



# Consumer preferences for the Mediterranean Diet: Results of an empirical analysis

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## ARTICLE INFO

### Keywords:

Agriculture

Food

Systemic interaction

## ABSTRACT

The Mediterranean Diet is a very healthy diet for the human organism. The study focuses on consumer behavior toward products that are part of the Mediterranean Diet. The purpose of this research is to give an insight into food awareness, to improve consumer health, by highlighting the food pyramid and lifestyles related to the Mediterranean Diet, and to understand cultural customs and habits regarding food. The empirical analysis was carried out through a survey of a sample of consumers. The questionnaire, administered online, included general cultural questions on the Mediterranean Diet, food groups, individual lifestyles, and eating habits of the consumers interviewed. Adherence to the Mediterranean diet model, concentrated in the territories proper of the Mediterranean, leads to an agri-food model that favors the development of local agri-food products, with the consequent increase in demand for products proper to Mediterranean agriculture. This situation potentially makes it possible to expand the supply of agri-food businesses that produce products of the Mediterranean diet and thus determine a positive effect of increased income and employment in the area. The results show that this dietary regime is widely followed and can be an opportunity for Mediterranean agro-food enterprises to expand the offer and produce healthier products aimed at that segment of consumers that follow this diet to reduce the risk of cardiovascular diseases or to prevent and cure metabolic diseases (such as hypertension, type 2 diabetes) and to prevent obesity.

## 1. Introduction

In the last decade, new fashions and new consumption have led to the identification of healthy food as something exclusive, food innovation has pushed the world's population to follow the new food fashion. It is interesting to observe how in today's society, the introduction of these new foods transforms the eating style, even of consumers living in the Mediterranean, and leads to the intake of numerous fats and proteins of animal origin typical of European diets, creating a unique mix in which average daily calories reach unprecedented levels, exceeding 3000 calories. Thus, eating habits, characterized by an excessive calorie intake compared to what is necessary, have changed the type of diet, leading to chronic diseases such as diabetes (even in children), high blood pressure, and other diseases that have become widespread in our society (hypercholesterolemia and Crohn's disease, ulcerative colitis, etc.) [1]. In the light of this situation, it is necessary and fundamental to

undertake a lifelong diet that is therefore correct and healthy, so that diseases are reduced and a virtuous circle between agriculture-food and health is undertaken. A monotonous diet is not recommended, even though it can lead to serious consequences, it is, therefore, useful to establish a varied diet, using a combination of different foods, each providing specific energy and nutrients [2–4]. The Mediterranean Diet responds perfectly to these types of needs, identified as a health-protective lifestyle, which, despite being a set of traditions that encompass thousands of years of history, is passed down between generations [5–7]. Today, the Mediterranean diet model is a *modus vivendi* and a modern way of life that harks back to the past, to ancient cultural customs in which everything was healthy and beneficial. The new scientific certainties give it a real and secure value, in fact since 2010 it has been included in the list of Intangible Cultural Heritage of Humanity provided by UNESCO, which certifies and recognizes the benefits of food as a set of skills, knowledge, rites, symbols, and traditions concerning

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<https://doi.org/10.1016/j.jafr.2022.100371>

Received 27 June 2022; Received in revised form 14 August 2022; Accepted 20 August 2022

Available online 24 August 2022

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the cultivation, harvesting, fishing, breeding, conservation, cooking and above all the sharing and consumption of food' (Unesco, s.d.). The benefits of the Mediterranean diet have been studied by numerous researchers and scientists who have schematized the results into a pyramid scheme, resulting in a graphic and practical model that represents and encapsulates the Mediterranean Diet, which is the Food Pyramid [8]. Through this graphic key, it is possible to identify which foods to prefer during the day and the week and which ones only occasionally [9]. However, this graphical model's uniqueness lies in searching for fresh and seasonal foods or unprocessed foods. It also offers a general picture of the physical activity, conviviality, and sociability of the subjects who follow it, as it requires meals to be eaten in the company of family and/or friends, a factor that may intervene to ameliorate many of the cases of loneliness and closure to dialogue, given the constant use of smartphones and social networks [10–12]. Moreover, choices at the table have a direct impact on the environment and the Mediterranean Diet represents a sustainable diet model for current and future generations [13]. The Mediterranean Diet model is based on a diet that favors fresh, unprocessed, and Km 0 produce and adheres to 11 of the 17 United Nations Sustainable Development Goals [14,15].

## 2. Consumer behavior at the basis of food marketing strategies

In the post-modern society, it is important to emphasize the centrality of the consumer in the increasingly market-oriented concept of marketing, where the company produces a product that satisfies market needs. This marketing concept leads the company to take a global and long-term view of the business where it operates [16,17]. In particular, the enterprise should always improve production aspects to better meet market needs and increase sales and consequently revenue. Therefore, the marketing concept puts consumer behavior at the forefront, against which business strategies are planned. The study of consumer behavior is the starting point for the definition of marketing strategies and choices regarding a product, price, communication, and distribution policies. Lifestyles influence the behavior of every consumer. What each consumer eats is the result of history, culture, climate, and the type of work they do. In this case, we can very well say that food consumption is locally determined; that is, each place has a food style that differentiates it from other territorial contexts. Lifestyles are the result of the interaction of various forces such as economic resources, social relations, and the cultural dimension. Therefore, classifying consumers serves to develop market strategies that invest them in their entirety, allow them to define targets, position the product or brand, and communicate it appropriately. Companies are involved in the creation of a social, economic, value-for-money, and overall context and thus of people's reference system. Purchasing and consumption behaviors are not linked only to the type of food products or to the profile of the consumer himself, but rather to the constant interaction between the environment (place of consumption) and the reputation of individual food products (image, knowledge, reputation). These aspects play a fundamental role in determining consumer purchasing behavior. The promotion of healthy eating patterns, such as the Mediterranean diet, contributes to the well-being of the consumer and also the community.

## 3. Materials and methods

To achieve the research objectives, a survey was carried out through the administration of a questionnaire using the web interview technique. The survey sought to investigate food consumption and lifestyles related to the foods of the Mediterranean Diet. The survey was conducted from December 04, 2021 to February 14, 2022, among the Sicilian population, using an online platform, accessible from any device with an Internet connection. In Sicily, life expectancy at birth ranges from 78.9 years for a low level of education to 81.5 years for a high level among men and from 83.3 years for a low level of education to 85.3 years for a high level among women. The survey was disseminated

through private social networks (Facebook, Instagram, and WhatsApp) and personal mailing lists. This method of administering the questionnaire is very timely and provides a greater amount of data on the population; in fact, it was quite effective for the objectives of the research, as it facilitated the wide dissemination of the survey questionnaire at a time when, due to the pandemic, there were many territorial constraints. The questionnaire was validated. In particular, it was decided a priori, during the design phase of the questionnaire, how many answer options the participants in the survey could give to the multiple choice questions. Adherence to MD was assessed by analyzing the consumer's aptitude for knowing the foods that are part of it. Some data reported by the Italian annual report on Internet use show that the Italian Internet-using penetration stood at 82% (January 2020); in particular, 94% of Internet users, aged between 16 and 64, use smartphones to connect, and 99% of them have visited or used a social network or messaging services [18]. The questionnaire administered was specially constructed using the Google Form platform. In order to have comparability of the information and to be considered a valid investigative tool, it attempted to formulate the questions clearly, calmly, and objectively, avoiding any possible response bias. The questionnaire consisted of 43 questions divided into six different sections: (1) title and subject of the survey; (2) knowledge of the Mediterranean Diet (6 questions: 4 on the level of knowledge of the cornerstones and 2 if you follow the Mediterranean diet); (3) lifestyle (6 questions on daily habits: how much water do you drink per day, if you exercise and with what intensity, if you smoke or drink alcohol); (4) food groups (17 questions: 16 of all the foods of the Mediterranean Diet, in which the consumer had to indicate the portions consumed daily or weekly according to the food); (5) food habits (8 statements in which a linear scale from 1 to 7 indicated agreement or disagreement, the statements indicated: whether one prefers fresh, seasonal or local products or whether the information is read on the label etc.); (6) socio-demographic characteristics (6 questions: age, gender, number of family members, educational qualification, average monthly household income and city of residence). The study was conducted in full compliance with national privacy regulations. All participants were fully informed of the requirements of the study and were duly warned, prior to before, that this would be an anonymous questionnaire. Participant's personal information, including names, is anonymized to maintain and protect confidentiality. The anonymous nature of the web survey in no way allows us to trace sensitive personal data. Participants completed the questionnaire by connecting to the link generated by the Google platform. Once completed, each questionnaire was sent to the Google platform and the final database was downloaded as a Microsoft Excel spreadsheet.

## 4. Results

The web survey ended on February 14, 2022 and the data were collected after careful analysis. The survey participants were 501 consumers who completed the questionnaire aged between 18 and 75. Women respondents represented 68% of the participants, and the remaining 32% were men. The variability of the age sample shows the multiple participation of all age groups, which makes it clear how many participants of each age contributed to the questionnaire. To better analyze the results, the sample of consumers surveyed was divided by age group according to other similar research [16]. The 18–24 age group accounted for 24%. The 25–31 age group is represented by 31% of the participants, the 32–38 age group has a percentage of 10%, and from 39 to 45 the percentage is 8. While the 46–52 age group is represented by 10%, from 53 to 59 the percentage is 7%. The 60–67 age group is low and accounts for 8%, and the last group from 68 to >74 is represented by 2%. For the average monthly income of the household, as it was not compulsory to mark the option, 473 participants responded and 28 abstained, of whom 230, or 48%, have no difficulty in reaching the end of the month, and another 100 (21%) manage to save every month, while 99 participants (21%) have some difficulty in reaching the end of

the month, and 10%, or 44 consumers, have great difficulty in reaching the end of the month (Table 1). Most of the participants are familiar with the Mediterranean Diet (MD) 56% of the respondents, know the foods that are part of the MD while 38% only partially and only 6% do not know them.

The many benefits are widely acknowledged (48% of the sample), while another large chunk, 43%, chose the option 'yes, in part' and the remaining 9% do not know what they are (Table 2).

The majority of the population consumes cereals, 2–3 portions per day. As for fruit, it denotes a high consumption during the day, with 220 participants stating that they consume two portions. For better absorption of nutrients and variability, we recommend combining fruit portions with 2–3 portions of vegetables during the day. As many as 189 consumers indicate that they consume vegetables only once a day (38%), and another 184 consume two portions (37%) (Fig. 1).

Other important elements that are part of MD are legumes, which should be consumed, in various ways, at least 2–3 times a week. The highest incidence, 40%, is that the answer '1 time a week' is followed by '2 times a week' with 36%, then the answer '3 times a week' was chosen for 15% and 3.6% got '4 times a week', but 22 participants answered not to consume legumes. Meat consumption during the week is determined as follows: 28% consume meat three times a week, 26% drink it twice a week, and 15% once a week. These data show that meat consumption is not excessive; of note are the 27 people who do not consume meat and are therefore used to a vegan or vegetarian diet. The survey also showed that there is a higher consumption of white meat, 3–4 times, compared to red meat, which is chosen more frequently 1–2 times a week, slightly exceeding the preference for white meat consumption. Italy's olive oil, which has countless plantations, is the most widely used and preferred among other oils. It is important to note that for many Italian farms it represents a high source of income and is one of the most exported

**Table 1**  
Characteristics of the interviewed sample (%).

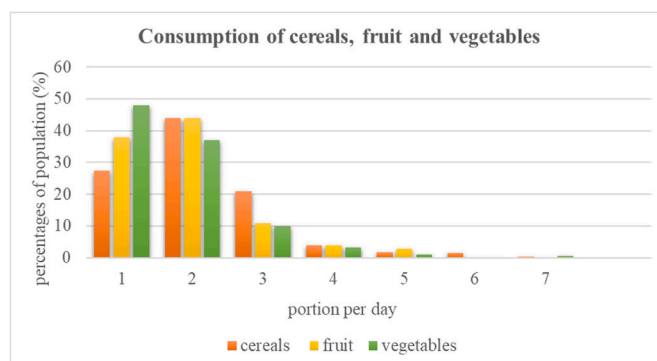
	%
<b>Sex</b>	
Males	32
Females	68
<b>Age classes (years)</b>	
18–24	24
25–31	31
32–38	10
39–45	8
46–52	10
53–59	7
60–67	8
68– > 74	2
<b>Family size (members)</b>	
1	12
2	13
3	19
4	43
5 or more	13
<b>Qualification</b>	
Lower secondary school	12
High school diploma	41
Degree	47
<b>Average monthly income of the family</b>	
A lot of difficulties getting to the end of the month	10
Some difficulty getting to the end of the month	21
No difficulty in reaching the end of the month	48
Manage to save money every month	21
<b>City of residence</b>	
Large city >250,000 inhabitants	20
Medium-sized cities (between 5001 and 250,000 inhabitants) close to large cities	22
Medium-sized cities (between 5001 and 250,000 inhabitants) far from large cities	24
The small cities (up to 5000 inhabitants) close to large cities	13
Small cities (up to 5000 inhabitants) far from large cities	21

Source: Elaboration on directly measured data

**Table 2**  
Data of knowledge of food and benefit of MD (%).

	%
<b>Do you know the food of the Mediterranean Diet?</b>	
Yes	56
Yes, partly	38
No	6
<b>Do you know the benefits of this food?</b>	
Yes	48
Yes, partly	43
No	9

Source: Elaboration on directly measured data



**Fig. 1.** Consumption of cereals, fruit, and vegetables per day.

Source: Elaboration on directly measured data

products abroad, together with wine, pasta, and cheese among the foods that are part of the Mediterranean diet. 94% of the surveyed population uses olive oil and prefers it to butter for seasoning food. Five percent of the participants consumed seed oil and a low percentage indicated a choice of butter and no consumption of edible fats (Table 3). Two respondents, seeing a different option in the box, emphasized that they use extra virgin olive oil, consumers who are aware of the good characteristics that this type of oil possesses. Consumers not only preferred olive oil but also stated that they use it more 1–2 times than a day to season various foods and dishes.

The analyzed data were grouped into six items, for each of which the average category adherence was calculated and then a grouped bar graph was constructed to better understand whether the 501 participants agreed or disagreed with the statements. The results show that there is a strong adherence; over 50%, in choosing to consume fresh, seasonal, and local produce over ready-made or frozen products and in selecting the most nutritious products and looking at or comparing labels as consumers showed themselves to be careful in their consumption choices and thus in their purchasing (Table 4).

## 5. Discussions

Focusing on consumers' eating habits and lifestyles, following the Mediterranean Diet is important for the prevention of many diseases and

**Table 3**  
Data of knowledge of food and benefit of MD (%).

	%
No type	0.8
Butter	0.2
Seed oil	5
Olive oil	94

Source: Elaboration on directly measured data

**Table 4**  
Eating habits score from 1 to 7 and %.

		%
<b>Local</b>		
totally disagree	1	1
	2	1
	3	5
	4	8.7
	5	16.8
	6	17
	7	50.5
totally agree		
Snack	1	49
	2	17.8
	3	11.4
	4	9.4
	5	6.8
	6	3
	7	2.6
totally agree		
Nutritional quality	1	16.6
	2	16
	3	16
	4	24.8
	5	12.8
	6	5.6
	7	8.2
totally agree		
Convenience	1	24.8
	2	25.6
	3	20
	4	16.4
	5	6.8
	6	4
	7	2.4
totally agree		
Freshness	1	1
	2	2
	3	4
	4	6.6
	5	11
	6	20
	7	55.4
totally agree		
Product info	1	6.4
	2	7
	3	11
	4	15.3
	5	18.2
	6	13.6
	7	28.5
totally agree		

Source: Elaboration on directly measured data

thus for maintaining good health [19]. The results of the survey shown in the tables above indicate that a good percentage follows the Mediterranean Diet and uses its products. However, another percentage, although low, does not follow it and this denotes that they consume MD products but not in the right portions. They consume these products because perhaps they have been handed down from generation to generation, for cultural and historical reasons, and also because of their location, a residential area far from the big cities that favors the greater consumption of fresh, seasonal, Km 0 food; those products that have a short supply chain from the countryside to table. As opposed to big cities that rely on large-scale distribution, where the product is ready to eat, easily transported, and has a long shelf life, and perhaps that has a cost that is not excessive and is affordable for the lower-middle income bracket. The majority of the sample of respondents are women, almost three times as many as men (68% Table 1). This makes it clear that the figure of the woman is predominant and important in food choices in fact, she is careful to look at the labels on products and compare them with each other to choose the most nutritious. It is she who does the shopping and then decides which products to buy for home consumption. Furthermore, as can be seen from the survey, it is the predominant

family with four members. The analysis shows that cereals, fruit, vegetables, milk, and dairy products are consumed daily and meals are accompanied by moderate consumption of wine and very little sweets, which are only consumed at family or patronal feasts, these are the main characteristics of the Mediterranean Diet. It can therefore be said that a large proportion of those interviewed adheres, albeit unintentionally, to this globally recognized dietary model. Since the MD is characterized by an abundance of foods of vegetable origin, the survey showed that, just as these foods are preferred, the use of olive oil is also strongly preferred to butter; , in the United States, for example, the daily diet is different because it includes many saturated fats of animal origin, such as butter, lard, and red meat.

## 6. Conclusions

The purpose of this article is to understand the cultural habits and customs concerning the diet of the consumers who volunteered to fill in the questionnaire. To focus on how the Mediterranean diet influences consumers' lifestyles, to improve their health, and how food choices can guide various business strategies. The study revealed the level of knowledge and adherence to the Mediterranean Diet foods of 501 participants. The analysis showed that the products that normally occupy the first positions in the food pyramid remain those most consumed by all individuals such as cereals, fruit, vegetables, and olive oil. Regarding nutritional categories, respondents rely on and are careful in their choice of products by looking at labels, so it is assumed that advertising influences sales. We can highlight the need for stricter regulation in marketing and advertising practices, encouraging consumption and following the typical Mediterranean diet, using it as a claim to reach more consumers. The concepts of advertising and marketing combined, from which the Mediterranean Diet benefits and the advertised food products more purchased. Talking about the Mediterranean Diet is becoming more and more important because, besides having a strong economic value, it is always an integral part of our daily life, of our eating habits. The concept of the Mediterranean diet represents not only a set of products and recipes or a food style, but above all a millenary culture, a way of life, an economic system, and a means of sustainable development for all regions of Italy, particularly those in the South, which claim true paternity. However, Italy's agri-food industry comprises various multi-purpose activities, capable of enhancing all the resources of the territory and its productions, focusing for example on the production of typical local products. It leads to the development of these areas, increasing tourism, promoting the history and culture of the territory, and perpetuation of ancient practices and traditions. At the same time, it enhances not only the typical product of the area but also the company that produces it, keeping alive these realities that convey that sense of popular tradition, also merging in an increase in tourism and food and wine. Territorial development favors the enhancement of the qualities and organoleptic and nutritional characteristics of local and typical products of the production area. To make the most of the territory and its services, it is necessary to implement strong information campaigns to raise awareness of proper nutrition. It should be one of the fundamental topics to be addressed in educational institutions, in families, in television forums, to be followed in collective catering models or the process stages of the food industry, so that a healthy and correct diet is imparted and consequently the multiple benefits of the Mediterranean Diet. The Mediterranean Diet, a practical diet for our ancestors, is still today a dietary model that protects man from disease. From this point, it should be remembered that the ancient Greeks said that most of man's diseases are largely due to the type of diet. Finally, the Mediterranean Diet stands as a 'correct eating style' for both the family and the community at large. For the family in that, it promotes 'human well-being' and thus a lower likelihood of preventing disease. For the State, the Mediterranean Diet can be a strategy to lower public spending on health as a function that has positive effects on health and contributes to the decrease in the manifestation of diseases. In Italy, it is known that the

national health system is responsible for human care, through public spending which manifests pathologies deriving from ‘unhealthy’ diets. Ultimately, the Mediterranean Diet can represent a food model for socio-economic and territorial development shortly.

### Declaration of competing interest

We have submitted the manuscript entitled “Consumer preferences for the Mediterranean Diet: results of an empirical analysis” to Journal of agriculture and food research.

We declare not to be in conflict of interest Journal of agriculture and food research.

We hope that this manuscript can be taken into consideration for publication in to Journal of agriculture and food research.

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