version of the manuscript. (*)

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Declaration of competing interest

The authors declare no conflict of interest.

Table 5
Correlations (r) between beliefs and their relative direct measure and intention in the sample interested (*).

| Beliefs                                | Construct | Correlation with the construct | Correlation with intention |
|----------------------------------------|-----------|---------------------------------|-----------------------------|
|                                        | r         | p                              |                             |
| Increased purchase of organic food     | Attitude  | 0.44                           | 0.40                        |
| Increased purchase of local food       | Attitude  | 0.38                           | 0.41                        |
| Reducing the purchase of food with high salt, sugar, fat and palm oil | Attitude | 0.66                           | 0.51                        |
| Media                                 | Subjective Norm | 0.55                           | 0.47                        |
| Doctors and nutritionists             | Subjective Norm | 0.22                           | 0.18                        |
| Family members                        | Subjective Norm | –0.13                          | 0.07                        |
| I choose shopping channels if they offer sustainable food to increase consumption | PBC     | 0.04                           | 0.09                        |
| I consider my current diet habits to be Adequate | PBC     | 0.09                           | –0.22                       |
| I do not think I have sufficient reasons to increase my consumption of sustainable food | PBC     | 0.10                           | –0.54                       |

(*) Our elaboration.
