The short- and long-term effects of the COVID-19 pandemic

How consumers changed their purchasing choices for healthy and environmentally friendly products

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[1] This document might contain (parts of) texts from earlier submitted documents within the same educational programme, related to the Master's Thesis process of the same author as the author of this work.

Abstract

This paper quantitively investigates how consumers changed their purchasing choices since the start of the COVID-19 pandemic, and how consumers plan to change their long-term purchasing choices post-pandemic. The purchasing choices investigated are firstly health-friendly food products (e.g., low sugar food), secondly environment-friendly products (e.g., sustainable products) and lastly products which are both health- and environment-friendly (e.g., locally produced food). By analyzing data, obtained through an online questionnaire, the findings contribute to existing research with a pioneering study of the two timeframes, which assists economic actors by providing information applicable to their current and future strategies. The results show that consumers have changed their purchasing choices. While some products (e.g., fresh and locally produced food) are increasingly purchased, others (e.g., sustainable products) are bought less. Although the long-term results were similar to the short-term, they were a bit more optimistic, i.e., consumers expect to purchase more health- and environment-friendly products.

Acknowledgements

1   Introduction

In 2019, reports of lung infections from an unidentified source emerged in Wuhan, China. The later identified coronavirus disease 2019 (COVID-19) spread rapidly and the World Health Organization (WHO) declared the infection surge as a pandemic on the 11th of March 2020 (World Health Organization Regional Office for Europe, s.d.). Besides a health crisis, the pandemic is also "*a socio-economic crisis, a humanitarian crisis, a security crisis, and a human rights crisis*" and thus burdens diverse facets of the formerly lived lifestyle (United Nations [UN], 2020a). Consequently, humans' health is directly, but also indirectly threatened by the pandemic through disruptions in people's lives (Abdelkarim et al., 2020). Further, notable environmental changes like improved air and water quality emerged during the pandemic and emphasize the relationship of the world's consumption society and climate change (Chow, 2020; Helm, 2020). Moreover, the pandemic is a pivotal moment for consumers, because consumers might deviate from choices usually undertaken and a new *"mindset"* can be invoked during life-changing events *or "in times of trouble"* (Avramakis, Puttaiah, & Raverkar, 2020; (Campbell, Inman, Kirmani, & Price, 2020; Grashuis, Segovia, & Skevas, 2020; Price, Coulter, Strizhakova, & Schultz, 2018). Accordingly, it is likely that consumers' purchasing choices have substantially altered since the start of the pandemic, but these changes might also be sustained once the pandemic ends (Accenture, 2020b; Sheth, 2020). Therefore, consumers might be more conscious about how 'friendly' their purchasing choices are with regards to their health and the environment in the short- and the long-term.

Therefore, this research investigates how the pandemic has influenced consumer behavior. The pandemic is viewed as a broad term encompassing different layers and can be interpreted according to personal relevancy. Consequently, its effects on consumer behavior are wide-ranging and complex (Baumgaertner, Hamilton, Krone, Lo, & Tyson, 2020). However, this paper defines consumer behavior as the choices consumers make to purchase products, more specifically for Fast-Moving Consumer Goods (FMCG) (Corporate Finance Institute, s.d.; Kenton, 2021). FMCG are products used and sold frequently, that are very much in demand or perishable and that are sold at an affordable price. FMCG can exist out of many types of products, including food, drinks, cosmetics, etc. Nevertheless, this research specifically concentrates on health- and environment-friendly products. Health-friendly products are defined as *fresh food* and *food containing low levels of sugar, salt* and *calories* (Ahmadi Kaliji, Borsellino, & Schimmenti, 2020)*,* environment-friendly products as *sustainable products, products from ecologically responsible companies, products with environment-friendly ingredients* and *products with environment-friendly packaging,* also *pre-packaged products* are studied which are environment-unfriendly (Bhattacharya et al., 2020; Chamhuri, Siwar, Talib, & Taufique, 2014; Joshi & Rahman, 2017, 2019). Additionally, the literature showed that some products have an overlapping influence and that products with a combined health and environmental nature should also be considered (Ewing-Chow, 2020a). So, health- and environment-friendly products are defined as *locally produced, organic, vegetarian* and *vegan food*, whereas *meat* and *animal products* are regarded unfriendly (Ahmadi Kaliji et al., 2020; Business Research Company, 2020; Ewing-Chow, 2020a; Globe Newswire, 2020; One Planet Network, 2020). Hence, the research question of this master thesis is ***'the short- and long-term effects of the COVID-19 pandemic: how consumers changed their purchasing choices for healthy and environmentally friendly products'***. The conceptual framework below (figure 1) shows the researched concepts visually.

Furthermore, some researchers suggest that the effect of the pandemic on the purchasing choices for health-friendly products depends on consumers' mental health (Cocchi, Gallina, Maffei, Mattiolia, & Sciomer, 2020). For example, more stressed people are likely to resort to poor nutrition. 'Mental health' is therefore displayed as a moderator in figure 1.

Figure 1 Conceptual framework
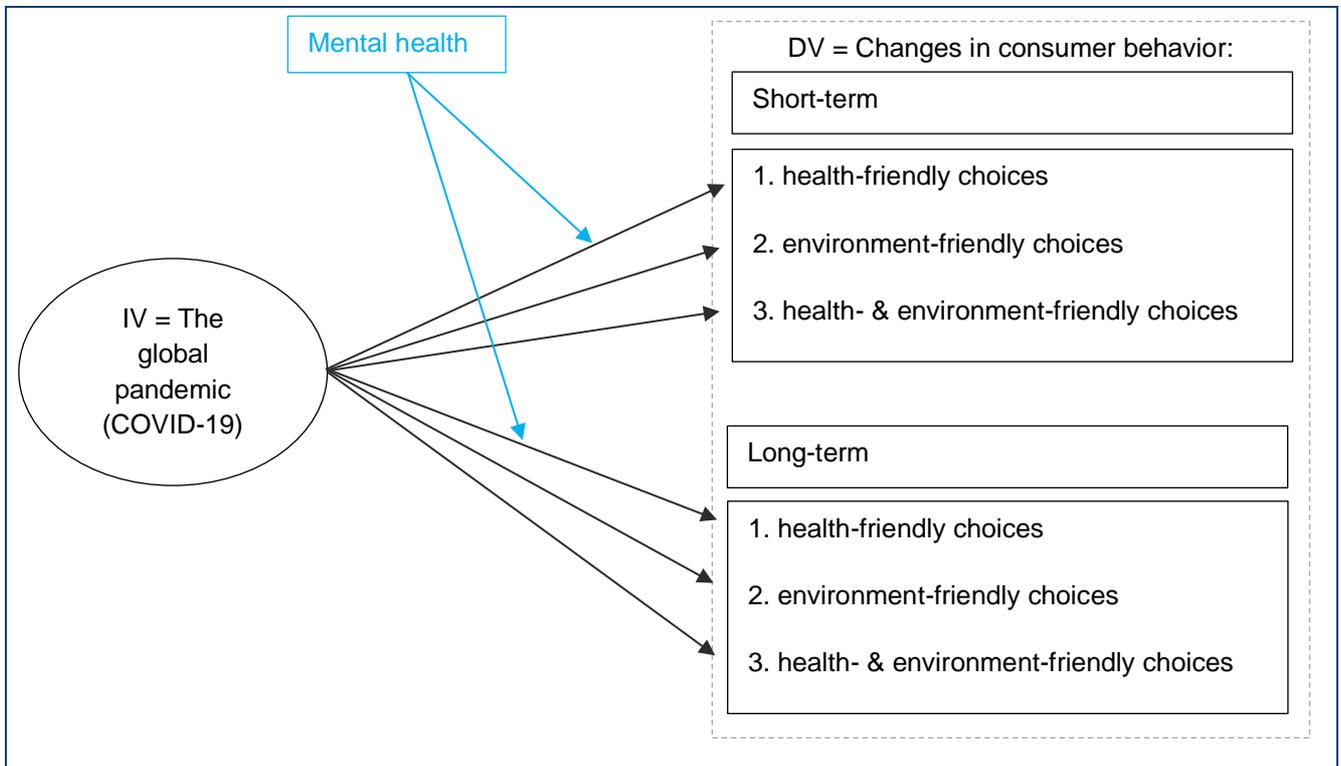
Following this, the more detailed research questions are:

- RQ1: What are the short-term effects of the COVID-19 pandemic on consumer behavior? How did consumers change their purchasing choices for health-, environment- and combined health- and environment-friendly products since the start of the pandemic?
- RQ2: What are the long-term effects of the COVID-19 pandemic on consumer behavior? How will consumers change their purchasing choices for health-, environment- and combined health- and environment-friendly products once the pandemic is over?
- RQ3: Do the purchasing choices for health-friendly products differ between consumers with better versus poorer mental health?

Lots of research have been conducted since the start of the pandemic, and related studies to the effects of COVID-19 are being contributed every day (Balasubramaniam, Javier, Shah, & Weiner, 2020). Still, each research can provide value and insights not yet discovered. Unlike, previous research, this research contributes to the academic literature with information largely obtained from people living in Northern America and Europe. This large region includes relevant consumers since it mainly includes two of the three biggest economies of the world, the United States and the European Union (Eurostat, 2020). Furthermore, most research have been focused on either health, like Abdelkarim et al. (2020), or the environment, like Ruano, Sanchez-Alcalde and Zambrano-Monserrate (2020), whereas this study aims to also combine both, as these are often interrelated (European Environment Agency; 2020). Though, the study of Ahmadi Kaliji et al. (2020) did focus on nutritional health, partly in relation to the environment. However, this research combines the found insights from existing literature to more comprehensively study the effect on purchasing choices for purely health- *and* purely environment-friendly products, *and* for combined health- and environment-friendly products. Further, this research particularly focuses on the *short-term* effects, so since the start of the pandemic, and also on the expected *long-term* purchasing choices. The research on the effects of the pandemic once the crisis ends is scarce and this study made an effort to gather data on this based on consumers' expectations. The view

of the two timeframes makes this research and the information disclosed even more innovative, because thus far (to the best of the researcher's knowledge) no prior research has investigated this area of focus identically.

In general, economic actors, like firms, marketeers, etc., need to be aware of the changes in expectations and needs to fully understand their customer, because it is crucial for good marketing management (Keller & Kotler, 2016). Furthermore, Nigel Hollis (2020) highlights that market research provides "*evidence-based advice*" to businesses, not only to increase profits, but also to help clients, avoid layoffs and make better decisions as a firm. This way, businesses can more quickly bounce back from any detrimental consequences caused by the pandemic. The information on the short-term changes in consumer choices is economically significant to for example retailers, because: *"How they help consumers navigate the pandemic will influence their future success"* (Accenture, 2020b). The long-term changes are important to respond correctly and to envision future wants, needs and expectations of their consumers, and to position their future strategies as best as possible (Accenture, 2020a; Mehta, Purohit, & Saxena, 2020). Likewise, Bakhtiari, said *"From a marketing perspective, most brands will need to rip up their marketing playbook and radically update their customer personas and and [sic] communication strategy"* (2020). Therefore, different health- and environment-related products are each time studied to see whether customers (will) purchase them more. Based on the findings, firms like supermarkets, can reorient their strategy, for instance more heavily focused on the promotion of specific goods, like locally produced foods.

To generalize the changed and predicted future changes in purchasing choices to the population of consumers residing in Northern American and European countries who purchase groceries, a quantitative approach was chosen to gather data by means of an online questionnaire. Hence, the insights obtained about this specific market can be employed by actors active in this region.

To explain the different concepts shown in the conceptual framework, this paper first discusses the existing literature. The literature also provides the basis for the establishment of expected relationships between the different concepts which led to the deduction of different hypotheses. Afterwards, the methods applied to conduct the research are explained, followed by a thorough discussion of the results. Then, the findings together with the limitations, the academic and managerial implications, and some suggestions for future research are discussed in the conclusion.

2   Literature review

In sections 2.1 *Health*, 2.2 *Environment* and 2.3 *Combined health and environment*, the literature review identifies the existing theories and gaps, relevant to the changes in purchasing choices for different products categorized either as health-, environment-, or health- and environment-friendly. Moreover, in 2.4, mental health is introduced as a possible moderator in the studied relationship. Based on the literature, hypotheses are constructed, which are studied in the subsequent sections.

In the following sections, any concepts highlighted in bold are important elements of focus in this research and were derived from prior literature, they represent the items used to measure the different variables for which an overview can be seen in table 1 'Variables and items'. Also, several hypotheses are proposed and each one is categorized with a label. The label starts with the letter 'H', referring to 'hypothesis'. Then, the letter S or L stand for 'short-term' or 'long-term' respectively. Next, the numbers 1, 2 or 3 refer to the 'health-friendly products', 'environment-friendly products' and 'combined health- and environment-friendly products' respectively. The number 4 designates the studied moderation of mental health.

2.1   Health

The pandemic can be regarded as a drastic trigger, along the lines of the 'troubling times' and the *"life-changing event"* ideas of Campbell et al. (2020) and Price et al. (2018) respectively, and consequently, triggering changes in health-related consumer behavior. On the one hand, the COVID-19 virus directly poses a threat to humans' health. On the other hand, the pandemic also indirectly induces changes on human health, including on nutrition, physical health and mental health (Abdelkarim et al., 2020). These are important elements for consumers because they affect the ability to cope with the pandemic and lower the risk of fatality by tackling some of the morbidities associated with severe infection (Berkes et al., 2020; Boisgontier et al., 2020; Burtscher, Burtscher, & Millet, 2020).

Although the pandemic influences multiple facets of health, this research considers the effects on health-related purchasing choices in the short- and the long-term. Consequently, only shifts in FMCG food choices made during the pandemic and possible choices longer term are discussed. Further, this section only studies choices purely health-friendly or -unfriendly, any choices that also have an overlapping environmental effect will be discussed in 2.4 *Combined health and environment*.

Ewing-Chow (2020a) predicts that by virtue of COVID-19, people will tend to eat more healthily. Additionally, Ahmadi Kaliji et al. (2020) discovered that consumers increasingly want to take care of their health and their immunity, by choosing healthier products. The researchers discuss the trend observed during the pandemic that in some cases consumers choose more **fresh foods including fruits and vegetables** and reach for food with **lower levels of salt, calories and sugar**. However, besides the shift to healthier food choices, more disordered food habits have also been observed (Meyer et al., 2020). Abdelkarim et al. (2020) found more unhealthy habits, such as uncontrolled eating.

Following the contradictory nature of the literature of both discovering more healthy and unhealthy nutritional behavior, it is necessary to research the nutritional choices further during the pandemic. Health-friendly product choices include buying *more* fresh food (fruits & vegetables) and *more*

food containing low levels of sugar, salt and calories. Based on this, the first short-term hypothesis is two-directional, i.e., the effect can be positive or negative and is as follows:

<u>HS1:</u> *The COVID-19 pandemic impacts consumers' choices to purchase health-friendly products in the short-term.*

Further, Ahmadi Kaliji et al. (2020) suggest that some consumers aim to also maintain the short-term choices for health-friendly products post-pandemic. To study this more profoundly the hypothesis is:

<u>HL1:</u> *The COVID-19 pandemic impacts consumers' choices to purchase health-friendly products in the long-term.*

2.2   Environment

Today, economies aim at constant advancements and production, but often forget the importance of the protection of ecosystems (Cheval et al., 2020). The United Nations Environment Programme wrote: *"Climate change is real and human activities are the main cause"* (s.d.). Moreover, the pandemic clearly shows that human health is closely interrelated with planetary health, and that environmental change played a role in the virus outbreak (Cheval et al., 2020; Institute for Global Environmental Strategies [IGES], 2020). The environment is especially relevant now, since sustained exposure to air pollution, like particular matter, is likely related to higher mortality risk upon infection with COVID-19 (Braun, Dominici, Nethery, Sabath, & Wu, 2020a; 2020b).

Already previous to the pandemic, sustainability has become a prominent principle among many consumers, and it can influence their product choices (Maione, Torre, Troisi, & Vincenza Ciasullo, 2017). Balderjahn, Paulssen and Peyer (2013) define 'sustainable consumption' as consumers behaving *"in an environmentally and socially responsible manner"* (p. 546). Environmentally sustainable and ethical consumption can therefore range from safeguarding the climate and resources, to recycling and energy conservation. Bask, Halme, Kallio and Kuula (2013) emphasized that consumers not only increasingly want to be aware of the physical good, but also want to know the effect of the complete supply chain. Further, it is important to study consumption levels and behaviors since they can be considered fundamental elements of climate change (Barr, Gilg, & Shaw, 2011). Joshi and Rahman (2017; 2019) and Chamhuri et al. (2014) propose several factors to measure consumers' environmentally consciousness including choosing **sustainable products, products from ecologically responsible companies, products with environment-friendly ingredients and products with environment-friendly packaging**.

Significant is that since the start of the pandemic, notable reductions of pollution and greenhouse gasses along with improved quality of both air, water and even cleaner beaches were observed across the globe (Cheval et al., 2020; Chow, 2020; Ruano et al., 2020; Wright, 2020; Yunus, Masago, & Hijioka, 2020). These effects on the environment were mainly caused by imposed restrictions worldwide, for example the shift of staying home, reducing transportation and also the decreasing manufacturing production and consumption levels (Welford & Yarbrough, 2021). Nevertheless, the decline in emissions came along with a lower GDP, therefore Helm (2020) indicates that the correlation between the reductions should raise more discussion about the impact of consumption on climate change. Besides forced restrictions, some consumers also consciously adapt their buying habits deliberately, according to Accenture (2020b) consumers reflect on their own consumption during the pandemic and that *"They are striving to shop locally, mindfully and cost-consciously*". In another article they add that consumers are more aware of the environment when shopping (2020a). Also, Internet Retailing (s.d.) wrote that consumers are

mindfully changing their preferences and purchases "*based on brands and retailers social responsibility, inclusiveness, or environmental impact*". Deloitte (s.d.) goes on to say that some consumers are now choosing for more sustainable options. Besides theses positive outcomes observed during the pandemic, some negative impacts were also confirmed (Ruano et al., 2020). For instance, increasing waste including more domestic and inorganic waste due to increased online ordering through channels such as social media, making use of home delivery services, etc. (Accenture, 2020a, 2020b; Charm et al., 2020; Wold, 2020). Additionally, a resurgence of single-use plastic is probable, since this is regarded as more hygienic (IGES, 2020). Indeed, also Bhattacharya et al. (2020) noticed an increase in demand for **pre-packaged products** and disposable plastics and hence also in waste from households. Moreover, they fear that the pandemic will reverse previous efforts of limiting the wide use of plastic worldwide and that governments should invest in policies reducing waste pollution.

Based on Joshi and Rahman (2017; 2019) Chamhuri et al. (2014) and Bhattacharya et al. (2020), choosing environment-friendly products include purchasing *more* sustainable products, products from ecologically responsible companies, products with environment-friendly ingredients and products with environment-friendly packaging and *less* pre-packaged products. Furthermore, the literature shows that purchasing choices for environment-friendly products have likely changed since the start of the pandemic, but that the direction remains ambiguous. The second short-term hypothesis is therefore:

<u>HS2:</u> *The COVID-19 pandemic impacts consumers' choices to purchase environment-friendly products in the short-term.*

Essential to acknowledge is that the found environmental changes including the "*reduced pressure on nature*" (Helm, 2020, p. 22), can only be considered short-term with a minimal significance on overall environmental problems and since human and economic losses were necessary for this reduction, it is not a sustainable manner of solving the environmental problems (Ruano et al., 2020; WHO, 2020a). Also, as soon as the pandemic and the restraints are over, pollution will likely increase again with the return and recovery of economies. Additionally, IGES (2020) mentions that the pandemic together with the preference of single-use plastics in some cases, could result in a missed possibility of creating a circular economy. Contrarily, Deloitte (s.d.) mentions that some of the shifted and environment-friendly behaviors that the pandemic brought along will probably endure longer-term. Moreover, Kotler (2020) believes that COVID-19 has advanced a *"post-consumerism"* movement, in which behavior and consumption will prove to be more opposed to the desire for mindless possessions and purchases. So, the literature reveals diverging views regarding the long-term effects on environment-friendly purchasing choices, the hypothesis is then:

<u>HL2:</u> *The COVID-19 pandemic impacts consumers' choices to purchase environment-friendly products in the long-term.*

2.3   Combined health and environment

Building further upon sections 2.1 *Health* and 2.2 *Environment*, Ahmadi Kaliji et al. (2020) said that "*COVID-19 Drives Consumer Behavior and Agro-Food Markets towards Healthier and More Sustainable Patterns*". Correspondingly, Ahmadi Kaliji et al. and One Planet Network (2020) highlight that since the start of the pandemic a movement toward more conscious consumption of food has started. This can for instance result in consumers opting for local and organic foods, even without knowing the actual environmental effect it generates (Lazzarini, Siegrist, & Visschers, 2017). In line with this, Globe Newswire (2020) wrote that: "*the demand for local, sustainable, and organic food production is increasing*". Likewise, Ewing-Chow (2020a) predicts

that by virtue of COVID-19 people will tend to eat more organically, healthily and that they will shift toward more locally produced foods. Thus, some consumer preferences toward certain product choices that have surged during the pandemic, share an overlapping effect on nutritional health and the environment. Therefore, a review on the existing literature regarding health- and environment-friendly product choices follows.

From the early 2000s, organic agriculture has known an increasing importance (Willer, 2020). Nevertheless, it is believed to play a bigger role as a result of the recent events. Firstly, because of the virus some people are more aware of the importance of food on their health (Askew, 2020). For example, to better their immunity and to avoid getting sick consumers mindfully switch to more organic options such as naturally grown vegetables. Also, the Business Research Company (2020) believes that COVID-19 developed a higher increase in demand for organic meat as compared to non-organic. In the early stages of the pandemic, various supermarkets in the United Kingdom observed increases in their **organic food** sales (Eurofresh Distribution, 2020; Globe Newswire, 2020), this indicates the tendency towards more organic options.

Next, a growing demand for **vegan and vegetarian food** is another probable outcome of the pandemic (Ewing-Chow, 2020a). Red and processed meat can affect health harmfully (Attwood & Hajat, 2020). A trend toward reducing meat intake was already noticeable pre-pandemic (Edwards, Palmer, Ramsing, Righter, & Wolson, 2018). Similarly, the non-dairy milk substitutes demand has also been growing over the past years (TBRC Blog, 2020). However, Attwood and Hajat (2020) noted that COVID-19 generated a decrease in overall demand for **meat and animal consumption**. The latter is believed to have taken place because of higher attention and knowledge of zoonosis and because of disruptions in supply chains. Also, Deloitte (s.d.) mentions that some consumers are now choosing to decrease meat and animal consumption to be more sustainable.

Buchwald (2020) mentioned that "*More than half of consumers around the world have started to buy more **locally-sourced products***". During the pandemic there was a raised importance among consumers of sourcing and food supply which could lead to for instance eating more locally produced food from e.g., the local farm (Ewing-Chow, 2020a). Locally produced food undergoes less pollution points of contact, is fresher and has better nutritional value (2020b). Moreover, some consumers have an increased environmental consciousness and since products travelling smaller distances are less harmful for the environment, consumers might prefer to buy locally (Accenture, 2020a, 2020b; Buchwald; Ewing-Chow, 2020b).

The literature supports a shift in consumers' purchasing choices for health- and environment-friendly products since the start of the pandemic. Health- and environment-friendly products include choosing *more* organic products, vegetarian and vegan products, locally produced food, and *less* meat and animal products. Although, there is an indication that the effect is mostly positive this study solely hypothesizes that consumer choices were impacted by the pandemic without specifying the possible direction, this to stay consistent with previous hypotheses. The hypothesis is:

HS3: The COVID-19 pandemic impacts consumers' choices to purchase health- and environment-friendly products in the short-term.

However, the literature does not mention any possible long-term behavior, thus more research investigating this is needed. Nevertheless, since researchers expect a change in the short-term, it could be expected that this also holds for the long-term. Therefore, the hypothesis is:

HL3: The COVID-19 pandemic impacts consumers' choices to purchase health- and environment-friendly products in the long-term.

2.4 Mental health as moderator

The population's mental state has proven to be important during the pandemic, because it influences the tendency to violence, to resort to addictions, to malnutrition, to be physically active, etc. (Adhanom Ghebreyesus, 2020; Budimir, Pieh, & Probst, 2020; Cocchi et al., 2020; Debata, Mishra, & Patnaik, 2020; Stults-Kolehmainen & Sinha, 2013; UN, 2020b).

In 2.1 *Health*, evidence was presented for both a positive and negative effect of the pandemic on health friendly purchasing choices. For instance, Cocchi et al. (2020) found that people are induced to shift to poor nutrition during the pandemic, they mention that it is because of stress that more high-calorie and sugary foods are consumed, and that stressed people eat less fresh food and more packaged foods. They called it "*stress-related eating*" (p. 1411). Hence, the literature provides evidence of mental health being a moderator on nutritional health and a difference in food purchasing choices in the short-term is expected between consumers characterized with different mental health. The hypothesis is therefore:

<u>HS4:</u> *The COVID-19 pandemic impacts consumers with poorer mental health more than consumers with less poor mental health, regarding the choices to purchase health-friendly products in the short-term.*

The literature for the long-term effect is scarce but based on the previous, it could be expected that a consumer's mental state will continue to impact purchasing choices for health-friendly products once the pandemic is over. Hence, the hypothesis is:

<u>HL4:</u> *The COVID-19 pandemic impacts consumers with poorer mental health more than consumers with less poor mental health, regarding the choices to purchase health-friendly products in the long-term.*

Furthermore, research shows that the mental health does influence the environment, because some consumers shop as a coping mechanism which causes overconsumption (Arnould, 2019). Also, the environment does influence mental health (Institute for European Environmental Policy, 2020). However, there is no literature supporting that, a consumer's mental state influences the effect of the pandemic on choosing environment-, and health- and environment-friendly products. Therefore, consumers' mental states are not expected to moderate the effect of the pandemic on these products.

3 Research methods

This section describes the methods used to perform this research. First, the population is defined. Then, an explanation is mentioned about how the data is collected, how the different variables and relationships are measured with distinctive items and about how the data analyses are performed.

3.1 Quantitative design and population

To research the different hypotheses, consumers had to be questioned about their purchasing choices for Fast-Moving Consumer Goods (FMCG), more specifically for health- and environment-related products. Therefore, the population exists of consumers who buy FMCG, so mostly people deciding on groceries in a household are considered.

However, to ensure the feasibility of reaching the population, the population is limited to Northern American and European countries as defined by the United Nations Statistics Division (s.d.). This region covers large and important economic areas (Eurostat, 2020). Also, only people over the age of 18 years old are considered part of the target population, since they are assumed to (partially) be responsible for purchasing the groceries. According to the UN Department of Economic and Social Affairs, Population Division (2019), the population from the age of 18 and above in Northern America and Europe in July 2020 existed of more than 800 million people. This is still a large population, however, the number of people actually deciding on the groceries will likely be lower as this often happens in households (Kramer, 2020).

To research the purchasing choices of this large population, data had to be collected from a sample in order to make inferences which could be generalized, and according to Elwood and Swanson (2005) this is best done using quantitative techniques. Essentially, the goal of this research is to find the relationships between different variables by using statistical analyses on data collected in a standardized way, this again indicates that a quantitative analysis best suits the goals of this study. Therefore, a quantitative approach was chosen.

3.2 Data collection

The necessary information about how consumers have changed their purchasing choices during the pandemic and how they plan to change their choices in the long-term did not exist yet, so there was a need to collect primary data. Based on Elwood and Swanson (2005) a survey research was shown to be appropriate to test the hypotheses by gathering data in a standard manner from a sample, to later generalize to the population. Moreover, surveys allow for cross-sectional data to be collected and this suits the purpose of this study well, to explain the effects of different variables whilst the pandemic still endures, but also to collect current information on expected long-term choices which can indicate some possibilities of future behavior.

Furthermore, to survey consumers a questionnaire was chosen since it makes the collection of data relatively easy, cheap and fast, and it allows for quantitative analyses of relationships between variables (Saunders, Lewis, & Thornhill, 2016). The paper version can be found under appendix 1 (table B.1). The questionnaire was distributed online through various channels of social media including Facebook, Instagram, WhatsApp, LinkedIn and Reddit by using Qualtrics software, which enables the respondents to answer questions either by using a web-browser or

their mobiles (Qualtrics, s.d.a.). Moreover, the survey was made available for respondents to self-complete from the 5th of March 2021 until the 2nd of April 2021. Also, the questionnaire was offered in English and Dutch since most people reached through these channels speak either one or both languages.

Different sampling techniques were used. First, the researcher of this paper was limited in time and funds and thus judgmental sampling was applied (Saunders et al., 2016). However, since this sampling technique can often lead to a low representation of the population, the researcher carefully selected different platforms which were deemed to induce a large accessibility to the target population of respondents with sufficiently diverse characters to ensure a heterogeneous group. For example, specific social media groups and acquaintances of the author were asked to fill in the questionnaire. These groups mainly existed out of parents and working adults, as these are likely to decide on groceries in households and represent the target population well. Also, a snowball technique was used by asking people reached to share the questionnaire with their friends and families, which can possibly result in more respondents with the desired characteristics (Saunders et al. 2016). Section 4 *Results* discusses whether the obtained sample is considered to be representable for the population.

3.3   Measurements

The literature and the conceptual framework presented in the introduction formed the basis for the gathering of data performed by the distributed questionnaire. Moreover, the variables and items deduced from certain sources identified in the literature review, together with the corresponding question number from the questionnaire can be seen in table 1 below. To recapitulate, the independent variable, 'the global pandemic', was expected to have various effects on the dependent variable, 'consumer behavior in the purchasing choices of 1. Health-friendly products, 2. Environment-friendly products and 3. combined health- and environment-friendly products'. Further, the expected effects of the pandemic are split into two different time frames, both the short-term and the long-term changes in purchasing choices.

The dependent variable thus exists out of three sub-variables which were already heavily discussed in the literature review. Each sub-variable was measured separately, through specific items which were identified and match the concepts deducted from the literature review in which they are highlighted in bold. Hence many sources were used to triangulate the needed items. The different items together with the most important sources consulted are also shown in table 1.

The items were identified in such a way that they could be implemented as questions asking about consumers' behavior in the questionnaire. Furthermore, the design of the questionnaire was created in five distinct parts. These parts and the reasoning behind the chosen items are explained in the following paragraphs.

Table 1 Variables and items

Variable type	Variable	Item	Source	Question n°	
Independent variable	The global pandemic (COVID-19)	/		/	
Dependent variable	Changes in Consumer behavior in 2 different time frames (ST & LT) -> purchasing choices of:			Short-term	Long-term
	1. Health-friendly products	Fresh food (fruits & vegetables) Low sugar food Low salt food Low calory food	Ahmadi Kaliji et al. (2020).	Q2 items: 6-9	Q3 items: 6-9
	2. Environment-friendly products	Sustainable products Products from ecologically responsible companies Products with environment-friendly ingredients Products with environment-friendly packaging Pre-packaged products (e.g. wrapped in plastic)[a]	Bhattacharya et al. (2020); Chamhuri et al. (2014); Joshi & Rahman (2017; 2019).	Q2 items: 1-5	Q3 items: 1-5
	3. Combined health- and environment-friendly products	Locally produced food Organic food Meat[a] and animal products[a] Vegetarian and vegan food	Ahmadi Kaliji et al. (2020); Business Research Company (2020); Ewing-Chow, (2020a); Globe Newswire (2020); One Planet Network (2020).	Q2 items: 10-15	Q3 items: 10-15
Moderator	Mental Health	Kessler Psychological Distress Scale: K6 Self-report measure Nervous Hopeless Restless So depressed that nothing can cheer you up That everything is an effort Worthless	K6+ self–report measure (s.d.); Allsop et al. (2016).	Q4 items: 1-6	
Demographic variables	Age Gender Country of residence Level of education	7 categories Male or female Drop-down list 6 categories	Self-formulated	Q5 Q6 Q7 Q8	

[a] Recoded item.

The first part of the questionnaire asked a filter question to ensure that only the desired audience of respondents would complete the questions. More specifically, an adequate respondent is responsible for the purchases of groceries in its household and either answered *Yes (1)* or *To a large extent, yes (2)*, if someone answered *No (3)* they did not meet the participation criteria and could not proceed with the questionnaire. These responses were self-formulated according to the required population of grocery shoppers, since someone had to either be in charge of the groceries in their household or for a great extent as groceries per household are often not bought by solely one person (Lake, 2021; Schaeffer, 2019).

Next, so that the questionnaire was more uniform and easier to complete, the second and third part both combined the same items of the dependent variables corresponding to the two timeframes. The second part covered the short-term changes and the third part the long-term changes, both parts were presented in a matrix form with a standardized introductory statement which incorporated the independent variable 'the global pandemic' in the formulation. This way respondents can interpret the independent variable according to personal relevancy since this research views the pandemic as a global term with several different layers. In this way the independent variable is implied and not measured explicitly, since the formulation of the statements immediately measured the effects of the pandemic on the choices consumers make. Therefore, there is no item or source mentioned for this variable in table 1. For the short-term formulation this statement was: '*Compared to before the pandemic, I now buy … more often'*. Whereas for the long-term it was formulated as: '*Once the pandemic is over, I think I will buy … more often'.* Then, respondents were given the different items to measure the three sub-variables of the dependent variable. However, they were sorted in a logical order from items only relating to environmentally impacting products, then items relating to nutritional products and lastly the combined health and environmentally impacting items were asked, this to make the responding easier.

For '1. Health-friendly products' the items identified in the literature include *fresh food (fruits & vegetables)* and food containing low levels of *sugar, salt and calories*, as proposed by Ahmadi Kaliji et al. (2020). Then the items for '2. Environment-friendly products' include *sustainable products and products from ecologically responsible companies, products with environment-friendly ingredients* and *products with environment-friendly packaging*. These items were most suitable for the purposes of this study and they were chosen from several factors proposed by Joshi and Rahman (2017; 2019) and Chamhuri et al. (2014) because they measure environmentally conscious choices. A last item which negatively impacts this sub-variable is *pre-packaged products (e.g. wrapped in plastic)* derived from Bhattacharya et al. (2020). Lastly, the '3. Combined health- and environment-friendly products' sub-variable was measured by asking respondents about their buying habits for *organic products, vegetarian and/or vegan products, meat and animal products* and *locally produced food*. These items were deemed most appropriate for this third sub-variable and were derived from multiple sources comprising of Ahmadi Kaliji et al. (2020), Business Research Company (2020), Ewing-Chow, (2020a), Globe Newswire (2020) and One Planet Network (2020).

Of all the previously mentioned sources, not all proposed a scale to measure the extent to which consumers choose to purchase these items, even if they did, they were inconsistent and difficult to combine into one questionnaire. Plus, the different items were combined into one large matrix question, which calls for consistency in the questioning. Therefore, the researcher of this study decided to put a Likert-type scale of five responses ranging from *strongly disagree (1)* to *strongly agree (5)* at the top of the matrix in both parts. Hence, for both the short-term as for the long-term the standardized statement was formulated to ask whether consumers buy *more* of a certain item. Consequently, answering *strongly agree (5)* equals choosing *more* of a certain product represented by the different items and vice versa. When someone chose *neutral (3),* this respondent indicates that no change in purchasing choices was made or is expected in the future.

So that the responses to each item could be interpreted in the same direction, the items *pre-packaged products (e.g. wrapped in plastic), meat* and *other animal products like dairy, eggs, etc.* were recoded when the data was collected. Accordingly, a higher score on the questionnaire to all items corresponds to being 'more environmentally friendly'.

The fourth part of the questionnaire asked about the mental health as a general consumer trait which was expected to play a moderating role on the purchasing choices of health-friendly products (HS4 & HL4). Mental health is a broad term and can encompass many concepts (Holmes, 2020). However, to measure the expected moderating effect of mental health the Kessler Psychological Distress Scale: K6 Self-report measure, was selected as the measure of mental health (K6+ self–report measure, s.d.). It is an existing scale which has been used in several research so far and has been verified to be internally consistent with Cronbach's alpha's going from 0.81 to 0.92 (Andrews et al., 2002; Easton, Hasson, Safadi, & Wang, 2017; Allsop et al., 2016). To ensure the reliability of the mental health scales used in the context of this research Cronbach alpha could not be improved by removing an item from the mental health question and was calculated to be 0.85. Therefore, it is considered internally consistent (Saunders et al., 2016). Additionally, the measure shows almost no biases based on educational level or gender (Allsop et al., 2016). Originally this scale measures one's feelings over the past 30 days, this period was modified to correspond to a general feeling in daily life to fit the purpose for this research (K6+ self–report measure, s.d.). In total six items asking about the frequency of certain feelings are questioned using a scale with five response categories (Barker et al., 2003). However, these scale responses were replaced by standardizing the introductory statement to '*In daily life I often feel…*', then for each one of the six items respondents could choose between five-scale Likert responses ranging from *strongly disagree (1)* to *strongly agree (5),* this to remove some ambiguity and to stay consistent to other scales used in the other parts of the questionnaire. By adding the answers to the different items together a score ranging from six to thirty could be obtained, the higher the resulting score the more distressed someone is (Allsop et al., 2016). In this research, the aim was to divide respondents into two groups of being characterized as *more* or *less* stressed, this is further explained in 4.4 *Moderation effect*.

Lastly the fifth part of the questionnaire existed out of demographical questions to find out the respondents' age, gender, country of residence and highest obtained level of education. The demographic questions portray the characteristics of the respondents and confirm whether the sample is representative for the population chosen or not, this is discussed in the section 4 *Results* (Saunders, et al., 2016). The demographic questions were not mandatory to fill in since some respondents might not be comfortable to share this data as it can be sensitive information (Toor, 2020). All demographic questions were self-formulated yet inspired by already existing question designs. For instance, after consulting several sources, age was asked by using seven categories that include all ages of the population (Bridges, Kongara, Squance, & Topham, 2015; Cook, 2013). Then, respondents could indicate their gender to be either *male* or *female*. Also, the country of residence during the pandemic was asked, since this might influence respondents' situation and vision of the independent variable 'the global pandemic'. For this a drop-down list provided by Qualtrics software was chosen. Lastly, the level of education was asked as a categorical variable using six categories which were simplified but inspired by "Uw hoogst behaalde diploma" (2017).

4   Results

This section first provides a description about the sample. Then, different analyses were performed to test the hypotheses, table B.2 (appendix 2) shows a summary of the tests executed per hypothesis. Additionally, the results from the different analyses are explained. Lastly, some post-hoc tests are briefly mentioned.

As is often applied in business research, this study uses a 95 per cent confidence level for the statistical analyses, meaning that at least 95 per cent of the sample corresponds to the targeted population's characteristics (Saunders et al., 2016). The margin of error tolerated is 5 per cent.

4.1   Sample

A total of 415 responses were collected. However, this dataset was cleaned to delete any invalid or useless responses, i.e., data seen as spam by Qualtrics and respondents who did not or only filled in the first question (Qualtrics, s.d.b.). Then, 331 respondents were reached who have either completely or largely finished the questionnaire. Nevertheless, 96 indicated to not be responsible for the purchasing of groceries in its household. So, after the first filter question, 236 responses were actually collected. Furthermore, one respondent indicated to be *17 or younger (1)*, however this answer was deleted from the sample to ensure that the sample fits the target population of people above the age 18 well (N = 235).

The next paragraphs describe the responses according to the demographic variables asked in the questionnaire. Also, to test the representability of the sample for the population, univariate Chi-square tests for goodness-of-fit were performed for each variable. This test was seen as appropriate since the items for measuring the demographic variables from one group (the sample), exist of different nominal categories (Laerd Statistics, s.d.).

Out of the 192 respondents who filled in their age, more than half of respondents (57.29 per cent) indicated to be between the ages of 18 and 29 years old, the complete distribution can be seen in table B.3 in appendix 3. To further compare the division of the ages of the sample to the division of ages in the population by means of a Chi-square goodness of fit test, the expected proportions of each age category were derived from UN, Department of Economic and Social Affairs, Population Division (2019). Nevertheless, since the category *70 or older (7)* was also never ticked, the expected proportions for each age category were calculated based division of age categories ranging from the ages of 18 to 69 only in the Northern American and European population. The calculated data used for this test, as well as the results can be seen in table B.4 and B.5 in appendix 3. The hypothesis that the age division from our sample is equal to the age division from the population (H_0) got rejected and so the frequencies of the age division from our sample do not correspond well to the expected division (chi-square = 153.92; *p* = 0.000). This is not surprising considering the sampling techniques used, because it is likely that mainly acquaintances from the researcher responded. These acquaintances belong to the most frequently observed age category of people between 18 and 29 years old, since the researcher herself falls within this category.

Moreover, out of 193 respondents 35 respondents specified to be male, while 158 are female[2]. So, the male-female ratio is approximately 18 per cent against 82 per cent. This distribution is surprising as it does not correspond to the approximately evenly divided world distribution of sexes in 2020 (UN Department of Economic and Social Affairs, Population Division, 2019). Also, to statistically test the representability of the sample compared to the population of people above the age of 18 in Northern America and Europe a Chi-square goodness of fit test was executed. The detailed data and statistical output can be seen in table B.6 and B.7 (appendix 3). The hypothesis that the gender division from our sample is equal to the gender division from the population (H_0) got rejected (chi-square = 69.812; p = 0.000). So, the test confirms that the frequencies of the gender division from our sample deviates from the expected distribution according to the population. The distribution cannot clearly be explained by the likeliness of each gender to fill in a web-based questionnaire, as some research suggest that men are more likely to answer web-based questionnaires than women and some research discovered the opposite (Diment & Garrett-Jones, 2007; Smith, 2008). However, it might be explained by the fact that women are more likely to be responsible for grocery buying than men (Lake, 2021; Schaeffer, 2019). And thus, women better fit the target population of consumers responsible for the groceries. Another reason could be the fact that the researcher is female, and her acquaintances reached are most probably also female.

Furthermore, the sample is highly educated with 72.03 per cent of the sample having obtained some kind of tertiary education. Further, around 27 per cent indicated to have attained secondary education and only one respondent indicated to have obtained no secondary education. To compare the sample education attainment to the population's education attainment also a Chi-square goodness of fit test was performed. However, population statistics on the target population's education attainment was solely available for North America and Europe separately (Wittgenstein Centre, s.d.). So, the average on the attainment level of education of both regions was taken. Further, the data was found for three categories 'no secondary, secondary (lower or upper) and tertiary education'. So, the responses to the four categories which are all tertiary education (master, doctoral degree, academic bachelor and professional bachelor) were recoded into one new category 'tertiary'. The results can be found under table B.8 and B.9 in appendix 3. The null hypothesis was rejected and there is a significant difference between the sample and the population (chi-square = 128.511; p = 0.000). Again, this is not surprising considering the sampling techniques used and that the researcher's acquaintances are mostly highly educated.

Also, 190 respondents indicated what their country of residence is during the pandemic. The hypothesis that the division of countries is equal to the division of the population got rejected according to the Chi-square goodness of fit test (chi-square = 8923.214; p = 0.000). Hence, the sample does not well represent the population. The calculation can be seen in table B.10 and B.11 (appendix 3). Most striking is that people residing in Belgium accounts for 81.58 per cent, while the country only represents 1.03 per cent of population[3]. Nevertheless, this is not surprising as the researcher herself is Belgian and many acquaintances are also residing in Belgium.

None of the demographic variables thus indicate that the respondents represent the population well. The sample mainly exists out of highly educated and female respondents between the ages of 18 and 29 who predominantly reside in Belgium during the pandemic. This is further addressed in 5 *Conclusion.*

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[2] The questionnaire also allowed respondents to answer *non-binary* and *other*, however these options were never marked and thus were not regarded during the analysis.

[3] The overrepresentation of Belgian residents did not bias the results, see 4.5.1 *Only Belgian sample.*

4.2   Descriptive statistics

The effects of the global pandemic were directly questioned, so no scales were necessary to capture this variable. Contrarily, the dependent variable is metric, and some insights can be obtained by looking at the descriptive statistics in appendix 4 table B.12 and B.13, representing the results for the short-term and the long-term respectively (Saunders et al., 2016). Noteworthy is that 235 respondents completed the short-term questions, though only 198 also finished the long-term questions. All short-term responses were retained because excluding the 37 who did not complete the long-term questions, did not yield different conclusions[4].

The results can visually be seen in the figures 2, 3 and 4, which show the means to each item in bar charts. The benchmark for the analysis is the *neutral (3)* response, exemplified by the red line in each figure. An item scoring higher than the benchmark is *more* environmentally friendly.

Remarkable, is that most items score below 3. However, *fresh food (fruits, vegetables, etc.), locally produced food, pre-packaged products (e.g. wrapped in plastic), meat* and *other animal products like dairy, eggs, etc.* are all above 3 for the short-term and long-term perspective. Whereas, *low sugar food, products with environment-friendly ingredients* and *products with environment-friendly packaging* are above 3 for the long-term and below 3 for the short-term view. In general, all items have a higher mean in the long-term than in the short-term, except for *meat* and *other animal products like dairy, eggs, etc.*, which have approximately the same mean in both the short-term and the long-term.

Figure 2 Health-friendly products

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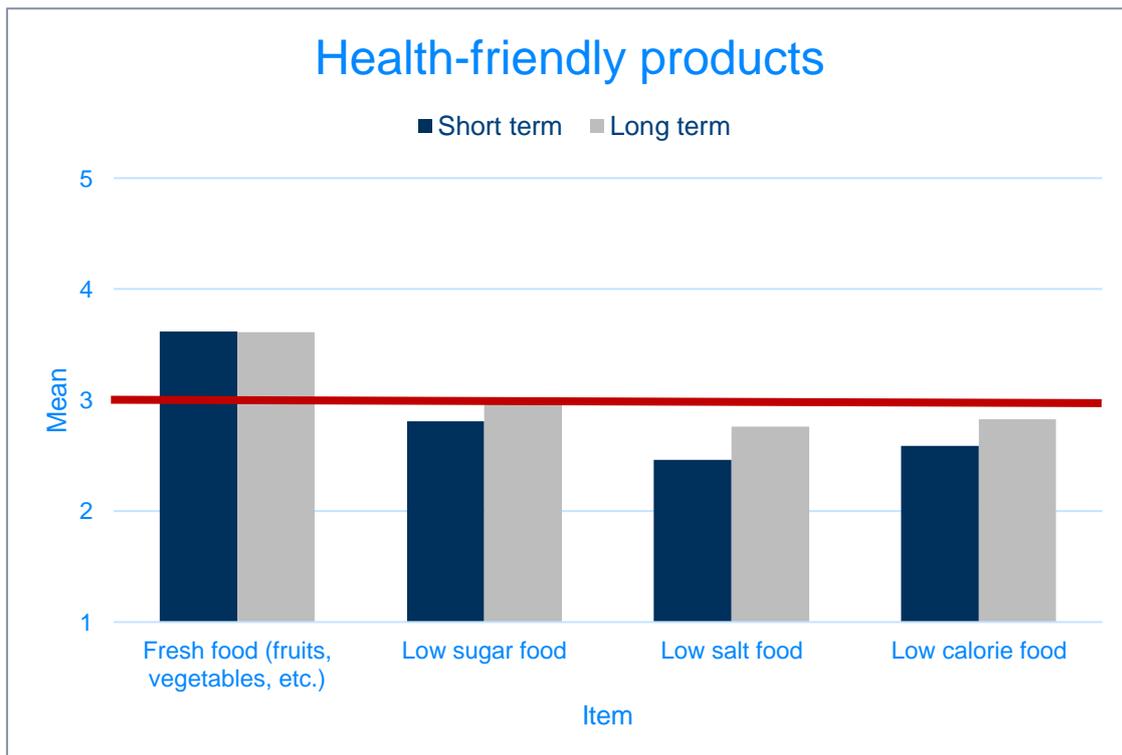
[4] Tests were run for both N = 235 and N = 198. No directions of means differed, but N = 235 generated more significant results as calculated in 4.3 *Hypotheses testing: univariate one sample T-test.*

Figure 3 Environment-friendly products

Environment-friendly products

■ Short term   ■ Long term
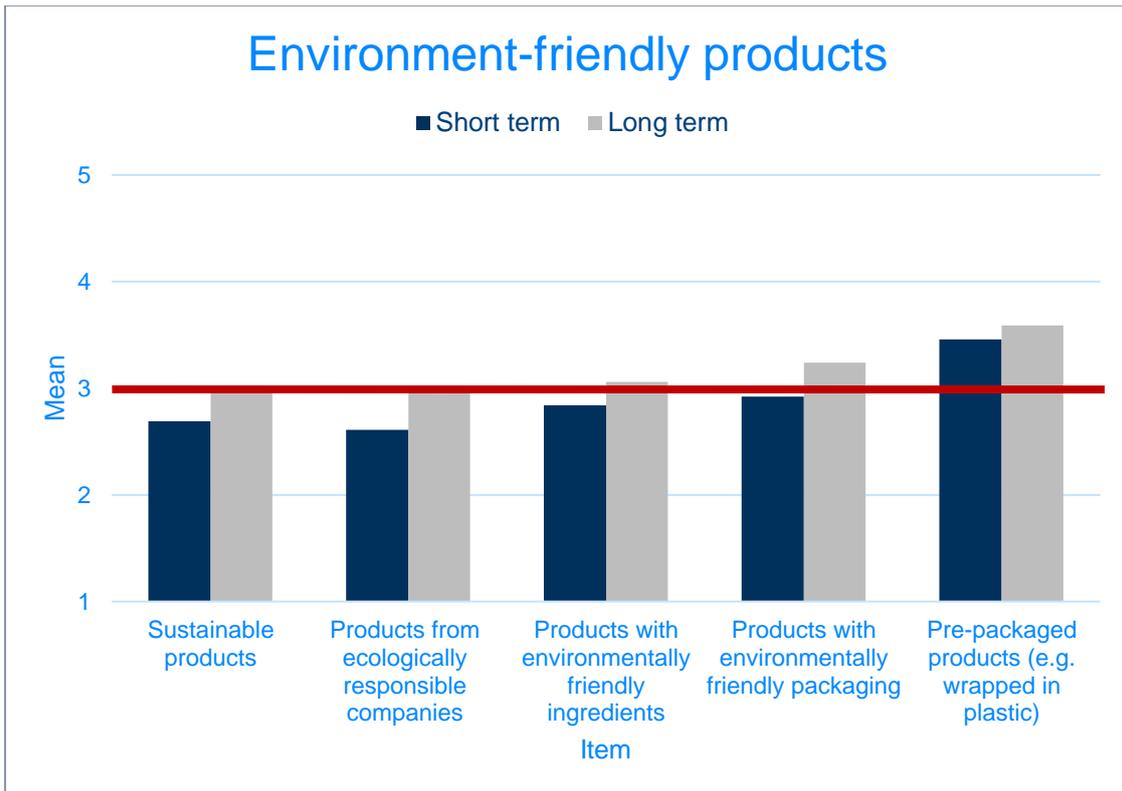
Figure 4 Health- and environment-friendly products

Combined health- and environment-friendly products

■ Short term   ■ Long term
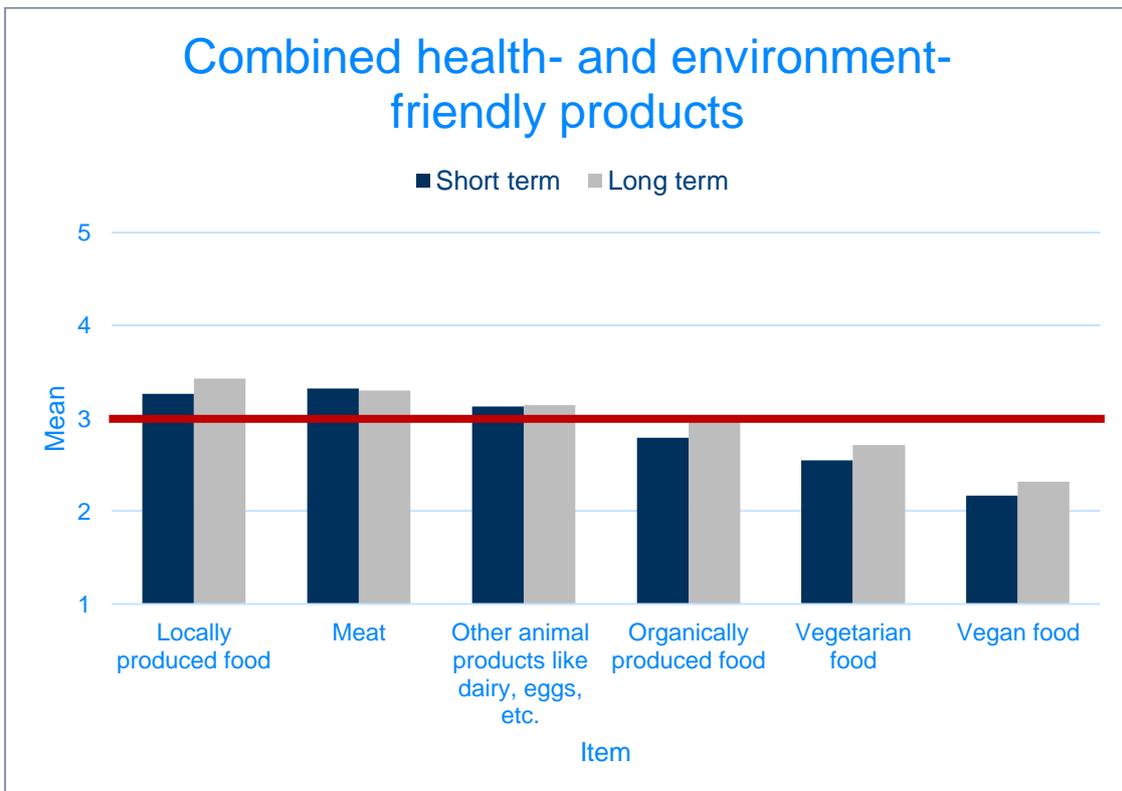
4.3 Hypotheses testing: univariate one sample T-test

Each hypothesis tested with a one sample T-test is briefly explained in the following paragraphs. The null and alternative hypothesis for each of these tests is expressed as:

H_0: Consumers are neutral to choosing more or less … in the short/long-term.

H_a: Consumers are not neutral to choosing more or less … in the short/long-term.

The ellipsis should be replaced by the items tested per T-test. The null hypothesis should each time be rejected, if not consumers' purchasing choices are not impacted by the pandemic and hypotheses identified in the literature review cannot be proven. To further identify the direction of the effect, i.e., whether consumers buy *more* or *less* of a certain item, the test value to which the test was compared is the *neutral (3)* benchmark. Therefore, the tests are each time two-tailed since the benchmark can be larger or smaller than the sample mean (Frost, s.d.).

4.3.1 Short-term

In table 2, the results for each corresponding item for the 'health-friendly products' sub-variable can be seen. For all items $p < 0.05$, therefore we reject the null hypothesis. So, *HS1* is true, and the respondents changed their purchasing behavior for this sub-variable in the short-term. Moreover, consumers on average tend to buy more *fresh food (fruits, vegetables, etc.), since* the mean difference is 0.62 higher than the test value. For the other items: *low sugar food*, *low salt food and low calorie food* the mean difference is lower (by 0.19, 0.54 and 0.41) than the test value, meaning that consumers on average tend to buy less of these items during the pandemic.

Table 2 One sample T-test health-friendly products ST

N = 235	Test Value = 3	t	df	Sig. (2-tailed)	Mean Difference
1. Health-friendly products	Fresh food (fruits, vegetables, etc.)	8.69	234	.000	.62
	Low sugar food	-2.61	234	.010	-.19
	Low salt food	-8.82	234	.000	-.54
	Low calorie food	-6.23	234	.000	-.41

To test *HS2*, the results for each corresponding item for the 'environment-friendly products' sub-variable are shown in table 3 below. The only item for which H_0 is not rejected is *products with environment-friendly packaging*. Out of the descriptive analysis it was established that consumers buy less of this item, however based on $p = 0.229 > 0.05$, it cannot be concluded that consumers buy significantly less of this item. For items: *sustainable products, products from ecologically responsible companies, products with environment-friendly ingredients* and *pre-packaged products $p < 0.05$*, and the respondents did in fact change their purchasing behavior for this sub-variable during the pandemic. Furthermore, consumers on average choose to buy less environmentally friendly concerning the first three items because they have a lower mean difference than the test value (by 0.31, 0.39 and 0.16) so they buy less of these items. Contrarily, consumers on average buy more environmentally friendly regarding *pre-packaged products* since the mean difference is bigger than the test value by 0.46. Note that this item was recoded and a higher score equals buying less of this item[5].

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[5] Recoded item, see 3.3 *Measurements*.

Table 3 One sample T-test environment-friendly products ST

N = 235	Test Value = 3	t	df	Sig. (2-tailed)	Mean Difference
2. Environment-friendly products	Sustainable products	-4.84	234	.000	-.31
	Products from ecologically responsible companies	-6.30	234	.000	-.39
	Products with environment-friendly ingredients	-2.46	234	.015	-.16
	Products with environment-friendly packaging	-1.21	234	.229	-.08
	Pre-packaged products (e.g. wrapped in plastic)[a]	6.95	234	.000	.46

[a] Recoded item, see 3.3 *Measurements*.

Table 4 below shows the results for each corresponding item for the 'combined health- and environment-friendly products' sub-variable which represents *HS3*. For all items $p < 0.05$, therefore we reject the null hypothesis and consumers therefore have changed their purchasing choices for each item during the pandemic. Moreover, consumers significantly tend to buy more health- and environment-friendly on *locally produced food*, *meat* and *other animal products like dairy, eggs, etc.*, by choosing to buy more *locally produced food*, and less *meat*[5] and *other animal products*[5] in the short-term. In addition to this, consumers on average buy less of *organically produced food, vegetarian food* and *vegan food.*

Table 4 One sample T-test health- and environment-friendly products ST

N = 235	Test Value = 3	t	df	Sig. (2-tailed)	Mean Difference
3. Combined health- and environment-friendly products	Locally produced food	3.74	234	.000	.26
	Meat[a]	4.76	234	.000	.32
	Other animal products like dairy, eggs, etc.[a]	2.16	234	.032	.13
	Organically produced food	-3.27	234	.001	-.21
	Vegetarian food	-5.73	234	.000	-.45
	Vegan food	-11.49	234	.000	-.83

[a] Recoded item, see 3.3 *Measurements*.

4.3.2 Long-term

The long-term effects follow the same logic as the short-term effects and only the most important takeaways will briefly be discussed. The more detailed results from each test can be found under table B.14 in appendix 4. Noteworthy, in the long-term no significant results were found for *low sugar food, sustainable products, products from ecologically responsible companies, products with environment-friendly ingredients* and *organically produced food*, since $p > 0.05$. For all other items, the null hypothesis got rejected and consumers are not neutral to choosing more or less of the items in the long-term. For the other items, namely *fresh food (fruits, vegetables, etc.), low salt food, low calorie food, pre-packaged products (e.g. wrapped in plastic)*, *locally produced food, meat, other animal products like dairy, eggs, etc., vegetarian food* and *vegan food* the effect found in the long-term is the same as in the short-term (i.e., a positive or negative direction). Interestingly, there seem to be differences in the extent that consumers are choosing to buy

certain items when comparing the short- and the long-term. Therefore, some post-hoc analyses were performed to see whether these are significant, see 4.5 *Post-hoc tests*.

In table 5 below, a summary of the found results for all univariate one sample tests is presented. A hypothesis found to be accomplished is labelled as 'confirmed' and if no significant results were found the label is 'not confirmed'.

Table 5 One sample T-test conclusion

items	ST[b] Results	Conclusion	LT[b] Results	Conclusion
	HS1		*HL1*	
Fresh food (fruits, vegetables, etc.)	mean = 3.62	Confirmed	mean = 3.61	Confirmed
	sig. Higher		sig. Higher	
Low sugar food	mean = 2.81	Confirmed	mean = 3.01	Not confirmed
	sig. Lower		n.s.	
Low salt food	mean = 2.46	Confirmed	mean = 2.76	Confirmed
	sig. Lower		sig. Lower	
Low calorie food	mean = 2.59	Confirmed	mean = 2.83	Confirmed
	sig. Lower		sig. Lower	
	HS2		*HL2*	
Sustainable products	mean = 2.69	Confirmed	mean = 2.99	Not confirmed
	sig. Lower		n.s.	
Products from ecologically responsible companies	mean = 2.61	Confirmed	mean = 2.97	Not confirmed
	sig. Lower		n.s.	
Products with environment-friendly ingredients	mean = 2.84	Confirmed	mean = 3.06	Not confirmed
	sig. Lower		n.s.	
Products with environment-friendly packaging	mean = 2.92	Not confirmed	mean = 3.24	Confirmed
	n.s.		sig. Higher	
Pre-packaged products (e.g. wrapped in plastic)[a]	mean = 3.46	Confirmed	mean = 3.59	Confirmed
	sig. Higher		sig. Higher	
	HS3		*HL3*	
Locally produced food	mean = 3.26	Confirmed	mean = 3.43	Confirmed
	sig. Higher		sig. Higher	
Meat[a]	mean = 3.32	Confirmed	mean = 3.30	Confirmed
	sig. Higher		sig. higher	
Other animal products like dairy, eggs, etc.[a]	mean = 3.13	Confirmed	mean = 3.14	Confirmed
	sig. Higher		sig. higher	
Organically produced food	mean = 2.79	Confirmed	mean = 2.98	Not confirmed
	sig. Lower		n.s.	
Vegetarian food	mean = 2.55	Confirmed	mean = 2.71	Confirmed
	sig. Lower		sig. Lower	
Vegan food	mean = 2.17	Confirmed	mean = 2.32	Confirmed
	sig. Lower		sig. Lower	

[a] Recoded item, see 3.3 *Measurements*.
[b] ST = short-term, LT = long-term.

4.4   Moderation effect

To test whether there is an interaction effect as suggested in hypotheses *HS4*: '*The COVID-19 pandemic impacts consumers with poorer mental health more than consumers with less poor mental health, regarding the choice to purchase health-friendly products in the short-term'* and in the long-term for *HL4*, there was a need to check for moderation of mental health.

A total of 195 respondents filled in the question asking about their general mental health. First, a total score of mental health per respondent needed to be calculated and was coded into a new variable (= Mental health). This variable is numerical and can be considered interval data as the difference between scores can be computed, however, the relative difference cannot be calculated (Saunders et al., 2016).

Then, it was necessary to divide the sample into two groups depending on their mental health, to test the hypotheses. Previous studies have applied different fixed cut-off points, indicating that there is not one specified best point to divide the groups (Easton et al., 2017; Max, Ong, Prochaska, Shi, & Sung, 2012). Therefore, some descriptive statistics were applied on the total score of mental health, to find out how balanced the scores were (table 6 below). The skewness (0.298) is deemed more or less symmetrical as this is between -0.5 and 0.5 (McNeese, 2016). Further, the mean (14.93) is nearly the same as the median (15). Hence, the sample is split into two groups by using the median as a cut-off point. People in the sample scoring below 15 belong to the 'less stressed people', and the part of the sample scoring equally or higher than 15 are the 'more stressed people'. This results into two nearly equally balanced groups see table 7 'Mental health groups'.

Table 6 Descriptive statistics of health-friendly items

Mental health	N	Min	Max	Mean	Median	Std. Deviation	Skewness	
							Statistic	Std. Error
	195	6	30	14.93	15.00	4.78	.298	.174

Table 7 Mental health groups

Group	Mental health	Frequency (N = 195)
Less stressed people	From 6 to 14	97
More stressed people	From 15 to 30	98

Descriptive statistics for both groups were calculated and the detailed overview can be seen in tables B.15 and B.16 in appendix 5, but to more clearly show the results the means of both tables were put into figure 5 below. Interestingly, none of the items score similarly on average between the two groups, neither in the short- or the long-term. Moreover, for both groups and timeframes, the items do have the same direction, either below or above the red benchmark line (= *Neutral (3)*). Except, however, in the long-term *more stressed people* have a mean higher than three for *low sugar food*, while *less stressed people* have a mean below three. The following section will show whether the differences between the groups are significant.

Figure 5 Health-friendly products per mental health group
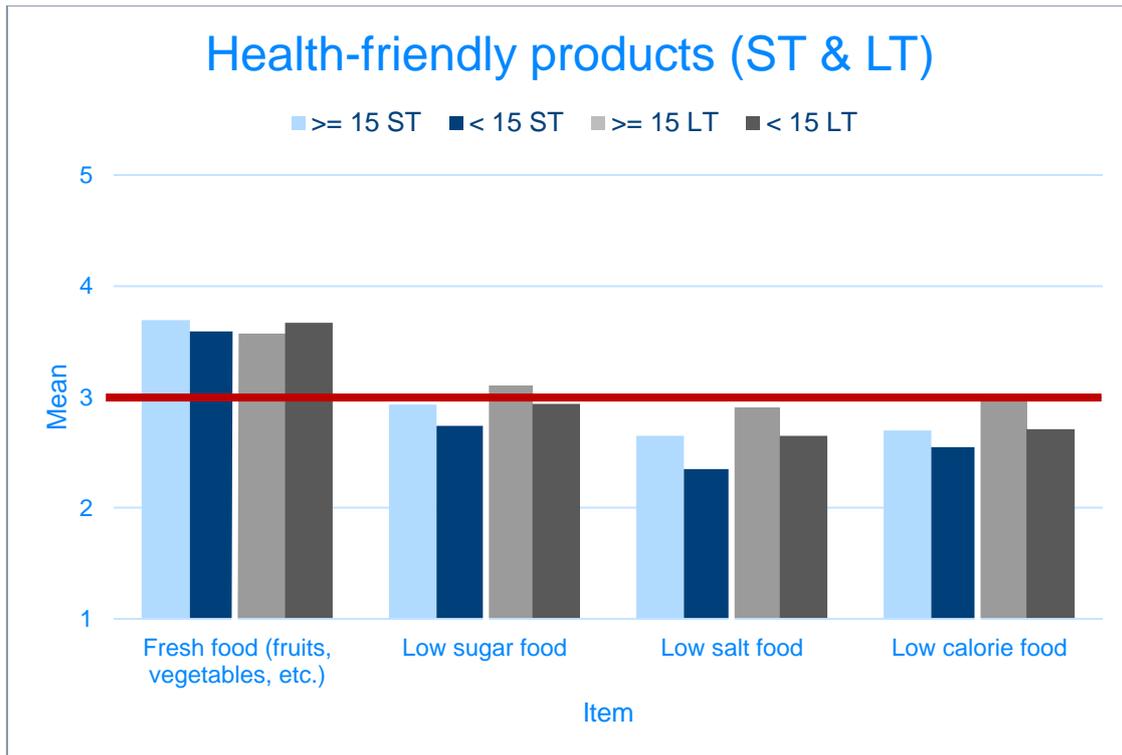
4.4.1 Hypotheses testing univariate independent T-test

Next, to test the hypotheses, the means of each item belonging to the health-friendly products were compared across the mental health groups for both the short- and the long-term. The scale of this variable is numerical, there were two groups to be compared and the two groups are independent as it is impossible for the subjects from the 'less stressed people' to also be in the 'more stressed people' group since the respondents were questioned independently. Therefore, an independent T-test was run to identify the interaction effects. For the independent T-tests done for each item of the health-friendly products in the short- and the long-term, the null and alternative hypothesis are:

H_0: The means of the two groups ('less stressed people' and 'more stressed people') are equal.

H_a: The means of the two groups ('less stressed people' and 'more stressed people') are unequal.

Consequently, the independent T-tests show us whether on average the two samples score significantly different from each other. If so, the means from the two groups can be compared to each other to prove or disprove the expected results as hypothesized from the literature. Again, the tests are two-tailed since the means of one group can be larger or smaller than the mean of the other group (Frost, s.d.).

4.4.1.1 short-term

When looking at the results from the test in table 8 below, it can be concluded that the variances of the different items are not significantly different between the two groups, because $p > 0.05$ for all items to Levene's Test. Accordingly, the test output to consider is the output in the rows corresponding to the assumption of equal variances (Kent State University, 2021). For *fresh food (fruits, vegetables, etc.)* ($t(193) = 0.676$, $p = 0.500$), *low sugar food* ($t(193) = 1.184$, $p = 0.238$) and *low calorie food* ($t(193) = .1.108$, $p = 0.269$), the null hypothesis cannot be rejected since $p >$

0.05. Meaning that, the mean of the two groups should be considered equal and the expected results as hypothesized from the literature cannot be proven to be true for these items.

Conversely, for the item *low salt food* (t(193) = 2.262, p = 0.025), the p value is smaller than the selected significance level of 0.05. Hence, the null hypothesis can be rejected and the means of the two groups are significantly different. The mean is 0.30 higher for the 'more stressed people', which can be interpreted as on average the 'more stressed people' indicated to purchase more low salt food in the short-term, compared to the 'less stressed people'. Therefore, the results actually prove that the hypothesis from the literature is contradicted, since it are not the 'more stressed people', but the 'less stressed people' that choose to be buy less low salt food. This is further discussed in 5 *Conclusion*.

Table 8 Independent Sample test health-friendly products ST

Independent Samples Test		Levene's Test for Equality of Variances		t-test for Equality of Means			
Item	Equal variances:	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Fresh food (fruits, vegetables, etc.)	assumed	.894	.345	.676	193	.500	.11
Low sugar food	assumed	3.640	.058	1.184	193	.238	.19
Low salt food	assumed	.671	.414	2.262	193	.025	.30
Low calorie food	assumed	3.014	.084	1.108	193	.269	.16

4.4.1.2   long-term

This section follows the same logic as the previous section about the short-term results, but applied to the statistical results for the long-term, visible in table 9.

For *fresh food (fruits, vegetables, etc.)* the variance is not significantly different between the two groups according to Levene's test since p > 0.05. Contrarily, the other items do not have a significant p value for Levene's test (p < 0.05), and it is assumed that the variances between the two groups do differ. Following this, neither *fresh food (fruits, vegetables, etc.)* (t(193) = -0.665, p = 0.507), *low sugar food* (t(185.50) = 1.074, p = 0.284)*, low salt food* (t(186.73) = 1.074, p = 0.078) nor *low calorie food* (t(188.95) = 1.074, p = 0.066) have p values lower than the significance level of 0.05, so the null hypotheses cannot be rejected and the means of the two groups are not significantly different in the long-term. Meaning that, the direct long-term effects are not significantly moderated by a respondent's mental health, and *HL4* is not proven.

Table 9 Independent Sample test health-friendly products LT

Independent Samples Test		Levene's Test for Equality of Variances		t-test for Equality of Means			
Item	Equal variances:	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Fresh food (fruits, vegetables, etc.)	assumed	.483	.488	-.665	193	.507	-.10
Low sugar food	not assumed	5.169	.024	1.074	185.50	.284	.16
Low salt food	not assumed	8463	.004	1.770	186.73	.078	.25
Low calorie food	not assumed	5.201	.024	1.848	188.95	.066	.27

4.4.2 Moderation among the other sub-variables

Although this study only hypothesized a moderation in the health-friendly variables, the gathered data also allowed to check whether there is a difference between the mental health groups for the other sub-variables. Therefore, these tests were also run. For most items no significant difference was observed, except for *organically produced food* ($t(193) = 2.334$, $p = 0.021$) and *vegan food* ($t(193) = 3.485$, $p = 0.001$) in the short-term, 'more stressed people' indicated to choose to buy more of these items, compared to 'less stressed people'. Also, *vegetarian food* ($t(193) = 2.083$, $p = 0.039$) and *vegan food* ($t(187.187) = 2.083$, $p = 0.005$) show significant differences in the long-term, 'more stressed people' indicated that they plan to buy more of these items than 'less stressed people'. The significantly different means to these items can be seen in table 10.

Table 10 Means per mental health group

Group	ST: organically produced food	ST: vegan food	LT: vegetarian food	LT: vegan food
Less stressed people	2.63	1.95	2.56	2.11
More stressed people	2.96	2.48	2.89	2.54

4.5 Post-hoc tests

To understand how sensitive the results are to some of the design choices made, a number of post-hoc tests were run and are described in what follows.

4.5.1 Only Belgian sample

Because the sample is predominantly residing in Belgium (81.58%), the univariate one sample T-tests were rerun exactly as performed in section 4.3 for solely the Belgian sample to see whether this overrepresentation biased the results in any way (see the results in table B.17, appendix 6). The results were compared to the results disclosed in section 4.3 and are presented in table B.18 in appendix 6. The findings indicate that no significances or directions differ, except for *products with environment-friendly packaging* in the long-term which is not significant for the Belgian sample, whereas the full sample indicate to choose this item significantly more. Though, it can be concluded that the results are overall identical with only the Belgian sample.

4.5.2 Paired sample t-test

A paired sample t-test was run to see whether the responses from the sample significantly differ between the two timeframes. The null and alternative hypotheses are:

H$_0$: The short-term results are equal to the long-term results.

H$_a$: The short-term results are not equal to the long-term results.

The results are visible in table B.19 (appendix 6), according to the significance level of 0.05, H$_0$ can be rejected for all items except for *fresh food (fruits, vegetables, etc.), pre-packaged products (e.g. wrapped in plastic), meat* and *other animal products like dairy, eggs, etc.*, because $p > 0.05$. Hence, the purchasing choices for all other items do differ significantly between the two timeframes. Interestingly, higher scores were observed for the long- than for the short-term. Furthermore, the analysis also showed that the short- and long-term results are highly and positively correlated with each other (table B.20, appendix 6). Signifying that a respondent answering highly for an item in the short-term also responded highly for the same item in the long-term.

5   Conclusion

The purpose of this master's thesis was to uncover how consumers have changed their own purchasing choices for health-, environment- and combined health- and environment-friendly products because of the COVID-19 pandemic. This for the short-term, so since the start of the pandemic, and for the long-term, once the pandemic is over. The results obtained through quantitative analyses on data gathered through an online questionnaire are summarized in the following paragraphs and can more simply be viewed in table 11. The table shows both the short- and the long-term results for the different items investigated. Then, per item and per corresponding timeframe it is mentioned whether the results of the research specified that consumers (will) choose to purchase *more* or *less* of that item. Moreover, the green (red) color signifies that the purchasing behavior is more (less) beneficial for health and/or the environment. Furthermore, next to some items a slash symbol (/) is shown, indicating that no significant effect was found, i.e., consumers did not significantly change their purchasing choices for that item in the corresponding timeframe. Also shown is whether mental health moderates the purchasing choice for an item. Note that 'more stressed people' are compared to 'less stressed people'. However, the overall effect on purchasing choices still corresponds to the found main effect for both groups, e.g., consumers buy *less* vegan products in the short-term, but more stressed people choose *more* vegan food than less stressed people. Here, the slash symbol represents that there was no significant difference on purchasing choices depending on consumers' mental state.

Table 11 Changed consumer purchasing choices

Items	ST[a]	LT[a]	Mental health & ST[a]	Mental health & LT[a]
Health-friendly products				
Fresh food (fruits, vegetables, etc.)	More	More	/	/
Low sugar food	Less	/	/	/
Low salt food	Less	Less	More stressed people: more	/
Low calorie food	Less	Less	/	/
Environment-friendly products				
Sustainable products	Less	/	/	/
Products from ecologically responsible companies	Less	/	/	/
Products with environment-friendly ingredients	Less	/	/	/
Products with environment-friendly packaging	/	More	/	/
Pre-packaged products (e.g. wrapped in plastic)	Less	Less	/	/
Health- and environment-friendly products				
Locally produced food	More	More	/	/
Meat	Less	Less	/	/
Other animal products like dairy, eggs, etc.	Less	Less	/	/
Organically produced food	Less	/	More stressed people: more	/
Vegetarian food	Less	Less	/	More stressed people: more
Vegan food	Less	Less	More stressed people: more	More stressed people: more

[a] ST = short-term, LT = long-term.

Overall, the results of this study show that, as hypothesized, consumers have changed their purchasing choices for most health-, environment- and combined health- and environment-friendly products since the start of the pandemic, and also plan to change this post-pandemic. However, the detailed research questions introduced at the beginning of this paper also asked 'how' the purchasing choices (will) change for the short- and long-term. Therefore, the direction of the effects must be considered. The literature was mostly ambiguous about this direction. However, this study found a predominantly negative effect on the items, i.e., consumers choose to purchase *less* of most items. This could be explained by the fact that the studied items might belong to a niche market reaching a particular segment of people (Shams, 2020). For example, Sheehan (2021) lists several larger niche markets, including *"health and wellness"* and *"conscious consumers"* in which customers attach importance to their health and the environment respectively. The mainstream population of consumers is likely to not share the same interests in these products as the niche customers and hence (will) purchase less of these items.

Nevertheless, table 11 shows that the items are not all impacted equally since a positive effect was found for *fresh food* and *locally produced food* in the short- and long-term, and on *products with environment-friendly packaging* in the long-term. Notable, *meat* and *other animal products* are bought less, but this is also beneficial for health and the environment. This is in line with some previous research and commercial press (Accenture, 2020a, 2020b; Ahmadi Kaliji et al., 2020; Attwood & Hajat, 2020; Buchwald, 2020; Ewing-Chow, 2020b). It could be argued that these items are to a lesser extent seen as niche products and are also of interest to mainstream consumers.

Moreover, the nonsignificant effects (/) indicate that it cannot be concluded that consumers (will) alter their purchasing choices for those specific items. Interestingly, less significances were established in the long-term than in the short-term, this however is not surprising since the literature is highly divided on what the long-term effects of the pandemic will be. Future research can shed more light on the yet nonsignificant items. Nonetheless, these null effects can also indicate that the sample is balanced and that this overall does not result in a dominant direction of change.

The third detailed research question presented in 1 *Introduction*, asked whether purchasing choices for health-friendly products differ depending on consumers' mental state. This because some researchers found disordered food habits (Abdelkarim et al., 2020; Meyer et al., 2020), and Cocchi et al. (2020) even suggest that this is caused by stress. This study also found some negative impacts on health-friendly items, though mostly no effect was found between consumers characterized with differing levels of mental health. Thus, the moderation of mental health on health-friendly products in the short- and long-term was not confirmed like hypothesized. The only exception are the short-term purchasing choices for *low salt food*. However, unlike hypothesized, it is the consumer with a better mental health that chooses to buy less *low salt food*, and not the people with poorer mental health. Different reasons exist why people would eat more salty foods, but the found result cannot be explained by existing literature (Berry, 2017). Normally stress induces people to eat more salty food, which is the opposite of the observed effect. An explanation can be that respondents interpreted the formulation incorrectly and that they did not perceive *low salt food* as being healthy. This can be due to the fact that the formulation was confusing or because this item was asked immediately after *low sugar food*, hence some might have seen *salt* as the opponent of *sugar* and deemed it to be healthier. This could be prevented by formulating it as 'very salty food' and recoding it in the analyses, this way respondents can more clearly understand that *salt* is considered unhealthy.

As additional tests, the environment- and health- and environment-friendly products were analyzed. Like expected, no significant differences between the groups were found for environment-friendly products. However, it became apparent that, although no moderating effects of mental health were expected, 'more stressed people' (will) choose more of *organically produced* and *vegan food* in the short-term, and *vegetarian* and *vegan food* in the long-term than

'less stressed people'. Interestingly, Goetzke, Nitzko and Spiller (2014) found no effect of *"cognitive-emotional well-being"* on choosing *"organic food"*, whereas this study did establish a significant difference depending on mental state. Perhaps this is because 'more stressed people' are aware of their mental state and could be more motivated to better this by eating organically (Apaolaza, Hartmann, D'Souza, & López, 2018). Furthermore, in 2021 Huybrechts, Iguacel, Michels and Moreno found a link between some mental problems, like depression, and a diet rich of *vegetarian* and *vegan food*. Therefore, the found effect might not be a moderating effect of mental health on choosing health- and environment-friendly products but choosing the vegetarian and vegan options might induce a distressed mental state. Future research should further investigate these arguments.

Noteworthy is that although more non-significances were observed in the long-term, the direction of the significant findings are similar in both timeframes. However, post-hoc analysis revealed that significantly higher scores were observed in the long- than in the short-term for most items. This indicates that people are more optimistic about their future purchasing behavior and expect to purchase products that are better for their health and the environment once the pandemic is over. This optimism is not necessarily caused by the pandemic, because people generally have biased expectations of the future (Lench & Bench, 2012).

The key conclusion of this research is that, in general, consumers have changed their purchasing choices for health-, environment- and combined health- and environment-friendly products since the start of the pandemic, and also plan to change this for some products post-pandemic. Overall consumers (will) choose to purchase less of the studied items, except for *fresh food* and *locally produced food* in the short- and long-term, and for *products with environment-friendly packaging* in the long-term. The implications of these findings for managers and academia are discussed in the next section. Though the main takeaway is that, if applicable, economic actors targeting mainstream consumers should therefore consider concentrating their (marketing) strategy on promoting local and fresh food, and on the environmental friendliness of products' packaging.

5.1   Academic and managerial implications

This research established some interesting insights. Therefore, the academic and managerial contributions are discussed in following paragraphs.

This research innovatively investigates consumers' purchasing choices for health-, environment- and combined health- and environment-friendly products. These sub-variables of consumer behavior are interrelated, yet not adequately and comprehensively studied in the past (European Environment Agency, 2020). Likewise, both the effects of the pandemic since the start of the virus outbreak and the possible effects once the pandemic ends are studied. The combination of two studied timeframes makes the research inventive and it contributes insights to the scarce knowledge on the possible future outcomes of the pandemic.

More practically, this study researched economic outcomes in the form of consumers' product choices which economic actors like retailers, business, marketeers etc. can certainly use. The table above, showing the overview of the findings can more easily help different economic actors to direct their strategies in various ways. Some examples are given in the next paragraphs.

The short-term effects on the purchasing choices for the studied products endure to be significant as long as the pandemic lasts, because this way economic actors can adapt their strategies according to the consumers' preferences and wishes (Accenture, 2020b). For instance, this research established that consumers tend to purchase more *fresh food* and *locally produced food*. It is important to act into this consumer behavior during the pandemic, because these nutritional

products are appreciated anew, but if nothing is undertaken, the *"momentum"* will get lost (Van Rompaey, 2021). Therefore, stores' marketing strategies should play into this and communicate this by for example introducing promotions encouraging 'buying locally', emphasizing the freshness of their products and even providing possible recipes using local and fresh ingredients. The other studied products are chosen less in the short-term, and these results can also be applied in a business setting. For instance, to satisfy consumers' preferences businesses could offer products with minimal plastic packaging and/or animal products because consumers indicated to choose less *pre-packaged products (e.g. wrapped in plastic)* and *animal products like dairy, eggs, etc.* By communicating this in-store, online and/or in other marketing announcements, consumers might notice this and prefer to purchase goods from those businesses. Furthermore, consumers choose less low *sugar, salt* and *calorie food, sustainable products*, etc. this could have some negative implications for companies intensively focused on the healthiness and 'greenness' of their products. Businesses could consider a change in their strategy. For instance, discontinuing or shifting the focus of some marketing promotions, so that investments and resources put into communicating those product features can be saved.

These short-term applications should be extended in the long-term since the expected purchasing choices established follow similar directions once the pandemic ends. Moreover, it is even more important for future strategies to promote the above-mentioned items, since in the long-term significantly higher results were found and consumers indicated to choose those items more than in the short-term. Applying the long-term findings is best done diligently since they are based on consumers' expectations which might change. So, it is advisable to confirm the long-term results with the latest research.

The aim of this study was mainly focused on information that could help retailers, businesses, etc. However, also governments might use the results to see how grocery shoppers behave and how they plan to act in the future. Especially when contemplating strategies to restructure health systems and to see whether for instance consumers are ready to change their habits toward more healthy foods. In particular, governments aiming to meet the United Nations' Sustainable Development Goals by 2030 can notice that they might be impeded by the fact that in the short-term consumers indicated to purchase less healthy food, e.g., *low sugar food*, environment-friendly products, e.g., *sustainable products*, etc. this shows that more efforts are needed to promote healthy and environmentally friendly consumer behavior (UN, s.d.). The introduction mentioned that the pandemic is a pivotal moment for consumer behavior and Cohen (2020) suggests that COVID-19 can be considered both an 'experiment' to scale down consumerism, and an opportunity to improve our current lifestyle. The researcher calls for action favoring more sustainable consumption and Bhattacharya et al. (2020) proposes that governments should invest in stimulating "*circular economy (CE) based solutions*" (p. 9) for producers and consumers. This research confirms those findings because purchasing health- and environment-friendly products is limited to just a few items, like *local* and *fresh food*. Furthermore, and as said before, the health-, environment- and health- and environment-friendly products might mainly appeal to a niche consumer. Therefore, the mainstream consumers are not yet highly interested in these products and might not consider them as being beneficial. Hence, governments should indeed undertake more action to also encourage mainstream consumers to choose more healthy and environmentally friendly products.

5.2   Limitations and suggestions for future research

Throughout the process of conducting this research several drawbacks were noticed. Because the researcher was limited in time and funds, the different demographic variables indicated that the sample poorly represents the population. The sample mainly exists out of highly educated and female respondents between the ages of 18 and 29 who predominantly resided in Belgium

during the pandemic. So, the judgement and snowball sampling techniques used did not reach the wanted target and mostly reached acquaintances from a similar population segment as the researcher. The respondents reached might have biased the findings in several ways. Firstly, young adults possess less disposable income and hence a lower budget for groceries (Blumberg, 2018; Statista Research Department, 2021). Therefore, the respondents might not have a budget to engage in 'pro' health and environment behavior. So, the negative effects observed on the purchasing choices for the products might be due to the fact that consumers find those products too expensive, especially since, these products are often pricier (Linden, 2020; Mikstas, 2020; Seastainable, 2019; Shanker, 2015). Moreover, considering the age of the sample, healthy eating might not be a priority (Beasley, Hackett, & Maxwell, 2004). Likewise, according to Morrison and Beer (2017) the most environmentally aware consumers are *"middle-aged"* and these are not adequately represented by the sample. Furthermore, although Van den Bergh (2020) found that Belgian consumers care more about sustainability, etc. than before the pandemic, other countries e.g., Sweden, Canada…, are still more environment and health conscious (U.S. News, s.d.). Hence, more variation in the sample could have led to different and possibly higher results.

Probability sampling could have been more appropriate as this more accurately provides inferences from the sample about a population (Saunders et al., 2016). Also, increasing the sample size and weighting the results of the sample could possibly enhance the generalization of the results (Thomas, s.d.). The sample size and poor representation might explain the many non-significant results obtained. Future research should try and improve this to see if other results are found.

During the analysis it became evident that the questionnaire might have confused certain respondents, for instance the aforementioned formulation of *low salt food*. This could lead to wrong interpretations of the questions. Furthermore, the terms used can be interpreted personally, for instance *vegan food*, is often differently understood depending on the individual (Williams, 2020). Also, it is possible that some respondents did not understand that they had to compare their purchasing choices from before the pandemic with those from during and after the pandemic. Therefore, some may have compared their behavior with other's behavior and since the mainstream consumer is not as radical in the purchasing of the studied items as niche consumers, they may have considered their behavior poorly.

Also, this research regarded mental health as a consumer trait and thus as static over time. However, in reality mental health can fluctuate and should be interpreted carefully (Heads Up, s.d.; Ritchie & Roser, 2018). Moreover, the respondents were split into two groups of either being 'more stressed' or 'less stressed', however this is a bit simplistic and considering more different groups would be better. A solution could be to consider mental health as a continuous variable, and this might lead to different findings. However, future researchers should examine this more profoundly to find the best approach. Furthermore, for research feasibility only mental health was considered as a possible moderator, though other factors like physical health, budget, etc. could influence the investigated variables as well.

Moreover, this study asked participants to self-respond the online questions on a cross-sectional basis. However, consumers might not completely recall their behavior from pre-pandemic times and the choices consumers actually make are likely to differ from what consumers think their behavior to be. Furthermore, since this research investigated two timelines, one of which are predictions about future behavior, a follow-up study should be performed post-pandemic. This way, it can be verified whether consumers' purchasing choices correspond to what was found to be expected. This research thus serves as the foundation for additional research, since significant results were found, and consumers think they have altered their purchasing choices. However, future researchers should consider studying actual behavior by making observations of the purchasing choices over time to draw more thorough conclusions.

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Appendix 1

Table B.1 Questionnaire

Questionnaire: Consumer behavior COVID-19

Part 1: Filter questions

Q1 Are you responsible for the purchases of groceries in your household?
- o Yes (1)
- o To a large extent, yes (2)
- o No (3)

Part 2: Short-term Consumer behavior

In the following, the COVID-19 pandemic will be referred to as 'the pandemic'.
Please check the appropriate answer to the following questions which are about your overall purchasing choices since the start of the pandemic.

Q2 Please indicate to what extent you agree or disagree with the following statements:
Compared to before the pandemic, I now buy … more often.

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
… sustainable products (1)	o	o	o	o	o
… products from ecologically responsible companies (2)	o	o	o	o	o
… products with environment-friendly ingredients (3)	o	o	o	o	o
… products with environment-friendly packaging (4)	o	o	o	o	o
… pre-packaged products (e.g. wrapped in plastic) (5)	o	o	o	o	o
… fresh food (fruits, vegetables, etc.) (6)	o	o	o	o	o
… low sugar food (7)	o	o	o	o	o
… low salt food (8)	o	o	o	o	o
… low calorie food (9)	o	o	o	o	o
… locally produced food (10)	o	o	o	o	o
… meat (11)	o	o	o	o	o
… other animal products like dairy, eggs, etc. (12)	o	o	o	o	o
… organically produced food (13)	o	o	o	o	o
… vegetarian food (14)	o	o	o	o	o
… vegan food (15)	o	o	o	o	o

Part 3: Long-term Consumer behavior

Please check the appropriate answer to the following questions which are about your expected future purchasing choices once the pandemic is over.

Q3 Please indicate to what extent you agree or disagree with the following statements: *Once the pandemic is over, I think I will buy … <u>more often</u>.*

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
… sustainable products (1)	○	○	○	○	○
… products from ecologically responsible companies (2)	○	○	○	○	○
… products with environment-friendly ingredients (3)	○	○	○	○	○
… products with environment-friendly packaging (4)	○	○	○	○	○
… pre-packaged products (e.g. wrapped in plastic) (5)	○	○	○	○	○
… fresh food (fruits, vegetables, etc.) (6)	○	○	○	○	○
… low sugar food (7)	○	○	○	○	○
… low salt food (8)	○	○	○	○	○
… low calorie food (9)	○	○	○	○	○
… locally produced food (10)	○	○	○	○	○
… meat (11)	○	○	○	○	○
… other animal products like dairy, eggs, etc. (12)	○	○	○	○	○
… organically produced food (13)	○	○	○	○	○
… vegetarian food (14)	○	○	○	○	○
… vegan food (15)	○	○	○	○	○

Part 4: Mental Health

Q4 The following statement refers to how you generally feel in daily life. Please indicate to what extent you agree or disagree with the following statements: *In daily life I often feel…*

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
Nervous (1)	○	○	○	○	○
Hopeless (2)	○	○	○	○	○
Restless (3)	○	○	○	○	○
So depressed that nothing can cheer you up (4)	○	○	○	○	○
That everything is an effort (5)	○	○	○	○	○
Worthless (6)	○	○	○	○	○

Part 5: Socio-Demo

Q5 What is your age?
    ○   17 or younger (1)
    ○   18-29 (2)
    ○   30-39 (3)
    ○   40-49 (4)
    ○   50-59 (5)
    ○   60-69 (6)
    ○   70 or older (7)

Q6 What is your gender?
    ○   Male (0)
    ○   Female (1)
    ○   ~~Non-binary (3)~~
    ○   ~~Other (4) _____~~

Q7 What is your country of residence during the pandemic? Drop-down menu with country list: Afghanistan (1) ... Zimbabwe (1357)

Q8 What is the highest level of education that you have completed?
    ○   No secondary education (1)
    ○   Secondary education (2)
    ○   Professional bachelor (3)
    ○   Academic bachelor (4)
    ○   Master (5)
    ○   Doctoral degree (6)

Appendix 2

Table B.2 Hypotheses overview

Hypothesis[a]	Items	Statistical test	Benchmark
HS1: ST health-friendly products HL1: LT health-friendly products	Fresh food (fruits, vegetables, etc.) Low sugar food Low salt food Low calorie food	1 sample T-test for each item[b]	(3) Neutral
HS2: ST environment-friendly products HL2: LT environment-friendly products	Sustainable products Products from ecologically responsible companies Products with environment-friendly ingredients Products with environment-friendly packaging Pre-packaged products (e.g. wrapped in plastic)[c]	1 sample T-test for each item[b]	(3) Neutral
HS3: ST health- and environment-friendly products HL3: LT health- and environment-friendly products	Locally produced food Meat[c] Other animal products like dairy, eggs, etc.[c] Organically produced food Vegetarian food Vegan food	1 sample T-test for each item[b]	(3) Neutral
HS4: ST consumers with poorer mental health are more impacted than consumers with less poor mental health for health-friendly products HL4: LT consumers with poorer mental health are more impacted than consumers with less poor mental health for health-friendly products	Fresh food (fruits, vegetables, etc.) Low sugar food Low salt food Low calorie food	Independent T-test for each item. 2 groups more/less mentally distressed people[d]	(15) Median split

[a] ST = short-term, LT = long-term.
[b] A one sample T-test was deemed suitable because a five-point Likert scale was used and only one group of items is each time compared.
[c] During the analysis this item was recoded so that a higher score equals buying less of the item and this corresponds to being 'more … friendly' for all items, see 3.3 *Measurements*.
[d] An independent T-test was seen as appropriate because a five-point Likert scale was used and two groups independent from one another were compared per item.

Appendix 3

Table B.3 Demographical information sample

		Frequency	Percentage (%)
Responsible for groceries	Yes	136	41.09
	To a large extent, yes	99	29.91
	No	96	29.00
	Total	331	100.00
Age	17 or younger	0	0
	18-29	110	57.29
	30-39	15	7.81
	40-49	29	15.10
	50-59	28	14.58
	60-69	10	5.21
	70 or older	0	0
	Total	192	100.00
Gender	Male	35	18.13
	Female	158	81.87
	Non-binary	0	0
	Other	0	0
	Total	193	100.00
Highest level of education	No secondary education	1	.52
	Secondary education	53	27.46
	Master	45	23.32
	Doctoral degree	1	.52
	Academic bachelor	48	24.87
	Professional bachelor	45	23.32
	Total	193	100.00
Country of residence during the pandemic	Austria	2	1.05
	Belgium	155	81.58
	Canada	1	.53
	France	1	.53
	Germany	6	3.16
	Ireland	1	.53
	Italy	2	1.05
	Latvia	1	.53
	Malta	1	.53
	Montenegro	1	.53
	Netherlands	1	.53
	Norway	1	.53
	Poland	1	.53
	Portugal	1	.53
	Romania	1	.53
	Slovakia	1	.53
	Spain	1	.53
	Sweden	1	.53
	United Kingdom of Great Britain and Northern Ireland	2	1.05
	United States of America	9	4.74
	Total	190	100.00

Table B.4 Age distribution

Age	Frequency	Sample percentage (%)	Percentage population (%)	Expected approximate frequency of N = 192 based on population percentage	Residual
18-29	110	57.29	21.25	41	69.0
30-39	15	7.81	20.67	40	-25.0
40-49	29	15.10	19.30	38	-9.0
50-59	28	14.58	20.18	39	-11.0
60-69	10	5.21	17.99	34	-24.0
Total	192	100.00	100.00	192	

Calculation of population statistics for 2020 based on data from United Nations, Department of Economic and Social Affairs, Population Division (2019), calculated through Excel and SPSS.

Table B.5 Age Chi-square tests goodness-of-fit

Chi-Square	153.922[a]	[a] 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 34.0.
df	4	
Asymp. Sig.	.000	

H_0: The age division from our sample is equal to the age division from the population.
H_a: The age division from our sample is not equal to the age division from the population.

Table B.6 Gender distribution

Gender	Sample frequency	Sample percentage (%)	Percentage population (%)	Expected approximate frequency of N = 193 based on population percentage	Residual
Male	35	18.13	48.04	93	-58.0
Female	158	81.87	51.95	100	58.0
Total	193	100.00	100.00	193	

Calculation of population statistics for 2020 based on data from United Nations, Department of Economic and Social Affairs, Population Division (2019), calculated through Excel and SPSS.

Table B.7 Gender Chi-square tests goodness-of-fit

Chi-Square	69.812[a]	[a] 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 93.0.
df	1	
Asymp. Sig.	.000	

H_0: The gender division from our sample is equal to the gender division from the population.
H_a: The gender division from our sample is not equal to the gender division from the population.

Table B.8 Education attainment

Education attainment	Sample frequency	Sample percentage (%)	Percentage population (%)	Expected approximate frequency of N = 193 based on population percentage	Residual
No secondary	1	.52	4.35	8.6	-7.6
Secondary (lower or upper)	53	27.46	60.85	119.6	-66.6
Tertiary	139	72.03	33	64.9	74.1
Total	193	100			

Calculation of population statistics for 2020 based on data from Wittgenstein Centre (s.d.), calculated through Excel and SPSS.

Table B.9 Education Chi-square tests goodness-of-fit

Chi-Square	128.511[a]	[a] 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 8.6.
df	2	
Asymp. Sig.	.000	

H_0: The education attainment division from our sample is equal to the education attainment division from the population.
H_a: The education attainment division from our sample is not equal to the education attainment division from the population.

Table B.10 Country distribution

Country	Frequency	Sample percentage (%)	Percentage population (%)	Expected approximate frequency of N = 192 based on population percentage	Residual
Austria	2	1.05	0.83	2.1	-.1
Belgium	155	81.58	1.03	2.6	152.4
Canada	1	.53	3.43	8.8	-7.8
France	1	.53	5.76	14.8	-13.8
Germany	6	3.16	7.80	20.0	-14.0
Ireland	1	.53	0.42	1.3	-.3
Italy	2	1.05	5.70	14.6	-12.6
Latvia	1	.53	0.17	.4	.6
Malta	1	.53	0.04	.1	.9
Montenegro	1	.53	0.05	.1	.9
Netherlands	1	.53	1.55	4.0	-3.0
Norway	1	.53	0.48	1.2	-.2
Poland	1	.53	3.48	8.9	-7.9
Portugal	1	.53	0.96	2.5	-1.5
Romania	1	.53	1.75	4.5	-3.5
Slovakia	1	.53	0.50	1.3	-.3
Spain	1	.53	4.33	11.1	-10.1
Sweden	1	.53	0.89	2.3	-1.3
United Kingdom of Great Britain & Northern Ireland	2	1.05	6.01	15.4	-13.4
United States of America	9	4.74	28.84	73.9	-64.9
Total	190	100.00	74.03		
Missing			25.97	49,3457	

Calculation of population statistics for 2020 based on data from United Nations, Department of Economic and Social Affairs, Population Division (2019), calculated through Excel and SPSS.

Table B.11 Country Chi-square tests goodness-of-fit

Chi-Square	8923.214[a]	[a] 12 cells (60.0%) have expected frequencies less than 5. The minimum expected cell frequency is .1.
df	19	
Asymp. Sig.	.000	
H_0: The country division from our sample is equal to the country division from the population. H_a: The country division from our sample is not equal to the country division from the population.		

Appendix 4

Table B.12 Short-term descriptive statistics for each item

	N = 235	N	Min	Max	Mean	Std. Deviation
1. Health-friendly products	Fresh food (fruits, vegetables, etc.)	235	1	5	3.62	1.09
	Low sugar food	235	1	5	2.81	1.10
	Low salt food	235	1	5	2.46	.94
	Low calorie food	235	1	5	2.59	1.01
2. Environment-friendly products	Sustainable products	235	1	5	2.69	.97
	Products from ecologically responsible companies	235	1	5	2.61	.94
	Products with environment-friendly ingredients	235	1	5	2.84	1.01
	Products with environment-friendly packaging	235	1	5	2.92	1.03
	Pre-packaged products (e.g. wrapped in plastic)[a]	235	1	5	2.54	1.01
3. Combined health- and environment-friendly products	Locally produced food	235	1	5	3.26	1.05
	Meat[a]	235	1	5	3.32	1.03
	Other animal products like dairy, eggs, etc.[a]	235	1	5	3.13	.91
	Organically produced food	235	1	5	2.79	1.00
	Vegetarian food	235	1	5	2.55	1.19
	Vegan food	235	1	5	2.17	1.10

[a] Recoded item, see 3.3 *Measurements.*

Table B.13 Long-term descriptive statistics for each item

	N = 198	N	Min	Max	Mean	Std. Deviation
1. Health-friendly products	Fresh food (fruits, vegetables, etc.)	198	1	5	3.61	1.04
	Low sugar food	198	1	5	3.01	1.07
	Low salt food	198	1	5	2.76	.99
	Low calorie food	198	1	5	2.83	1.02
2. Environment-friendly products	Sustainable products	198	1	5	2.99	1.05
	Products from ecologically responsible companies	198	1	5	2.97	1.01
	Products with environment-friendly ingredients	198	1	5	3.06	1.02
	Products with environment-friendly packaging	198	1	5	3.24	1.08
	Pre-packaged products (e.g. wrapped in plastic)[a]	198	1	5	2.41	.99
3. Combined health- and environment-friendly products	Locally produced food	198	1	5	3.43	1.01
	Meat[a]	198	1	5	3.30	1.03
	Other animal products like dairy, eggs, etc.[a]	198	1	5	3.14	.93
	Organically produced food	198	1	5	2.98	1.05
	Vegetarian food	198	1	5	2.71	1.12
	Vegan food	198	1	5	2.32	1.06

[a] Recoded item, see 3.3 *Measurements*.

Table B.14 Sample T-test results long-term

Test Value = 3 N = 198		t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference Lower	Upper
1. Health-friendly products	Fresh food (fruits, vegetables, etc.)	8.23	197	.000	.61	.46	.76
	Low sugar food	.07	197	.947	.01	-.14	.15
	Low salt food	-3.45	197	.001	-.24	-.38	-.10
	Low calorie food	-2.30	197	.023	-.17	-.31	-.02
2. Environment-friendly products	Sustainable products	-.07	197	.946	-.01	-.15	.14
	Products from ecologically responsible companies	-.35	197	.725	-.03	-.17	.12
	Products with environment-friendly ingredients	.84	197	.402	.06	-.08	.20
	Products with environment-friendly packaging	3.08	197	.002	.24	.09	.39
	Pre-packaged products (e.g. wrapped in plastic)[a]	8.35	197	.000	.59	.45	.72
3. Combined health- and environment-friendly products	Locally produced food	5.96	197	.000	.43	.29	.57
	Meat[a]	4.07	197	.000	.30	.15	.44
	Other animal products like dairy, eggs, etc.[a]	2.14	197	.033	.14	.01	.27
	Organically produced food	-.20	197	.840	-.02	-.16	.13
	Vegetarian food	-3.62	197	.000	-.29	-.44	-.13
	Vegan food	-9.02	197	.000	-.68	-.83	-.53

[a] Recoded item, see 3.3 *Measurements*.

Appendix 5

Table B.15 Descriptive statistics of health-friendly items according to mental health group, short-term

	Mental health	N	Mean	Std. Deviation	Std. Error Mean
Fresh food (fruits, vegetables, etc.)	>= 15	98	3.69	1.07	.11
	< 15	97	3.59	1.13	.11
Low sugar food	>= 15	98	2.93	1.01	.10
	< 15	97	2.74	1.18	.12
Low salt food	>= 15	98	2.65	.87	.09
	< 15	97	2.35	.99	.10
Low calorie food	>= 15	98	2.70	.91	.09
	< 15	97	2.55	1.07	.11

- More stressed people: >= 15
- Less stressed people: < 15

Table B.16 Descriptive statistics of health-friendly items according to mental health group, long-term

	Mental health	N	Mean	Std. Deviation	Std. Error Mean
Fresh food (fruits, vegetables, etc.)	>= 15	98	3.57	.99	.10
	< 15	97	3.67	1.08	.11
Low sugar food	>= 15	98	3.10	.96	.10
	< 15	97	2.94	1.16	.12
Low salt food	>= 15	98	2.90	.89	.09
	< 15	97	2.65	1.06	.11
Low calorie food	>= 15	98	2.98	.94	.10
	< 15	97	2.71	1.08	.11

- More stressed people: >= 15
- Less stressed people: < 15

Appendix 6

Table B.17 Results one sample T-test: Belgian sample

Test Value = 3 N = 155 Df = 154		ST[b] t	ST[b] Sig. (2-tailed)	ST[b] Mean	LT[b] t	LT[b] Sig. (2-tailed)	LT[b] Mean
1. Health-friendly products	Fresh food (fruits, vegetables, etc.)	7597	.000	3.67	6649	.000	3.57
	Low sugar food	-2285	.024	2.80	-.467	.641	2.96
	Low salt food	-7477	.000	2.45	-4066	.000	2.70
	Low calorie food	-5643	.000	2.57	-2610	.010	2.79
2. Environment-friendly products	Sustainable products	-4403	.000	2.66	-1485	.140	2.88
	Products from ecologically responsible companies	-5688	.000	2.58	-1887	.061	2.85
	Products with environment-friendly ingredients	-2801	.006	2.77	-.557	.578	2.95
	Products with environment-friendly packaging	-1559	.121	2.87	1450	.149	3.12
	Pre-packaged products (e.g. wrapped in plastic)[a]	7309	.000	3.57	8790	.000	3.65
3. Combined health- and environment-friendly products	Locally produced food	2381	.018	3.21	4116	.000	3.34
	Meat[a]	4120	.000	3.33	4846	.000	3.37
	Other animal products like dairy, eggs, etc.[a]	2079	.039	3.15	2969	.003	3.21
	Organically produced food	-2990	.003	2.76	-1101	.273	2.91
	Vegetarian food	-4240	.000	2.59	-3238	.001	2.71
	Vegan food	-10689	.000	2.14	-8689	.000	2.28

[a] Recoded item, see 3.3 *Measurements*.

[b] ST = short-term, LT = long-term.

Table B.18 Comparing sample and Belgian sample

items	ST[b]	ST[b] Belgian sample	LT[b]	LT[b] Belgian sample
	HS1		*HL1*	
Fresh food (fruits, vegetables, etc.)	mean = 3.62	mean = 3.67	mean = 3.61	mean = 3.57
	sig. Higher	sig. Higher	sig. Higher	sig. Higher
Low sugar food	mean = 2.81	mean = 2.80	mean = 3.01	mean = 2.96
	sig. Lower	sig. Lower	n.s.	n.s.
Low salt food	mean = 2.46	mean = 2.45	mean = 2.76	mean = 2.70
	sig. Lower	sig. Lower	sig. Lower	sig. Lower
Low calorie food	mean = 2.59	mean = 2.57	mean = 2.83	mean = 2.79
	sig. Lower	sig. Lower	sig. Lower	sig. Lower
	HS2		*HL2*	
Sustainable products	mean = 2.69	mean = 2.66	mean = 2.99	mean = 2.88
	sig. Lower	sig. Lower	n.s.	n.s.
Products from ecologically responsible companies	mean = 2.61	mean = 2.58	mean = 2.97	mean = 2.85
	sig. Lower	sig. Lower	n.s.	n.s.
Products with environment-friendly ingredients	mean = 2.84	mean = 2.77	mean = 3.06	mean = 2.95
	sig. Lower	sig. Lower	n.s.	n.s.
Products with environment-friendly packaging	mean = 2.92	mean = 2.87	mean = 3.24	mean = 3.12
	n.s.	n.s.	**sig. Higher**	**n.s.**
Pre-packaged products (e.g. wrapped in plastic)[a]	mean = 3.46	mean = 3.57	mean = 3.59	mean = 3.65
	sig. Higher	sig. Higher	sig. Higher	sig. Higher
	HS3		*HL3*	
Locally produced food	mean = 3.26	mean = 3.21	mean = 3.43	mean = 3.34
	sig. Higher	sig. Higher	sig. Higher	sig. Higher
Meat[a]	mean = 3.32	mean = 3.33	mean = 3.30	mean = 3.37
	sig. Higher	sig. Higher	sig. higher	sig. Higher
Other animal products like dairy, eggs, etc.[a]	mean = 3.13	mean = 3.15	mean = 3.14	mean = 3.21
	sig. Higher	sig. Higher	sig. higher	sig. Higher
Organically produced food	mean = 2.79	mean = 2.76	mean = 2.98	mean = 2.91
	sig. Lower	sig. Lower	n.s.	n.s.
Vegetarian food	mean = 2.55	mean = 2.59	mean = 2.71	mean = 2.71
	sig. Lower	sig. Lower	sig. Lower	sig. Lower
Vegan food	mean = 2.17	mean = 2.14	mean = 2.32	mean = 2.28
	sig. Lower	sig. Lower	sig. Lower	sig. Lower

[a] Recoded item, see 3.3 *Measurements*.
[b] ST = short-term, LT = long-term.

Table B.19 Paired sample t-test

Paired Differences			Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		T	df	Sig. (2-tailed)
Sub-variable	Pair	ST & LT:[b]				Lower	Upper			
1. Health-friendly products	1	Fresh food (fruits, vegetables, etc.)	.02	.90	.06	-.11	.15	.317	197	.751
	2	Low sugar food	-.18	.82	.06	-.30	-.07	-3.132	197	.002
	3	Low salt food	-.27	.72	.05	-.37	-.17	-5.214	197	.000
	4	Low calorie food	-.22	.74	.05	-.33	-.12	-4.219	197	.000
2. Environment-friendly products	5	Sustainable products	-.27	.91	.06	-.40	-.15	-4.215	197	.000
	6	Products from ecologically responsible companies	-.32	.88	.06	-.44	-.19	-5.081	197	.000
	7	Products with environment-friendly ingredients	-.20	.79	.06	-.31	-.09	-3.613	197	.000
	8	Products with environment-friendly packaging	-.30	.92	.07	-.43	-.17	-4.576	197	.000
	9	Pre-packaged products (e.g. wrapped in plastic)[a]	-.14	1.17	.08	-.31	.02	-1.700	197	.091
3. Combined health- and environment-friendly products	10	Locally produced food	-.17	.98	.07	-.30	-.03	-2.391	197	.018
	11	Meat[a]	-.01	.82	.06	-.12	.10	-.174	197	.862
	12	Other animal products like dairy, eggs, etc.[a]	-.02	.75	.05	-.13	.09	-.377	197	.706
	13	Organically produced food	-.18	.77	.05	-.29	-.07	-3.342	197	.001
	14	Vegetarian food	-.13	.81	.06	-.25	-.02	-2.269	197	.024
	15	Vegan food	-.11	.66	.05	-.20	-.02	-2.372	197	.019

[a] Recoded item, see 3.3 *Measurements*.
[b] ST = short-term, LT = long-term.

Table B.20 Paired Samples Correlations

Paired Samples Correlations					
	Pair		N	Correlation	Sig.
1. Health-friendly products	1	Fresh food (fruits, vegetables, etc.)	198	.651	.000
	2	Low sugar food	198	.717	.000
	3	Low salt food	198	.721	.000
	4	Low calorie food	198	.730	.000
2. Environment-friendly products	5	Sustainable products	198	.598	.000
	6	Products from ecologically responsible companies	198	.590	.000
	7	Products with environment-friendly ingredients	198	.699	.000
	8	Products with environment-friendly packaging	198	.624	.000
	9	Pre-packaged products (e.g. wrapped in plastic)[a]	198	.334	.000
3. Combined health- and environment-friendly products	10	Locally produced food	198	.555	.000
	11	Meat[a]	198	.684	.000
	12	Other animal products like dairy, eggs, etc.[a]	198	.662	.000
	13	Organically produced food	198	.722	.000
	14	Vegetarian food	198	.757	.000
	15	Vegan food	198	.813	.000

H_0: $\rho = 0$ H_a: $\rho \neq 0$.
[a] Recoded item, see 3.3 *Measurements*.

Press release

KU LEUVEN

Consumers purchase less sustainable products since the start of the COVID-19 pandemic

Market research performed at KU Leuven's faculty of Business and Economics, studied the effects of the COVID-19 pandemic on healthy and environmentally conscious grocery shopping. Bad news for 'green businesses' because consumers are buying less environmentally friendly products compared to before the pandemic.

Sustainable grocery shopping

Shopping more sustainably and choosing more environmentally friendly products have known an increased importance before the start of the pandemic. However, the outbreak of the virus drastically changed everyone's lifestyle and consumption habits. Therefore, the aim of the research was to discover whether consumers have become more conscious when shopping for groceries since the start of the pandemic. Even though consumers indicated to increasingly buy local, they choose less products from ecologically responsible companies, less products with environmentally friendly ingredients and less products that are sustainable.

Post-pandemic

In addition to this, information was gathered about the expectations that consumers have regarding their purchases once the pandemic comes to an end. In general, people are more optimistic about their healthy and environmentally friendly future choices. However, the future of purchasing sustainable products is still uncertain and the actual results in a post-pandemic world are yet to be discovered through time.

Sustainable Development Goals

What does this mean for governments aiming to meet the United Nations' 2030 Sustainable Development Goals? The study shows that more action should be undertaken by governments to encourage consumers to choose more healthy and environmentally friendly products.

The study

A business student at KU Leuven questioned nearly 200 respondents about their purchasing choices for groceries. The respondents were asked to fill in an online questionnaire about various healthy and environmentally friendly products.

END / --

About KU Leuven

The Catholic University of Leuven is a prestigious Belgian university founded in 1425. With its more than 60,000 students and 15 faculties, the university offers a wide range of academic study programs. Their focus on scientific research makes it Europe's most innovative university. For more information see https://www.kuleuven.be/over-kuleuven.

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