

Sustainable and healthy purchasing behaviors towards palm oil-based food in Italy

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Abstract

Purpose – Palm oil is widely used in the food industry; however, there are two main controversies connected to its use, namely, its nutritional value and the environmental consequences deriving from its crop. In Italy, the use of palm oil has recently been criticized, inasmuch that some important bakery companies decided to substitute it, creating a real food marketing case. Through a focus on biscuits, this study is aimed at profiling consumers with regard to palm oil issue to better comprehend if the presence of this ingredient truly influences their food purchases and if they care about the nutritional and environmental aspects, highlighting the impact of the Covid-19 pandemic on consumers' consumption.

Design/methodology/approach – A questionnaire was administered to 243 subjects in Italy, in order to apply a cluster analysis.

Findings – The findings show the presence of three main kinds of consumers: (1) compromise finders (sensitive to cost savings but trying to privilege palm-oil free food), (2) brand-loyal consumers (palm oil does not influence their preferences) and (3) healthsensitives (the presence of palm oil profoundly affects their choices), who represent the majority of our sample. The results and implications are discussed.

Originality/value – Research on palm oil is essentially focused on chemistry, natural sciences or on its industrial uses: this study analyzes the consumer point of view by applying a different methodology compared to existing studies.

Keywords Palm oil, Food, Food marketing, Sustainable consumption, Consumers

Paper type Research paper

Introduction

Palm oil is widely used in different kinds of products and by different kinds of industries, such as food (sweets, biscuits, peanut butter and baked products), biofuel and cosmetics (Martinez *et al.*, 2017; Reijnders and Huijbregts, 2008). From a chemical point of view, palm oil is abundant in palmitic acid, β -carotene and vitamin E; moreover, it is made up of the same percentages of saturated and unsaturated fat, the only vegetable oil with this characteristic (Mba *et al.*, 2015), and it provides phytonutrients, such as tocotrienols, carotenoids and

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phytosterols (May and Nesaretnam, 2014). Production is essentially concentrated in South-East Asia, but it has also been found recently in Africa (especially since 2000, as indicated by Ordway *et al.*, 2017) and Latin America (Saswattecha *et al.*, 2017; Hansen *et al.*, 2015). Despite the increasing demand (Gan and Dong Li, 2014) – in 2015, 55.70 million tons of palm oil were produced, but it is expected to increase to 78 million tons by 2020, as shown by Khatun *et al.* (2017) – production cannot be unlimited due to the necessity of climate suitability. According to the calculations presented by Pirker *et al.* (2016), 1.37 billion hectares of Earth's surface are cultivable with palm oil, and only 17% of this area is still exploitable.

Despite the evident relevance of this vegetable oil in markets, its production and use are often causes of controversy for two main reasons: its nutritional value and the environmental consequences deriving from its crop. With regard to the food aspect, some scholars highlight that, in parallel with some of its positive aspects for the industry, specifically its low cost (Carter *et al.*, 2007), its high oxidative stability, the availability of large quantities of product, and its neutral taste and smell, there are some characteristics that could be unhealthy, such as the copious presence of saturated fatty acids (Matthäus, 2007) and the palmitic acid content, despite the conflicting results about its consequences on cancer and cardiovascular diseases (Mancini *et al.*, 2015). As specified above, the second issue regards the impact of the palm oil crop on the environment, which inspired the creation of some specific certifications (such as Roundtable for Sustainable Palm Oil, Malaysian Sustainable Palm Oil, Indonesian Sustainable Palm Oil) to promote a more sustainable approach (Jamaludin *et al.*, 2018; Ruyschaert and Salles, 2014). Specifically, the negative consequences can be summarized as deforestation, threats to biodiversity and pollution (Wilcove *et al.*, 2013; Warr and Yusuf, 2011; Wilcove and Koh, 2010; Fitzherbert *et al.*, 2008). Koh and Wilcove (2007) highlight that according to non-governmental organizations, tropical forests in South-east Asia risk being jeopardized by oil palm producers, threatening biodiversity (Koh *et al.*, 2013), with a consequent reduction of faunal variety. According to data presented by Austin *et al.* (2017) the expansion of oil palm-planted areas caused the deforestation of 117,000 hectares per year in Indonesia (since 1995 to 2015). Silalertruksa *et al.* (2017) underline that cultivating oil palm without considering land and climate suitability (as occurs in some territories of North Thailand, where an intensive treatment and an irrigation supply are necessary to plant this tree) to satisfy the increased demand induces higher Greenhouse gas emissions and a larger water scarcity footprint per ton of fresh fruit bunches. Solidaridad (2022), in its Palm Oil Barometer 2022, moreover, points out the necessity to consider also the central role of smallholder farmers (in Asia, Latin America and Africa) in the sustainability agenda.

Another thorny issue is represented by working conditions in the plantations of Malaysia and Indonesia. As described by Pye (2018), this type of work is characterized by precariousness, temporariness and low wages (also below the legal minimum); moreover, child labor is a common practice.

All of these controversies have caused a marketing case in recent years in Italy, inasmuch that some food companies (in particular bakeries, both market leaders and some of the followers) decided to substitute palm oil with a different oil (such as sunflower oil). The debate on the consequences of palm oil and the worries of consumers influenced some of the largest bakery companies to commercialize palm oil-free products (especially when Barilla, the leader, gave up this ingredient, ensued by their followers). Since palm oil is the most produced and used vegetable oil in the world (Hansen *et al.*, 2015), it is evident that skepticism by consumers and the consequent attitude by companies could impact demand and marketing choices. Starting from this premise, this research is aimed at profiling consumers on the basis of their attitude towards palm oil. Do consumers pay attention to the nutritional and/or sustainable aspects of palm oil-based food? Has the pandemic changed consumers' sensitivity? From this point of view, that paper can contribute to marketing theory by showing the approach of consumers, whose attitude is essential for addressing companies'

choices. As a matter of fact, a potential low acceptance of palm oil by consumers could upset its large demand, due fundamentally to its moderate costs and to its versatility. This manuscript can fill a gap in the scientific literature. Research on palm oil is essentially focused on chemistry, natural sciences or its industrial use; this study analyzes and profiles the consumer point of view, from a marketing perspective, which is essential to provide companies with a tool for better comprehending consumer opinions and the way to make choices, particularly relevant because of the recent development of literature on palm oil consumption. Just recently, this has also been highlighted by [Verneau *et al.* \(2019\)](#) who carried out one of the studies focused on consumption, specifically on the impact of environmental, social and health concerns as drivers of not consuming palm oil-based products, finding that health concerns are the main reasons to avoid products containing palm oil. With this regard, our study differs from the one by [Verneau *et al.* \(2019\)](#) because the latter one is focused on the drivers of palm oil reduction for consumers while ours is a profiling study; in addition methodologically, our research implements a cluster analysis, while [Verneau *et al.* \(2019\)](#) apply a structural equation modeling.

After the revision of literature on palm oil, from the point of view of consumers and firms, the focus of the paper moves to our analysis through a questionnaire, in order to profile Italian consumers about palm oil issues. Marketing implications are finally discussed.

Literature review on food, consumption and sustainability

As analyzed, consumption of palm oil-based products and the consequent attitude by companies may be influenced by nutritional and/or sustainable evaluations (a study carried out by [Gassler and Spiller, 2018](#), showed that 88% of their sample had heard about palm oil, but approximately 60% related it with negative associations). [Röhr *et al.* \(2005\)](#) distinguished two typologies of consumers: price-sensitive (they consider price as the most influent variable, paying less attention to origin, production and place of purchase) and safety-sensitive, for whom food quality is the first criterion of choice (according to [Bornkssel *et al.*, 2014](#), health motivations are the most relevant predictors of ingredient awareness). [Mascarello *et al.* \(2015\)](#) studied Italian consumers from this perspective, highlighting similarly the coexistence of two kinds of consumers – those who purchase on the basis of organoleptic criteria and those whose choices are driven by the place and methods of production.

Typology of a segment can also influence sustainable marketing strategies in a company; as a matter of fact, [Belz and Schmidt-Riediger \(2009\)](#) show how companies that are positioned in the premium and quality segment pay more attention to sustainable marketing than those in the price segment. With regard to food and environmental sustainability, [Vanhonacker *et al.* \(2013\)](#), in a study focused on more sustainable food choices (in particular meat substitutes), distinguished 5 clusters of consumers: active (low ecological footprint, high interest in ecology and nutrition and willing to pay a higher price for “green” food), unwilling (aware of their high ecological footprint but they do not pay attention to the environment in their food purchases), conscious (their intentions do not coincide with their real behavior), ignorant (they ignore their ecological footprint and environmental issues in their purchases) and uncertain (low awareness about the concept of ecological footprint but their attitude is greener than those of the ignorant and unwilling groups). Interestingly, age can positively impact on the propensity to purchase in a more sustainable way ([Casalegno *et al.*, 2022](#)). Specifically, they found that older people (generation X) tend to buy more sustainable products (both green and socially-responsible ones) and, moreover, showed how sustainable purchases are not moved by collectivism but from the will to safeguard the environment. Recently, research on palm oil focused on consumption ([Hinkes and Schulz, 2019](#); [Capecci *et al.*, 2019](#); [Aguiar *et al.*, 2018](#); [Shankar and Hawkes, 2013](#); [Disdier *et al.*, 2013](#)). Notably, Hinkes and Schulz studied German consumers, finding concerns about the presence of this vegetable fat in food products, even though it is not one of the most influential on

consumption decisions; on the contrary, [Aguiar et al. \(2018\)](#), who highlight that palm oil is perceived a natural ingredient. Moreover, [Disdier et al. \(2013\)](#) focused on the maximum price that consumers are willing to pay to buy food that does or does not contain palm oil among its ingredients. The experiment conducted in this paper aimed to highlight how the propensity to purchase products with and without palm oil and the respective maximum price payable are subject to oscillations and changes due to information on risks to health and the environment provided to the participants during the experiment. The experiment was conducted on a heterogeneous and representative sample of 101 French consumers, with the sample divided into two groups. For both groups, the greatest impact on the willingness to pay for the palm oil-based product was due to the disclosure of information on environmental damage in Indonesia and Malaysia, followed by information on health risks and those related to the use of the soil. Thus, the sample was more sensitive to issues related to environmental protection, and becoming aware of deforestation in Malaysia and Indonesia has had the greatest negative impact on the maximum price they were willing to pay for a less eco-sustainable product.

Palm oil, sustainability and firm performance

Sustainability issues linked to palm oil are also related to aspects of competitive advantage. This is particularly relevant because of the link between Corporate Social Responsibility and financial performances, as also recently highlighted by [Cho et al. \(2019\)](#) who found a partial positive correlation between Corporate Social Responsibility profitability and firm value in Korean firms. Similarly, a positive relationship has been found by [Maqbool and Zameer \(2018\)](#), [Alsheehhi et al. \(2018\)](#), [Cavaco and Crifo \(2014\)](#). Green practices and their benefits for finance are further underlined by [Scholtens \(2006\)](#) and [Grewatsch and Kleindienst \(2017\)](#).

A specific focus on food industry is the one carried on by [Nirino et al. \(2020\)](#), in particular they analyzed data from 190 food and beverage companies finding two results: social outcomes practices positively influence financial measures such as ROA (return on assets), ROS (return on sales) and ROE (return on equity) while environmental ones have insignificant or non-positive impact. Recently [Buallay \(2022\)](#) studied the level of sustainability reporting and Food Industry performance, by analyzing 1,426 observations from 31 countries during the period 2008–2017. This scholar found that there is a significant relationship between the environmental, social and corporate governance (ESG) and ROE while the relationship is non-significant between environmental, social and corporate governance and ROA and market performance. Interestingly, [Sheng Tey et al. \(2021\)](#) reviewed literature on financial costs related to the Roundtable on Sustainable Palm Oil (RSPO) certification, showing in particular that the existing literature highlights a contrasting outcome, as a matter of fact the main studies on the topic reveal net financial benefits (two studies) and negative returns (one study). With regards to RSPO, another interesting research has been carried out by [Sheng Tey et al. \(2020\)](#). They, in particular, studied the profitability deriving from the adoption of the RSPO certification on plantation companies, in terms of ROIC (Return on Invested Capital): the researchers, by considering 39 plantation companies listed in the Kuala Lumpur Stock Exchange, have verified that profitability is affected by different factors such as timing of entry, resource allocation, business efficiency and, finally, price of crude palm oil. Specifically, they found there is a positive relationship between the timing of adopting a sustainability standard and an improved financial performance.

COVID effects on food industry and food consumption

The COVID-19 pandemic has affected consumers' consumption ([Amicarelli et al., 2021](#)) due to different factors. Interestingly, [Caso et al. \(2022\)](#) analyzed the Italian context after the first

Covid-19 lockdown in terms of consumption, finding that the attention on healthiness of food increased during the lockdown and decreased in the post-lockdown period, while junk food consumption decreased both during and after the lockdown. It has been studied that negative emotions could impact on food consumption (Caso *et al.*, 2020; Reichenberger *et al.*, 2018) and, as a matter of fact, Di Renzo *et al.* (2021) showed – in a study which involved 602 Italian consumers-that, during the lockdown, food consumption was also considered a way of reducing anxiety. In terms of food choices, some studies highlight an increased number of meals (Yang *et al.*, 2022; Scarmozzino and Visioli, 2020) even though, in the first period of the pandemic, food consumption could have been reduced due to lower incomes, especially for some food categories (fruit, animal-derived food), to the benefit of cheaper products and shelf packaged food (Yang *et al.*, 2022). Recently, Timpanaro and Cascone (2022) highlighted that consciousness about sustainability has increased after restrictions. In particular, they underline the increased environmental and health concerns by consumers, which cause a significant orientation to palm-oil free products, even though this seemed to be a decision matured long before the Covid-19 pandemic.

Irawan *et al.* (2022), moreover, focused on palm oil industry consequences deriving from Covid-19, in particular they found that demand disruption is higher than supply disruption and the decrease of household income generated the impossibility for farmers to access to basic goods. Not only, the entire supply chain has suffered the pandemic effects (Ivanov and Das, 2020), despite the growing necessity to make it more sustainable (Kasim *et al.*, 2021), as highlighted by Hafiz *et al.* (2022) whose study shed light to the most relevant elements of a palm oil-sustainable supply chain, which are firstly environmental costs, rapidity and adaptability, in particular in a post-pandemic period. Abdul-Hamid *et al.* (2021) suggest that circular economy is the best solution through the implementation of the Industry 4.0, in order to improve the operations and production of the palm oil-industry.

Method

Preliminary study

Before implementing the cluster analysis, the researchers organized a qualitative focus group in order to explore the attitudes towards palm oil-based food, through a sensory experimental study. Specifically, a group of ten participants participated (7 women, 3 men, age between 25 and 80 years old) who, initially, answered some questions about the knowledge of palm oil. Just three participants (2 women and 1 man) affirmed to pay attention to a healthy diet and 7 out of 10 (6 women and 1 man) stated to be informed about issues connected to palm oil.

Afterward, the researchers carried on the sensory phase. They selected Sandwich bread of two different Italian brands, the first one (brand X, leader in Italy for processed bakery products) containing palm oil, the second one (brand Y) was palm-oil free. Firstly, the researchers proposed the product with no package, in order not to influence the participants, who know nothing about the products (in particular about the presence/absence of palm oil): they were asked to taste the Sandwich bread and they all agree to prefer to the first version for its softness (the one with palm-oil, albeit they did not know this particular). In a second moment, the participants had to taste again the product, but this time the researchers described the list of ingredients for both the versions, without mention the name of the brands (first version X: flour, water, palm oil, yeast and salt; second version Y: flour, water, lard, yeast and salt). The new information influenced the participants, insomuch that 7 out of 10 declared to prefer version Y because of the absence of palm oil. Finally, in the third stage, the products were presented in their original package, so the brands were unveiled. This particular changed a lot their preferences, as a matter of fact just three participants declared to prefer brand Y (palm-oil free) while the majority preferred brand X (the most popular in Italy for bakery products). Finally, in terms of price, the participants declared to be aware that the

absence of palm oil could have an impact on prices, in particular if the product is qualitatively better than the palm oil-based one.

From this preliminary study, the researchers gathered relevant information (in particular on the existence of different variables to consider, e.g. ingredients, brand, price, knowledge about the issue) to organize the questionnaire for the main study.

Main study

The analysis was developed through a questionnaire administered both in online and paper formats. The administered questionnaires were identical for both formats and were submitted to a randomly selected sample of 243 individuals, of which 144 were women and 99 were men. The questionnaire consisted of twenty-three questions, divided into different sections. The main areas analyzed regard the consumption and purchase of some food containing palm oil (specifically biscuits) and an analysis of the issue with consequent influences on their purchases. In particular, the focus was on biscuits because corresponding production companies have been among those more active in Italy in turning their product into a palm oil-free one, basing their communication strategy on this characteristic (Garzia, 2017). The researchers focused on the Italian case because of the peculiar impact that this ingredient has had on consumption (Hucal, 2015) manifesting concerns about it (Capecchi *et al.*, 2019); on the other hand, scientific literature on palm oil-based food (Verneau, 2019) and on sustainable consumption show the focus for the Italian case (Casalegno *et al.*, 2022; Shao *et al.*, 2016; Annunziata *et al.*, 2016; Pomarici and Vecchio, 2014).

The questionnaire was rigidly structured and standardized by asking both questions with dichotomous answers and closed questions, but with several alternatives, some of which used Likert evaluation scales. Microsoft Excel software was used for the analysis and the elaboration of the data. The sample was chosen randomly (similarly to another food sustainability-based study by De Canio and Martinelli, 2021) via web, specifically via social networks (as they are becoming popular and popular for social sciences research, see Coderoni and Perito, 2020). There was not a list a list of participants from which to choose.

To classify consumers on the basis of their attitudes towards palm oil, a cluster analysis was carried out.

Reduction of variable sets through the Pearson Index. The study starts with the analysis of this question: “When you buy food products, to what extent do the following variables affect you?” The response options included price, experience, idea of health, food safety, brand, word of mouth and origin and method of production. These responses were evaluated on a five-point scale that starts from a lower pole corresponding to the answer “not at all” and a superior pole corresponding to “very much”. In the first instance, from an analysis of the averages, the item with the highest rating was the one corresponding to “food safety” (4.32), followed by “experience” (4.30), “brand” (3.49) and “price” (3.47). The objective of this first phase was to reduce the set of seven items to a set of three. Therefore, an analysis of the deviations was conducted. In 75.42% of cases, individuals associated a score similar to the “price” and “brand” items; that is, a deviation of the answers equal to zero or one in absolute value. Upon verifying this similarity, the set of variables was reduced considering the average of the two items (price and brand) as a single variable. Through the use of the Pearson correlation analysis, a possible relationship between the different items was evaluated (see Table 1).

By evaluating the correlation among the different items, it was found that among “idea of health”, “food safety” and “method of origin and production”, the Pearson correlation coefficients were near or above 0.7, indicating a moderate correlation between “idea of health” and “method of origin and production”, a quite strong correlation between “idea of health” and “food safety” and a high correlation between “food safety” and “method of origin and production”. The relevant data are included in the annex in Table 2.

The data set was then further reduced, summarizing the three items by the average of the values of their responses. Thus, from the three previous variables only one will be studied, related to food safety, the idea of health and the production method of production.

Finally, by analyzing the graphical trend of the answers to question 5, the curve associated with the item “word of mouth” always obtained an evaluation that was lower than the average of the other items. When the specific average was evaluated, it was determined that “word of mouth” was not an element that provides a great deal of influence in the evaluation and in the purchasing process of food products. For this reason, the item in question was considered marginal in the continuation of the analysis. In the course of the study, the analyzed item set was composed of the following.

- (1) Price and brand,
- (2) Experience and
- (3) Healthiness.

Cluster analysis. In statistics with the term cluster analysis (Everitt *et al.*, 2011), or simply clustering, a set of techniques, i.e. multivariate data analysis, is aimed at grouping data into

Table 1.
The sample

Age	F	M	Tot.
<20	18	15	33
20–30	50	44	94
31–45	36	16	52
46–60	31	10	41
61 or more	9	14	23
Tot.	144	99	243

Source(s): Authors work

Table 2.
Pearson index

Index	Variables analyzed
0.701366837	Food safety
0.67638013	Idea of health
0.563337172	Idea of health
0.030881711	Idea of health
0.025778799	Idea of health
0.06992447	Idea of health
0.091657949	Idea of health
-0.119387199	Food safety
0.076625117	Food safety
0.10570353	Food safety
0.06610089	Food safety
-0.079625214	Method of origin and production
0.019846564	Method of origin and production
0.038899932	Method of origin and production
-0.027660724	Method of origin and production
0.134747042	Price
0.090890253	Price
0.048623589	Price
0.041437802	Brand
0.29532833	Brand
0.13476398	Word of mouth

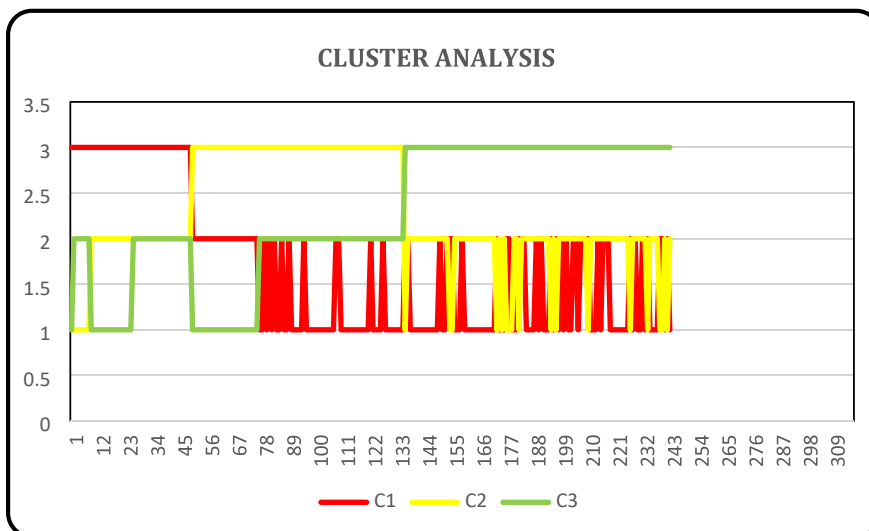
Source(s): Authors work

homogeneous elements. Clustering techniques are based on measures related to the similarities between the elements, which are very often evaluated in terms of distance between variables in a multidimensional space. The clustering algorithms group the elements on the basis of their mutual distance and therefore whether or not they belong to a set depends on how much the element taken into consideration is distant from the whole itself. Figure 1 shows the development of the cluster analysis of the studied sample. In the case in point, exclusive cluster analysis, or hard clustering, was used: each response was assigned to one and only one group (de Carvalho *et al.*, 2012), creating a hierarchy of preferences for each respondent, from 1 to 3. In Figure 1, the distance between the lines has no value since only those belonging to the slot corresponding to “3” became part of the cluster. The resulting clusters cannot have elements in common. From this analysis, three clusters were identified.

Findings

The following clusters were identified: cluster 1, called “Money for value”, refers to individuals who tend to favor price or brand in their purchases; cluster 2, called “Experience”, is made up of individuals for whom experience is the factor predominant; and cluster 3, called “Healthy”, is made up of individuals for whom the average of the evaluations attributed to the idea of health, food safety and origin and the production method has a preponderant value in the purchasing process.

The cluster “Money for value” represents 20% of the total sample and has a slightly higher than average number of men; moreover, it is possible to find a presence of “over 45” individuals, superior to the other clusters. The cluster “Experience” constitutes 35% of the sample. In this group, individuals are predominantly under 45; in particular, almost 50% of under 30 participants are in this cluster. Finally, the cluster “Healthy” represents 45% of the sample and is the most sizeable. The percentage of individuals over 60 in this cluster is practically negligible (0.7% of the total), and we find that approximately 57% of all respondents are aged between 30 and 60 years. The female presence slightly exceeds the average compared to the sample analyzed (see Table 3).



Source(s): Authors work

Figure 1.
Cluster analysis

One section of the questionnaire was dedicated to the analysis of consumers' attitudes towards the purchase and consumption of biscuits. We decided to focus on this kind of food because it raises many controversies related to the use of palm oil (like bakery products in general), and the corresponding producing companies were among the most reactive in Italy. As a matter of fact, many companies decided to highlight the text "palm oil-free" on their packages (often indicating the substitution of olive or sunflower oil or, in most cases, pointing out that palm oil was never used, even before the issue came to the forefront). From the questionnaire, it was possible to deduce that one out of five respondents consumes biscuits; with regard to purchases, the percentage of individuals involved who had never bought biscuits was very low (0.04%). By combining the answers to questions 8 and 9, which asked how often biscuits are consumed and at what time of the day, some differences between the members of the different clusters were found. The individuals belonging to the "Money for value" cluster usually consume biscuits every day at breakfast; similarly, those belonging to the "Experience" cluster often consume them in the first meal of the day, while those belonging to the "Healthy" cluster show a greater propensity to consume them in different moments. The answers regarding purchase showed that 80% of respondents buy biscuits at the supermarket. Another question was about the attention of individuals towards brands and if the brand was a greater influence than the price. The selection of the brands taken into consideration was weighted according to their different characteristics:

- (1) Mulino Bianco (Barilla), brand leader of bakery processed food in Italy, which has recently chosen to eliminate palm oil from its biscuits;
- (2) Divella, a "follower" brand, whose biscuits correspond to a lower price range compared to Mulino Bianco. This company also decided to substitute palm oil after the media campaign against it;
- (3) Di Leo, which anticipated its competitors by producing palm oil-free biscuits for 25 years (long before the palm oil case broke out, aspiring to be perceived as a health-focused and green company);
- (4) Balocco, which represents another important player in the biscuits market. This company also decided to eliminate palm oil in 2016.

Obviously, the participants could state that they purchased considering the price and not the brand as the most important variable. As easily hypothesized, the "Healthy" cluster comprised the group of consumers less attentive to promotions, in contrast to the "Money for value" cluster, which paid more attention to periodic discounts. Even individuals belonging to the "Experience" cluster were strongly interested in promotions and usually relied on brand. Mulino Bianco is the favorite brand among the clusters; the second choice is Divella for the "Money for value" and "Experience" clusters and Di Leo for the "Healthy" cluster.

	Money for value			Experience			Healthy		
	Women	Men	Tot.	Women	Men	Tot.	Women	Men	Tot.
Younger than 20	2	4	6	10	7	17	6	4	10
From 20 to 30	9	10	19	23	15	38	18	19	37
From 30 to 45	4	2	6	10	6	16	22	8	30
From 45 to 60	8	1	9	7	2	9	16	7	23
60 or more	3	6	9	1	5	6	5	3	8
Tot.	26	23	49	51	35	86	67	41	108

Table 3.
Demographics of
the clusters

Source(s): Authors work

Focus on palm oil

First, the researchers analyzed the degree of knowledge of the palm oil case and its consequences for the food industry: predictably, all of the sample, except for two subjects (both men, one 45–60 years old aged, the other younger than 20 years old), knew about it; these two subjects, for this reason, could not continue to complete the questionnaire. The sample, therefore, decreased from 243 to 241 subjects, with 20.16% belonging to the cluster “Money for value”, 35.39% to “Experience” and 44.4% to “Healthy”. The question “Where did you hear about it?” was structured in such a way as to allow the participants to give more answers since the sources of information on a matter like this could not be unique. The means by which the case has been known the most were TV and the radio, immediately followed by the web. Newspapers and word of mouth have not played a fundamental role. Among the answer options, the field “reading the product packaging” was also included; 63 (26.14%) of the 241 respondents crossed this field, 23 of which were aged between 20 and 30 years.

With regard to the question about the way they look for information about palm oil, most of the sample stated that they searched for information on the web ($n = 142$, 58.92%) or said they had not directly searched for information, but had heard about it ($n = 81$, 33.6%). These data are probably influenced by the fact that a large percentage of individuals are inclined to use the web frequently (53% of them are under 30).

Questions 18, 19 and 20 were carefully connected and analyzed in light of the clustered subdivisions (as shown in Table 4). These three questions are focused on the effects on consumers. In particular:

- (1) Question 18 analyzed whether, considering the palm oil issue, the participants pay more attention to analyzing the labels of the food products they purchase;
- (2) Question 19 asked the subjects if they continued to buy food produced by companies that use palm oil, despite the controversies and
- (3) Question number 20 asked to evaluate, on a five-degree scale, how much the palm oil case has affected food purchases.

Within the cluster “Experience”, 20% of individuals said they were not influenced at all by the palm oil issue, and they continued to buy products from companies that used it in their production process and did not feel the need to pay more attention to the label when purchasing. The most substantial part (27%) of this cluster believed that the incidence of the

Money for value	1	2	3	4	5	Tot
<i>Degree of attention to choose sustainable products</i>						
Low cost biscuits	2	3	5	3	1	14
“Green” biscuits			10	15	10	35
<i>Tot.</i>	2	3	15	18	11	49
<i>Experience</i>						
Low cost biscuits	3	6	2	2	1	14
“Green” biscuits	1	7	23	26	15	72
<i>Tot.</i>	4	13	25	28	16	86
<i>Healthy</i>						
Low cost biscuits	1		5			6
“Green” biscuits	1		19	42	40	102
<i>Tot.</i>	2		24	42	40	108

Source(s): Authors work

Table 4. Degree of attention to choose sustainable products

palm oil issue was average (value three of the proposed scale). Regarding individuals for whom this issue had a profound impact, 10.60% of the respondents said they no longer purchase products from companies that used the palm oil component, while 40% continued to do so, probably because most of the market players have now eliminated this ingredient. Those belonging to the cluster “Money for value” were the least affected by the issue with only 8% of them declaring to have been influenced “very much” (compared to 11% of the cluster “Experience” and 23% of cluster “Healthy”). However, it should be noted that 4% of members of this group of consumers have decided to eliminate brands of companies which use palm oil from their purchases due to the problems related to it. The attention to the label was remarkable in this group of consumers, with 40% of individuals claiming to pay more attention to the label as a result of the issue. Finally, by analyzing the cluster “Healthy”, it was immediately possible to notice that 81% of the answers had scores ranging from 3 to 5, corresponding to the evaluation “very high” in the scale. One out of three individuals belonging to the group of consumers declared that they no longer buy food products from companies that produce using palm oil, and 61% of them evaluated the impact of the issue on purchases as very influential.

Continuing the analysis, the results obtained from the last two questions of the questionnaire, related to sustainability linked to food products, were crossed. Question 23, on the other side, asked participants to express their degree of attention to choosing sustainable products (through a 5-point Likert scale question). Table 4 shows on the lines the choice made between the two different types of biscuits in columns, and the results emerged from the 23rd question.

The analysis of the results shows that most of the participants preferred the “green” option, meaning biscuits with environmental certification. Only 14% of the sample preferred the lower-cost alternative; of the remaining 86% of respondents, most belonged to the clusters “Healthy” (48%) and “Money for value” (30%). From question 21 (“How much do you think you are informed about the healthiness of food?”), it is possible to notice that the subjects belonging to the cluster “Experience”, composed of individuals who attribute considerable importance to the factor experience in their purchasing process, had the highest percentage of individuals who considered themselves poorly informed about this issue (31%). In the cluster “Healthy”, “sufficiently” and “very much” (69%) were the prevailing responses, as opposed to the cluster “Money for value”, for which 41% considered themselves as “little” or “very little” informed. The analysis ended by presenting the answers to question 6 (“Do you usually read the ingredients on the label?”). By analyzing the responses of the different clusters, it is possible to notice their different approach. In the cluster “Money for value”, most declared that they rarely read the labels of the products they buy; in contrast, the cluster “Experience” had the largest percentage of individuals who do not read labels at all (20% compared to the 8% of the cluster “Healthy” and 16% of the cluster “Money for value”); finally, as can be easily predicted, the cluster “Healthy” was largely composed of individuals who usually read the label during their purchasing (67%).

Discussion

In summary, three kinds of consumers were detected:

- (1) *Compromise finders* (cluster “Money for value”): this kind of consumer tends to purchase on the basis of price, and for this reason, they are very sensitive to promotions and brands; the percentage of men is higher than in the other clusters, and in terms of age, these consumers are essentially over 45. They consider the palm oil issue as quite relevant inasmuch that they pay attention to labels and environmental certifications; however, they consider cost saving as another criterion of choice.

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- (2) *Brand-loyal consumers* (cluster “Experience”): Their experience in purchasing decisions is fundamental. This is a segment of consumers loyal to their favorite brand. In terms of age, they are younger than the other clusters (less than 30 years old) and are sensitive to promotions. With regard to palm oil, they are less influenced, so the presence of this ingredient does not affect their choices: if their favorite brand produces palm oil-based food, they would continue to buy it. In terms of the information, they declare not having sufficient knowledge about the issue and do not read labels. Attention to sustainability is medium-high.
 - (3) *Health sensitives* (cluster “Healthy”): Health, method of production, origin and food safety are the prevalent criteria of choice. Numerically, this cluster represents almost a half of our sample, making it the predominant cluster. It is composed, mainly, of subjects aged 30 to 60, and the presence of women is higher on average. As a cluster, they are less sensitive to promotions, so cost saving is not a priority. They are, moreover, the kind of consumers more influenced by the palm oil issue; therefore, they prefer not to purchase food products commercialized by companies that use palm oil. Health sensitives are the most informed consumers and pay much attention to reading labels. In terms of price, they are willing to pay an additional charge to purchase a high-quality food, produced in an environmentally friendly way. Indeed, this is the cluster that pays more attention to sustainable issues, clearly available to pay a higher price for more sustainable product.

A relevant issue for food companies

The presence of palm oil has become a relevant issue for food companies. In recent years, especially in Italy, this ingredient has profoundly influenced the food marketing policies of some important companies, in particular those that produce bakery products. This study, carried out in-region, represents a new contribution in the literature because it profiles Italian consumers in regard to palm oil as a criticized ingredient for processed food products. With regard to our research questions, we found three kinds of consumers (compromise finders, brand-loyal consumers and health sensitives), as described above. By analyzing our findings, it seems food companies have chosen the right approach, as *health sensitives* represent the majority of consumers of our sample. Furthermore, it is necessary to highlight that also price-sensitive consumers try to find a compromise between savings and palm-oil absence; as a matter of fact, when excluding the younger cluster, the others tend to notice if a product contains palm oil or not. This is particularly consistent with the communication strategies adopted by those companies, which exploit the communicative power of packaging by printing the text “palm oil-free” on the front of their packaging, thus allowing less-attentive consumers to read this information. Since the attention to palm oil has become very evident, the communication strategies implemented by the companies seems to meet consumers’ preferences. Moreover, it is clear that by substituting palm oil food, companies have not necessarily made their products 100% healthy. From this perspective, it is evident that palm oil has been a “scapegoat” of processed food, since there are sometimes other ingredients present in the product that are not completely healthy (such as preservatives or excessive sugar). Is it a purely a question of marketing? The answer is unclear. No because there is a great deal of controversy surrounding palm oil (as described in the first part of this study); thus, its use may be easily criticized. Yes because there are also other categories of unhealthy/unsustainable ingredients that are ignored or less attacked. The Italian giant “Ferrero” represents an exception in this scenario since it has decided not to substitute palm oil but to strengthen communication regarding its certified and sustainable palm oil (which is one of the ingredients of Nutella hazelnut cream). It remains to be seen whether the palm oil issue will be a circumscribed issue over time or if it will be a perennial enemy to be avoided by food

companies. However, marketing literature, from this point of view, suggests some tools which might help foster more sustainable purchasing behaviors (Trudel, 2019; Silva *et al.*, 2017; Grunert *et al.*, 2014) and, recently, De Oliveira Júnior *et al.* (2023) have highlighted the role of storytelling to support engagement behaviors. This means that marketing initiatives can positively impact on consumers' choices and encourage more sustainable attitudes.

The pandemic, furthermore, has impacted on consumer behavior. As a matter of fact, consumers pay more attention to health and hygiene and for more natural and fresh products. In addition, there is more attention to sustainable practices and to e-commerce shopping (Kohli *et al.*, 2020). This is, of course, really impactful on palm oil marketing initiatives.

This research has some limitations. First, it is geographically limited in that it considers consumers of a country with a strong tradition in terms of good nutrition, in which extra virgin olive oil is a typical ingredient. This means that there is a particular culture of healthy food, which undoubtedly influenced the research. Another limitation is represented by the fact that while the issue has been analyzed as a whole, a focus is needed, especially considering that the approach of consumers could have been different if the analysis had been based on a particular kind of food, such as hazelnut cream (Nutella by Ferrero is, by far, the most famous cream, besides being the most present on the shelves: as described, Ferrero decided not to substitute palm oil). This could be an idea for a new study. There is absolutely room for further research: comparing different cultures could be very interesting, as could organizing a sensorial study on palm oil-based products compared to food made with finer oils. Additional research could contemplate the companies' point of view by analyzing this issue in terms of supply and business to business policies.

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