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INTERREG MED 2014 – 2020

Promoting Mediterranean innovation capacities to develop smart and sustainable growth

Building up Mediterranean diet knowledge

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Mediterranean diet products' analysis

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1. Mediterranean Diet Health and Nutrition

1.1. Introduction: Mediterranean Diet throughout History

Mediterranean Diet has its origin in adjacent regions to the Mediterranean Sea basin, a place with distinctive environmental characteristics and played a relevant role in humanity history. Some historians call this geographical area "the cradle of society" due to its relevance during ancient world development. Mediterranean regions were a meeting place that enabled several cultures to interact. Civilizations exchanged customs, lifestyles, languages and beliefs, which were changing and transforming over the time, from Cretans, Phoenicians, Greeks to Romans (1).

Agriculture had a key role, being cereals and vegetables the most available foods. Whereas animal foods were less frequents than fish and seafood, especially in the recipes from richer population. Bread, wine, olives and olive oil were the most habitual foods (2). Mediterranean Diet has been continuously evolving; different people influenced and contributed with novel foods that enriched this dietary pattern. Mediterranean Diet has been also influenced by German people, who were mainly nomads, hunters and farmers (3). Arab people also contributed with some key foods such as spices, which are highly appreciated, and plant-based vegetables such as aubergines, almonds, oranges, lemons and pomegranates (4). In addition, the discovery of America represented an important ephemerid that brought a wide range of unknown foods (e.g. potatoes, tomatoes, peppers, corn and new varieties of beans (5). Those foods are now part of the foundations of the Mediterranean Diet.

Currently, traditional Mediterranean Diet is usually described such as diet in Crete, Greece and regions in the south of Italy at the beginning of the 1960s. However, Spanish, Italian, Moroccan, French, Lebanese, Turkish, Portuguese and other Mediterranean countries diets have similarities in their composition. In addition, this food pattern is accompanied by regular physical activity (6).

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In 2013, United Nations Educational, Scientific and Cultural Organization (UNESCO) recognized the Mediterranean Diet as a part of Human Culture and Intangible Cultural Heritage.

Mediterranean Diet goes beyond to be only an exceptional dietary pattern; it also involved life-style, a Mediterranean dynamic cultural complex, which include traditions concerning to agriculture, fishing and livestock, food processing, preservation, cooking techniques, food sharing and consumption. Cooking and meals are perfect social meetings to exchange ideas and communicate with family, friends and neighbours, to forge closer ties, in cordiality and respect. The Mediterranean Diet has a main role in culture, being present in festivities, celebrations and daily life, represented in crafts, in markets, as places for exchange, or inside familiar nucleus, where techniques and recipes are transmitted.

Dietary intake and food pattern plays a relevant role in human health. However, the link between the Mediterranean Diet and health was not described until 1960, after that some scientific results were available. The American physiologist Ancel Keys and his colleagues published the Seven Countries study (6), an observational study that showed the relationship between the Mediterranean dietary pattern and its protective effect against coronary heart disease and cardiovascular mortality. This study linked by the first time saturated fat acids intake and high fasting total cholesterol blood levels with coronary heart disease mortality in different populations. Similar results were subsequently observed by the MONICA (Multinational Monitoring of Trends and Determinants in Cardiovascular Disease) program (7) which collected data about total mortality and mortality from heart disease in 26 countries between 1950 and 1978. Data permitted to observe a north-south gradient, so that North countries had a higher cardiovascular disease-related mortality than South countries. Moreover, it has been noted that Mediterranean Diet is present in certain regions so-called Blue Zones (Sardinia in Italy and Icaria in Greece), which are distinguished by their life expectancy and quality of life (8).

Over the last several decades, scientific evidence has related Mediterranean Diet adherence with health benefits in blood lipids concentration, blood pressure, insulin

resistance, arterial stiffness, oxidative stress, lower cardiovascular risk and a better evolution of diabetes and cardiovascular diseases (9–11). This has contributed to its recognition such as a healthy diet by several international organisations. Since 2010, American Dietary Guidelines included Mediterranean eating pattern style as an example of a healthy diet (12,13), but also traditional Mediterranean Diet has been introduce in gastronomy because of its ingredients and tasty key foods.

This document review knowledge and scientific evidence about the Mediterranean Diet, focusing on the general understanding about Mediterranean Diet characteristics, analysing their principal food components and the Mediterranean Diet and health link. Moreover, partners' countries Mediterranean Diet adherence is evaluated and their association with health parameters is described.

In addition, it has been considered necessary to group the data from the different food composition tables in each country considering they are indispensable tools to carry out a proper nutritional assessment of food. The differences between the tables are variable depending on the bibliographic sources consulted, the natural variability of the food (animal feed, soil fertilization, ripeness, region of origin, etc.), technological treatments, sampling methods and several other factors. Another relevant tool to highlight were the different graphic representations of their national recommendations on healthy nutrition, which is an efficient way to assure that the information provided in the different nutritional food guides is easier to understand, and it was interesting to learn how each country represented and transmitted it.

1.2. Methodology

This document overviews knowledge and scientific evidence about the Mediterranean Diet. It focuses on the general understanding about Mediterranean Diet characteristics, analysing their principal food components, at nutritional level and health link. Furthermore, Mediterranean Diet and life-expectancy, mortality rates and the most prevalent non-communicable diseases (obesity and overweight, cardiovascular diseases, type 2 diabetes, cancer, mental disorders and chronic respiratory diseases) link is reviewed, based on scientific evidence obtained from epidemiological and dietary intervention studies, underlying the protective action of these food components, in the context of the Mediterranean Diet.

Relevant studies, systematic reviews and meta-analysis were searched to obtain the reference lists in MEDLINE, PUBMED, and Cochrane Library databases, and reviewed the English language literature, of humans, with no time restriction.

In addition, to evaluate each partners' country Mediterranean Diet adherence the Mediterranean Adequacy Index (MAI) has been calculated. This index has been previously used to study the adherence of a country or a population to the Mediterranean Diet, and it is a useful tool to compare availability trends between different countries (14–18). Based on available data in Food Balance Sheets from FAOSTAT database (19), information about 2000-2011 average energy availability (kcal/capita/day) form every food has been obtained. This period allowed to analyse the most recent and complete data available from every partner's country. Although Mediterranean diet definition is variable, MAI considers and distinguishes between typical Mediterranean foods and non-typical Mediterranean foods. According to a study conducted by da Silva *et al* (14), Mediterranean food groups considered were olive oil, olives, cereals (beer was excluded from the cereal group), starchy roots, herbs and spices, fruits (except wine grapes), vegetables, nuts, fish and seafood, legumes and wine. While the Non-Mediterranean food groups were other sources of fat apart from olive oil, sugar and sweeteners, alcoholic beverages (except wine and beer), meat, beer, sugar crops, oil crops, offal, stimulants (coffee, cocoa beans, tea), animal fat and

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miscellaneous products. Equally, eggs and dairy foods were not included in the index because they were considered common components to all dietary patterns. MAI was calculated by dividing the energy provided by the total sum of Mediterranean food groups by the energy from the Non-Mediterranean food groups (14,17,20). Data are represented such as mean ± standard deviation.

Furthermore, in order to study relationship between partners' countries adherence to the Mediterranean Diet and health parameters, partners' health-related information was obtained from the European Health for All database (HFA-DB, (21)). All population, female and male: crude death rate per 1000 population, total fertility rate, life expectancy at birth, life expectancy at age 65 (years), disability-adjusted life expectancy, diseases of circulatory system, diseases of circulatory system, +65 years, ischaemic heart disease, ischaemic heart disease, +65 years, cerebrovascular diseases, cerebrovascular diseases, +65 years, malignant neoplasms, trachea/bronchus/lung cancer, 0–64 years, trachea/bronchus/lung cancer, +65 years, female cancer of the cervix uteri, suicide and self-inflicted injury, prevalence of diabetes mellitus (%), prevalence of overweight and obesity (defined as BMI = 25 kg/m^2 and 30 kg/m^2, respectively) in people aged 18 years and over, WHO estimates (%). Following data analysis are based on 2011 information, which correspond to the most complete data for all partners' countries. Punctually, there have been unknown-data, so in order to conduct the analysis close years' information has been used (2008-2012).

Linear regression models were fitted to analyse the associations of MAI variation in health-related variables, with the statistical software SPSS® (Statistical Package for the Social Sciences; version 22 for Windows). A number of models were examined. Model 1 was adjusted for natural logarithm of MAI (LnMAI), due to the skewed distribution of this variable. Model 2 was further adjusted for labour force as percentage of population, age-standardized prevalence of overweight, mid-year population, and private-sector expenditure on health as % of GDP, WHO estimates. These adjusts were adapted according to population analysis: all population, female or male population. Significance was set at p-values < 0.05.

Regarding the food composition tables an exhaustive search was carried out in different food composition databases:

Albania, Bosnia and Herzegovina and Croatia (The database covers also the Balkan food Platform, which includes other Balkan countries): Serbian Food Composition Database, 2016 – SFCD

Cyprus: Cyprus Food Composition Tables, 2013 – Cyprus and when information was not available in this database Food Composition Tables for the Near East, 1982 – FCTNE

Greece: Nutritional composition of Greek foods and traditional dishes by laboratory analysis, 2007 - HHF

Italy: Food Composition Database for Epidemiological Studies in Italy, 2015 - BDA

Portugal: PortFIR, 2015 - INSA

Slovenia: OPEN platform for clinical nutrition, 2013 – OPKP

Spain: Base de Datos BEDCA, 2007 – BEDCA

Food composition was gathered for each group and for each country, namely: Energy (Kcal), FAT (g), Saturated fat [Fasat] (g), Carbohydrates [CHO] (g), SUGAR (g), Total dietary fibber [FIBT] (g), Protein [PROT] (g), Salt (g), for 100 g of product. Data was gathered exactly as it appeared in the databases, including decimals, "zeros" and the blank spaces (meaning there is no information available).

Furthermore, the foods/beverages studied in each group were related to the Mediterranean diet pyramid. However, some products were adapted in order to be able to gather more information, e.g. tomato was added to the Vegetables group, and black pepper to the Herbs and Spices group, sunflower seeds to the Seeds group. For the Bread, Pasta and Rice group data for both wheat and whole meal foods were gathered. For the Pulses, lentils and chickpeas were chosen, since "beans" seemed a non-specific word and could lead to bias.

Respecting the graphic representations of the recommendations on healthy nutrition, national food based dietary guidelines (FBDG) were used for countries that possessed it, according to the information presented by the Food and Agriculture Organization of the United Nations (Food-based dietary guidelines. (2017). Available at: http://www.fao.org/nutrition/education/food-dietary-guidelines/en/)

1.3. Results

1.3.1 Food pyramids

At present, there are many sources of information that provide advice on nutrition and how the population should be fed, and sometimes, this creates confusion, because each country has different cultures, and this is difficult to adapt. That is why the dietary guidelines are an important part of promoting the consumption of adequate food within each sector of the world's population.

The food guides are the educational tool that the health administrations make available to the general healthy population in order to adapt in an easy and understandable way the scientific knowledge about the nutritional requirements and food composition. They are shown graphically and easy to understand. Almost all countries have a guide, designed according to the policies that govern it. It is considered a very useful tool to educate and guide the population towards a healthier diet. They are extremely important because they influence the promotion of health and thus prevent diseases that are increasing today. They are also adapted in relation to the culture, customs, and availability of food for each of them.

- **Albania**

Recommendations on healthy nutrition in Albania (Albanian: Rekomandime për një ushqyerje të shëndetshme në Shqipëri) (22)

Executing entities:
Public Health, Ministry of Health
Draft Stability Pact on the Strengthening of Food Security and Nutrition Services in the Southeast Countries
Reproductive Health Sector
Food quality sector, Ministry of Agriculture, Food and Customer Protection,
Ministry of Education and Science
Institute of Public Health
Directorate of Public Health
Center for Economic Education and the Growth of Children in the Municipality of Tirana

Fig. 1 – Graphic representation: Pyramid (Albania).

Supporting entities: -
Year of publication: 2008
Language: Albanian and English
Format: Report
Graphic representation: Pyramid
Validation: Pending.

- **Bosnia and Herzegovina**

Guide on nutrition for the adult population (Bosnian: Vodič o ishrani za odraslu populaciju) (23)

Executing entities:
Institute of Public Health Federation of Bosnia and Herzegovina
Federal Ministry of Health
Federal Ministry of Education
Non-governmental organizations
WHO

Supporting entities: -
Year of publication: 2004
Language: Bosnian
Format: Report
Graphic representation: Round pyramid
Validation: Pending

Fig. 1 – Representación gráfica: Pirámide redonda (Bosnia y Herzegovina).

- **Croatia**

Dietary guidelines (Croatian: Prehrambene smjernice).(24)

Executing entities:
Ministry of Health
Ministry of Education
Institute of Public Health of Croatia
Clinical hospitals

Supporting entities: -
Year of publication: 2002
Language: Croatian
Format: Report
Graphic representation: Pyramid
Validation: Pending

Fig. 2 – Graphic representation: Pyramid (Croatia).

- **Cyprus**

National nutrition and exercise guidelines (Greek: εθνικές οδηγίες διατροφής και άσκησης) (25)

Executing entities:
Ministry of Health
Ministry of Education
Consumer and nutrition associations
Non-governmental organizations

Supporting entities: -
Year of publication: 2007
Language: Greek
Format: Report
Graphic representation: Pyramid
Validation: Pending

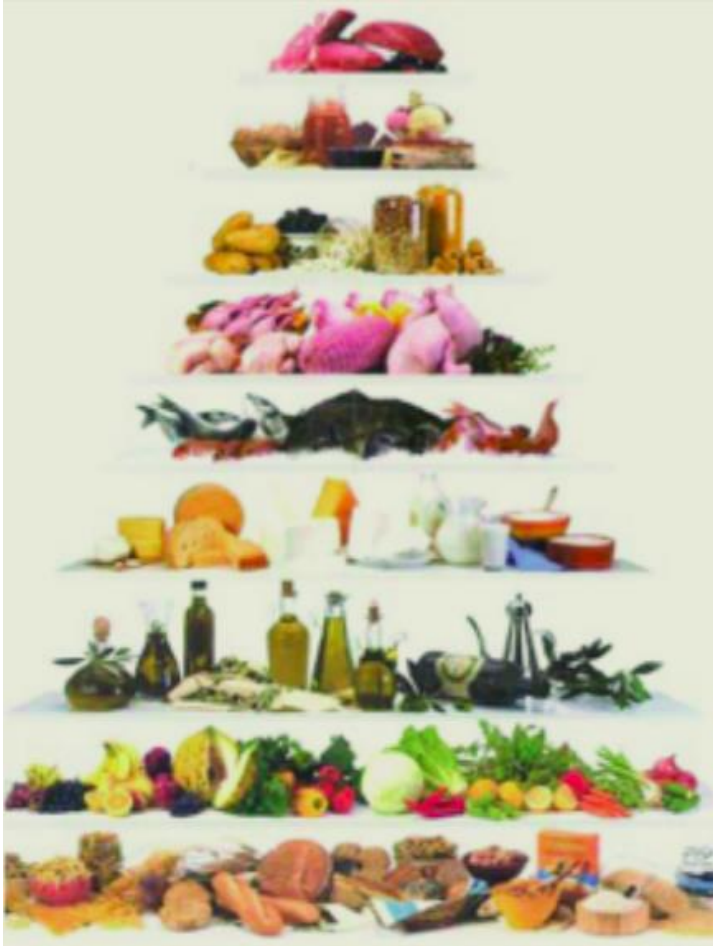

Fig.3 – Graphic representation: Pyramid (Cyprus).

- **Greece**

Dietary guidelines for adults in Greece (26)

Executing entities:
Supreme Scientific Health Council
Hellenic Ministry of Health

Supporting entities: -
Year of publication: 1999
Language: Greek and English
Format: Website
Graphic representation: Pyramid
Validation: Pending

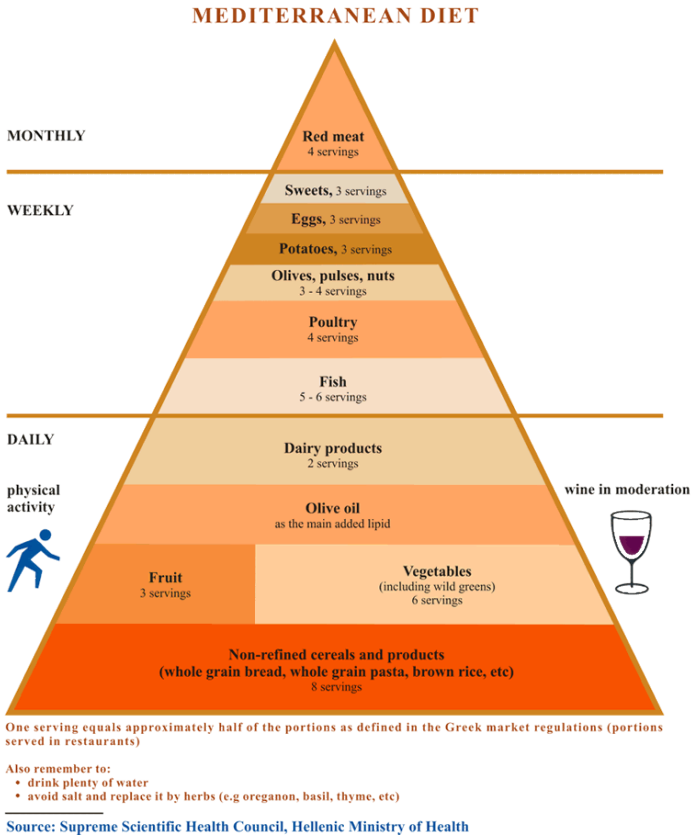

Fig. 4 – Graphic representation: Pyramid (Greece).

- **Italy**

Guidelines for healthy Italian food habits, 2003 (Italian: Linee guida per una sana alimentazione italiana. Revisione 2003) (27)

Executing entities:
Istituto Nazionale di Ricerca per gli Alimenti e la Nutrizione
Istituto Superiore di Sanità
Università di Parma
Università La Sapienza
Università di Bologna
Ospedale S. Filippo Neri
Università di Milano
Università di Padova
WHO Politiche Nutrizionali
Ospedale Bambin Gesù
Università di Napoli
Università di Ferrara
Università della Tuscia

Supporting entities: -
Year of publication: 2003
Language: Italian
Format: Report
Graphic representation: No
Validation: Pending

- **Portugal**

A nova roda dos alimentos – 2015 (28)

Executing entities:
Faculdade de Ciências da Nutrição e Alimentação da Universidade do Porto

Entidades avaladoras:
Instituto do Consumidor
Faculdade de Ciências da Nutrição e Alimentação da Universidade do Porto
Associação Portuguesa de Nutricionistas

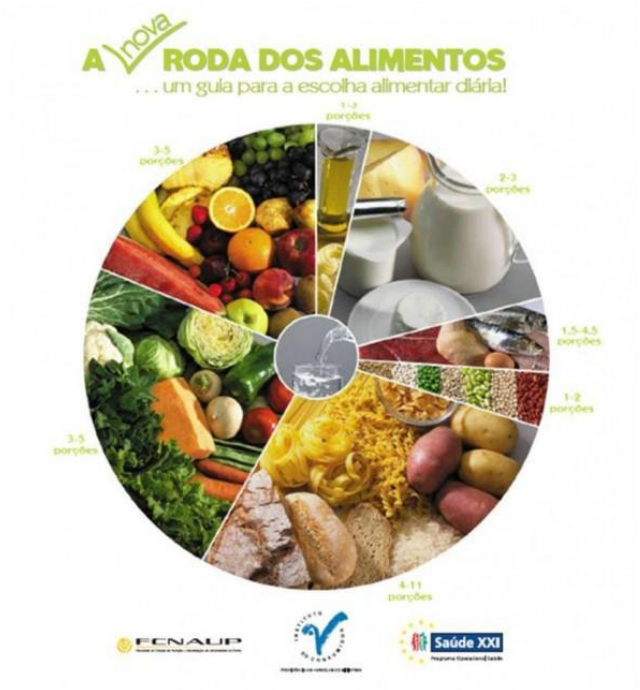

Fig. 6 – Graphic representation: The new food wheel (Portugal).

Year of publication: 2015
Language: Portuguese
Format: Poster
Graphic representation: Wheel (plate)
Validation: No
Other information: The Food Wheel emerged in 1977 during the campaign "Know how to eat is to know how to live" and in 2003 it was restructured due to the evolution of scientific knowledge and the clear alteration of the alimentary habits of the Portuguese. This project was developed within the framework of the Health XXI program, through a protocol between the Faculty of Nutrition and Food Sciences of the University of Oporto and the Consumer Institute.
In this way, some of the groups were subdivided and water was added.

- **Slovenia**

12 steps to healthy eating (Slovene: 12 korakov do zdravega prehranjevanja) (Nacionalni Institut Za Javno Zdravje, 2011; Priporočila Za Zdravo Prehranjevanje, 2009) (29)

Executing entities:
National Institute of Public Health
World Health Organization CINDI Program (Integrated Intervention of Integrated Noncommunicable Diseases in Slovenia) in Slovenia Experts

Supporting entities: -
Year of publication: 2009
Language: Slovenian
Format: Report and poster
Graphic representation: Pyramid
Validation: SEARCH

Slovenia's dietary guidelines "12 steps to healthy eating" were published in 2000 and revised in 2011. The "food pyramid" (Slovenian: Z zdravo prehrano in gibanjem do zdravja) was published in 2000 and revised in 2015. " (Slovenian: Zdrav krožnik) was published in 2007.

Fig. 5 – Graphic representation: Pyramid (Slovenia).

- **Spain**

Dietary guidelines for the Spanish population; the new pyramid of healthy eating (30)

Executing entities:
Spanish Society of Community Nutrition (SENC)

Supporting entities: City Council of Guadix; Behavioral Sciences Institute; CEU-San Pablo-Hospitals of Madrid; CiberOBN; Dieticians Association of Andalusia; Ministry of Health, Community of Madrid; Consellería de Sanitat, Generalitat Valenciana; Departament de Sanitat, Generalitat de Catalunya; FINISH; FIDEC Foundation- UPV / EHU; Nutritional Research Foundation; Jiménez Díaz Foundation; Clinical Hospital of Madrid; Hospital La Paz-Madrid; Virgen del Rocío Hospital-Seville; IMIM-CIBERESP; Carlos III Health Institute; Nutrition without Borders; SEMER; SEMERGEN; SemFYC; SENC; SEPEAP; CEU-San Pablo University; Complutense University; University of Barcelona; Cadiz University; University of Granada; University of the Balearic Islands; University of Las Palmas de Gran Canaria; University of Leon; University of Navarra; Sevilla University; University of Valladolid; University of the Basque Country, UPV-EHU; Open University of Catalonia; polytechnic university of Valencia; Ramón Llull University; Rovira i Virgili University

Fig. 6 – Graphic representation: Food Guide Pyramid for the Spanish population (Spain).

Year of publication: 2016
Language: Spanish
Format: Report
Graphic representation: Pyramid
Validation: No
Other information: The Working Group of the Spanish Society of Community Nutrition (SENC) to update the Dietary Guidelines for the Spanish population has been working in the last two years in the review of scientific evidence as a basis for updating the

Dietary Guidelines. He has considered the most frequent health problems with a focus on public health, the most prevalent eating habits, as well as the practice of physical activity and sedentary lifestyle in the Spanish population. It has also taken into account the current socio-economic context and relevant cultural factors.

An important part of the review process has been the involvement of consumers, considering their contributions and points of view. Other sectors have also been involved. Our recognition of the work, contributions, comments and involvement of all scientists, citizens and professionals who have collaborated in this initiative.

- **Mediterranean countries**

Mediterranean Diet Pyramid: a current lifestyle. Guide for the adult population (2010).

Executing entities:
Fundación Dieta Mediterránea

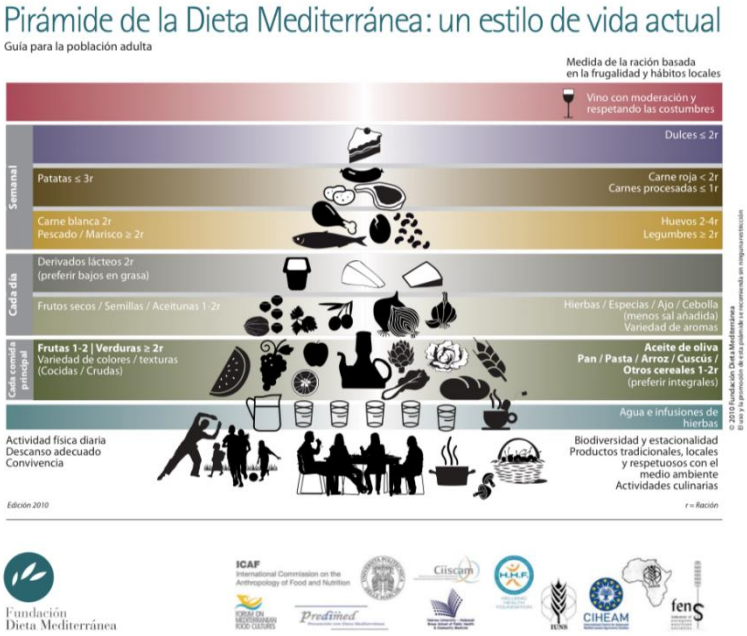

Fig. 9 - Graphic representation: Meidterranean Diet Pyramid

Supporting entities: International Commission on the Anthropology of Food and Nutrition; Red-Predimed; Universitat Politécnica Delle Marche; Centro Interuniversitario Internazionale di Studi sulle Culture Alimentari Mediterranee; Hellenic Health Foundation; International Union of Nutritional Sciences ; Hebrew University – Hadassah Braun School of Public Health & Community Medicine; International Centre for Advanced Mediterranean Agronomic Studies; Federation of African Nutrition Societies; Federation of European Nutrition Societies

Year of publication: 2010

Language: Arab, Spanish, Catalan, Euskera, French, Galician, Greek, English, Italian, Portuguese

Format: Article

Graphic representation: Pyramid

Validation: No

1.3.1. Food composition tables

These tables are mainly used to estimate both energy and nutrient intakes. Food composition varies widely depending on the variety of the plants and animals, the type of crop and cultivation methods, as well as the feeding conditions of the animals. Other factors that are important to mention about the products analysed are, for the most part, their freshness, storage time and conditions.

Other aspects that impact over the food composition assessment are the techniques used to determine the different components, which can give very different values. This means that there are very different results among the various existing tables.

The food composition tables and databases are a very effecting tool for assessing the general nutritional status of a population. Put this way, the information collected in these databases are valuable for designing nutritional policies, carrying out research studies on nutrition, designing new products and even providing helpful information to consumers, which are increasingly concerned about knowing the characteristics of the food they eat.

Tab. 1 – Food products for each group regarding nutritional information

Food group	Foods/beverages studied
Water	Tap water
Herbal infusions	Tea, leaves, dried (mainly *Camelia sinensis*)
Fruits	Watermelon, raw Red grape, raw Orange, raw Apple, whole, raw
Vegetables	Artichoke, raw Tomato, raw Lettuce, raw
Olive oil	Olive oil
Bread	Whole meal bread White bread
Pasta	Whole meal macaroni/pasta Macaroni/pasta
Rice	Rice, brown/unpolished Rice, white/polished
Couscous	Couscous/durum wheat semolina
Other cereals	Barley, grain, raw Rye, grain, raw
Nuts and Seeds	Walnuts

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Food group	Foods/beverages studied
	Almonds Sunflower seed
Olives	Olives
Herbs and spices	Coriander, leaves, raw Black pepper
Garlic	Garlic, raw
Onions	Onion, raw
Dairy	Yogurt, strained/Greek Sheep/ewe cheese Cow cheese
White meat	Chicken, raw
Fish/seafood	Tuna, raw Shrimp, raw
Eggs	Chicken eggs, whole, raw
Legumes	Lentils, dried Chickpeas, dried
Potatoes	Potato, raw
Red Meat	Pork loin, raw Beef loin, raw
Processed meat	Cured ham Sausage
Sweets	Chocolate cake or other when chocolate cake was not available
Wine	Red wine

Tab. 2 – Water group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	0	0	0	0	0	0		0
Bosnia and Herze-govina	0	0	0	0	0	0		0
Croatia	0	0	0	0	0	0		0
Cyprus								
Greece	0	0		0	0	0	0	0
Italy	0	0	0	0	0	0	0	0
Portugal	0	0	0	0	0	0	0	0.005
Slovenia	0	0	0	0	0	0	0	0
Spain	0	0	0	0	0	0	0	0

Tab. 3 – Herbal infusions group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	275.24	1.5		40		43	4.5	
Bosnia and Herzegovina	275.24	1.5		40		43	4.5	
Croatia	275.24	1.5		40		43	4.5	
Cyprus	293	2.3		62.4		9.2	21.4	
Greece								
Italy	108	2	0.57	3	3		19.6	
Portugal								
Slovenia	144	4.36	0	0.8	0.8	55.8	24.5	0
Spain								

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Tab 4. – Watermelon, raw – Fruits group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	37	0.217		7.55			0.6	
Bosnia and Herze-govina	37	0.217		7.55			0.6	
Croatia	37	0.217		7.55			0.6	
Cyprus	24	0.1		6.1		0.3	0.4	
Greece								
Italy	15	trace	0	3.7	3.7	0.2	0.4	
Portugal	26	0.2	0	5.5	5.6	0.3	0.4	
Slovenia	37.89	0.2	0.054	8.29	8.29	0.22	0.6	0.01
Spain	20	trace	0.1	4.5		0.5	0.4	

Tab 5. – Red grape, raw – Fruits group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	56.9	0.1		13.5		2.1	0.5	
Bosnia and Herze-govina	56.9	0.1		13.5		2.1	0.5	
Croatia	56.9	0.1		13.5		2.1	0.5	
Cyprus	72	0.3	18.8			1	0.6	
Greece								
Italy	61	0.1	0.03	15.6	15.6	1.5	0.5	
Portugal	83	0.5	0.1	18.6	18.6	0.9	0.3	0.005
Slovenia	99.44	0.055	0.054	23.9	15.48	0.9	0.455	
Spain	72	0.7	0.05	15.5		0.4	0.6	

Tab. 6 – Orange, raw – Fruits group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	46			11.54	9.14	2	0.7	
Bosnia and Herze-govina	46			11.54	9.14	2	0.7	
Croatia	46			11.54	9.14	2	0.7	
Cyprus	45	0.2		11.2		0.6	1	
Greece								
Italy	34	0.2	0.03	7.8	7.8	1.6	0.7	
Portugal	48	0.2	0	8.9	8.9	1.8	1.1	0.01
Slovenia	63	15.5	0.035	15.5		4.5	1.3	
Spain	38	trace	0.028	8.6		2	0.8	

Tab. 7 – Apple, raw – Fruits group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	45	0.3		10	10	2.4	0.2	
Bosnia and Herze-govina	45	0.3		10	10	2.4	0.2	
Croatia	45	0.3		10	10	2.4	0.2	
Cyprus	56	0.2		14.5		0.8	0.4	
Greece								
Italy	38	trace	0	10	10	2.6	0.2	
Portugal	64	0.5	0.1	13.4	13.4	2.1	0.2	0.015
Slovenia	59.89	0.11	0.021	14.35	10.31	2.02	0.155	
Spain	50	trace	0.2	12		2	0.3	

Tab.8 – Artichoke, raw – Vegetables group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	22	0.12		2.63		1.08	2.4	
Bosnia and Herzegovina	22	0.12		2.63		1.08	2.4	
Croatia	22	0.12		2.63		1.08	2.4	
Cyprus	41	0.2		8		0.9	4.4	
Greece								
Italy	22	0.2	0.05	2.5	1.9	5.5	2.7	
Portugal	51	0.2	0	6.8	2.7	5	3	0.21
Slovenia	53	0.34	0.081	11.95	0.99	8.6	2.89	
Spain	23	0.2	0.09	2.26		9.4	2.9	

Tab. 9 – Tomato, raw – Vegetables group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	25.48	0.3		5.7	2.32		0.7	
Bosnia and Herzegovina	25.48	0.3		5.7	2.32		0.7	
Croatia	25.48	0.3		5.7	2.32		0.7	
Cyprus	19	0.2		4.2		0.6	1.1	
Greece	16	0.1		4.5		0.3	1	
Italy	17	0.2	0.03	2.8	2.8	1.1	1.2	
Portugal	22	0.3	0	3.5	3.5	1.3	0.8	0.032
Slovenia	20.41	0.078	0.037	3.94	2.52	0.468	0.85	
Spain	19	0.1	trace	3.5		1.1	0.9	

Tab. 10 – Lettuce, raw – Vegetables group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	11	0.2		4.5			1.1	
Bosnia and Herze-govina	11	0.2		4.5			1.1	
Croatia	11	0.2		4.5			1.1	
Cyprus	24	0.4		5		0.7	1.3	
Greece								
Italy	19	0.4	0.05	2.2	2.2	1.5	1.8	
Portugal	15	0.2	0	0.8	0.8	1.3	1.8	0.0075
Slovenia	14	0.14	0.018	2.97	1.97	1.2	0.9	
Spain	16	0.6	0.12	1.4		1.5	1.125	

Tab. 11 – Olive oil – Oil group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	899	99.9						
Bosnia and Herzegovina	899	99.9						
Croatia	899	99.9						
Cyprus	900	100	16					
Greece	892	99.9	14.5	0	0	0	0	0
Italy	899	99.9	14.5	0	0	0	0	0
Portugal	900	99.9	14.4	0	0	0	0.1	0
Slovenia	884.32	100	13.97					
Spain	887	99.9	17.06	0	0	0	0	

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Tab. 12 – White bread – Bread group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	262.9	0.5		50.8	2.5	4.3	6.8	
Bosnia and Herzegovina	262.9	0.5		50.8	2.5	4.3	6.8	
Croatia	262.9	0.5		50.8	2.5	4.3	6.8	
Cyprus	292	1.1		64.4			4.3	
Greece	281	2.5	1.1	57.4		2	9.1	
Italy	277	0.2	0.05	64.7	0.6	2.8	8.1	
Portugal	290	2.2	0.5	57.3	2.1	3.8	8.4	1.52
Slovenia	254.78	1.28	0.803	50.18	2.81	1.22	9.73	
Spain	240	1.6	0.39	47		3.5	8.3	

Tab. 13 – Whole meal bread – Bread group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	198	1.201		38.7	2.529	8.115	7.29	
Bosnia and Herzegovina	198	1.201		38.7	2.529	8.115	7.29	
Croatia	198	1.201		38.7	2.529	8.115	7.29	
Cyprus	259	1.2		57.4			8.8	
Greece								
Italy	243	1.3	0.3	53.8	2.5	5.7	7.5	
Portugal	232	3	0.7	39.9	2.2	7.4	7.6	1.25
Slovenia	200.79	0.563	0.803	40.7	5.75	7.36	7.49	
Spain	251	3	0.7	44		6	10.9	

Tab. 14 – Pasta/macaroni – Pasta group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	366.43	1.8		76		3.2	12.3	
Bosnia and Herzegovina	366.43	1.8		76		3.2	12.3	
Croatia	366.43	1.8		76		3.2	12.3	
Cyprus	379	1.7		78.1			10.9	
Greece								
Italy	356	0.3	0.07	82.8	2.7	2.6	10.8	
Portugal	360	3.1	0.9	67.6	1.8	3	13.9	0.048
Slovenia	371	1.51		74.67	2.67		13.4	
Spain	353	1.45	0.19	70.9		5	12.5	

Tab. 15 – Whole meal pasta/macaroni – Pasta group – Nutritional information per-100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	354.76	2.9		73.3			13.1	
Bosnia and Herzegovina	354.76	2.9		73.3			13.1	
Croatia	354.76	2.9		73.3			13.1	
Cyprus								
Greece								
Italy	324	2.5	0.58	66.2	3.7	11.5	13.4	
Portugal								
Slovenia	348	1.4	0.258	75.03			14.63	
Spain	347	2.5	1.1	66.2		11.5	13.4	

Tab. 16 – White/polished rice – Rice group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	362.86	1.2		79			8.4	
Bosnia and Herzegovina	362.86	1.2		79			8.4	
Croatia	362.86	1.2		79			8.4	
Cyprus	348	1.4	0.4	68.3			6.5	
Greece	325	trace		77		1.3	5.6	
Italy	362	0.6	0.14	87.6		0.2	7	
Portugal	347	0.4	0.1	78.1	0	2.1	6.7	0.015
Slovenia	360	0.58	0.158	79.34			6.61	
Spain	387	0.9	0.21	86		0.2	7	

Tab. 17 – Brown/unpolished rice – Rice group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	362.86	1.2		79			8.4	
Bosnia and Herzegovina	362.86	1.2		79			8.4	
Croatia	362.86	1.2		79			8.4	
Cyprus	348	1.4	0.4	68.3			6.5	
Greece								
Italy	357	2.8	0.56	81.3	1.3	3.8	6.7	
Portugal	351	2.5	0.5	71.6	0	3.8	8.6	0.0075
Slovenia	357.08	1.3	0.67	78	0.6	2.21	7.05	
Spain	386	2.63	0.52	81.3		3	7.5	

Tab. 18 – Couscous/semolina – Couscous group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	356.43	2.7		70			9.2	
Bosnia and Herzegovina	356.43	2.7		70			9.2	
Croatia	356.43	2.7		70			9.2	
Cyprus	358	1.9		74.8		0.3	8.7	
Greece	344	1.1	0.2	73.1			10.1	
Italy	342	0.5	0.12	77.6	1.9	3.6	11.5	
Portugal								
Slovenia	376	0.64	0.117	77.43		5	12.76	
Spain								

Tab. 19 – Barley, grain, raw – Other cereals group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	349.9	1.9		72.8			10.4	
Bosnia and Herzegovina	349.9	1.9		72.8			10.4	
Croatia	349.9	1.9		72.8			10.4	
Cyprus	327	3	0.6	74.1		6.1	9.9	
Greece								
Italy	360	1.9	0.4	80	trace	14.8	10.6	
Portugal								
Slovenia	365.03	2.7	0.53	73.64	1.71	9.8	10.32	
Spain	323	2.1	0.3	64		14.8	10.6	

Tab. 20 – Rye, grain, raw – Other cereals group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)	Reference
Albania	322	1.7		60.1	6.1	13.2	9.2		Rye grain (Raz zrno), SFCD
Bosnia and Herze-govina	322	1.7		60.1	6.1	13.2	9.2		Rye grain (Raz zrno), SFCD
Croatia	322	1.7		60.1	6.1	13.2	9.2		Rye grain (Raz zrno), SFCD
Cyprus	334	2.5		71.8		1.8	11.9		RYE (Secale cereale) whole grain or meal, FCTNE
Greece									No info
Italy	335	2	0.23	75.9	0	11.7	8.2		Flour, rye, dark, BDA
Portugal	375	1.3	0.2	76	0	11.7	9	0.025	Farinha de centeio tipo 85, INSA
Slovenia	367.7	1.68	0.269	79.04	2.31	19.64	7.8		Rye, OPKP
Spain	408	2.5	0.29	79.8		14.6	14.8		Centeno, crudo, BEDCA

Tab. 21 – Walnuts – Nuts and Seeds group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	671	63.4	6.68	8.57	3.8	5.93	15.8	
Bosnia and Herzegovina	671	63.4	6.68	8.57	3.8	5.93	15.8	
Croatia	671	63.4	6.68	8.57	3.8	5.93	15.8	
Cyprus	436	41.5		13.2		0.9	10	
Greece								
Italy	582	57.7	4.72	5.5	3.4	3.5	10.5	
Portugal	699	67.5	5.4	3.6	2.6	5.2	16.7	0.03
Slovenia	720.13	32.08		5.07	0.984		6.64	
Spain	595	63.28	7.42	3.3		5.2	14	

Tab. 22 – Hazelnuts – Nuts and Seeds group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	535	46.6	3.89	8.8	4.96	4.6	19.3	
Bosnia and Herzegovina	535	46.6	3.89	8.8	4.96	4.6	19.3	
Croatia	535	46.6	3.89	8.8	4.96	4.6	19.3	
Cyprus	567	57.4		20		2.7	16.1	
Greece	535	46.6	5.5	8.8		4.6	19.3	
Italy	603	55.3	4.59	4.6	3.7	12.7	22	
Portugal	650	56.8	4.7	7.1	5	12.2	21.6	0.015
Slovenia	597	52.83	4.05	19.29	4.9	11.8	22.09	
Spain	590	52.93	4.04	6.6		13.4	22.9	

Tab. 23 – Sunflower seed – Nuts and Seeds group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	647	56.5	6.6	13		7.4	18	
Bosnia and Herzegovina	647	56.5	6.6	13		7.4	18	
Croatia	647	56.5	6.6	13		7.4	18	
Cyprus	557	45.6		26		3.4	20.2	
Greece								
Italy								
Portugal								
Slovenia	582	49.8	5.22	24.07	2.73	11.1	19.33	
Spain	574	43	5.93	20		2.7	27	

Tab. 24 – Olives group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	271.5	26.7		5.6		4	2.2	
Bosnia and Herzegovina	271.5	26.7		5.6		4	2.2	
Croatia	271.5	26.7		5.6		4	2.2	
Cyprus	191	21	15.6	2.6		1.5	1.8	
Greece	185	19	2.5	4.7		1.4	1.2	
Italy	268	27	3.78	5	5	2.4	1.5	
Portugal	180	18.5	2.9	0	0	4	1.4	5.25
Slovenia	106.12	12.06						
Spain	120	12.5	2.6	1		4.8	1.3	

Tab. 25 – Coriander, raw – Herbs and Spices group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania								
Bosnia and Herzegovina								
Croatia								
Cyprus	42	0.6		7.9		0.9	3.3	
Greece								
Italy								
Portugal	28	0.6	0.1	1.8	1.5	2.9	2.4	0.07
Slovenia	23	0.52	0.014	3.67	0.87	2.8	2.13	
Spain								

Tab. 26 – Pepper, raw – Herbs and Spices group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	347.3	6.5	0.5	62.7			9.5	
Bosnia and Herzegovina	347.3	6.5	0.5	62.7			9.5	
Croatia	347.3	6.5	0.5	62.7			9.5	
Cyprus	237	2.9		57.4			16.1	
Greece								
Italy	217	3.3	0.98	38.3	38.3	26.5	10.8	
Portugal	273	2.7	0.9	38.3	38.3	26.5	10.7	0.062
Slovenia	345.35	3.26	0.98	64.81	0.64	26.5	12	
Spain	230	3.3	0.98	38.3		26.5	11	

Tab. 27 – Garlic, raw – Garlic group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	159.76	0.5	0.09	33.1			6.4	
Bosnia and Herzegovina	159.76	0.5	0.09	33.1			6.4	
Croatia	159.76	0.5	0.09	33.1			6.4	
Cyprus	132	0.2		30.3		0.6	5.1	
Greece	64			13.6			4	
Italy	40	0.6	0.11	8.4	8.4	2.3	0.9	
Portugal	72	0.6	0.1	11.3	1.3	3	3.8	0.025
Slovenia	72.45	0.07		15.79	1.54		1.89	
Spain	117	0.23	0.05	24.3		1.2	3.93	

Tab. 28 – Onion, raw – Onion group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	28	0.25	0.0095	10	5.98	1.7	1.177	
Bosnia and Herzegovina	28	0.25	0.0095	10	5.98	1.7	1.177	
Croatia	28	0.25	0.0095	10	5.98	1.7	1.177	
Cyprus	35	0.1		8.4		1.4	1.8	
Greece	33			6.9		0.8	1.1	
Italy	26	0.1	0.02	5.7	5.7	1.1	1	
Portugal	20	0.2	0	3.1	2.2	1.3	0.9	0.0025
Slovenia	35	0		8	4	2	1	
Spain	26	trace	trace	5.3		1.8	1.12	

Tab. 29 – Yogurt, strained – Dairy products group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	62	3.2	2.1	4.5	4.5		3.2	
Bosnia and Herzegovina	62	3.2	2.1	4.5	4.5		3.2	
Croatia	62	3.2	2.1	4.5	4.5		3.2	
Cyprus	112	5.5		7.9			7.7	
Greece	122	6.7	4.5	7.4		0	6.7	
Italy	115	9.1	4.83	2	2	0	6.4	
Portugal	54	1.8	1	5	5	0	4.2	0.16
Slovenia	108.9	9	5	4	4		3.2	
Spain	139	10.2	6.8	5.4		0	6.4	

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Tab. 30 – Sheep/ewe – Dairy products group– Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	376	27.9	17.6	1.22			30.2	
Bosnia and Herzegovina	376	27.9	17.6	1.22			30.2	
Croatia	376	27.9	17.6	1.22			30.2	
Cyprus	303	19.8	18.2	0.9			18	
Greece	228	18.4	12.2	4.8		0	10	
Italy	364	27.3	17.13	2.1	2.1	0	27.7	
Portugal	313	25	13.1	0.1	0.1	0	21	2.25
Slovenia	231.29	18.1	11.35	0.53	0.52		17	
Spain	389	30.4	0.763	0.5		0	28.77	

Tab. 31 – Cow cheese – Dairy products group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	322.38	25.1	16.2	0.9	0.05		24.1	
Bosnia and Herzegovina	322.38	25.1	16.2	0.9	0.05		24.1	
Croatia	322.38	25.1	16.2	0.9	0.05		24.1	
Cyprus	342	25.4	15.3	7.3			26.2	
Greece								
Italy	253	19.5	11.43	0.7	0.7	0	18.7	
Portugal	316	23.4	12.6	0.2	0.2	0	26	2.12
Slovenia	371	29.68	18.76	2.79	0.51		23.24	
Spain	336	28.3	17.3	trace		trace	20.7	

Tab. 32 – Chicken, raw – White meat group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	180	11.8	2.34	0			18.8	
Bosnia and Herzegovina	180	11.8	2.34	0			18.8	
Croatia	180	11.8	2.34	0			18.8	
Cyprus	189	11.8		0			19.4	
Greece								
Italy	171	10.6	3.27	0	0	0	19	
Portugal	201	13.6	3.2	0	0	0	19.6	0.18
Slovenia	131.83	9.2	1.65				12.41	
Spain	167	9.25	2.66	0		0	20.85	

Tab. 33 – Shrimp, raw – Fish/seafood group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	91	0.74	0.231	1.439			18.6	
Bosnia and Herzegovina	91	0.74	0.231	1.439			18.6	
Croatia	91	0.74	0.231	1.439			18.6	
Cyprus	101	0.6		4.8			17.9	
Greece								
Italy	71	0.6	0.09	2.9	2.9	0	13.6	
Portugal	77	0.6	0.1	0.3	0	0	17.6	0.48
Slovenia	107	1.22	0.33	0	0	0	23.71	
Spain	83	0.6	0.1	1.5		0	17.6	

Tab. 34 – Chicken, eggs, raw – Eggs group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	142	9.9	2.6	0.8			12.6	
Bosnia and Herzegovina	142	9.9	2.6	0.8			12.6	
Croatia	142	9.9	2.6	0.8			12.6	
Cyprus	138	9.3	2.82	1.5			12.9	
Greece	155	11.1	3.5	1.9		0	11.5	
Italy	128	8.7	3.17	trace	trace	0	12.4	
Portugal	149	10.8	2.7	0	0	0	13	0.35
Slovenia	117.17	7.88	2.94	0.616	0.3		11.08	
Spain	150	11.1	3.1	trace		0	12.5	

Tab. 35 – Lentils, dried – Legumes group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	340	1.5	0.3	60.1	1	18	24.4	
Bosnia and Herzegovina	340	1.5	0.3	60.1	1	18	24.4	
Croatia	340	1.5	0.3	60.1	1	18	24.4	
Cyprus	354	1.6	0.42	62.6		4.9	24.7	
Greece								
Italy	325	2.5	0.34	54	2.4	13.7	25	
Portugal	321	0.7	0.1	47.6	1.2	11.8	25.2	0.03
Slovenia	345	2.17	0.379	59.15		10.8	24.95	
Spain	310	1.17	0.17	48.7		9.7	24.8	

Tab. 36 – Chickpeas, dried – Legumes group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	361	6.4	0.9	42		7.6	18.8	
Bosnia and Herzegovina	361	6.4	0.9	42		7.6	18.8	
Croatia	361	6.4	0.9	42		7.6	18.8	
Cyprus	357	3.4		63.2		4.1	20.7	
Greece	361	6.4	0.9	55.4		7.6	18.8	
Italy	335	4.9	0.63	54.3	3.7	13.8	21.8	
Portugal	354	5	0.5	51.4	2.8	13.5	19	0.015
Slovenia	387	6.69	0.69	57.8	10.5	10.8	22.4	
Spain	336	6.3	0.42	49.2		14.97	19.3	

Tab. 37 – Potato, raw – Legumes group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	76.67	0.3	0.06	17.2		1.3	1.8	
Bosnia and Herzegovina	76.67	0.3	0.06	17.2		1.3	1.8	
Croatia	76.67	0.3	0.06	17.2		1.3	1.8	
Cyprus	72	0		16.2		1.3	1.8	
Greece	52	trace		13.2		0.8	1.9	
Italy	85	1	0.19	18	0.4	1.6	2.1	
Portugal	90	0	0	19.2	1.2	1.6	2.5	0.022
Slovenia	71.25	0.035		15.3	0	2.27	2.15	
Spain	73	0.2	0.03	15.2		1.7	2.2	

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Tab. 38 – Pork loin, raw – Red meat group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	117	3.5	1.357	0			21.2	
Bosnia and Herzegovina	117	3.5	1.357	0			21.2	
Croatia	117	3.5	1.357	0			21.2	
Cyprus								
Greece								
Italy	172	9.9	3.5	0	0	0	20.8	
Portugal	131	4.7	1.6	0	0	0	22.2	0.13
Slovenia	118	3.5	1.4	0	0	0	21.2	
Spain	152	8.9	3.28	0		0	18	

Tab. 39 – Beef loin, raw – Red meat group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	121	4	1.802	0			21.2	
Bosnia and Herzegovina	121	4	1.802	0			21.2	
Croatia	121	4	1.802	0			21.2	
Cyprus								
Greece								
Italy	134	5.2	1.73	0	0	0	21.8	
Portugal	114	3.3	1.4	0	0	0	21	0.15
Slovenia	99.34	2.37	0.721	0		0	19.29	
Spain	136	4.5	2	0		0	23.5	

Tab. 40 – Cured ham – Processed meat group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	138	6	2.6	0			21	
Bosnia and Herzegovina	138	6	2.6	0			21	
Croatia	138	6	2.6	0			21	
Cyprus	106	2.8		4.5			15.9	
Greece								
Italy	268	18.4	6.05	0	0	0	25.5	
Portugal	215	12.8	4.1	0	0	0	25	6.42
Slovenia	196.02	5.41	8.13	0.69			35.78	
Spain	319	22.6	7.94	0.2		0	28.8	

Tab. 41 – Sausage – Processed meat group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	514	44.36	16.95	0			24.14	
Bosnia and Herze-govina	514	44.36	16.95	0			24.14	
Croatia	514	44.36	16.95	0			24.14	
Cyprus	354	28.5		1.9			22.5	
Greece								
Italy								
Portugal	544	53.6	18.5	0	0	0	15.4	6.58
Slovenia	304	26.53	8.8				15.09	
Spain	323	23.1	9.6	1.9		0	27	

Tab. 42 – Chocolate cake/sweets – Sweets group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	389	20.05		52.84		2.2	3.48	
Bosnia and Herze-govina	389	20.05		52.84		2.2	3.48	
Croatia	389	20.05		52.84		2.2	3.48	
Cyprus	363	11	1.1	59.4		1.4	6	0.2
Greece	470	33.4	5	42.1		6.8	11.1	
Italy	411	25.8	14.32	33.5	21.1	7.5	13.2	
Portugal	463	26.4	11.1	47	26.8	3.8	7.4	1.08
Slovenia	371	15.1	5.43	53.4		1.6	5.3	
Spain	440	27.94	16.9	41.77		1.83	5.18	

Tab. 43 – Red wine – Wine group – Nutritional information per 100 g product.

Country	Energy (Kcal)	FAT (g)	FASAT (g)	CHO (g)	SUGAR (g)	FIBT (g)	PROT (g)	Salt (g)
Albania	68			0.2			0.1	
Bosnia and Herzegovina	68			0.2			0.1	
Croatia	68			0.2			0.1	
Cyprus								
Greece								
Italy	68	0	0	0.2	0.2	0	0.1	
Portugal	66	0	0	0.2	0.2	0	0.1	22
Slovenia	84.36			2.61	0.62		0.07	
Spain	71	0	0	0.3		0	0.23	

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1.3.2. Sustainability

The concept of sustainability emerges negatively, as a result of the analyses of the world situation, which can be described as a "planetary emergency", as an unsustainable situation that seriously threatens the future of humanity. (32)

The current concept of sustainability appears for the first time in the Brundtland report published in 1987. Also called “our common future”, this document prepared for the United Nations, alerted for the first time about the negative environmental consequences of economic development and globalization trying to offer solutions to the problems derived from industrialization and population growth. Decades later, sustainability must guarantee the needs of the present without compromising future generations or giving up any of the three essential pillars: environmental protection, social development and economic growth.

In its environmental aspect, sustainability defends that nature is not an inexhaustible source of resources and ensures its protection and rational use. Aspects such as environmental care, investment in renewable energies, the saving of water, the commitment to sustainable mobility or the innovation in construction and architecture contribute to achieve this environmental sustainability from several fronts.

At the social level, sustainability promotes the development of individuals, communities and cultures to achieve a global level of quality, health, and adequate and equitable education. The struggle for gender equality, especially in developing countries, is another aspect that, over the next few years, will form the basis of social sustainability.

Sustainability also seeks to boost economic growth that generates equitable wealth without damaging natural resources. An equal investment and distribution of economic resources will enable the other pillars of sustainability to be promoted in order to achieve full development. Humanity faces numerous challenges to ensure that all people have equal opportunities for development and well-being. In 2000, the United Nations adopted eight goals to meet the major needs of the poorest; 15 years

later, 193 countries approved the 2030 Agenda that contains the objectives of sustainable development, a set of common goals to protect the planet and ensure the welfare of all people.

These goals require the active involvement of civil society, businesses, administrations and countries around the world whose success would mean a more egalitarian and livable world. These are 17 ambitious objectives that are interrelated and often the key to one's success will involve the most frequent issues linked to another. The objectives could be summarized as follows:

1. The eradication of poverty and hunger by ensuring a healthy life.
2. Universalize access to basic services such as water, sanitation and sustainable energy.
3. Support the generation of development opportunities through inclusive education and decent work.
4. Promote innovation and resilient infrastructure by creating communities and cities capable of producing and consuming sustainably.
5. Reduce global inequalities, especially those of gender.
6. Caring for the environment by combating climate change and protecting the oceans and terrestrial ecosystems.
7. Promote collaboration between the different social actors to create an environment of peace and sustainable development0. (33)

It is increasingly evident that the current use, development and management of the planet's water resources and the services they provide are unsustainable. Water use has been growing at more than twice the rate of population increases in the last century, and an increasing number of regions are chronically short of water.

Water is a key determinant in all aspects of social, economic and environmental development and should therefore be a central focus of any post-2015 framework for poverty eradication, food security, resilience to natural and human-induced disasters, and global sustainable development.

Water cuts across all sectors and boundaries and is impacted by a number of externalities such as economic development, changing lifestyles and consumption patterns, an increasing and mobile global population, climate change, and technological and social changes. Leaders need to make water an integral part of their decision-making processes.

Safe drinking water, sanitation and hygiene, the sustainable management and development of water resources and the protection of aquatic biological resources, wastewater management and water quality are all indispensable elements for building a water-secure world. (34)

Table 44. Water withdrawal for agriculture use (%) – FAOSTAT 2002

	%	Flag description
Albania	-	No data
Bosnia and Herzegovina	-	No data
Croatia	-	No data
Cyprus	76,19	Calculated data
Greece	90,73	Calculated data
Italy	-	No data
Portugal	73,05	Calculated data
Slovenia	3,23	Calculated data
Spain	63,93	Calculated data

Climate change adds another challenge to food and agriculture systems. It poses a fundamental threat to global food security, sustainable development and poverty eradication. Agriculture, including the forestry and fisheries sectors, must adapt to the impacts of climate change and improve the resilience of rural production systems and value chains while managing a sustainable increase in its goods and services.

While agriculture, forestry and fisheries do contribute to Greenhouse Gas (GHG) emissions, they also offer opportunities for climate change mitigation. When supported through appropriate incentive mechanisms, mitigation can work in synergy with adaptation, contributing substantially to rural development and

environmental sustainability. Climate change must be addressed as an integral part of the overall development agenda to result in sustainable beneficial outcomes. (35). In the following table, you can see the amount of CO2 emitted by different areas. Italy is the country with the highest amount of CO2 in the transport and industry sector, while Spain in the agriculture sector.

Table 45. Emissions of CO2 eq. by sectors (Gigagrams) – FAOSTAT 2002

	Transport	Industrial processes and product use	Agriculture total
Albania	2,406.0131	672.7411	2,788.2319
Bosnia and Herzegovina	2,831.6371	1,844.6508	2,482.6629
Croatia	6,174.2252	4,954.7867	2,736.0329
Cyprus	1980	1,197.559	424.4276
Greece	21,965.2995	10,259.52	7,933.7607
Italy	113,437.4851	44,707.5581	29,726.8279
Portugal	17,276.5142	16,326.5478	6,129.0686
Slovenia	4,408.7086	2,716.0685	1,495.1721
Spain	101,765.1471	37,381.9812	36,037.9914

The world has the capacity to produce enough food to feed everyone adequately. Yet despite progress made over the past two decades, about 793 million (2015) people in the world, or just over one in every nine human beings, still suffer from hunger on a daily basis. While it has decreased from 18.6 percent in 1990-92 to less than 11 percent in 2014-16, this persistently high number remains unacceptable.

The right to adequate food is a universal human right that is realized when all people always have physical and economic access to adequate food or the means for its procurement, without discrimination of any kind. Ensuring food security requires action in multiple dimensions, including improving the governance of food systems; inclusive and responsible investments in agriculture and rural areas, in health and education; empowering small producers; and strengthening social protection mechanisms for risk reduction.

Table 46 Prevalence of severe food insecurity in the total population (%) – FAOSTAT 2015-2017

	%	Flag description
Albania	10.5	FAO estimate
Bosnia and Herzegovina	1.5	FAO estimate
Croatia	0.8	FAO estimate
Cyprus	-	Not reported
Greece	3.1	FAO estimate
Italy	1	FAO estimate
Portugal	3.7	FAO estimate
Slovenia	-	Not reported
Spain	1.4	FAO estimate

Looking at Table 46, you can compare that Albania, Portugal and Greece respectively have the highest prevalence of food insecurity, while Croatia has the lowest percentage.

Given that food security is defined and understood through its four dimensions (availability, access, stability and utilization) it can best be explained and measured through a 'suite of indicators'. Hunger and food insecurity can be ended within a generation. For this to happen, however, more concerted efforts are required. All the pledges made to eradicate hunger and food insecurity need to be translated into policy and programme implementation and the mobilization of enough financial resources. (36)

On the other hand, we are currently undergoing climate change and population growth where diets are getting worse. Food production and consumption are responsible for 19-29% of greenhouse gas emissions. The increase in meat consumption could grow by 80% by 2050. Meanwhile, malnutrition remains a problem in all its forms. From malnutrition, and micronutrient deficiency to overweight and obesity. Furthermore, non-communicable diseases, especially type II diabetes, coronary heart disease and certain types of cancer are rising. Because of this, it is necessary to promote healthier food systems that are sustainable.

The definition of a sustainable diet was presented at an FAO Symposium in 2012: "Sustainable diets protect and respect biodiversity and ecosystems. They are culturally accepted, accessible, economically fair and affordable; nutritionally appropriate, safe and healthy, and at the same time optimize natural and human resources" (37). It is a definition that involves both, the logical components of nutrition and the environment and the economic and sociocultural aspects where these diets are immersed.

More and more countries are incorporating sustainability criteria into food guides. As it is important that it becomes an increasingly widespread feature, the United Nations (UN) edited in 2016 a review of the inclusion of these criteria within the actions it has carried out in the UN Decade of Action on Nutrition 2016-2025. It aims to be a guide for the incorporation of these aspects in other countries.

In 2015, the Sustainable Development Summit was held where UN countries adopted the 2030 Agenda with 17 Sustainable Development Goals (SDGs). Several goals are related to the definition of a sustainable diet:

- 2nd goal - Ending hunger, achieving food security and improving nutrition and promoting sustainable agriculture.
- 3rd goal - Ensure healthy living and promote welfare for all at all ages.
- 6th goal - Ensure water availability and sustainable management, and sanitation for all.
- 12th goal - Ensure sustainable consumption and production patterns.
- 14th goal - Conserve and sustainably utilize oceans, seas and marine resources for sustainable development.

The Mediterranean Diet is a valuable cultural heritage that represents much more than a simple nutritional, rich and healthy pattern. It is a balanced lifestyle that gathers recipes, cooking forms, celebrations, customs, typical products, and diverse human activities. UNESCO recognized this by including the Mediterranean Diet on the Representative List of Intangible Cultural Heritage of Humanity in 2010.

In the Mediterranean Diet, foods of vegetable origin are consumed abundantly: fruits, vegetables, legumes, mushrooms and nuts. Daily bread, food from grains (pasta, rice) and dairy products (mainly yogurt and cheese) are consumed. The main source of fat is olive oil.

The definition of a sustainable diet is explained in the Mediterranean Diet by four separate benefits:

1. Increased health and nutrition. It is associated to the prevention of major chronic NCDs.
2. Reduced environmental impact and biodiversity richness. Many studies show that it has a lower environmental impact than other diets. Moreover, there is an extraordinary richness of biological diversity and the use of many species, both cultivated and wild.
3. A high sociocultural value of food. Consumption is linked to production and social and cultural factors.
4. A positive local economic return. Designations of origin and quality standards are enhanced. (38)

The Mediterranean Diet is being studied in depth by FAO and CIHEAM (International Center for Advanced Mediterranean Agronomic Studies) as a sustainable diet model. It has been scientifically proven, and there is increasing evidence, that it is a healthy dietary pattern based on vegetable consumption. Many studies indicate that their environmental impact is lower. If we increase adherence to the Mediterranean Diet in the Mediterranean population, we improve dietary diversity and consumption of plants with lower greenhouse gas emissions. In this way, we reduce the loss of food diversity, the consumption of animal products and the use of natural resources. It is also important to promote the consumption of seasonal and local products to reduce emissions due to distribution and transportation. (39)

An important additional point to study is fishing: fish is an important part of the Mediterranean Diet. Different factors have damaged the health of the Mediterranean Sea: unsustainable development, pollution, habitat destruction, and overfishing. The

UN is getting involved to improve the situation: it is the 17th objective of the Sustainable Development Goals. Strategies are being proposed to achieve this: Implement integrated ecosystem planning and management, adopt a sustainable blue economy approach, achieve climate resilience and carbon-free economies, unlock the productive potential of natural assets through public and private financing, reduce the footprint of mass tourism and seek more sustainable tourism models, and ensure the sustainability of the fisheries sector. (40)

Furthermore, due to the growth of aquaculture, the GFCM (General Fisheries Commission of the Mediterranean) is working on the sustainable development of aquafarming in the Mediterranean. The objectives are to develop an efficient regulatory and administrative framework, improve interactions between aquaculture and the environment, facilitate market-oriented aquaculture and improve public perception. (41)

Different studies analyze the impact of the adjustment to a Mediterranean Diet. Detailed below. Adopting the Mediterranean Diet would mean a reduction in greenhouse gas emissions of between 6% and 17% and a reduction in land use of 48%. (42) A projection from 2009 to 2050 estimated that implementing a Mediterranean Diet would reduce emissions for food production by 30%. And then there would be no increase in these emissions despite a population increase of 36%. (43The environmental footprint of a diet is measurable. A study in Spain has shown that the environmental footprint of the Mediterranean Diet is lower than the Spanish diet and much lower than the Western diet. Land use in agriculture, energy and water consumption, and greenhouse gas emissions have been measured. The adherence of Spaniards to the Mediterranean Diet would reduce the environmental footprint in all these aspects: land use in agriculture 58%, energy consumption 52%, 33% water consumption and 72% greenhouse gas emissions. Adherence to a Western diet, on the other hand, would increase these measurements by 12 to 72%. (44)

Another study in Italy also measured the environmental footprint. In this case, regarding carbon, water, and ecological footprint, the result is the same.

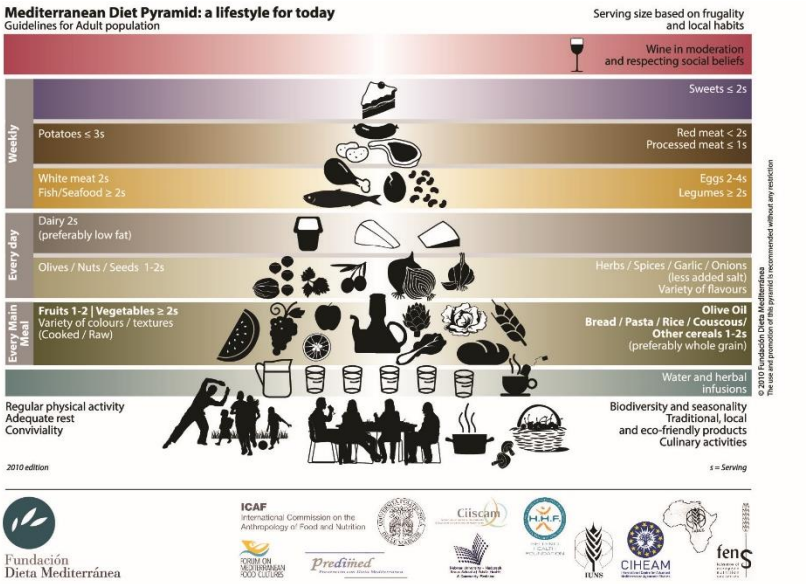
Mediterranean Diet is inferior to the Italian diet. Also, adopting the Mediterranean Diet would not represent any changes to family spending. (45)

The sustainability of the Mediterranean Diet and the consumption of organic foods has also been analyzed. "Organic agriculture is a holistic system of production management that promotes and improves the health of the agroecosystem, and in particular biodiversity, biological cycles, and soil biological activity. It emphasizes the use of management practices, preferring the use of external inputs to the farm, taking into account that regional conditions will require locally adapted systems. This is achieved by using, whenever possible, cultural, biological and mechanical methods, as opposed to the use of synthetic materials, to fulfill each specific function within the system. " (Codex Alimentarius Commission, 1999). In both cases, indicators related to sustainability were improved. The best result was found in the organic food consumption group with adherence to the Mediterranean Diet except for economic reasons. (46,47)

1.3.3. Components of the Mediterranean Diet

Plant-based foods are the main constituents of the Mediterranean Diet. This dietary pattern is rich in fruits, vegetables, beans, legumes and whole grains cereals, with complex carbohydrates. Nuts and seeds are also present in daily intake. Moreover, it is also rich in monounsaturated fatty acids due to olive oil, which is a key food of Mediterranean Diet and it is used for all cooking and dressing techniques. While animal origin foods intake is less relevant, dairy foods consumption is low or moderate, mainly fermented milks like yogurt and cheese, which are recommended daily. On the one hand, fish, seafood and lean meat intake are present in diet around twice per week. Eggs consumption is also moderate, whereas red meat and processed meat intake is limited, less than once per week. On the other hand, it is common to accompany food intake with moderate wine drinking during meals. Mediterranean Diet also stands out for its spices richness, which strength its organoleptic qualities, mainly smell and taste, outside adding salt or fat. Another added value is that the ingredients used in characteristic Mediterranean recipes are mainly seasonal, grown or produced locally and they are minimally processed. Moreover, seasonal fruits are the most common daily desserts, promoting a reduction in simple sugar presence (48,49).

Fig.10. Mediterranean Diet Foundation's Pyramid f



Beyond foods that make up Mediterranean Diet, it is based on social harmony and family time, daily meetings around the table, special events and festivities sharing the cooking time and traditional recipes, which passed down through families. Therefore, Mediterranean Diet is a life-style, within the framework of an active life, including work, outdoor leisure activities and adequate rest.

From the nutritional point of view, in traditional Mediterranean Diet, total fats represent approximately a 25-35% of daily energy intake and only 7-8% of it is saturated fat acids, being scarce in animal fats. By contrast, it is rich in monounsaturated fatty acids. As well, it has an adequate Healthy omega-6 and omega-3 fatty acids ratio. Regarding to carbohydrates content, they are mainly complex carbohydrates, with a minor presence of simple sugars. The characteristic plant origin foods content makes Mediterranean Diet rich in fibre, vitamins, minerals and in phytochemical compounds, which are present in small quantities and provide antioxidant among other health benefits (50).

Fruits and Vegetables

Fruits and vegetables are the basis of Mediterranean Diet. These are present in a high variety in almost all recipes of traditional cuisine. Equally, they can be eat raw or cooked and this is particularly beneficial given that food nutrients, micronutrients and minority compound levels vary depending on cooking temperature and procedures (14). Although, nowadays vegetables and fruits are available annually thanks to the development of new growing and crop techniques and globalization. Despite the fact that food industry enhanced unsustainable crop, Mediterranean Diet is featured by nearby products and seasonality. For that reason, fruits and vegetables are varied and vary during the year. Regarding to that, it is difficult to detail all fruits and vegetables in Mediterranean Diet, however, some of them are summarized in table 47

Tab. 47 – Fruits and vegetables in Mediterranean Diet

FRUITS	VEGETABLES
Orange, mandarin, apple, pears, strawberries, grapes, dates, figs, melons, watermelons, peaches, apricots, nectarines, lemons, cherries, pomegranates, blueberries, plums, etc.	Tomatoes, potatoes, onions, scallions, garlic, carrots, cucumber, peppers, zucchinis, broccoli, cabbage, Brussels sprouts, spinach, chard, artichokes, lettuce, beets, aubergines, pumpkin, radishes, turnips, sweet potatoes, asparagus, chicory, etc.

Fruits and vegetables have high water content and provide to diet macronutrients, micronutrients and phytochemicals (e.g. natural bioactive compounds with antioxidant proprieties, among other). Fruits highlight by their contribution of potassium and vitamin C intake, and vegetables are sources of vitamin A, C, K, E, B1, B3, B6, choline and minerals such as potassium, copper, folate, magnesium, iron, manganese and leaf vegetables contribute with carotenoids, vitamin A, C, E, folate, iron and calcium intake. Moreover, fruits and vegetables are one of the main sources of dietary fibre and phytochemicals compounds, which are liked with healthier status (51–53).

Fruit and vegetable intake has been related with several health benefits. A high consumption is associated with reduced risk of hypertension, cardiovascular heart disease and stroke, additionally to a probable cancer risk reduction when fruit and vegetables intake is high, especially during the exposure to carcinogens, such us smokers. On one hand, it seems to be enough scientific evidence that support the anti-obesogenic role of fruits and vegetables, due to its potential preventive effect on body weight gain by contributing to weight stability, because their intake usually substitute calorie-rich products (54). On the other hand, overweight and obesity are key risk factors in type 2 diabetes development, so an abundant intake of fruits and vegetables might be inversely related with diabetes type 2 incidence; however no direct associations had been observed. In addition, dementia, osteoporosis, some degenerative ocular diseases, respiratory diseases (such as asthma, chronic obstructive

pulmonary disease (COPD)) and rheumatoid arthritis are pathologies that showed favourably response to fruit and vegetable intake (55).

Whole Grain Cereals

Whole grains offer higher health benefits than refined grains, which are stripped of valuable nutrients in the refining process. Grain kernels contain three parts, the bran, germ and endosperm. In the late 19th century, it changed the way to process grains. Milling leaves only the soft, easy-to-digest endosperm, and strips away the bran and the germ. Without the fibrous bran, the grain is easier to chew. The germ is removed because of its fat content, which can limit the shelf life of processed wheat products. The resulting highly processed grains are much lower in nutritional quality, since process strips away more than half of B vitamins, almost all vitamin E, and virtually all of the fibre. Although some nutrients may be added back by fortification, other health-promoting components of whole grains cannot be replaced (56).

Some academic and industry consortium, like the Health Grain Forum, have suggested that the food labelled as "whole grain" should contain more than 30% of whole-grain ingredients, and more whole grain than refined grain ingredients, based on its dry-weight (56). An easy way to tell if a food product is high in 100% whole grains is to make sure it is listed first or second in the ingredient list. Or better yet, choose unprocessed whole grains: 1. Amaranth; 2. Kamut; 3. Spelt; 4. Barley; 5. Millet; 6. Wild Rice; 7. Brown Rice; 8. Quinoa; 9. Triticale; 10. Buckwheat; 11. Rye; 12. Bulgur; 13. Oat; 14. Corn; and 15. Sorghum.

The 2015-2020 Dietary Guidelines for Americans from the Department of Agriculture of US Government recommends eating 85 g (6 ounces) of grain foods daily and getting at least half of that grain intake from 100% whole grains (13). However, due to an increasing amount of research showing the various health benefits derived from whole grains, and even a possible detrimental effect when eating mostly refined grains, the recommendation is to choose mostly whole grains instead of refined grains. Denmark, in Europe, recommend the consumption of at least 75 g/day (57), whereas the Mediterranean diet pyramid recommends the consumption of one or two servings

of cereals (20 to 40 g) at each main meal (in the form of bread, pasta, rice, couscous and others), preferably whole grain (58).

Whole grain kernels contain the three parts, the bran, germ, and endosperm. The bran is the fibre-rich outer layer that supplies B vitamins, iron, copper, zinc, magnesium, and several phytochemicals, that have key role in disease prevention. The germ is the core of the seed and it is rich in healthy fats, vitamin E, B vitamins, and also phytochemicals. The endosperm is the interior layer that holds carbohydrates, protein, and small amounts of B vitamins and minerals. Refined grains lack of bran and endosperm, and only maintain the core of the seed.

Nowadays, all researchers consider that in the relationship between carbohydrates and health the quality of the carbohydrates is as important as the quantity. Most of the studies performed have shown a connection between whole grains and better health, although the absence of a universally accepted definition of "whole grain" difficult to study its consumption in any population.

Mortality: A meta-analysis combining results from studies conducted in the U.S., the United Kingdom, and Scandinavian countries (which included health information from over 786,000 individuals), found that people who ate 70 grams/day of whole grains—compared with those who ate little or no whole grains—had a 22% lower risk of total mortality, a 23% lower risk of cardiovascular disease mortality, and a 20% lower risk of cancer mortality (59).

Cardiovascular Disease: Eating whole grains instead of refined grains lowers plasma total cholesterol, low-density lipoprotein (LDL) cholesterol, triglycerides, and insulin concentrations. A meta-analysis of seven major studies showed that cardiovascular disease (heart attack, stroke, or the need for a procedure to bypass or open a clogged artery) was 21% less likely in people who ate 2.5 or more servings of whole-grain foods a day compared with those who ate less than 2 servings a week (60).

Diabetes: Replacing refined grains with whole grains and eating at least 2 servings of whole grains daily may help to reduce type 2 diabetes risk. The fibre, nutrients, and

phytochemicals in whole grains may improve insulin sensitivity and glucose metabolism and slow the absorption of food, preventing blood sugar spikes. In contrast, refined grains tend to have a high glycaemic index and glycaemic load with less fibre and nutrients. In a study of more than 160,000 women whose health and dietary habits were followed for up to 18 years, those who averaged 2 to 3 servings of whole grains a day were 30% less likely to have developed type 2 diabetes than those who rarely ate whole grains. When the researchers combined these results with those of several other large studies, they found that eating an extra 2 servings of whole grains a day decreased the risk of type 2 diabetes by 21% (61).

Cancer: The data on cancer are mixed, with some studies showing a protective effect of whole grains and others showing none. Thus, a large five-year study among nearly 500,000 men and women suggests that eating whole grains, but not dietary fibre, offers modest protection against colorectal cancer (62). By contrast, a review of four large population studies also showed a protective effect of whole grains from colorectal cancer, with a cumulative risk reduction of 21% (63).

Extra Virgin Olive Oil

Olive oil is a key component of the Mediterranean Diet, being the main source of vegetable fat, especially monounsaturated fatty acids (MUFA). According to the International Olive Council, there are five different types of olive oil: i. Extra Virgin Olive Oil; ii: Virgin Olive Oil; iii: Refined Olive Oil; iv: Olive Pomace Oil and v. Lampante Oil.

Extra Virgin Olive Oil (EVOO) is the best olive oil and it is very precise regards production methods, taste and chemical composition. EVOO must come from the first pressing of fresh olives, normally within 24 hours of harvesting, must be extracted by non-chemical, mechanical means, and without the use of excessive heat, the free fatty acid or acidity level must be less than 0.8% and it must be defect free – having a perfect taste and aroma. It contains multiple bioactive and antioxidant components, such as polyphenols, phytosterols and vitamin E (64). Virgin olive oil also comes from the first pressing and must have an acidity level of less than 2% therefore it is of inferior quality to Extra Virgin Olive Oil. It is flavour intensity can vary and its taste is milder than EVOO.

In contrast, some olive oils are refined by using agents such as acids, alkalis, and heat to extract as much oil as possible from the olive pulp that remains after the first pressing. The result is a fattier and more acidic oil which lacks taste, aroma and natural antioxidants. This is why producers need to add unrefined Extra Virgin or Virgin Olive Oil to impart some of flavour, colour and aroma into the blend. Since refined olive oil during the refining process loses phytochemicals, this oil is mixed with virgin olive oil to enhance the flavour, constituting the so-called common olive oil (65). The olive – pomace oil is the lowest grade of olive oil and it is made from the by-products of EVOO production. It is bland and extremely low in antioxidants. The lampante oil has severe defects, usually from bad fruit or poor processing practices. It is not fit for human consumption until it has been refined. Finally, the rapeseed oil obtained from canola is one of the oldest known vegetable oil that is also rich in oleic acid, but that differs in several other compounds with common olive oil (65).

Olive oil as a food and the Mediterranean Diet as a food pattern are associated with a decreased risk of cardiovascular disease, obesity, metabolic syndrome, type-2 diabetes and hypertension. A Mediterranean diet rich in olive oil and olive oil per se has been shown to improve cardiovascular risk factors, such as lipid profiles, blood pressure, postprandial hyperlipidemia, endothelial dysfunction, oxidative stress, and antithrombotic profiles. Although some of these beneficial effects can be attributed to the minor components of olive oil, it is very difficult to differentiate the effects of these components from those of the all fruit and even from the effects of the all diet, in this case, the Mediterranean diet (66).

All-cause mortality and cardiovascular mortality: Recent studies consistently support the concept that the OO-rich Mediterranean Diet is compatible with healthier aging and increased longevity. In the PREDIMED (PREvención con DIeta MEDiterránea) trial, olive oil consumption, specifically the extra-virgin variety, was associated with reduced risks of cardiovascular disease and mortality in individuals at high cardiovascular risk. For each 10 g/d increase in extra-virgin olive oil consumption, cardiovascular disease and mortality risk decreased by 10% and 7%, respectively (67). Similarly, a lower risk of mortality was associated with regular consumption of olive oil in an Italian population

after myocardial infarction and also in an elderly population. In the Spanish cohort of the European Prospective Investigation into Cancer and Nutrition (EPIC) study, total olive oil consumption has been associated with a decreased risk of coronary heart disease, and also all-cause and cardiovascular mortality (68). Thus, there is compiling evidences that olive oil consumption is associated with low all-cause and cardiovascular mortality.

Cardiovascular disease: Evidence suggests that olive oil intake is inversely associated with cardiovascular disease (CVD) in the Spanish general population and in a cohort of Italian women (66). A recent meta-analysis concluded that epidemiologic studies consistently found an inverse association between olive oil consumption and stroke, but there were inconsistencies between studies assessing coronary heart disease (CHD) as the end-point (69). Of note, most of the previous studies made no distinction among the different varieties of olive oil. However, several studies have found a greater beneficial effect in CHD and cardiovascular risk factors for the extra virgin olive oil variety than for the common variety (70). This distinction is important because EVOO contains much higher amounts of polyphenols than common olive oil. These polyphenols may have cardiovascular benefits beyond the lipid profile.

Diabetes: Demonstrated by dietary interventions in different population, olive oil consumption Improvement of glucose metabolism in normal subjects and patients with type 2 diabetes. Substitution of MUFA for SFA results in lower insulin requirement and plasma glucose concentrations, and is at least as effective as CHO. Two prospective studies from Southern European cohorts suggest a lower incidence of diabetes with increasing adherence to Mediterranean Diet in previously healthy persons or survivors of a myocardial infarction. In the PREDIMED trial, the arm of participants who followed a Mediterranean Diet supplemented with extra virgin olive oil showed a 40% reduction in the incidence of diabetes mellitus without significant changes in body weight (71).

Cancer: In countries where the population adheres to the Mediterranean Diet, such as Spain, Greece and Italy, and OO is the principal source of fat, rates of cancer incidence are lower than in northern European countries. Experimental and human cellular

studies have provided new evidence on the potential protective effect of olive oil on cancer. Furthermore, results of case-control and cohort studies suggest that MUFA intake including olive oil is associated with a reduction in cancer risk (mainly breast, colorectal and prostate cancers) (67).

Other effects: Olive oil consumption may also have favourable effects on obesity, reduces age-related cognitive decline and incidence of Alzheimer's disease (67).

In addition, different cohort and intervention studies have observed that olive oil consumption promotes of a less prothrombotic environment compared with SFA-rich diets, influencing different thrombogenic factors: reduction of platelet aggregation, thromboxane B2 production, von Willebrand factor (vWf), tissue factor, tissue factor pathway inhibitor, PAI-1, Factor VII and Factor XII. These latter effects may also help to explain the reduced incidence in myocardial infarction and stroke observed in subjects with higher consumption of olive oil in several cohort studies (67).

Nuts and Seeds

Tree nuts are, by definition, dry fruits with one seed in which the ovary wall becomes hard to maturity. Common edible tree nuts include walnuts, almonds, hazelnuts, cashews, macadamia nuts, pistachios, pecans and pine nuts, but the consumer definition also includes peanuts, which are botanically legumes, but have a nutrient profile similar to that of the tree nuts and thus are identified as part of the nuts food group (72). The term "seeds" include in addition to tree nuts and peanuts, whole grains, pulses, coffee, cocoa and cocoa products such as chocolate. All these seeds are small embryonic plants enclosed in a coat, the product of the ripened ovule of flowering plants after pollination and the completion of the process of reproduction (73,74).

Tree nuts and seeds are complex matrices in the outer layer and the germ, rich in minerals, vitamins and bioactive phytochemicals that protect the DNA of the plant from oxidative stress and facilitating the perpetuation of the species (72). Edible seeds, particularly fat-rich nuts are good sources of energy. Most of the energy in nuts comes from fat, but fatty acids are mostly unsaturated. Some nuts, especially walnuts, contain

sizable amounts of polyunsaturated fatty acids (PUFA), including linoleic acid (18:2n-6) and α-linolenic acid (C18:3n-3), the principal plant n-3 fatty acid. Most of seeds are rich in carbohydrate and fibre, and its content in proteins provides most essential amino acids.

Regarding micronutrients, nuts and seeds are rich in many vitamins (vitamin B6 and E, niacin and folic acid), minerals (Mg, K, and Ca) and other phytochemical compounds such as carotenoids and polyphenols (mainly, stigmasterol, campesterol, resveratrol amd catechins) (73).

Nuts and seeds have been subject of extensive *in vitro*, animal, epidemiological and clinical research.

In vitro studies have observed, for instance, that nuts extract may decrease the production of lipopolysaccharide (LPS)-induced reactive oxygen species (73) and that pistachios consumption increase the activity of paraoxonase 1 (PON1) and arylesterase, both markers of antioxidant capacity in experimental animals after 10 weeks of intervention. Similarly, walnuts inhibit inflammatory response, including transcription factor NF-κB in brain tissues (73).

At least 15 prospective cohort studies analysed the effects of nut consumption on coronary heart disease, stroke, total cancer, all-cause mortality and other causes of mortality (74-76). In summary, the results of these studies allow to estimate an 8% reduction in incidence of coronary heart disease risk for each weekly serving of nuts. Protection against coronary heart disease mortality with increasing nut consumption was also observed in the PREDIMED study population when assessed as a longitudinal study (77). Results from other cohort studies such as the Nurses' Health Study (NHS) and the Health Professionals Follow-up Study with follow-up of 30 y 24 years, respectively, again showed the same reduction in coronary heart disease mortality with increasing nut consumption, but also in all-cause and cancer mortality. Similarly, reduction in incidence of stroke, diabetes mellitus, metabolic syndrome, incident hypertension and total cancer have been observed in different cohort studies when increasing weekly nut consumption (76).

In addition to PREDIMED trial, other randomized clinical trials have investigated the effects of nut consumption on cardiovascular risk factors as an attempt to understand the underlying mechanisms for protection from coronary heart disease and others. Most studies have evaluated the effects of diets supplemented with nuts vs control diets for outcomes on lipid profile in subjects with normal or moderately elevated blood cholesterol levels (78). Other studies have assessed the effects of nut diets on glycemic control, blood pressure, insulin sensitivity, endothelial function and inflammatory status (74). In fact, walnuts reduced total cholesterol by 5.1%, LDL-cholesterol by 7.4% and LDL: HDL ratio by 8.3% (79). Nuts may also improve glycemic control in patients with diabetes mellitus, as well as blood pressure, endothelial function, and total peripheral resistance (80). Part of these latter effects has been attributed to their richness in L-arginine, PUFA and polyphenols (54). Finally, nuts may also improve oxidative status and inflammatory status (81). Thus, the effects of nuts on cardiovascular risk are beyond established cholesterol lowering without incurring increases in adiposity.

Moderate Wine Consumption

Wine is an alcoholic drink made from fermented grape juice. Yeast consumes the sugar in the grapes and converts it to ethanol, carbon dioxide, and heat. Different varieties of grapes and strains of yeasts produce different styles of wine. The effects of wine consumption on health depend on the amount consumed, but also the food with it is consumed. The highest protect effects of wine are reaches when it is consumed in moderation in a healthy diet such as the Mediterranean Diet (9).

Excessive alcohol use is a risk factor for innumerable adverse health outcomes, including cognitive impairment, cancer, cardiomyopathy, cirrhosis, gastrointestinal bleeding, trauma, and social devastation (82). However, several scientific evidences have pointed out that moderate alcohol consumption, especially wine and beer consumption may exert a protective effects on health reducing all-cause, cardiovascular and cancer mortality, as well incidence of cardiovascular disease, diabetes, neurodegenerative diseases and even certain types of cancer (83). The key is

the maintenance of a daily moderate consumption of alcohol. The National Institute on Alcohol Abuse and Alcoholism (NIAAA) has defined moderate or low-risk alcohol use as intake of ≤4 drinks on any single day AND ≤14 drinks per week for men and ≤3 drinks on any single day AND ≤7 drinks per week for women (84). Of note, the American Geriatrics Society, NIAAA, and others recommend a limit of 1 drink daily for both men and women aged 65 years and older (85).

The nutritional characteristics of a wine will depend of the type you consider, mainly white or red wine (table 48). The number of calories in wine also depends on the type of wine you choose and the serving size. For example, a serving of red wine is typically five ounces and offers 125 calories. White wine is somewhat lower in calories. Accordingly, the amount of alcohol in the different types of wine also varies significantly between varieties, but the assumption is that wine is 12% ABV (percentage of the drink made up by alcohol). The Table details the main nutritional characteristics of red and white wines according to the USDA (Department of Agriculture of the US Government). The estimated glycemic load of wine is zero. There is no fat, no proteins in wine. However, wine, especially red wine, is very rich in polyphenols, which include a large group of several hundred chemical compounds that affect the taste, colour and mouthfeel of wine. These compounds include phenolic acids, stilbenoids, flavonols, dihydroflavonols, anthocyanins, flavanol monomers (catechins) and flavanol polymers (proanthocyanidins) acids. Finally, wine is also very rich in micronutrients (vitamins and minerals).

Tab.48 – Compositional and Nutritional Characteristics of Red and White Wines (per serving, 147 g wine). Source: Adapted from USDA. Abbreviation: DFE (dietary folate equivalents).

Nutrient	Red wine	White wine
Water (g)	127	128
Energy (kcal)	125	121
Protein (g)	0.10	0.10
Lipid (fat, g)	0.00	0.00
Carbohydrate (g)	3.84	3.82
Total sugars (g)	0.91	1.41
Calcium (mg)	12	13
Iron (mg)	0.68	0.40

Nutrient	Red wine	White wine
Magnesium (mg)	18	15
Phosphorus (mg)	34	26
Potassium (mg)	187	104
Sodium (mg)	6.0	7.0
Zinc (mg)	0.21	0.18
Folate (DFE, µg)	1.0	1.0
Niacin (mg)	0.329	0.159
Riboflavin (mg)	0.046	0.022
Thiamin (mg)	0.007	0.007
Vitamin B6 (mg)	0.084	0.074
Vitamin K (µg)	0.6	0.6

Moderate alcohol use is among the most widely studied exposures in the biomedical literature and has been critically reviewed at considerable length by the NIAAA (84). First, epidemiological studies consistently suggest a lower risk of coronary heart disease and myocardial infarction (MI) among moderate drinkers than abstainers. Indeed, the association of moderate alcohol intake appears to be similar among individuals at both low and high cardiovascular risk and even among those with prevalent cardiovascular disease. Of note, a cumulative meta-analysis suggested that our best estimate of the association of alcohol and CHD has not changed in almost 20 years (86).

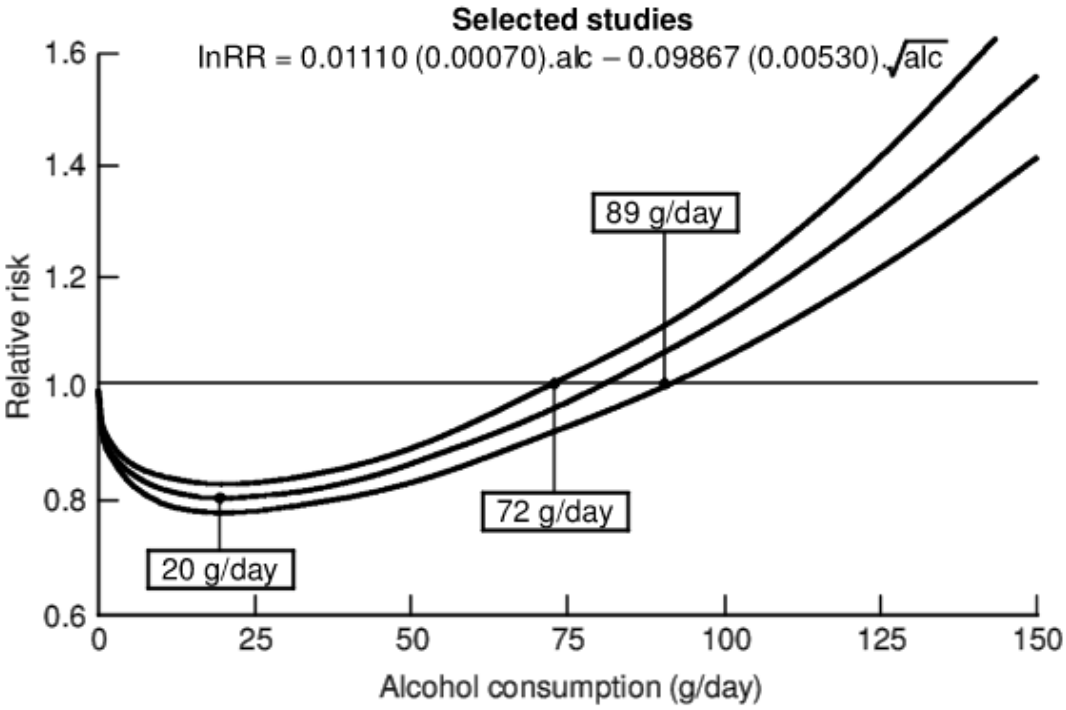
Different meta-analyses have examined the details of the relationship of alcohol consumption and risk of CHD. In the most quantitative analysis, risk gradually declined until a nadir at 20 gm/day (~1.4 drinks per day) (86). Summary relative risks of

approximately 0.8 were found, suggesting that moderate drinking is associated with 20% lower risk of CHD relative to abstention (Figure 10).

In general, the specific type of alcoholic beverage type consumed appears to be less important than the consistency with which alcohol is consumed. The beverage most likely to be inversely related to CHD in a given population tends to be the one most widely consumed in that population. Two systematic reviews of this topic have concluded that beverage type is relatively unimportant, while a recent meta-analysis found higher benefits from wine and beer than from spirits (83). The effect of alcohol on HDL-cholesterol (HDL-C; its major putative mediator) also does not differ by beverage type in controlled experiments. Thus, observational evidence generally supports the hypothesis that it is ethanol intake, per se, that is associated with lower risk of CHD.

Although less well-studied, evidence overall suggests that other coronary outcomes commonly used in clinical trials (e.g., unstable angina, coronary revascularization)

Fig.11. Relative risks of approximately 0.8 were found, suggesting that moderate drinking is associated with 20% lower risk of CHD relative to abstention



demonstrate similar associations with alcohol as does myocardial infarction. Indeed, several cohort studies have shown similar relationships across all coronary outcomes.

Other cardiovascular outcomes have also been studied extensively in relation to moderate drinking. The association of alcohol consumption with total stroke is complex, given differing associations with the major stroke types of ischemic and haemorrhagic stroke. Of note, it is likely that subtypes within these major types further differ in their associations with alcohol, presumably due to their disparate underlying etiologies. Nonetheless, light-moderate drinking has been associated with a lower risk of ischemic stroke of approximately the same magnitude as for CHD, while haemorrhagic stroke appears to have a dose-dependent positive association with alcohol intake. Etiologically, both effects could reflect an antiplatelet effect of alcohol, with the ascending limb of the J-shape for ischemic stroke further reflecting the role of hypertension due to excessive alcohol intake.

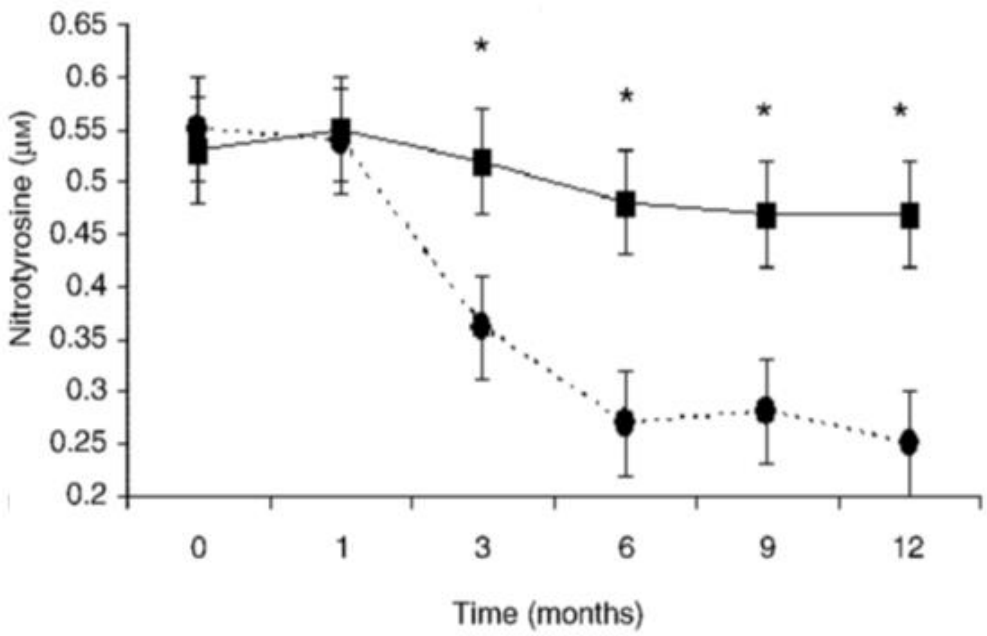
Beyond CHD and ischemic stroke, an increasingly strong series of observational studies now link moderate drinking to lower risk of type II diabetes (87). Meta-analyses suggest that the magnitude of this association might even exceed of CHD, with summary relative risks suggesting ~30% lower risk.

Previous Trials of Alcohol Consumption on Chronic Disease Risk Factors

Dozens of trials of moderate drinking over a few weeks have been conducted, many by Dr. Estruch, Hendriks and Shai (88,89). However, very few trials have administered alcohol for more than a few months. Two crossover trials administered alcohol for 16 and 12 weeks, but their design limits their zzz applicability to a long-term RCT. Importantly, a few studies of 3-24 months duration have now been reported. These provide important lessons about the feasibility and design of a long-term randomized trial of alcohol consumption. An Italian group reported a one-year randomized trial of one glass daily of red wine among 115 diabetic survivors of acute MI, although the nature of the intervention was unclear; a specific red wine was recommended, but it is uncertain whether this beverage was actually dispensed. Patients randomized to red wine demonstrated increases in HDL-C and, surprisingly, in echocardiographically determined left ventricular function. Inflammatory markers and insulin resistance also declined. Although biomarkers specific to alcohol were not reported, trends in nitrotyrosine (a short-term marker of oxidative stress) declined throughout the 12 months, suggesting sustained adherence (Figure 11, (90)).

In a 3-month parallel-design trial in Israel comparing wine with a non-alcoholic malt beverage in ~100 non-drinking diabetic adults, Shai et al. found that initiation of wine

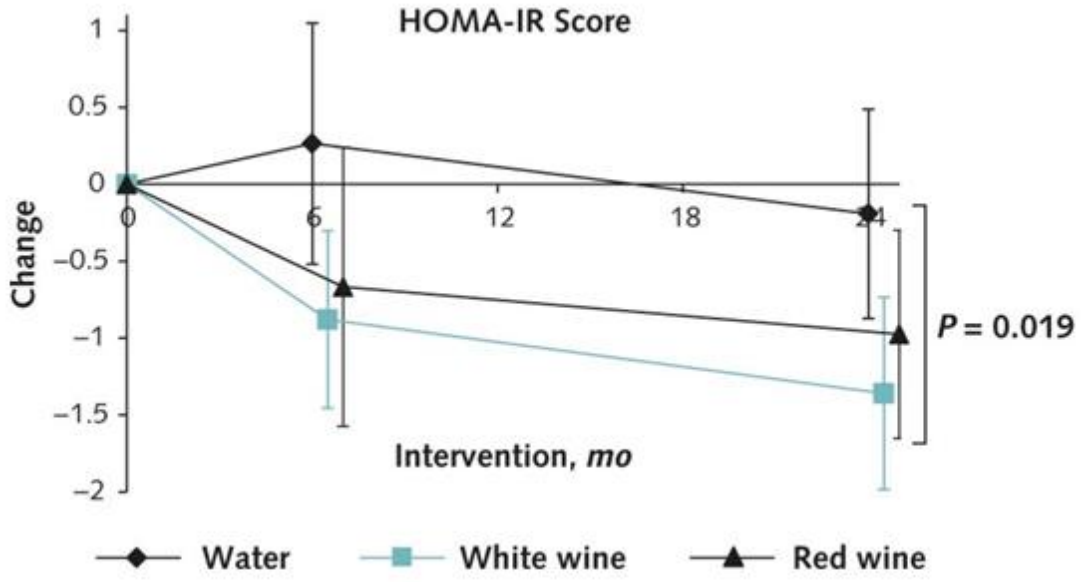
Fig. 12. Trends in nitrotyrosine (a short-term marker of oxidative stress) declined throughout the 12 months, suggesting sustained adherence



reduced fasting but not post-load glucose. Sleep improved among those randomized to wine, with no other serious side effects. In a ground-breaking follow-up, Shai and colleagues recently reported results of a 24-month-long randomized trial of diabetic adults, assigning individuals to 150 ml of mineral water, white wine, or red wine daily. Among several notable findings, insulin sensitivity improved in both wine groups relative to mineral water, with consistent improvement across the study period (Figure 12). ALT, AST, bilirubin, and alkaline phosphatase did not differ between the 3 groups (89).

Shorter trials of alcohol intake on a variety of secondary outcomes are available and suggest some plausible mechanisms for the effects of moderate drinking. The most compelling results of short-term trials of alcohol intake in humans are on levels of HDL-C. This effect of alcohol has been found so consistently and powerfully that HDL-C now provides a plausible biomarker for alcohol consumption, at least at the population level, and has been used to validate questionnaire-based assessments. A meta-analysis of 36 experimental trials of alcohol administration found that intake of 30 gm/day (i.e., ~2 drinks) raised HDL-C by ~4 mg/dl, an 8% increase from pre-treatment

Fig. 13. Insulin sensitivity improved in both wine groups relative to mineral water, with consistent improvement across the study period



values. As noted, the effect was similar in studies of beer, wine, spirits, or pure ethanol (91).

Short-term trials have also examined the effect of alcohol on measures of glucose metabolism and control. In crossover studies, the USDA found that alcohol consumption had no effect on fasting glucose levels but lowered insulin levels, consistent with improved insulin sensitivity.

Cancer: several non-cardiovascular outcomes have strong, plausible relations with moderate drinking, and these bear directly on the safety of any clinical trial of alcohol consumption. Among these, cancer is the most feared and breast cancer the best studied. In observational studies, alcohol consumption appears to have a linear association with breast cancer, with no safe level of intake. Some evidence suggests a similar relationship for other cancers, although the strongest evidence is for oropharyngeal and oesophageal cancers that are less common in the U.S. Perhaps most compellingly, moderate alcohol consumption has been associated with a lower risk of total mortality, chiefly reflecting its inverse association with cardiovascular mortality.

Herbs and spices

Herbs and spices have a leading role in Mediterranean Diet, contributing to the well-known flavours and smells related to traditional food preparations like seasonings or traditional sauces, such us pesto. Parsley, oregano, basil, thyme, dill, fennel, marjoram, rosemary, lavender, bay leaf, sage, savoury, hyssop cumin and coriander are just few examples of the wide variety of spices and herbs used in Mediterranean Diet. They can be used as colorants, preservatives and they are useful for salt replacement, which have a special interest in the case of people with hypertension and it is a simple, but effective, strategy to reduce salt consumption in also general population.

Herbs and species are relevant by their phytochemicals content that contribute to the organoleptic characteristics and health effects, rather than their contribution at macronutrient level. For instance, bay leaf is flavones-rich food, such as quercetin;

kaempferol and coriander seeds are notable by their caffeoyl derivatives and *p*-coumaric acid content, while leafs are rich in quercetin-3-*O*-rutinoside (92). Cooking methods also influence spices and herbs composition, that is why the highest phytochemical levels are found in warm liquid and steaming preparations while grilling can reduce their amount and antioxidant capacity (93).

Additionally, herbal extracts has been traditionally used for medical uses by different population, included Mediterranean regions (94). Numerous studies have been conducted in both animals and humans to evaluate herbs and spices effects in health, and it has been found association with benefits over metabolic syndrome, type 2 diabetes, inflammatory level, as well as improvements in blood lipid, glucose levels and blood pressure (95,96). Nevertheless, it is important to continue developing studies in this area, to obtain more robust evidences.

Dairy Foods

Mediterranean Diet include moderate daily intake of dairy products, mainly fermented products such as cheese and yogurt, which traditionally have allowed to preserve milk and to add rich nutrient foods to the diet (58) and have a lower lactose content, but also Mediterranean Diet include milk, which is mostly consumed by children. Cheese, for example, can be eaten alone with bread, added to salads or other culinary preparations, while milk is mainly drunk during breakfast.

Dairy foods are an important source of protein, calcium and vitamin D. In general, these foods are rich in saturated fats so, some guidelines recommend non-fat or moderate low fat products intake. However, this recommendation it is currently under study.

Dairy foods intake has been related with health effects. Evidence relates fermented food intake in Mediterranean Diet, like cheese and yogurt, with positive microbiome modulation (97,98), in addition these fermented dairy products are associated with lower cardiovascular risk (99,100). Furthermore, a randomized controlled trial, that included old individuals at high risk of cardiovascular disease eating Mediterranean

Diet, found that a high daily dairy consumption, especially yogurt, was associated with lower type 2 diabetes risk (101,102), while a high intake of low-fat dairy products, yogurt and low-fat milk were related with a reduction of metabolic syndrome risk. However, there are controversial results about cheese intake and metabolic syndrome risk (103,104). This study also observed that high total dairy intake and low fat milk consumption in Mediterranean Diet context was related with a lower colorectal cancer risk (105). Nevertheless, more research is needed in this area (106,107).

Legumes

Mediterranean Diet is rich in legumes (or pulses) intake, like chickpeas, lentils, white beans, broad beans or lupins, among other. They are consumed at least 2 times per week, frequently in stews, soups or as a part of salad.

At nutritional level, legumes intake is a source of vegetable protein, fibre, vitamins, minerals and minority phytochemical compounds.

At nutritional level, legumes intake is a source of plan-based protein, they are low in fat, rich in fibre and contribute with minority phytochemical compounds, which are related to bioactive properties but, at the same time, may have anti-nutritional properties that are eliminated or reduced through processing, soaking, sprouting and fermentation processes. Legumes have a particular interest because are a source of essential amino acids, excluding sulphur containing amino acids, that in combination with other foods represent a good alternative and can substitute red or processed meat and improve diet quality.

Regarding to health, a high legume intake has been associated with health improvements. A meta-analysis that included results from 6 studies and 80,871 incident hypertension cases, concluded that there was an inverse association between legume intake and hypertension risk (108). Moreover, legumes intake has been related to a reduction in total cholesterol and LDL-C (109), so legumes may have a protector role. In addition, high legumes intake has been related to lower obesity and overweight risk (54), and this might be due to a satiating effect, especially in a context of energy

restricted dietary patterns (110). Furthermore, gut microbiota legume fermentation leads to the synthesis of short-chain fatty acids, like butyrate, which is a biological interesting compound due to its association with antitumor properties (111,112). In PREDIMED study, a randomized clinical trial, that included old subjects with high cardiovascular risk, found that high legumes intake was associated with lower risk of cancer mortality (113). This study also observed that high legume intake in the framework of Mediterranean Diet was inversely associated with type 2 incidence (114). Legumes can modulate blood glucose levels and contributed to improve insulin sensitivity (115), which is particularly interesting in diabetes treatment (116). Besides, legumes phytochemical compounds are also relevant because of their antioxidant activity (117).

Fish and Shellfish

Mediterranean Diet includes a moderate and varied intake of fish (lean fish, oily fish) and shellfish, around 2 or more serves per week. Generally, the variety of the fish consumed depends on the availability, according to sea proximity and the season (cod, sardines, anchovy, mackerel, hake, herring, bluefin tuna, octopus, crustaceans like lobsters and crabs, etc.(84,118)).

Both fish and shellfish are good sources of high quality proteins and lipids, mainly long-chain PUFA content, especially omega-3 derives such as eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). Although their lipid profile vary significantly among species, saltwater fish have a higher fat content and are richer in omega-3 fatty acids than others (119). Fish is also a good mineral and vitamins source (mainly calcium, iron, selenium, zinc, and vitamin A, B3, B6, B12, E, and D (120)). Nevertheless, it is possible to find certain environmental contaminants, such as heavy metals and organic compounds, in some fish species due to the accumulation along the food chain. For that reason, predatory larger and longest-lived fish may have the highest levels (121).

Polyunsaturated omega-3 fatty acids are present in cellular membrane composition and can participate in gene expression modulation (122,123). They participate in cognitive and retina development and desired omega-3 levels of intake have been

associated with beneficial cardiovascular effects (antithrombotic, hypolipidemic, anti-inflammatory and vasodilator (124)). Its intake has been associated with cardiac death prevention by arrhythmia, heart failure and ischemic cardiac events (125). In addition, omega-3-mediated inflammatory response reduction seems to show a protective effect against obesity, metabolic syndrome and type 2 diabetes development, which diseases are characterized by low degree of chronic inflammation (126). Concerning to pollutant levels, a varied diet that includes different fish species prevent a high exposure to these compounds and this is special interesting for frequently fish consumers, pregnant and breastfeeding women and young children (127).

Lean Meat and Eggs

Although Mediterranean Diet is mainly a plant-based dietary pattern, it also includes moderate intake of lean meat, such as poultry and eggs, while red and processed meat intake is limited (58). Eggs, for instance, are used as the main ingredient in some traditional recipe preparations.

Lean meat and eggs are high quality protein, mineral and vitamin sources. Lean meat composition is based on lower saturated fatty acids levels compared to non-lean meats, while eggs composition is rich in monounsaturated fatty acids and cholesterol (51).

Lean meat intake instead of red or processed meat is more beneficial, especially in the prevention of some diseases which a high intake of red and processed meat have been associated to a higher risk: metabolic syndrome, type 2 diabetes, cardiovascular diseases, and some kinds of cancer (128–131). In fact, processed meat has been recently classified as carcinogenic agent and red meat as a probably carcinogenic agent by the International Agency for Research on Cancer (IARC) from the World Health Organization (WHO, (132)).

The association between eggs and health has been widely discussed, mainly because of their high cholesterol content. Last published results suggest that egg intake is associated to total cholesterol (TC) blood plasma, LDL-C and high-density lipoprotein

cholesterol (HDL-C) increase, but without effect over triglycerides concentration or LDL-C/HDL-C and TC/HDL-C ratios (133). However, regarding cardiovascular diseases risk and eggs intake link, there appears not to be enough scientific evidence that support this association, however in patients with cardiovascular diseases and/or type 2 diabetes a moderate intake would be prudent (134,135). Nevertheless, controversies remain in this field and more research is necessary.

1.3.4. Mediterranean Diet and Health: evidences

Life Expectancy and Mortality Rates

Several ecological and cohort studies have evaluated the effects of a high adherence to traditional Mediterranean diet to life expectancy and, consequently, to all-cause mortality and mortality due to specific causes. The second phase of the Seven Country Study, an ecological study, already observed a significantly lower mortality due to cardiovascular disease in Greece compared to the mortality observed in USA or Finland in the sixties (136). More recent ecological studies have confirmed the high life expectancy of Mediterranean counties (i.e. Spain and Israel) compared to the countries from the North of Europe or USA. In fact, Spain ranked the second position behind Japan in the ranking of the countries with the highest life expectancy (137). These differences in life expectancy and mortality rates observed between countries have been attributed to lifestyle habits followed by general population from these countries, mainly the dietary patterns followed and the exercise performed. Several cohort studies have also analysed the relationship between Mediterranean diet also observed that high adherence to traditional Mediterranean diet was significant associated with low death risk (138). A population-based investigation involving 22,043 adults in Greece who were followed-up a mean of 44 months observed that a higher degree of adherence to the Mediterranean diet was associated with a reduction in total mortality (adjusted hazard ratio for death associated with a two-point increment in the Mediterranean-diet score, 0.75 [95 percent confidence interval, 0.64 to 0.87]). Thus, greater adherence to the traditional Mediterranean diet is associated with a significant reduction in total mortality. In other longitudinal analysis on 5,200 individuals aged ≥65

years from the Italian Moli-sani study cohort (2005-2010) who were followed-up a mean of 8.1 years, adherence to the MD was appraised by the a priori Mediterranean diet score (MDS; range 0-9). A one-point increase in the MDS was associated with lower risk of all-cause, coronary artery disease / cerebrovascular and non-cardiovascular/non-cancer mortality (multi-variable hazard ratio (HR)=0·94; 95 % CI 0·90, 0·98; HR=0·91; 95 % CI 0·83, 0·99 and HR=0·89; 95 % CI 0·81, 0·96, respectively) (139).

Several meta-analyses of cohort studies that have analysed the relationship between adherence to Mediterranean diet and all-cause and cardiovascular mortality have observed Again, in the most recent meta-analysis, in which PubMed and Scopus databases were searched from inception until April 2018 to identify prospective studies on the Mediterranean diet and death risk in the elderly. This meta-analysis again showed that closer adherence to the Mediterranean diet was associated with prolonged survival in elderly individuals, suggesting the appropriateness for older persons to adopt/preserve the Mediterranean diet to maximise their prospects for survival.

Obesity and Overweight

Obesity is a key risk factor for morbidity and mortality from cardiovascular disease and for the development of type 2 diabetes, some cancers, and musculoskeletal disorders (140). The standard recommendation for the prevention and treatment of obesity is restricting dietary energy intake and increasing physical activity. Because of the high energy of fat, the belief persists that increased dietary fat intake will lead to weight gain, whereas reduced fat intake will promote weight loss. By sharp contrast with this view, results from clinical trials testing low-fat diets for the prevention of cardiovascular disease in postmenopausal women and patients with diabetes did not show any benefit of reduced fat intake with respect to prevention of cardiovascular disease outcomes (141). The results of a meta-analysis of trials comparing low-fat versus high-fat dietary interventions favoured high-fat diets for weight loss, albeit only in the context of calorie restriction (142). In addition, long-term adherence to energy-restricted diets low in fat and high in complex carbohydrates to achieve weight loss is

generally poor and weight regain usually ensues 6-12 months after commencing such diets (143). In this context, short-term and long-term randomized controlled trials of a high-calorie, high-fat diet as the Mediterranean diet for weight loss suggested that there was no effect on bodyweight when the diet was not calorie restricted (144). Thus, after a median 4.8 years of follow-up, participants in the PREDIMED trial had marginally reduced bodyweight and increased waist circumference. The adjusted difference in 5-year changes in bodyweight in the Mediterranean diet with olive oil group was -0.41 kg (95% CI, -0.83 to 0.01; p=0.056) and in the nut group -0.02 kg (-0.45 to 0.42; p=0.942), compared with the control group. The adjusted difference in 5-year changes in waist circumference was -0.47 cm (-1.11 to 0.18; p=0.154) in the Mediterranean diet with olive oil group and -0.92 cm (-1.60 to -0.24; p=0.008) in the nut group, compared with the control group. Thus, a long-term intervention with an unrestricted-calorie, high-vegetable-fat Mediterranean diet was associated with null changes or even small decreases in bodyweight and less gain in central adiposity compared with a control diet. These results lend support to advice not restricting intake of healthy fats for body weight maintenance.

Cardiovascular Diseases

Cardiovascular disease continues to be the main cause of death worldwide. Lifestyle factors, including a healthy diet as Mediterranean diet, are considered the main determinants of health (145). In this context, observational cohort studies (138) and a secondary prevention trial, the Lyon Heart Diet Study (146), have shown that increasing adherence to the Mediterranean diet has been consistently associated with lower cardiovascular risk inverse associations between adherence to the Mediterranean diet and cardiovascular risk. In fact, a systematic review ranked the Mediterranean diet as the most likely dietary model to provide protection against coronary heart disease (147). Small clinical trials have uncovered plausible biological mechanisms to explain the salutary effects of this food pattern. The PREDIMED study was designed as a randomized trial to test the efficacy of two Mediterranean diets, one supplemented with extra-virgin olive oil and another with nuts, compared with a control diet (advice on a low-fat diet) on primary cardiovascular prevention. In this trial of high-risk

individuals without cardiovascular disease, assignment to an energy-unrestricted Mediterranean diet supplemented with either extra-virgin olive oil or nuts was associated with a 30% relative reduction in major cardiovascular events and a 1.7 to 2.1 percentage point absolute reduction over 5 years. A per-protocol analysis also suggests that greater risk reductions would be achieved under full adherence (148).

In conclusion, in this primary prevention trial, we observed high-risk individuals assigned to energy-unrestricted Mediterranean diets, supplemented with extra-virgin olive oil or nuts, experienced a lower rate of major cardiovascular events than those assigned to a reduced fat diet. Our findings support a beneficial effect of the Mediterranean diet for the primary prevention of cardiovascular disease.

Type 2 Diabetes

Type 2 diabetes mellitus represents a major health problem because worldwide prevalence has more than doubled in the past 3 decades, with nearly 347 million persons with diabetes in 2010, and is a potent risk factor for cardiovascular disease (CVD), blindness, renal failure, and lower limb amputation (149). Prospective epidemiologic studies strongly suggest that dietary patterns characterized by high consumption of fruit, vegetables, whole grains, and fish and reduced consumption of red and processed meat, sugar-sweetened beverages and starchy foods delay diabetes onset (150). In the last years, the traditional Mediterranean diet has emerged as a healthy dietary pattern that is also associated with a decreased risk for diabetes (151). The Mediterranean diet is moderately rich in fat (35% to 40% of energy), especially from vegetable sources (rich in olive oil and nuts), and relatively low in dairy products. Moderate consumption of alcohol, mostly wine, and frequent use of sauces with tomato, onions, garlic, and spices for meal preparation are also typical.

Data from the PREDIMED (Prevención con Dieta Mediterránea) study (71,152) showed that traditional Mediterranean diets enriched with high-fat foods of vegetable origin decreased the incidence of diabetes. In this trial, we found that a long-term intervention with a high quality dietary pattern akin to the traditional Mediterranean diet and rich in extra virgin olive oil could reduce the incidence of diabetes in older

persons at high cardiovascular risk. This beneficial effect was mainly due to the overall composition of the dietary pattern, and not to calorie restriction, increased physical activity, or weight loss because such lifestyle changes were not part of the intervention and between-group changes were negligible. After a median 4.1-year follow-up, a statistically significant 40% relative risk reduction in diabetes risk was seen in the Mediterranean diet groups supplemented with EVOO, in comparison with the control diet group.

In conclusion, the PREDIMED trial provides strong evidence that long-term adherence to a Mediterranean diet supplemented with olive oil without energy restrictions, which is high in monounsaturated fat and bioactive polyphenols, results in a substantial reduction in the risk for type 2 diabetes among older persons with high cardiovascular risk. Of note, this dietary pattern is palatable and has a high potential for long-term sustainability, with obvious public health implications for primary prevention of diabetes.

Cancer

Mortality rate due to cancer has been decreasing since the 1990s, most likely due to improved measures of preventive examinations as well as therapeutic interventions. However, this heterogeneous complex of diseases still remains one of the major causes of premature death worldwide as it is ranked second to cardiovascular diseases in current statistics. Cancer incidence is estimated to be 18% by the year 2030 (153).

A recent meta-analysis included randomized trials (RCTs), cohort (for specific tumours only incidence cases were used) studies, and case-control studies (154). This updated review has included a total number of 83 studies, 27 more than previous meta-analysis. An overall population of 2,130,753 subjects was included in the present update. The highest adherence score to a Mediterranean diet was inversely associated with a lower risk of cancer mortality (RR: 0.86, 95% CI 0.81 to 0.91; n = 14 studies), colorectal cancer (RR: 0.82, 95% CI 0.75 to 0.88; n = 11 studies), breast cancer (RR: 0.43, 95% CI 0.21 to 0.88; n = 1 study) (RR: 0.92, 95% CI 0.87 to 0.96; n = 16 studies), gastric cancer (RR: 0.72, 95% CI 0.60 to 0.86; n = 4 studies), liver cancer (RR: 0.58, 95% CI 0.46 to 0.73; n = 2 studies), head

and neck cancer (RR: 0.49, 95% CI 0.37 to 0.66; n = 7 studies), and prostate cancer (RR: 0.96, 95% CI 0.92 to 1.00; n = 6 studies).

Of note, it should be remarked the protective effects of Mediterranean diet on the prevention of breast cancer, the more frequent cancer in women (155), and on prostate cancer, the most frequent cancer in men (156).

Among cancer survivors, the association between the adherence to the highest Mediterranean diet category and risk of cancer mortality, and cancer recurrence was not statistically significant. Pooled analyses of individual components of the Mediterranean diet revealed that the protective effects appear to be most attributable to fruits, vegetables, and whole grains.

In conclusion, the latest meta-analysis confirms an important inverse association between adherence to a Mediterranean diet and cancer mortality and risk of several cancer types, especially colorectal cancer. These observed beneficial effects are mainly driven by higher intakes of fruits, vegetables, and whole grains.

Mental Disorders

A consequence of population aging is an increased prevalence of age-related diseases, including dementia (157). Effective preventive strategies for cognitive decline and dementia are a public health need. There is some evidence of an association between dietary habits and the development of dementia (158). Cohort studies suggest that adherence to Mediterranean-type dietary patterns is associated with reduced risk of cognitive impairment and dementia (159).

In these studies, analyses were adjusted for sex, age, energy intake and variables related to brain integrity, which are also risk factors for dementia, including educational level, physical activity, APOE genotype, and vascular risk variables. In these fully adjusted models, high adherence to Mediterranean diet has been useful to reduce incidence of total dementia and for Alzheimer's disease. Previously conducted nutrition intervention trials aimed at improving cognition or delaying progression from mild cognitive impairment to dementia have used B vitamins, vitamin E, n-3

long-chain polyunsaturated fatty acids, or vitamin D, and have mostly been ineffective (160). However, a healthy overall dietary pattern such as Mediterranean diet supplemented with extra virgin olive oil and mixed nuts have reduced rates of age-related cognitive decline after dietary intervention for 4 years (161).

Data increasingly show that some dietary patterns are connected with reduced prevalence and reduced risk of psychiatric illness, mainly anxiety and depression, but also including bipolar disorders. Studies carried out in recent years also indicate that dietary interventions in patients with depression may constitute an effective and accessible treatment strategy in depression. Thus, a healthy diet such as Mediterranean diet may help to prevent and even to improve psychiatric disorders. Thus, in diabetic participants in the PREDIMED trial we also found a significant inverse association of the Mediterranean diet with incident depression (152).

In summary, consistent findings from large observational cohorts and also intervention trial have pointed out that high adherence to traditional.

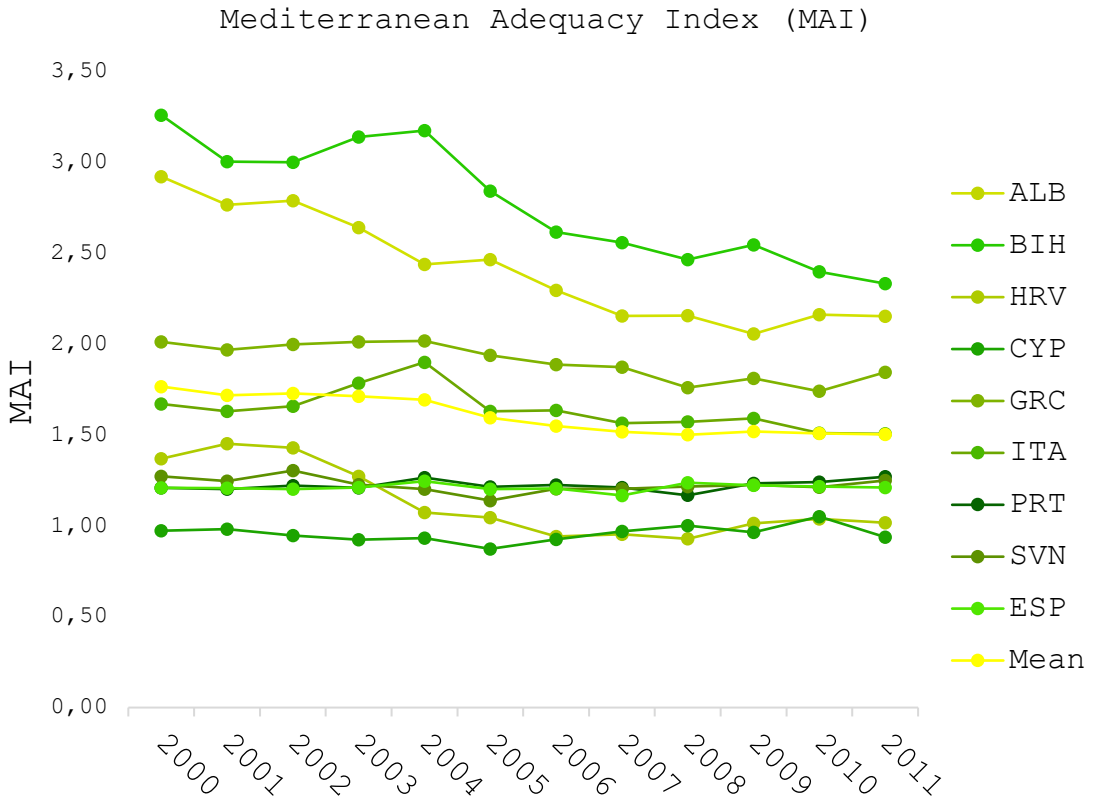
1.3.5. Adherence to Mediterranean Diet of Partners' countries and their Health link

Mediterranean Diet Adherence: 2000-2011

Briefly, Mediterranean Adequacy Index (MAI) allows evaluating population and/or countries Mediterranean Diet adherence (for more information see methods section). The MAI from partners' countries has been calculated with the following results.

Mean partner countries' Mediterranean Diet adherence has reduced by 12.8% during 2000-2011 period (Fig. 13), from 1.72 ± 0.72 to 1.50 ± 0.50. Bosnia and Herzegovina (2.78 ± 0.33), Albania (2.42 ± 0.30), Greece (1.91 ± 0.10) and Italy (1.64 ± 0.11) have the highest MAI results. While Cyprus (0.96 ± 0.04), Croatia (1.13 ± 0.20), Spain (1.21 ±0.02) and Portugal

Fig. 14 – Partner's counties Mediterranean Adequacy Index (MAI) in 2000-2011 period. Albania (ALB), Bosnia and Herzegovina (BIH), Croatia (HRV), Cyprus (CYP), Greece (GRC), Italy (ITA), Portugal (PRT), Slovenia (SVN) and Spain (ESP).



(1.22 ± 0.03) have the lowest MAI results in 2000-2011 period. However, Spanish, Portuguese, Slovene (1.23 ± 0.04) and Cypress MAI have remain more stable than other partner's MAI in this period.

Partners' countries Mediterranean Diet adherence has been reduced or maintained in 2000-2011 period. This tendency coincides with previously published results (14,162), which analysed 1961-1965, 2000-2003 and 2004-2011 periods, and found that Mediterranean countries were drifting away from the Mediterranean dietary pattern to a western diet. Besides, mean MAI from partners' countries during 2000-2003 period (1.75 ± 0.75) was lower than mean World MAI value in 2000-2003 period, that was estimated in 2.03 (14,162). However, mean MAI form partners' countries was slightly higher than MAI from Non-Mediterranean countries (1.14 ± 0.67) in this period.

These dietary pattern variations might be related to the highest food availability, and the rise of non-Mediterranean foods accessibility, which would promote dietary homogenization, globally (163). In addition, socioeconomic factors may also play a key role in reducing adherence to Mediterranean Diet, such as increasing urbanization, the economic crisis (2007-2008) and raised basic Mediterranean food prices (164).

Although MAI is a useful tool to compare availability trends between different countries, it has limitations like variation in Mediterranean diet definition, or non-Mediterranean foods selection, beside it does not take into account the different proportions of the food items, giving the same importance to all index components (20,165).

1.3.6. MD Adherence, Life Expectancy and Mortality Rates

Mediterranean Diet adherence from partners' countries and death rate, life expectancy at birth, at 65 years old and disability-adjusted life expectancy association has been studied. It should be noted that no causal relationship could be extrapolated from this analysis.

It has been found that higher MAI results were associated with a significantly lower crude death rate ($P < 0.043$), when all population were considered (Table 49) and significantly related to longer life expectancy in males older than 65 years ($P < 0.017$).

Moreover, it appear to exist a statistical tendency between higher MAI results and a higher life expectancy at birth, only when all population is considered.

Tab. 49 – β-coefficients (95% Confidence Interval (CI)) for association between Mediterranean Adequacy Index (MAI) and death rate per 1000 population, life expectancy at birth, life expectancy at age 65 and disability-adjusted life expectancy (all population, female and male) from partner's countries, in 2011.

	Model 1	*p*-Value	Model 2	*p*-Value
All population - Crude death rate per 1000 population	-0.24 (-4.50;4.02)	0.882	-2.89 (-5.39;-0.4)	**0.043***
Female - Crude death rate per 1000 population	-0.43 (-4.33;3.46)	0.773	-2.23 (-12.23;7.78)	0.216
Male - Crude death rate per 1000 population	0,33 (-4.43;5.09)	0.857	-3.57 (-25.81;18.67)	0.290
All population - Life expectancy at birth (years)	-2.219 (-7.708;3.270)	0.371	2.479 (-0.033;4.990)	0.052#
Female - Life expectancy at birth (years)	-2.680 (-7.965;2.605)	0.269	2.332 (-1.81;6.481)	0.172
Male - Life expectancy at birth (years)	-1.626 (-7.692-4.440)	0.546	3.005 (-1.842;7.851)	0.143
All population - Life expectancy at age 65 (years)	-1.424 (-5.447;2.599)	0.430	2.225 (-0.995;5.444)	0.115
Female - Life expectancy at age 65 (years)	-2.023 (-6.610;2.564)	0.332	2.386 (-2.451;7.223)	0.214
Male - Life expectancy at age 65 (years)	-0.592 (-4.451;3.266)	0.727	2.341 (0.796;3.886)	**0.017***
All population - Disability-adjusted life expectancy	-2.285 (-7.804;3.234)	0.360	0.085 (-9.318;9.488)	0.979
Female - Disability-adjusted life expectancy	-2.202 (-7.321;2.917)	0.343	1.325 (-7.096;9.747)	0.651
Male - Disability-adjusted life expectancy	-2.090 (-7.990;3.810)	0.430	-0.568 (-10.211;9.074)	0.863

These results are in accord with results of two recently published meta-analysis (140,141). On the one hand, a meta-analysis of 33 prospective cohort studies (225 600 deaths) which observed an inverse association between Mediterranean Diet and all-cause mortality. This study found that moderate alcohol consumption, and high fruit

and vegetable intakes were the Mediterranean Diet food components most inversely associated with mortality (166). On the other hand, an umbrella review of meta-analysis about Mediterranean Diet and multiple health outcomes (167), which include 13 meta-analysis and 12 800 000 subjects. It support that current scientific evidence indicate that a greater adherence to the Mediterranean Diet is associated with a lower overall mortality and with a reduction of chronic diseases risk. Although, studies dietary assessment heterogeneity and insufficiencies in the study design prevent to quantify the association between Mediterranean Diet adherence and health outcomes and life quality.

In one Italian cohort of low cardiovascular risk volunteers (*n* = 1658) was observed after 12-years follow-up that greater adherence to Mediterranean Diet was related to lower cardiovascular risk and mortality (168). A similar study carried out in Spain found comparable results; a low adherence to Mediterranean Diet was related to a higher all causes mortality (Hazard Ratio (HR) 0.79; 95% CI 0.69, 0.91 (169)). Previously, this association had been described by Trichopoulou *et al* (170) in Greek population (*n* = 22,043). There cannot be found similar study cohorts in Albania, nevertheless, the so-called Albanian paradox associate rich fruit, vegetable and cereals intake, in Mediterranean Diet bases, in the context of a low-energy intake with longer life expectancy (171).

As for life-expectancy, an epidemiological study which included 71,333 Swedish participants observed, after 15 years follow-up, that to report a higher Mediterranean Diet adherence was associated with up to 2 years of longer survival (172). However, contrary to this results, authors did not found sex differences, both women and men with high Mediterranean Diet adherence were associated with a longer life-span (Hazard Ratio (HR) = 0.96; 95 % CI: 0.94–0.98, HR = 0.96; 95 % CI: 0.95–0.98, respectively). The HALE (Healthy Ageing: a Longitudinal study in Europe) project (173), observed that elder subjects, between 70-90 years old from 11 European countries, who had a good adherence to Mediterranean Diet and a healthy lifestyle appear to have up-to 50% less probability to all-causes mortality.

1.3.7. MD Adherence, Obesity and Overweight

Mediterranean Diet adherence from partners' countries, obesity and overweight association was analysed, without statistical significant results (*P* > 0.05, all, table 50).

Tab . 50 – β-coefficients (95% Confidence Interval (CI)) for association between Mediterranean Adequacy Index (MAI), age-standardized prevalence of overweight (defined as BMI = 25 kg/m2) and prevalence of obesity (defined as BMI = 30 kg/m2) in people aged 18 years and over, WHO estimates (%), (all population, female and male) from partner's countries, in 2011.

	Model 1	*p*-Value	Model 2	*p*-Value
All population - Prevalence of overweight (BMI = 25 kg/m2)	-4.412 (-12.187; 3.363)	0.222	-3.521 (-22.937; 15.895)	0.641
Female - Prevalence of overweight (BMI = 25 kg/m2)	-3.705 (-10.764;3.354)	0.255	-2.985 (-21.617; 15.648)	0.680
Male - Prevalence of overweight (BMI = 25 kg/m2)	-4.069 (-12.179; 4.041)	0.274	-4.019 (-22.768; 14.731)	0.584
All population - Prevalence of obesity (BMI = 30 kg/m2)	-3.002 (-8.595;2.591)	0.245	-3.091 (-18.501; 12.318)	0.607
Female - Prevalence of obesity (BMI = 30 kg/m2)	-2.572 (-8.269; 3.126)	0.321	-2.241 (-17.920; 13.438)	0.712
Male - Prevalence of obesity (BMI = 30 kg/m2)	-3.521 (-9.319; 2.277)	0.194	-3.695 (-19.083; 11.694)	0.542

Obesity is one of the greatest public preventable health challenges. It is a multifactorial disease, tightly related to lack of physical activity and high-energy intakes. Moreover, obesity is one of the principal risk factors of type 2 diabetes and cardiovascular diseases. Contrary to these results, Mediterranean Diet has been associated with long-term weight management and modest weight loss (174).

In one Italian section of the prospective European Prospective Investigation into Cancer and Nutrition (EPIC) cohort (175), was observed, that after 12 years of follow-up, a higher adherence to Mediterranean Diet was related to lower body-weight changes only in normopeso volunteers at baseline. As well, it was associated to a lower obesity and overweight risk (Odds ratio (OR): 0.91, 95% CI 0.84–0.99, versus low adherence to Mediterranean Diet volunteers), lower waist circumference and abdominal obesity risk, a metabolic disorder indicator. This preventive association between abdominal

obesity and Mediterranean Diet adherence was also observed by Funtikova *et al* (176), in a 10-years Spanish population study(*n* = 3,058).

PREDIMED-Plus trial is a multicentre randomized controlled trial, which evaluates long-term hypocaloric intensive Mediterranean Diet intervention versus a non-intensive standard Mediterranean Diet recommendation on weight loss and cardiovascular prevention in high cardiovascular risk adults between 55-70 years (*n* = 626). After 12 months intervention, participants in the intervention group lost 3.2 kg and improved significantly cardiovascular risk factors (waist circumference, fasting glucose, triglycerides, and HDL cholesterol, insulin resistance, HbA1c (glycated haemoglobin), and circulating levels of leptin, interleukin-18, and MCP-1 (monocyte chemoattractant protein 1), $P < 0.05$, all, (177)). In addition, it has been observed that quality of dietary fat is associated with body weight, so that substitution of saturated fatty acids by monounsaturated fatty acids or polyunsaturated fatty acids were related to 0.38 kg of weight-loss (95% CI -0.69, -0.07) and -0.51 kg (95% CI -0.81, -0.20), respectively (178).

1.3.8. MD Adherence & Cardiovascular Diseases

It has been analysed the association between Mediterranean Diet adherence from partners' countries and diseases of circulatory system, in all ages and in older than 65 years, ischaemic heart diseases, in all ages and in older than 65 years, and cerebrovascular diseases, in all ages and in older than 65 years. However, no statistical significant results have been observed ($P > 0.05$, table 51).

Tab. 51 – β-coefficients (95% Confidence Interval (CI)) for association between Mediterranean Adequacy Index (MAI) and: diseases of circulatory system, in all ages and in older than 65 years, ischaemic heart diseases, in all ages and in older than 65 years, and cerebrovascular diseases, in all ages and in older than 65 years (all population, female and male) from partner's countries, in 2011.

	Model 1	*p*-Value	Model 2	*p*-Value
All population - Diseases of circulatory system, all ages, per 100000	173.000 (-77.267; 423.266)	0.146	-19.358 (-405.410; 366.693)	0.883
Female - Diseases of circulatory system, all ages, per 100000	168.826 (-56.465; 394.117)	0.120	-16.545 (-347.206; 314.116)	0.884
Male - Diseases of circulatory system, all ages, per 100000	176.165 (-104.562; 456.892)	0.181	-27.064 (-466.135; 412.007)	0.857
All population - Diseases of circulatory system, 65+, per 100000	1255.119 (-654.672; 3164.909)	0.164	-120.886 (-3238.071; 2996.300)	0.910
Female - Diseases of circulatory system, 65+, per 100000	1275.720 (-551.200; 3102.640)	0.143	-183.040 (-2901.061; 2534.981)	0.844
Male - Diseases of circulatory system, 65+, per 100000	1220.042 (-817.840; 3257.924)	0.200	-78.610 (-3617.153; 3459.932)	0.948
All population - Ischaemic heart disease, all ages, per 100000	-1.985 (-106.697; 102.727)	0.965	-10.006 (-250.349; 230.338)	0.903
Female - Ischaemic heart disease, all ages, per 100000	1.901 (-89.148; 92.949)	0.962	-11.360 (-227.795; 205.075)	0.878
Male - Ischaemic heart disease, all ages, per 100000	-9.206 (-130.294; 111.883)	0.862	-9.076 (-267.975; 249.824)	0.918
All population - Ischaemic heart disease, 65+, per 100000	-77.077 (-889.550; 735.396)	0.829	-110.482 (-2062.615; 1841.652)	0.869
Female - Ischaemic heart disease, 65+, per 100 000	-31.500 (-800.043; 737.042)	0.926	-131.382 (-1958.855; 1696.092)	0.834
Male - Ischaemic heart disease, 65+, per 100000	-152.499 (-1027.221; 722.223)	0.692	-90.189 (-2119.233; 1938.854)	0.896
All population - Cerebrovascular diseases, all ages, per 100000	63.281 (-19.223; 145.786)	0.113	59.381 (-134.500; 253.263)	0.402
Female - Cerebrovascular diseases, all ages, per 100000	65.959 (-10.017; 141.936)	0.079#	62.806 (-121.291; 246.903)	0.357

	Model 1	*p*-Value	Model 2	*p*-Value
Male - Cerebrovascular diseases, all ages, per 100000	59.066 (-31.930; 150.062)	0.169	52.700 (-151.852; 257.251)	0.472
All population - Cerebrovascular diseases, 65+, per 100000	509.537 (-161.429; 1180.503)	0.116	537.187 (-1106.934; 2181.308)	0.375
Female - Cerebrovascular diseases, 65+, per 100000	540.634 (-95.139; 1176.406)	0.084	555.676 (-1015.798; 2127.151)	0.342
Male - Cerebrovascular diseases, 65+, per 100000	463.575 (-257.433; 1184.583)	0.172	496.151 (-1225.016; 2217.319)	0.427

Adherence to Mediterranean Diet and cardiovascular risk prevention association has been extensively studied (153–156). A recently published meta-analysis of 41 reports (3 RCTs and 38 cohorts) reported Mediterranean Diet protection versus total cardiovascular incidence, total myocardial infraction incidence, and according to cohorts studies, protection against total cardiovascular mortality, coronary heart disease incidence and mortality, and stroke incidence and mortality (179).

In Spain, Estruch *et al.* (9,183) carry out the PREDIMED study, a multicentre randomized, controlled trial with 7447 participants at high cardiovascular risk (55-80 years), whom received Mediterranean Diet supplemented with EVOO or nuts or a low fat diet such as control diet. After a median follow-up of 4.8 years, the trial was stopped; due to in Mediterranean Diet supplemented groups cardiovascular events had been significantly reduced. In Sicily, a cross-sectional study (*n* = 3090) observe a positive association between higher Mediterranean Diet adherence and cardiovascular risk factors (obesity, hypertension and type 2 diabetes (184)). In Greece, the ATTICA study included 3042 healthy participants. After 10-years follow-up authors observed that a greater adherence by a high anti-inflammatory diet, like Mediterranean Diet, was inversely associated with cardiovascular incidence in subjects without metabolic syndrome (185). In Dalmatia (Croatia), was conducted a cross-sectional study which included a cohort of 1,001 volunteers. It was found a high Mediterranean Diet adherence in the island of Vis, however only 23% of the volunteers showed a good Mediterranean Diet adherence and it was lower between younger people, and nuts consumption was especially low (186). In a later study, Relja *et al.* (187) observe in a

cross-sectional study with Croatian population that nut consumption was associated with reduced cardiovascular risk. It was related to a more favourable waist-to-hip ratio, lesser odds of elevated fibrinogen and reduced HDL-C, compared to non-consumers.

1.3.9. Mediterranean Diet Adherence & Cancer

It has been analysed the association between Mediterranean Diet adherence from partners' countries and malignant neoplasms, in all ages and in older than 65-years, trachea/bronchus/lung cancer, in 0–64 years and older than 65-years, and female cancer of the cervix uteri, all ages and malignant neoplasm female breast, all ages.

The only statistically significant association has been found between MAI and malignant neoplasm female breast ($P < 0.037$, Table 52).

Tab. 52 – β-coefficients (95% Confidence Interval (CI)) for association between Mediterranean Adequacy Index (MAI) and malignant neoplasms, in all ages and in older than 65-years, trachea/bronchus/lung cancer, in 0–64 years and older than 65-years, and female cancer of the cervix uteri, all ages and malignant neoplasm female breast, all ages, per 100 000 (age-standardized death rate, all population, female and male) from partner's countries, in 2011.

	Model 1	*p*-Value	Model 2	*p*-Value
All population - Malignant neoplasms, all ages, per 100 000	-41.133 (-133.495; 51.229)	0.327	-80.294 (-283.754; 123.167)	0.298
Female - Malignant neoplasms, all ages, per 100 000	-33.468 (-100.509; 33.574)	0.276	-61.540 (-225.339; 102.259)	0.318
Male - Malignant neoplasms, all ages, per 100 000	-58.450 (-197.338; 80.438)	0.353	-116.012 (-408.085; 176.061)	0.295
All population - Malignant neoplasms, 65+, per 100 000	-324.956 (-830.590; 180.678)	0.172	-382.192 (-1622.414; 858.029)	0.399
Female - Malignant neoplasms, 65+, per 100 000	-256.890 (-647.062; 133.281)	0.163	-327.911 (-1404.847; 749.025)	0.404
Male - Malignant neoplasms, 65+, per 100 000	-486.116 (-1276.435; 304.202)	0.189	-549.243 (-2269.276; 1170.790)	0.384
All population - Trachea/bronchus/lung cancer, 0–64 years, per 100 000	0.443 (-14.861; 15.746)	0.947	-12.240 (-40.640; 16.161)	0.264

	Model 1	*p*-Value	Model 2	*p*-Value
Female - Trachea/bronchus/lung cancer, 0–64 years, per 100 000	-2.616 (-9.966; 4.735)	0.428	-4.126 (-19.813; 11.561)	0.464
Male - Trachea/bronchus/lung cancer, 0–64 years, per 100 000	4.109 (-21.476; 29.693)	0.715	-22.387 (-67.919; 23.144)	0.216
All population - Trachea/bronchus/lung cancer, 65+	-10.465 (-112.789; 91.859)	0.816	-17.339 (-242.579; 207.900)	0.822
Female - Trachea/bronchus/lung cancer, 65+	-5.921 (-66.234; 54.393)	0.823	5.557 (-129.980; 141.095)	0.904
Male - Trachea/bronchus/lung cancer, 65+	-30.138 (-226.380; 166.104)	0.727	-67.701 (-465.504; 330.103)	0.626
Female - Cancer of the cervix uteri, all ages	0.636 (-2.320; 3.592)	0.627	-2.161 (-8.157; 3.834)	0.334
Female - Malignant neoplasm female breast, all ages	-9.217 (-17.708; -0.726)	**0.037***	-14.033 (-42.552; 14.487)	0.215

Scientific evidence available support the Mediterranean Diet association with overall cancer rates reduction, as well as significantly lower rates of digestive tract cancers (188). A meta-analysis which included 2,130,753 subjects and 83 studies observed that the greatest adherence to Mediterranean Diet was inversely associated with cancer mortality, colorectal cancer, breast cancer, gastric cancer, liver cancer, head and neck cancer and prostate cancer, being fruits, vegetables and whole grain foods the most protective Mediterranean Diet food elements (189).

Concerning to breast cancer, a multicase-control study which analysed 1,181 incident cases of female breast cancer and 1,682 healthy controls found that the Mediterranean dietary pattern seemed to be protective, but only among postmenopausal women, while Western dietary appear to increase breast cancer risk in both premenopausal women and postmenopausal women (190).

1.3.10. Mediterranean Diet Adherence & Type 2 Diabetes

It has been analysed the association between Mediterranean Diet adherence from partners' countries and prevalence of type 2 diabetes. Statistical significant association has been found, in both models ($P < 0.05$, Table 53).

Tab. 53 – β-coefficients (95% Confidence Interval (CI)) for association between Mediterranean Adequacy Index (MAI) and Prevalence of diabetes mellitus (%) (age-standardized death rate, all population, female and male) from partner's countries, in 2011.

	Model 1	*p*-Value	Model 2	*p*-Value
All population - Prevalence of diabetes mellitus (%)	-7.537 (-14.780; -0.294)	**0.044***	-16,617 (-23,508; -9,725)	**0.009***

This results coincide with the meta-analysis elaborated by Schwingshackl *et al*. (191) conclusion. Which indicates that there is a moderate quality evidence that support greater adherence to a Mediterranean diet association with a significant 19% reduction in the risk of diabetes.

In Greece, the ATTICA study (n = 343) found that in prediabetic subjects high adherence to the Mediterranean Diet was associated with a low risk of developing diabetes and CVD (192). EPIC cohort, allowed to obtain similar results, high Mediterranean Diet adherence was related to lower values of plasma lipids, blood pressure, glycated hemoglobin, and BMI (193).

1.3.11. Mediterranean Diet Adherence & Mental Disorders

It has been analysed the association between Mediterranean Diet adherence from partners' countries and prevalence of suicides and self-inflicted injury events. However, no statistically significant association has been found ($P > 0.05$, Table 54).

Tab. 54 – β-coefficients (95% Confidence Interval (CI)) for association between Mediterranean Adequacy Index (MAI) and suicide and self-inflicted injury, all ages, per 100 000, age-standardized death rate, all population, female and male) from partner's countries, in 2011.

	Model 1	*p*-Value	Model 2	*p*-Value
All population - suicide and self-inflicted injury	-10.859 (-23.688; 1.969)	0.085	-0.165 (-30.705; 24.771)	0.756
Female - suicide and self-inflicted injury	-4.666 (-10.011; 0.680)	0.078	-1.878 (-12.014; 8.258)	0.597
Male - suicide and self-inflicted injury	-18.051 (-39.647; 3.545)	0.089	-5.406 (-52.265; 41.454)	0.738

Nevertheless, there are scientific evidences that support this association. A like the Hellenic Longitudinal Investigation of Ageing and Diet (HELIAD) study (194), a 1,865 subjects trial which results suggest that adherence to the Mediterranean Diet is associated with better cognitive performance and lower dementia rates in Greek elders. Thought, more most robustly designed studies are needed in this field (195).

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1.4. Conclusions

The Mediterranean Diet is a life-style pattern, heritage of millennia of interactions amongst the societies and cultures of the Mediterranean Basin. This dietary pattern is rich in high-quality macronutrients, micronutrients and bioactive compounds, such as phytochemicals. Mediterranean Diet is rich in fruits, vegetables, beans, legumes and whole grains cereals. It is also abundant in nuts and seeds. Moreover, olive oil is a central element, present in each daily meal. Mediterranean Diet also include a moderate dairy foods, eggs, fish and shellfish consumption. While meat and processed foods take second place. Mediterranean Diet also stands out for their spices richness, and moderate wine drinking during meals. In addition, Mediterranean Diet recipes use seasonal; foods are grown or produced locally and minimally processed.

Mediterranean Diet has historically related to healthy effects. Nowadays, scientific evidence supports this statement, and Mediterranean Diet is recognized as a healthy dietary pattern by international health organizations like, World Health Organization (WHO) and it is recommended by dietary guidelines worldwide. Mediterranean Diet adherence has been associated with a longer life expectancy and higher quality-life, furthermore, with prevention of most prevalent non-communicable diseases (obesity, overweight, cardiovascular diseases, cancer, type 2 diabetes and cognitive diseases).

Moreover, adherence to Mediterranean Diet from partners' countries has been evaluated, as their relation with each country health parameters, and it has been observed, once again, that adherence to Mediterranean Diet is being gradually lost, with all consequences that that implies.

Because Mediterranean Diet goes beyond a dietary pattern, it is a complex system that involve individuals, culture and society, and environment that is continuously evolving and that needs to share but also remember.

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1.5. References

1. Braudel F, Duby G, Gatto L. Il Mediterraneo : lo spazio e la storia, gli uomini e la tradizione. Newton Compton; 2002.
2. Montanari M, Devroey J-P. Il mondo in cucina : storia, identità, scambi. Laterza; 2002.
3. Montanari M. Convivio : storia e cultura dei piaceri della tavola dall'Antichitá al Medioevo. Ed. Laterza; 1989.
4. Tannahill R. Storia del cibo. Rizzoli; 1987.
5. Montanari M. La fame e l'abbondanza : storia dell'alimentazione in Europa. Laterza; 1997.
6. Keys A AC, Blackburn H, Buzina R, Djordjević BS, Dontas AS, Fidanza F, et al. Seven countries : a multivariate analysis of death and coronary heart disease. Cambridge: Harvard University Press; 1980. 381 p.
7. Thom TJ, Epstein FH, Feldman JJ, Leaverton PE. Trends in total mortality and mortality from heart disease in 26 countries from 1950 to 1978. Int J Epidemiol. 1985 Dec;14(4):510–20.
8. Wellmark. Blue Zones Project [Internet]. Minneapolis, MN: Blue Zones. 2013. Available from: http://www.bluezones.com/
9. Estruch R, Ros E, Salas-Salvadó J, Covas M-I, Corella D, Arós F, et al. Primary Prevention of Cardiovascular Disease with a Mediterranean Diet. N Engl J Med. 2013 Apr 4;368(14):1279–90.
10. Serra-Majem L, Roman B, Estruch R. Scientific Evidence of Interventions Using the Mediterranean Diet: A Systematic Review. Nutr Rev. 2006 Feb;64(2 Pt 2):S27–47.
11. Lorgeril M de, Salen P. Dietary Prevention of Coronary Heart Disease: The Lyon Diet Heart Study and After. In: Nutrition and Fitness: Mental Health, Aging, and the Implementation of a Healthy Diet and Physical Activity Lifestyle. Basel: KARGER; 2005. p. 103–14.

12. Department of Agricuture U, Department of Health U, Services H. Dietary Guidelines for Anericans 2010 - DietaryGuidelines. 2010.

13. U.S. Department of Health and Human Services and U.S. Department of Agriculture. 2015 – 2020 Dietary Guidelines for Americans: Eight Edition. U.S. Department of Health and Human Services and U.S. Department of Agriculture. 2015.

14. da Silva R, Bach-Faig A, Raidó Quintana B, Buckland G, Vaz de Almeida MD, Serra-Majem L. Worldwide variation of adherence to the Mediterranean diet, in 1961–1965 and 2000–2003. Public Health Nutr. 2009 Sep 1;12(9A):1676–84.

15. Bach-Faig A, Fuentes-Bol C, Ramos D, Carrasco JL, Roman B, Bertomeu IF, et al. The Mediterranean diet in Spain: adherence trends during the past two decades using the Mediterranean Adequacy Index. Public Health Nutr. 2011 Apr 29;14(04):622–8.

16. Balanza R, García-Lorda P, Pérez-Rodrigo C, Aranceta J, Bonet MB, Salas-Salvadó J. Trends in food availability determined by the Food and Agriculture Organization's food balance sheets in Mediterranean Europe in comparison with other European areas. Public Health Nutr. 2007 Feb 1;10(2):168–76.

17. Fidanza F, Alberti A, Lanti M, Menotti A. Mediterranean Adequacy Index: correlation with 25-year mortality from coronary heart disease in the Seven Countries Study. Nutr Metab Cardiovasc Dis. 2004 Oct 1;14(5):254–8.

18. Rodrigues SSP, Caraher M, Trichopoulou A, de Almeida MD V. Portuguese households' diet quality (adherence to Mediterranean food pattern and compliance with WHO population dietary goals): trends, regional disparities and socioeconomic determinants. Eur J Clin Nutr. 2008 Nov 1;62(11):1263–72.

19. FAOSTAT [Internet]. [cited 2019 Apr 26]. Available from: http://www.fao.org/faostat/en/#data/FBS

20. Alberti A, Fruttini D, Fidanza F. The Mediterranean Adequacy Index: Further confirming results of validity. Nutr Metab Cardiovasc Dis. 2009 Jan;19(1):61–6.

21. European Health for All database (HFA-DB) data source - European Health

Information Gateway [Internet]. [cited 2019 Apr 27]. Available from: https://gateway.euro.who.int/en/datasets/european-health-for-all-database/

22. Food and Agriculture Organization of the United Nations. (2008). Food-based dietary guidelines - Albania. [online] Available at: http://www.fao.org/nutrition/education/food-based-dietary-guidelines/regions/countries/albania/es/.

23. Food and Agriculture Organization of the United Nations. (2004). Food-based dietary guidelines - Bosnia and Herzegovina. [online] Available at: http://www.fao.org/nutrition/education/food-based-dietary-guidelines/regions/countries/bosnia-and-herzegovina/es/.

24. Food and Agriculture Organization of the United Nations. (2002). Food-based dietary guidelines - Croatia. [online] Available at: http://www.fao.org/nutrition/education/food-based-dietary-guidelines/regions/countries/croatia/es/.

25. Food and Agriculture Organization of the United Nations. (2007). Food-based dietary guidelines - Cyprus. [online] Available at: http://www.fao.org/nutrition/education/food-dietary-guidelines/regions/countries/cyprus/en/.

26. Food and Agriculture Organization of the United Nations. (2014). Food-based dietary guidelines - Greece. [online] Available at: http://www.fao.org/nutrition/education/food-based-dietary-guidelines/regions/countries/greece/es/.

27. Food and Agriculture Organization of the United Nations. (2019). Food-based dietary guidelines - Italy. [online] Available at: http://www.fao.org/nutrition/education/food-based-dietary-guidelines/regions/countries/italy/es/.

28. Food and Agriculture Organization of the United Nations. (2003). Food-based dietary guidelines - Portugal. [online] Available at: http://www.fao.org/nutrition/education/food-based-dietary-

guidelines/regions/countries/portugal/es/.

29. Food and Agriculture Organization of the United Nations. (2019). Food-based dietary guidelines - Slovenia. [online] Available at: http://www.fao.org/nutrition/education/food-based-dietary-guidelines/regions/countries/slovenia/es/.

30. Food and Agriculture Organization of the United Nations. (2008). Food-based dietary guidelines - Spain. [online] Available at: http://www.fao.org/nutrition/education/food-based-dietary-guidelines/regions/countries/spain/es/.

31. FUNDACIÓN DIETA MEDITERRANEA. (2010). ¿QUÉ ES LA DIETA MEDITERRÁNEA?. [online] Available at: https://dietamediterranea.com/nutricion-saludable-ejercicio-fisico/.

32. Macedo, B. (2005). El concepto de sostenibilidad. [online] Tallerdesustentabilidad.ced.cl. Available at: http://tallerdesustentabilidad.ced.cl/wp/wp-content/uploads/2015/04/UNESCO-El-concepto-de-sustentabilidad.pdf [Accessed 2 May 2019].

33. Acciona.com. (n.d.). ¿Qué es el Desarrollo Sostenible y los Objetivos Globales? | ACCIONA. [online] Available at: https://www.acciona.com/es/desarrollo-sostenible/ [Accessed 2 May 2019].

34. Fao.org. (2019). Water | Sustainable Development Goals | Food and Agriculture Organization of the United Nations. [online] Available at: http://www.fao.org/sustainable-development-goals/overview/fao-and-the-post-2015-development-agenda/water/en/ [Accessed 2 May 2019].

35. Fao.org. (2019). Climate change | Sustainable Development Goals | Food and Agriculture Organization of the United Nations. [online] Available at: http://www.fao.org/sustainable-development-goals/overview/fao-and-the-post-2015-development-agenda/climate-change/en/ [Accessed 2 May 2019].

36. Fao.org. (2019). Food security and the right to food | Sustainable Development Goals | Food and Agriculture Organization of the United Nations. [online]

Available at: http://www.fao.org/sustainable-development-goals/overview/fao-and-the-post-2015-development-agenda/food-security-and-the-right-to-food/en/ [Accessed 2 May 2019].

37. Burlingame B, Dernini S, editors. Sustainable Diets: Directions and Solutions for Policy, Research and Action. Rome: FAO; 2012

38. S Dernini S, Berry EM, Serra-Majem L, La Vecchia C, Capone R, Medina FX, Aranceta-Bartrina J, Belahsen R , Burlingame B, Calabrese G, Corella D, Donini LM, Lairon D , Meybeck A, Pekcan AG, Piscopo S, Yngve A, Trichopoulou A. Med Diet 4.0: the Mediterranean diet with four sustainable benefits. Public Health Nutrition. 2016. 20(7), 1322–1330

39. CIHEAM. Mediterranean food consumption patterns: diet, environment, society, economy and health. Options Méditerranéennes. 2017. A, 120, 139-184.Randone. et al. Reviving the Economy of the Mediterranean Sea: Actions for a Sustainable Future. Rome: WWF Mediterranean Marine Initiative; 2017

40. Randone. et al. Reviving the Economy of the Mediterranean Sea: Actions for a Sustainable Future. Rome: WWF Mediterranean Marine Initiative.; 2017

41. El estado mundial de la pesca y la acuicultura 2018. Cumplir los objetivos de desarrollo sostenible. Roma: FAO; 2018.

42. Hallström E, Carlsson-Kanyama A, Börjesson P. Environmental impact of dietary change: a systematic review. Journal of Cleaner Production 9. 2015. 1-11.

43. Tilman D, Clark M. Global diets link environmental sustainability and human health. Nature. London. 2014. 515: 7528, 518-22.

44. Sáez-Almendros S, Obrador B, Bach-Faig A, Serra-Majem L. Environmental footprints of Mediterranean versus Western dietary patterns: beyond the health benefits of the Mediterranean diet. Environmental Health. 2013. 12:118

45. Germani A, Vitiello V, Giusti AM, Pinto A, Donini LM, Valeria del Balzo V. Environmental and economic sustainability of the Mediterranean Diet. Int J Food Sci Nutr. 2014; 65(8): 1008–1012.

46. Seconda L, Baudry J, Allès B, Hamza O, Boizot-Szantai C, Soler L-G, Galan P, Hercberg S, Lairon D, Kesse-Guyot E. Assessment of the Sustainability of the Mediterranean Diet Combined with Organic Food Consumption: An Individual Behaviour Approach. Nutrients. 2017. 9, 61.

47. UNEP/MAP. Mediterranean Strategy for Sustainable Development.

48. Shen J, Wilmot KA, Ghasemzadeh N, Molloy DL, Burkman G, Mekonnen G, et al. Mediterranean Dietary Patterns and Cardiovascular Health. Annu Rev Nutr. 2015 Jul 17;35(1):425–49.

49. Trichopoulou A, Bamia C, Trichopoulos D. Anatomy of health effects of Mediterranean diet: Greek EPIC prospective cohort study.

50. Zamora-Ros R, Serafini M, Estruch R, Lamuela-Raventós RMM, Martínez-González MAA, Salas-Salvadó J, et al. Mediterranean diet and non enzymatic antioxidant capacity in the PREDIMED study: Evidence for a mechanism of antioxidant tuning. Nutr Metab Cardiovasc Dis. 2013 Dec;23(12):1167–74.

51. Food Composition Databases Show Foods List [Internet]. [cited 2019 Apr 15]. Available from: https://ndb.nal.usda.gov/ndb/search/list

52. Slavin JL, Lloyd B. Health Benefits of Fruits and Vegetables. Adv Nutr. 2012 Jul 1;3(4):506.

53. Liu RH. Health-Promoting Components of Fruits and Vegetables in the Diet. Adv Nutr. 2013 May 1;4(3):384S-392S.

54. Schlesinger S, Neuenschwander M, Schwedhelm C, Hoffmann G, Bechthold A, Boeing H, et al. Food Groups and Risk of Overweight, Obesity, and Weight Gain: A Systematic Review and Dose-Response Meta-Analysis of Prospective Studies. Adv Nutr. 2019 Mar 1;10(2):205–18.

55 Boeing H, Bechthold A, Bub A, Ellinger S, Haller D, Kroke A, et al. Critical review: vegetables and fruit in the prevention of chronic diseases. Eur J Nutr. 2012 Sep;51(6):637–63.

56. Ross AB, van der Kamp J-W, King R, Lê K-A, Mejborn H, Seal CJ, et al.

Perspective: A Definition for Whole-Grain Food Products-Recommendations from the Healthgrain Forum. Adv Nutr. 2017 Jul;8(4):525–31.

57. Frølich W, Aman P, Tetens I. Whole grain foods and health - a Scandinavian perspective. Food Nutr Res. 2013 Jan 19;57(1):18503.

58. Bach-Faig A, Berry EM, Lairon D, Reguant J, Trichopoulou A, Dernini S, et al. Mediterranean diet pyramid today. Science and cultural updates. Public Health Nutr. 2011 Dec 13;14(12A):2274–84.

59. Zong G, Gao A, Hu FB, Sun Q. Whole Grain Intake and Mortality From All Causes, Cardiovascular Disease, and Cancer. Circulation. 2016 Jun 14;133(24):2370–80.

60. Mellen PB, Walsh TF, Herrington DM. Whole grain intake and cardiovascular disease: A meta-analysis. Nutr Metab Cardiovasc Dis. 2008 May;18(4):283–90.

61. de Munter JSL, Hu FB, Spiegelman D, Franz M, van Dam RM. Whole Grain, Bran, and Germ Intake and Risk of Type 2 Diabetes: A Prospective Cohort Study and Systematic Review. Groop LC, editor. PLoS Med. 2007 Aug 28;4(8):e261.

62. Strayer L, Jacobs DR, Schairer C, Schatzkin A, Flood A. Dietary carbohydrate, glycemic index, and glycemic load and the risk of colorectal cancer in the BCDDP cohort. Cancer Causes Control. 2007 Oct;18(8):853–63.

63. Aune D, Chan DSM, Lau R, Vieira R, Greenwood DC, Kampman E, et al. Dietary fibre, whole grains, and risk of colorectal cancer: systematic review and dose-response meta-analysis of prospective studies. BMJ. 2011 Nov 11;343(nov10 1):d6617–d6617.

64. COVAS M. Olive oil and the cardiovascular system. Pharmacol Res. 2007 Mar;55(3):175–86.

65. Hoffman R, Gerber M. Can rapeseed oil replace olive oil as part of a Mediterranean-style diet? Br J Nutr. 2014 Dec 14;112(11):1882–95.

66. López-Miranda J, Pérez-Jiménez F, Ros E, De Caterina R, Badimón L, Covas MI,

et al. Olive oil and health: Summary of the II international conference on olive oil and health consensus report, Jaén and Córdoba (Spain) 2008. Nutr Metab Cardiovasc Dis. 2010 May;20(4):284–94.

67. Guasch-Ferré M, Hu FB, Martínez-González MA, Fitó M, Bulló M, Estruch R, et al. Olive oil intake and risk of cardiovascular disease and mortality in the PREDIMED Study. BMC Med. 2014 Dec 13;12(1):78.

68. Buckland G, Mayén AL, Agudo A, Travier N, Navarro C, Huerta JM, et al. Olive oil intake and mortality within the Spanish population (EPIC-Spain). Am J Clin Nutr. 2012 Jul;96(1):142–9.

69. Martínez-González MA, Dominguez LJ, Delgado-Rodríguez M. Olive oil consumption and risk of CHD and/or stroke: a meta-analysis of case–control, cohort and intervention studies. Br J Nutr. 2014 Jul 28;112(2):248–59.

70. Covas M-I, Nyyssönen K, Poulsen HE, Kaikkonen J, Zunft H-JF, Kiesewetter H, et al. The Effect of Polyphenols in Olive Oil on Heart Disease Risk Factors. Ann Intern Med. 2006 Sep 5;145(5):333.

71. Salas-Salvadó J, Bulló M, Estruch R, Ros E, Covas M-I, Ibarrola-Jurado N, et al. Prevention of Diabetes With Mediterranean Diets. Ann Intern Med. 2014 Jan 7;160(1):1–10.

72. Ros E, Hu FB. Consumption of Plant Seeds and Cardiovascular Health. Circulation. 2013 Jul 30;128(5):553–65.

73. Bulló M, Juanola-Falgarona M, Hernández-Alonso P, Salas-Salvadó J. Nutrition attributes and health effects of pistachio nuts. Br J Nutr. 2015 Apr 7;113(S2):S79–93.

74. Ros E. Nuts and CVD. Br J Nutr. 2015 Apr 7;113 Suppl 2(S2):S111-20.

75. Fraser GE, Sabate J, Beeson WL, Strahan TM. A Possible Protective Effect of Nut Consumption on Risk of Coronary Heart Disease. Arch Intern Med. 1992 Jul 1;152(7):1416.

76. Aune D, Keum N, Giovannucci E, Fadnes LT, Boffetta P, Greenwood DC, et al.

Nut consumption and risk of cardiovascular disease, total cancer, all-cause and cause-specific mortality: a systematic review and dose-response meta-analysis of prospective studies. BMC Med. 2016 Dec 5;14(1):207.

77. Guasch-Ferre M, Bullo M, Martinez-Gonzalez MA, Ros E, Corella D, E. R, et al. Frequency of nut consumption and risk of total mortality in the predimed study. Ann Nutr Metab. 2013;62:17–8.

78. Zambón D, Sabaté J, Muñoz S, Campero B, Casals E, Merlos M, et al. Substituting walnuts for monounsaturated fat improves the serum lipid profile of hypercholesterolemic men and women. A randomized crossover trial. Ann Intern Med. 2000 Apr 4;132(7):538–46.

79. Jenkins DJA, Kendall CWC, Lamarche B, Banach MS, Srichaikul K, Vidgen E, et al. Nuts as a replacement for carbohydrates in the diabetic diet: a reanalysis of a randomised controlled trial. Diabetologia. 2018 Aug 23;61(8):1734–47.

80. Casas-Agustench P, López-Uriarte P, Ros E, Bulló M, Salas-Salvadó J. Nuts, hypertension and endothelial function. Nutr Metab Cardiovasc Dis. 2011 Jun;21:S21–33.

81. Berryman CE, Grieger JA, West SG, Chen C-YO, Blumberg JB, Rothblat GH, et al. Acute Consumption of Walnuts and Walnut Components Differentially Affect Postprandial Lipemia, Endothelial Function, Oxidative Stress, and Cholesterol Efflux in Humans with Mild Hypercholesterolemia. J Nutr. 2013 Jun 1;143(6):788–94.

82. Wang F, Zhang Y-J, Zhou Y, Li Y, Zhou T, Zheng J, et al. Effects of Beverages on Alcohol Metabolism: Potential Health Benefits and Harmful Impacts. Int J Mol Sci. 2016 Mar 9;17(3):354.

83. Costanzo S, Di Castelnuovo A, Donati MB, Iacoviello L, de Gaetano G. Wine, beer or spirit drinking in relation to fatal and non-fatal cardiovascular events: a meta-analysis. Eur J Epidemiol. 2011 Nov 11;26(11):833–50.

84. Naimi TS, Brewer RD, Mokdad A, Denny C, Serdula MK, Marks JS. Binge drinking among US adults. JAMA. 2003 Jan 1;289(1):70–5.

85. AGS Choosing Wisely Workgroup. American Geriatrics Society Identifies Another Five Things That Healthcare Providers and Patients Should Question. J Am Geriatr Soc. 2014 May;62(5):950–60.

86. Ronksley PE, Brien SE, Turner BJ, Mukamal KJ, Ghali WA. Association of alcohol consumption with selected cardiovascular disease outcomes: a systematic review and meta-analysis. BMJ. 2011 Feb 22;342:d671.

87. Joosten MM, Chiuve SE, Mukamal KJ, Hu FB, Hendriks HFJ, Rimm EB. Changes in Alcohol Consumption and Subsequent Risk of Type 2 Diabetes in Men. Diabetes. 2011 Jan;60(1):74–9.

88. Sacanella E, Vázquez-Agell M, Mena MP, Antúnez E, Fernández-Solá J, Nicolás JM, et al. Down-regulation of adhesion molecules and other inflammatory biomarkers after moderate wine consumption in healthy women: a randomized trial. Am J Clin Nutr. 2007 Nov 1;86(5):1463–9.

89. Gepner Y, Golan R, Harman-Boehm I, Henkin Y, Schwarzfuchs D, Shelef I, et al. Effects of Initiating Moderate Alcohol Intake on Cardiometabolic Risk in Adults With Type 2 Diabetes: A 2-Year Randomized, Controlled Trial. Ann Intern Med. 2015 Oct 20;163(8):569–79.

90. Marfella R, Cacciapuoti F, Siniscalchi M, Sasso FC, Marchese F, Cinone F, et al. Effect of moderate red wine intake on cardiac prognosis after recent acute myocardial infarction of subjects with Type 2 diabetes mellitus. Diabet Med. 2006 Sep;23(9):974–81.

91. Rimm EB, Williams P, Fosher K, Criqui M, Stampfer MJ. Moderate alcohol intake and lower risk of coronary heart disease: meta-analysis of effects on lipids and haemostatic factors. BMJ. 1999 Dec 11;319(7224):1523–8.

92. Bhagwat S, Haytowitz DB, Holden JM. USDA Database for the Flavonoid Content of Selected Foods Release 3.1. 2013.

93. Chohan M, Forster-Wilkins G, Opara EI. Determination of the Antioxidant Capacity of Culinary Herbs Subjected to Various Cooking and Storage Processes Using the ABTS*+ Radical Cation Assay. Plant Foods Hum Nutr. 2008

Jun 26;63(2):47–52.

94. Guarrera PM, Savo V. Wild food plants used in traditional vegetable mixtures in Italy. J Ethnopharmacol. 2016 Jun 5;185:202–34.

95. Bower A, Marquez S, de Mejia EG. The Health Benefits of Selected Culinary Herbs and Spices Found in the Traditional Mediterranean Diet. Crit Rev Food Sci Nutr. 2016 Dec 9;56(16):2728–46.

96. Guldiken B, Ozkan G, Catalkaya G, Ceylan FD, Ekin Yalcinkaya I, Capanoglu E. Phytochemicals of herbs and spices: Health versus toxicological effects. Food Chem Toxicol. 2018 Sep;119:37–49.

97. Kouris-Blazos A, Itsiopoulos C. Low all-cause mortality despite high cardiovascular risk in elderly Greek-born Australians: attenuating potential of diet? Asia Pac J Clin Nutr. 2014;23(4):532–44.

98. Marco ML, Heeney D, Binda S, Cifelli CJ, Cotter PD, Foligné B, et al. Health benefits of fermented foods: microbiota and beyond. Curr Opin Biotechnol. 2017 Apr 1;44:94–102.

99. Tapsell LC. Fermented dairy food and CVD risk. Br J Nutr. 2015 Apr 7;113(S2):S131–5.

100. de Goede J, Soedamah-Muthu SS, Pan A, Gijsbers L, Geleijnse JM. Dairy Consumption and Risk of Stroke: A Systematic Review and Updated Dose–Response Meta-Analysis of Prospective Cohort Studies. J Am Heart Assoc. 2016 May 6;5(5).

101. Díaz-López A, Bulló M, Martínez-González MA, Corella D, Estruch R, Fitó M, et al. Dairy product consumption and risk of type 2 diabetes in an elderly Spanish Mediterranean population at high cardiovascular risk. Eur J Nutr. 2016 Feb 7;55(1):349–60.

102. Díaz-López A, Bulló M, Martínez-González MA, Corella D, Estruch R, Fitó M, et al. Dairy product consumption and risk of type 2 diabetes in an elderly Spanish Mediterranean population at high cardiovascular risk. Eur J Nutr. 2016 Feb 7;55(1):349–60.

103. Babio N, Becerra-Tomas N, Martinez-Gonzalez MA, Corella D, Estruch R, Ros E, et al. Consumption of Yogurt, Low-Fat Milk, and Other Low-Fat Dairy Products Is Associated with Lower Risk of Metabolic Syndrome Incidence in an Elderly Mediterranean Population. J Nutr. 2015 Oct 1;145(10):2308–16.

104. Mena-Sánchez G, Babio N, Martínez-González MÁ, Corella D, Schröder H, Vioque J, et al. Fermented dairy products, diet quality, and cardio–metabolic profile of a Mediterranean cohort at high cardiovascular risk. Nutr Metab Cardiovasc Dis. 2018 Oct 1;28(10):1002–11.

105. Barrubés L, Babio N, Mena-Sánchez G, Toledo E, Ramírez-Sabio JB, Estruch R, et al. Dairy product consumption and risk of colorectal cancer in an older mediterranean population at high cardiovascular risk. Int J Cancer. 2018 Sep 15;143(6):1356–66.

106. Lu W, Chen H, Niu Y, Wu H, Xia D, Wu Y. Dairy products intake and cancer mortality risk: a meta-analysis of 11 population-based cohort studies. Nutr J. 2016 Dec 21;15(1):91.

107. Aune D, Navarro Rosenblatt DA, Chan DS, Vieira AR, Vieira R, Greenwood DC, et al. Dairy products, calcium, and prostate cancer risk: a systematic review and meta-analysis of cohort studies. Am J Clin Nutr. 2015 Jan 1;101(1):87–117.

108. Schwingshackl L, Schwedhelm C, Hoffmann G, Knüppel S, Iqbal K, Andriolo V, et al. Food Groups and Risk of Hypertension: A Systematic Review and Dose-Response Meta-Analysis of Prospective Studies. Adv Nutr An Int Rev J. 2017 Nov 15;8(6):793–803.

109. Bazzano LA, Thompson AM, Tees MT, Nguyen CH, Winham DM. Non-soy legume consumption lowers cholesterol levels: A meta-analysis of randomized controlled trials. Nutr Metab Cardiovasc Dis. 2011 Feb;21(2):94–103.

110. McCrory MA, Hamaker BR, Lovejoy JC, Eichelsdoerfer PE. Pulse Consumption, Satiety, and Weight Management. Adv Nutr. 2010 Nov 1;1(1):17–30.

111. Bird A, Conlon M, Christophersen C, Topping D. Resistant starch, large bowel fermentation and a broader perspective of prebiotics and probiotics. Benef

Microbes. 2010 Nov;1(4):423–31.

112. Zhu B, Sun Y, Qi L, Zhong R, Miao X. Dietary legume consumption reduces risk of colorectal cancer: evidence from a meta-analysis of cohort studies. Sci Rep. 2015 Aug 5;5(1):8797.

113. Papandreou C, Becerra-Tomás N, Bulló M, Martínez-González MÁ, Corella D, Estruch R, et al. Legume consumption and risk of all-cause, cardiovascular, and cancer mortality in the PREDIMED study. Clin Nutr. 2019 Feb;38(1):348–56.

114. Becerra-Tomás N, Díaz-López A, Rosique-Esteban N, Ros E, Buil-Cosiales P, Corella D, et al. Legume consumption is inversely associated with type 2 diabetes incidence in adults: A prospective assessment from the PREDIMED study. Clin Nutr. 2018 Jun;37(3):906–13.

115. Jenkins DJA, Kendall CWC, Augustin LSA, Mitchell S, Sahye-Pudaruth S, Blanco Mejia S, et al. Effect of Legumes as Part of a Low Glycemic Index Diet on Glycemic Control and Cardiovascular Risk Factors in Type 2 Diabetes Mellitus. Arch Intern Med. 2012 Nov 26;172(21):1653.

116. Ramdath D, Renwick S, Duncan AM. The Role of Pulses in the Dietary Management of Diabetes. Can J Diabetes. 2016 Aug 1;40(4):355–63.

117. Singh B, Singh JP, Kaur A, Singh N. Phenolic composition and antioxidant potential of grain legume seeds: A review. Food Res Int. 2017 Nov 1;101:1–16.

118. Simopoulos AP. Fish and Fish Oil in the Mediterranean Diets. Fish Fish Oil Heal Dis Prev. 2016 Jan 1;15–25.

119. Domingo JL, Bocio A, Falcó G, Llobet JM. Benefits and risks of fish consumption: Part I. A quantitative analysis of the intake of omega-3 fatty acids and chemical contaminants. Toxicology. 2007 Feb 12;230(2–3):219–26.

120. Sidhu KS. Health benefits and potential risks related to consumption of fish or fish oil. Regul Toxicol Pharmacol. 2003 Dec;38(3):336–44.

121. Kris-Etherton PM, Harris WS, Appel LJ. Fish Consumption, Fish Oil, Omega-3 Fatty Acids, and Cardiovascular Disease. Circulation. 2002 Nov 19;106(21):2747–

57.

122. Gil A, Serra-Majem L, Calder PC, Uauy R. Systematic reviews of the role of omega-3 fatty acids in the prevention and treatment of disease. Br J Nutr. 2012 Jun 17;107(S2):S1–2.

123. Corella D, Ordovás JM. Interactions between dietary *n-3* fatty acids and genetic variants and risk of disease. Br J Nutr. 2012 Jun 17;107(S2):S271–83.

124. Desnoyers M, Gilbert K, Rousseau G. Cardioprotective Effects of Omega-3 Polyunsaturated Fatty Acids: Dichotomy between Experimental and Clinical Studies. Mar Drugs. 2018 Jul 10;16(7).

125. Maki KC, Dicklin MR. Omega-3 Fatty Acid Supplementation and Cardiovascular Disease Risk: Glass Half Full or Time to Nail the Coffin Shut? Nutrients. 2018 Jul 4;10(7).

126. Tortosa-Caparrós E, Navas-Carrillo D, Marín F, Orenes-Piñero E. Anti-inflammatory effects of omega 3 and omega 6 polyunsaturated fatty acids in cardiovascular disease and metabolic syndrome. Crit Rev Food Sci Nutr. 2017 Nov 2;57(16):3421–9.

127. Gil A, Gil F. Fish, a Mediterranean source of *n* -3 PUFA: benefits do not justify limiting consumption. Br J Nutr. 2015 Apr 7;113(S2):S58–67.

128. Becerra-Tomás N, Babio N, Martínez-González MÁ, Corella D, Estruch R, Ros E, et al. Replacing red meat and processed red meat for white meat, fish, legumes or eggs is associated with lower risk of incidence of metabolic syndrome. Clin Nutr. 2016 Dec 1;35(6):1442–9.

129. Kouvari M, Notara V, Kalogeropoulos N, Panagiotakos DB. Diabetes mellitus associated with processed and unprocessed red meat: an overview. Int J Food Sci Nutr. 2016 Oct 2;67(7):735–43.

130. Micha R, Wallace SK, Mozaffarian D. Red and Processed Meat Consumption and Risk of Incident Coronary Heart Disease, Stroke, and Diabetes Mellitus. Circulation. 2010 Jun 1;121(21):2271–83.

131. Larsson SC, Wolk A. Meat consumption and risk of colorectal cancer: A meta-analysis of prospective studies. Int J Cancer. 2006 Dec 1;119(11):2657–64.

132. IARC Monographs evaluate consumption of red meat and processed meat. 2015.

133. Rouhani MH, Rashidi-Pourfard N, Salehi-Abargouei A, Karimi M, Haghighatdoost F. Effects of Egg Consumption on Blood Lipids: A Systematic Review and Meta-Analysis of Randomized Clinical Trials. J Am Coll Nutr. 2018 Feb 17;37(2):99–110.

134. Geiker NRW, Larsen ML, Dyerberg J, Stender S, Astrup A. Egg consumption, cardiovascular diseases and type 2 diabetes. Eur J Clin Nutr. 2018 Jan 27;72(1):44–56.

135. Shin JY, Xun P, Nakamura Y, He K. Egg consumption in relation to risk of cardiovascular disease and diabetes: a systematic review and meta-analysis. Am J Clin Nutr. 2013 Jul 1;98(1):146–59.

136. Menotti A, Puddu PE. How the Seven Countries Study contributed to the definition and development of the Mediterranean diet concept: A 50-year journey. Nutr Metab Cardiovasc Dis. 2015 Mar;25(3):245–52.

137. Foreman KJ, Marquez N, Dolgert A, Fukutaki K, Fullman N, McGaughey M, et al. Forecasting life expectancy, years of life lost, and all-cause and cause-specific mortality for 250 causes of death: reference and alternative scenarios for 2016–40 for 195 countries and territories. Lancet. 2018 Nov;392(10159):2052–90.

138. Sofi F, Abbate R, Gensini GF, Casini A. Accruing evidence on benefits of adherence to the Mediterranean diet on health: an updated systematic review and meta-analysis. Am J Clin Nutr. 2010 Nov 1;92(5):1189–96.

139. Bonaccio M, Di Castelnuovo A, Costanzo S, Gialluisi A, Persichillo M, Cerletti C, et al. Mediterranean diet and mortality in the elderly: a prospective cohort study and a meta-analysis. Br J Nutr. 2018 Oct 28;120(8):841–54.

140. Organization. WH. Global health risks : mortality and burden of disease attributable to selected major risks. [Internet]. World Health Organization.

2009. Available from: http://www.who.int/iris/handle/10665/44203

141. Hill JO, Wyatt HR, Peters JC. Energy Balance and Obesity. Circulation. 2012 Jul 3;126(1):126.

142. Tobias DK, Chen M, Manson JE, Ludwig DS, Willett W, Hu FB. Effect of low-fat diet interventions versus other diet interventions on long-term weight change in adults: a systematic review and meta-analysis. Lancet Diabetes Endocrinol. 2015 Dec;3(12):968–79.

143. McManus K, Antinoro L, Sacks F. A randomized controlled trial of a moderate-fat, low-energy diet compared with a low fat, low-energy diet for weight loss in overweight adults. Int J Obes. 2001 Oct 23;25(10):1503–11.

144. Estruch R, Martínez-González MA, Corella D, Salas-Salvadó J, Fitó M, Chiva-Blanch G, et al. Effect of a high-fat Mediterranean diet on bodyweight and waist circumference: a prespecified secondary outcomes analysis of the PREDIMED randomised controlled trial. Lancet Diabetes Endocrinol. 2016 Aug;4(8):666–76.

145. Li Y, Pan A, Wang DD, Liu X, Dhana K, Franco OH, et al. Impact of Healthy Lifestyle Factors on Life Expectancies in the US Population. Circulation. 2018 Jul 24;138(4):345–55.

146. de Lorgeril M, Salen P, Martin J-L, Monjaud I, Delaye J, Mamelle N. Mediterranean Diet, Traditional Risk Factors, and the Rate of Cardiovascular Complications After Myocardial Infarction. Circulation. 1999 Feb 16;99(6):779–85.

147. Mente A, de Koning L, Shannon HS, Anand SS. A Systematic Review of the Evidence Supporting a Causal Link Between Dietary Factors and Coronary Heart Disease. Arch Intern Med. 2009 Apr 13;169(7):659.

148. Shai I, Schwarzfuchs D, Henkin Y, Shahar DR, Witkow S, Greenberg I, et al. Weight Loss with a Low-Carbohydrate, Mediterranean, or Low-Fat Diet. N Engl J Med. 2008 Jul 17;359(3):229–41.

149. American Diabetes Association. Standards of Medical Care in Diabetes--2013. Diabetes Care. 2013 Jan 1;36(Supplement_1):S11–66.

150. Diabetes Prevention Program Research Group, Knowler WC, Fowler SE, Hamman RF, Christophi CA, Hoffman HJ, et al. 10-year follow-up of diabetes incidence and weight loss in the Diabetes Prevention Program Outcomes Study. Lancet. 2009 Nov 14;374(9702):1677–86.

151. InterAct Consortium, Romaguera D, Guevara M, Norat T, Langenberg C, Forouhi NG, et al. Mediterranean diet and type 2 diabetes risk in the European Prospective Investigation into Cancer and Nutrition (EPIC) study: the InterAct project. Diabetes Care. 2011 Sep 1;34(9):1913–8.

152. Salas-Salvado J, Bullo M, Babio N, Martinez-Gonzalez MA, Ibarrola-Jurado N, Basora J, et al. Reduction in the Incidence of Type 2 Diabetes With the Mediterranean Diet: Results of the PREDIMED-Reus nutrition intervention randomized trial. Diabetes Care. 2011 Jan 1;34(1):14–9.

153. Stewart BW, Bray F, Forman D, Ohgaki H, Straif K, Ullrich A, et al. Cancer prevention as part of precision medicine: “plenty to be done”. Carcinogenesis. 2016 Jan;37(1):2–9.

154. Schwingshackl L, Schwedhelm C, Galbete C, Hoffmann G. Adherence to Mediterranean Diet and Risk of Cancer: An Updated Systematic Review and Meta-Analysis. Nutrients. 2017 Sep 26;9(10):1063.

155. Toledo E, Salas-Salvadó J, Donat-Vargas C, Buil-Cosiales P, Estruch R, Ros E, et al. Mediterranean Diet and Invasive Breast Cancer Risk Among Women at High Cardiovascular Risk in the PREDIMED Trial. JAMA Intern Med. 2015 Nov 1;175(11):1752.

156. Russo GI, Solinas T, Urzì D, Privitera S, Campisi D, Cocci A, et al. Adherence to Mediterranean diet and prostate cancer risk in Sicily: population-based case-control study. Int J Impot Res. 2018 Oct 18;

157. Alzheimer’s Association. 2015 Alzheimer’s disease facts and figures. Alzheimers Dement. 2015 Mar;11(3):332–84.

158. Gómez-Pinilla F. Brain foods: the effects of nutrients on brain function. Nat Rev Neurosci. 2008 Jul 1;9(7):568–78.

159. Lourida I, Soni M, Thompson-Coon J, Purandare N, Lang IA, Ukoumunne OC, et al. Mediterranean Diet, Cognitive Function, and Dementia. Epidemiology. 2013 Jul;24(4):479–89.

160. Andrieu S, Coley N, Lovestone S, Aisen PS, Vellas B. Prevention of sporadic Alzheimer's disease: lessons learned from clinical trials and future directions. Lancet Neurol. 2015 Sep;14(9):926–44.

161. Valls-Pedret C, Sala-Vila A, Serra-Mir M, Corella D, de la Torre R, Martínez-González MÁ, et al. Mediterranean Diet and Age-Related Cognitive Decline. JAMA Intern Med. 2015 Jul 1;175(7):1094.

162. Vilarnau C, Stracker DM, Funtikov A, da Silva R, Estruch R, Bach-Faig A. Worldwide adherence to Mediterranean Diet between 1960 and 2011. Eur J Clin Nutr. 2018 Nov 28;1.

163. Vareiro D, Bach-Faig A, Raidó Quintana B, Bertomeu I, Buckland G, Vaz de Almeida MD, et al. Availability of Mediterranean and non-Mediterranean foods during the last four decades: comparison of several geographical areas. Public Health Nutr. 2009 Sep 1;12(9A):1667–75.

164. Bonaccio M, Bes-Rastrollo M, de Gaetano G, Iacoviello L. Challenges to the Mediterranean diet at a time of economic crisis. Nutr Metab Cardiovasc Dis. 2016 Dec;26(12):1057–63.

165. Alberti-Fidanza A, Fidanza F. Mediterranean Adequacy Index of Italian diets. Public Health Nutr. 2004 Oct;7(7):937–41.

166. Eleftheriou D, Benetou V, Trichopoulou A, La Vecchia C, Bamia C. Mediterranean diet and its components in relation to all-cause mortality: meta-analysis. Br J Nutr. 2018 Nov 28;120(10):1081–97.

167. Dinu M, Pagliai G, Casini A, Sofi F. Mediterranean diet and multiple health outcomes: an umbrella review of meta-analyses of observational studies and randomised trials. Eur J Clin Nutr. 2018 Jan 10;72(1):30–43.

168. Bo S, Ponzo V, Goitre I, Fadda M, Pezzana A, Beccuti G, et al. Predictive role of the Mediterranean diet on mortality in individuals at low cardiovascular risk: a

12-year follow-up population-based cohort study. J Transl Med. 2016 Apr 12;14:91.

169. Buckland G, Agudo A, Travier N, María Huerta J, Cirera L, Tormo M-J, et al. Adherence to the Mediterranean diet reduces mortality in the Spanish cohort of the European Prospective Investigation into Cancer and Nutrition (EPIC-Spain). Br J Nutr. 2011 Nov 28;106(10):1581–91.

170. Trichopoulou A, Costacou T, Bamia C, Trichopoulos D. Adherence to a Mediterranean Diet and Survival in a Greek Population. N Engl J Med. 2003 Jun 26;348(26):2599–608.

171. Gjonça A, Bobak M. Albanian paradox, another example of protective effect of Mediterranean lifestyle? Lancet (London, England). 1997 Dec 20;350(9094):1815–7.

172. Bellavia A, Tektonidis TG, Orsini N, Wolk A, Larsson SC. Quantifying the benefits of Mediterranean diet in terms of survival. Eur J Epidemiol. 2016 May 5;31(5):527–30.

173. Knoops KTB, de Groot LCPGM, Kromhout D, Perrin A-E, Moreiras-Varela O, Menotti A, et al. Mediterranean Diet, Lifestyle Factors, and 10-Year Mortality in Elderly European Men and Women. JAMA. 2004 Sep 22;292(12):1433.

174. Mancini JG, Filion KB, Atallah R, Eisenberg MJ. Systematic Review of the Mediterranean Diet for Long-Term Weight Loss. Am J Med. 2016 Apr;129(4):407-415.e4.

175. Agnoli C, Sieri S, Ricceri F, Giraudo MT, Masala G, Assedi M, et al. Adherence to a Mediterranean diet and long-term changes in weight and waist circumference in the EPIC-Italy cohort. Nutr Diabetes. 2018 Dec 25;8(1):22.

176. Funtikova AN, Benítez-Arciniega AA, Gomez SF, Fitó M, Elosua R, Schröder H. Mediterranean diet impact on changes in abdominal fat and 10-year incidence of abdominal obesity in a Spanish population. Br J Nutr. 2014 Apr 28;111(8):1481–7.

177. Salas-Salvadó J, Díaz-López A, Ruiz-Canela M, Basora J, Fitó M, Corella D, et al. Effect of a Lifestyle Intervention Program With Energy-Restricted

Mediterranean Diet and Exercise on Weight Loss and Cardiovascular Risk Factors: One-Year Results of the PREDIMED-Plus Trial. Diabetes Care. 2018 Nov 2;42(5):dc180836.

178. Beulen Y, Martínez-González M, van de Rest O, Salas-Salvadó J, Sorlí J, Gómez-Gracia E, et al. Quality of Dietary Fat Intake and Body Weight and Obesity in a Mediterranean Population: Secondary Analyses within the PREDIMED Trial. Nutrients. 2018 Dec 19;10(12):2011.

179. Becerra-Tomás N, Blanco Mejía S, Viguiliouk E, Khan T, Kendall CWC, Kahleova H, et al. Mediterranean diet, cardiovascular disease and mortality in diabetes: A systematic review and meta-analysis of prospective cohort studies and randomized clinical trials. Crit Rev Food Sci Nutr. 2019 Jan 24;1–21.

180. Martínez-González MA, Gea A, Ruiz-Canela M. The Mediterranean Diet and Cardiovascular Health. Circ Res. 2019 Mar 1;124(5):779–98.

181. Mattioli A V., Palmiero P, Manfrini O, Puddu PE, Nodari S, Dei Cas A, et al. Mediterranean diet impact on cardiovascular diseases. J Cardiovasc Med. 2017 Dec;18(12):925–35.

182. Rees K, Takeda A, Martin N, Ellis L, Wijesekara D, Vepa A, et al. Mediterranean-style diet for the primary and secondary prevention of cardiovascular disease. Cochrane Database Syst Rev. 2019 Mar 13;(3).

183. Estruch R, Ros E, Salas-Salvadó J, Covas M-I, Corella D, Arós F, et al. Primary Prevention of Cardiovascular Disease with a Mediterranean Diet Supplemented with Extra-Virgin Olive Oil or Nuts. N Engl J Med. 2018 Jun 21;378(25):e34.

184. Grosso G, Pajak A, Mistretta A, Marventano S, Raciti T, Buscemi S, et al. Protective role of the Mediterranean diet on several cardiovascular risk factors: Evidence from Sicily, southern Italy. Nutr Metab Cardiovasc Dis. 2014 Apr;24(4):370–7.

185. Georgousopoulou EN, Kouli G-M, Panagiotakos DB, Kalogeropoulou A, Zana A, Chrysohoou C, et al. Anti-inflammatory diet and 10-year (2002–2012)

cardiovascular disease incidence: The ATTICA study. Int J Cardiol. 2016 Nov 1;222:473–8.

186. Kolčić I, Relja A, Gelemanović A, Miljković A, Boban K, Hayward C, et al. Mediterranean diet in the southern Croatia - does it still exist? Croat Med J. 2016 Oct 31;57(5):415–24.

187. Relja A, Miljković A, Gelemanović A, Bošković M, Hayward C, Polašek O, et al. Nut Consumption and Cardiovascular Risk Factors: A Cross-Sectional Study in a Mediterranean Population. Nutrients. 2017 Nov 28;9(12):1296.

188. Barak Y, Fridman D. Impact of Mediterranean Diet on Cancer: Focused Literature Review. Cancer Genomics Proteomics. 2017;14(6):403–8.

189. Schwingshackl L, Schwedhelm C, Galbete C, Hoffmann G. Adherence to Mediterranean Diet and Risk of Cancer: An Updated Systematic Review and Meta-Analysis. Nutrients. 2017 Sep 26;9(10).

190. Castelló A, Boldo E, Pérez-Gómez B, Lope V, Altzibar JM, Martín V, et al. Adherence to the Western, Prudent and Mediterranean dietary patterns and breast cancer risk: MCC-Spain study. Maturitas. 2017 Sep;103:8–15.

191. Schwingshackl L, Missbach B, König J, Hoffmann G. Adherence to a Mediterranean diet and risk of diabetes: a systematic review and meta-analysis. Public Health Nutr. 2015 May 13;18(7):1292–9.

192. Filippatos TD, Panagiotakos DB, Georgousopoulou EN, Pitaraki E, Kouli G-M, Chrysohoou C, et al. Mediterranean Diet and 10-year (2002-2012) Incidence of Diabetes and Cardiovascular Disease in Participants with Prediabetes: The ATTICA study. Rev Diabet Stud. 2016;13(4):226–35.

193. Vitale M, Masulli M, Calabrese I, Rivellese AA, Bonora E, Signorini S, et al. Impact of a Mediterranean Dietary Pattern and Its Components on Cardiovascular Risk Factors, Glucose Control, and Body Weight in People with Type 2 Diabetes: A Real-Life Study. Nutrients. 2018 Aug 10;10(8).

194. Anastasiou CA, Yannakoulia M, Kosmidis MH, Dardiotis E, Hadjigeorgiou GM, Sakka P, et al. Mediterranean diet and cognitive health: Initial results from the

Hellenic Longitudinal Investigation of Ageing and Diet. Feart C, editor. PLoS One. 2017 Aug 1;12(8):e0182048.

195. Radd-Vagenas S, Duffy SL, Naismith SL, Brew BJ, Flood VM, Fiatarone Singh MA. Effect of the Mediterranean diet on cognition and brain morphology and function: a systematic review of randomized controlled trials. Am J Clin Nutr. 2018 Mar 1;107(3):389–404.

2. Mediterranean Diet Inventory

2.1. Introduction

It should be noted that intangible culture is a living treasure that belongs to humanity. It is a vital part of our way of integrating ourselves as humans and society. Following UNESCO (United National Educational, Scientific and Cultural Organization) guidelines, we must make it clear that intangible culture is alive, it's traditional, contemporary and living at the same time: intangible culture heritage not only includes past inherited traditions, but also contemporary rural and urban uses characteristic of various cultural groups.

Intangible culture is also an integrating phenomenon that is transmitted from generation to generation; it helps to instill a sense of identity and continuity, creating a connection between the past and the future through the present. It contributes to social cohesion by fostering a sense of identity and responsibility that helps individuals feel they are members of one or several communities as well as society in general.

Intangible cultural heritage can only be so if recognized as such by communities, groups or individuals who create, maintain and transmit it. Therefore, it is structured in the community. Without this recognition, no one can decide on their own (institutions, for example) that an expression or a specific use is a part of their heritage.

Living traditions expressed from generation to generation focus on oral traditions, as well as language as a vehicle that encompasses an immense variety of spoken forms, such as proverbs, riddles, tales, children's songs, legends, myths, epic songs and poems, spells, prayers, psalms, dramatic representations, rehearsals, etc. Oral traditions and expressions serve to transmit knowledge, cultural and social values, and collective memory. They are essential to keep cultures alive. Intangible cultural heritage also focuses on the arts of entertainment, ranging from vocal or instrumental music, dance and theater to pantomime, sung poetry and other expressions that reflect human creativity and that are also, to a certain degree, in many other areas of intangible cultural heritage.

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Rituals and festivities regarded as social uses are also an essential part of intangible cultural heritage. They create customs and structure the life of communities and groups, being shared and appreciated by many of its members. Their importance is that they reiterate the identity of those who practice them as a group or society and, whether they are practiced in public or in private, are closely connected to significant events.

Another fundamental aspect of intangible cultural heritage is associated to knowledge about nature and the universe. It includes many elements, for example, traditional ecological knowledge, the knowledge of indigenous people, knowledge about local flora and fauna, traditional medicine, beliefs, initiation rites, cosmologies, rites of possession, festivities and visual arts.

Finally, another important aspect of intangible cultural heritage are traditional artisanal techniques. The expressions of traditional crafts are very numerous: tools, clothing, jewelry, clothing and accessories for festivities and entertainment, containers and elements used for storage, objects used for transportation or protection against the weather, decorative arts and ritual objects, musical instruments and household goods, and playful or didactic toys. Many of these objects, such as those created for festive rites, are of ephemeral use, while others may become a legacy to be transmitted from generation to generation..

2.2. Methodology

The development of this inventory is a fundamental measure in protecting, disseminating and revitalizing of the Mediterranean Diet as a way of life. The inventory includes the different aspects of this way of life that socially, economically and symbolically, valuing tradition and innovation that create the current panorama of this social fact.

In the methodology designed for this inventory, food is the protagonist and the center of the inventory itself, following European guidelines. Within the CAP normative, the common agricultural policy of the European Union, framework, the Regulation published on November 21, 2012 on the quality regimes of agricultural products and foodstuffs defines that:

"The quality and diversity of the Union's agriculture, fishing and aquaculture production is one of its important strengths, which offers a competitive advantage for its producers and contributes significantly to the Union's living cultural and gastronomic heritage. This is due to the skills, knowledge and determination of the farmers and producers of the Union, who have kept traditions alive while taking into account the evolution of new production methods and materials"

This Regulation values the communities' role in the creation and maintenance of a heritage that transcends the production activity itself. This heritage is associated to nature, to society and symbols, therefore protecting these foods is protecting not only the economic interest of the Union, but its own identity. A normative space that establishes the differential quality characteristics of these foods is generated taking into account the relationship with the natural and cultural environment in which foods are produced, the techniques and procedures for their achievement, the economic activities they generate, the spaces and times in which they take place and their social and symbolic functions.

The same regulation determines that "The scope of appellations of origin and geographical indications, as well as guaranteed traditional specialties, must be

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restricted to those agricultural or food products whose characteristics are intrinsically linked to their geographical origin", including in this definition, both the territorial space and the human communities that inhabit and produce them.

The purpose of the appellations of origin according to the regulation is none other than "to assure farmers and producers a fair income for the qualities and characteristics of a particular product or its production method, and to offer clear information about the products with specific characteristics associated to a geographic origin, so that consumers make informed purchasing choices".

For these reasons, the focus of the inventory will be the exhaustive collection of foods with differential quality, information that according to the Regulation itself should be available to citizens and producers. The European Union makes the following databases available for consultation:

·DOOR (1) is a database that collects food and culinary preparations qualified as DO Designation of origin, PGI, protected geographical indication and TSG-guaranteed traditional speciality agri-food products: DOOR http://ec.europa.eu/agriculture/quality/door/list.html?locale=es

·E-BACCHUS (2) is a database that gathers DO, PGI and protected traditional wine terms from EU countries and those with bilateral agreements. http://ec.europa.eu/agriculture/markets/wine/e-bacchus/

·E-SPIRIT-DRINKS (3) is a database on protected geographical indications in the European Community for spirituous beverages originating in Member States and in third countries http://ec.europa.eu/agriculture/spirits/

These databases should be triangulated as far as possible with the bases defined in the countries themselves or in autonomous communities. In Spain's case, the consultation by Autonomous Community is available on the Ministry of Agriculture, Fisheries and Food website as well as the different Ministries of the Autonomous Communities.

Food is defined with three descriptors – the element names in the local and English languages, the description and the role it plays. The description should include the definition of the type of food, differential morphology and organoleptic properties. The "role" section generates greater interpretation difficulties.

This report has valued that the correct term would be "bond" understood as the differential fact of their choice and permanence in the food-economic system of the community it feeds. This fact must answer the following questions: Why has it been chosen as a synonym for quality? Why was it introduced in the diet pattern and/or why has it remained?

Historic, symbolic, determined and chosen bonds by the community itself are the determinants, beyond the role of a certain age group, level of expertise or gender. The privileged sources for these descriptions will be the files presented by the communities and endorsed by the different States where the characteristics of food are defined, its manufacturing process and the natural and cultural links of the food with the community are made explicit.

Once food items have been inventoried, recipes – understood as narrations that allow the execution of dishes – were collected that maintain the differential features of the geographical and cultural environments, listing ingredients, condiments and the necessary techniques, both for preparation and presentation of the dish; as well as the when and where they are consumed. Both traditional preparation associated to the communities in question as well as new creations were assessed. If direct fieldwork in the community was not possible for obtaining recipes, ethnographic atlases, specific bibliographies, television programs and documentaries specifically dedicated to this topic were used as sources.

Socioeconomic activities depending on food were also determined, understanding as such all those that have to do with production-extraction-collection of food, transformation, and distribution, including the websites of producers and regulator councils, as well as social networks, without forgetting those activities related to their dissemination and promotion –enotourism, agrotourism, gastrotourism, etc, festivals and product fairs, etc.

In the trades section, trades, local practises and craft techniques as well as experts in the entire manufacturing or production process of objects and products, with their specific work techniques, tools and spaces, knowledge crafts "complete" in front of the subdivision with partial information of the knowledge and roles in those socioeconomic activities. Craftsmen, both of objects of daily use and the fabrication of culinary creations have a place in this section. Potters, "esparteros", tinsmiths, carpenters-cabinetmakers, canners, curers,...shepherds, cooks.

Spaces and times of creation, transformation and consumption of food complete the inventory. Anthropized natural spaces, adapted food production activities, with rivers, aquifers and streams that allow cultivation, fishing and aquaculture; cultural spaces such as places of production or commensality. Time is marked in two different moments that are present, the time of daily life and the time of celebrations, where food makes the difference between one and the other. The festivities are treated in both annual cycles –festivities and life cycles -rites of passage and celebrations-.

In this inventory, a fundamental field to our understanding has been ignored. The imaginary of food and its use, as well as its place in the symbolic world – food that cures, post-partum foods, young children... as well as the assessment of commensality- is transmitted through oral expressions – legends, stories, sayings, nursery rhymes, jokes – that convey metaphors.

In the "presentation" of this way of life it is considered necessary to include those heritage manifestations recognized by the UNESCO in the representative lists: Intangible heritage, landscape and monumental heritage.

The ultimate goal is to "go beyond" the mere description turned into a catalog but to show a network in which each element is in synergy with the others to create this Mediterranean Diet culture.

Fig. 1 – Mediterranean Diet Inventory categories

FOOD: DOP, IGP, ETG

Recipes	Socio-economic activities	Subjects	Techniques	Festivities: Annual cycle/life cycle
Ingredients, culinary techniques, utensils, presentation, commensality Traditions/nouvelle cuisine	Production: livestock, agriculture, aquaculture, mariculture, beekeeping Transformation: canning, freezing, curing, smoking Dissemination: fairs, agrifood festivals...	Institutions, cooperatives Artisan-producers, specialized companies	Production-extraction, collection, transformation, conservation	Music, dance, representations

2.3. Results

Finally, a total of 1,232 items were collected for the Mediterranean Diet Inventory. Table 1 shows the classification by partners and by categories and table 2 by countries and categories.

To be able to consult all the inventoried items with all its details and their extensive description, consult the document MD.net_D.3.1.1_MDInventory.

Tab. 1 – Mediterranean Diet Elements by partner

	Food & Culinary Uses	Traditional food recipes	Landscape	Cultural spaces	Main production activities	Techniques & Trades	Festivities and Celebrations	Total
LP1	44	10	11	41	19	7	17	149
PP1	22	34	8	19	20	3	15	121
PP2	12	12	5	8	9	5	13	64
PP3	18	16	1	6	9	10	13	73
PP4	18	21	3	7	12	11	3	75
PP5/PP11	47	15	19	14	8	6	17	126
PP6	66	16	24	7	6	14	15	148
PP7	53	27	17	10	13	9	14	143
PP8	51	33	10	10	20	1	26	151
PP9	30	7	12	4	8	4	7	72
PP10	1	3	15	7	2		2	30
PP12	17	24	2	14	12	7	4	80
Total	379	218	127	147	138	77	146	1,232

Tab. 2 – Mediterranean Diet Elements by countries

	Food & Culinary Uses	Traditio-nal food recipes	Lands-cape	Cultural spaces	Main produc-tion ac-tivities	Techni-ques & Trades	Festivi-ties and Celebra-tions	Total
Albania	1	3	15	7	2	0	2	30
Bosnia Herzegovina	18	21	3	7	12	11	3	75
Croatia	12	12	5	8	9	5	13	64
Cyprus	17	24	2	14	12	7	4	80
Greece	18	16	1	6	9	10	13	73
Italy	127	44	40	55	40	20	38	364
Portugal	22	34	8	19	20	3	15	121
Spain	113	31	43	21	14	20	32	274
Slovenia	51	33	10	10	20	1	26	151
Total	379	218	127	147	138	77	146	1,232

2.4. Conclusions

Food is a social space that transcends beyond mere consumption; it is a nutritional practice but above all, it is cultural. Food must be understood as a universe that collects raw materials –foodstuffs- as well as the knowledge to obtain it. Gastronomy is understood as the techniques and processes of transformation, preparation and presentation of these foods. Commensality –where, how, why and who consume the foods- defines where that dish stands within the community. This shows us what is "right" regarding how it is consumed; prohibited foods in one country are considered privileged in another country.

The Mediterranean Diet, Intangible Heritage of Humanity, responds and clearly demonstrates the complexity of food and its social and symbolic significance. The Mediterranean basin includes the territories of southern Europe, northern Africa and the westernmost area of Asia. It is in these areas that the so-called Mediterranean civilizations developed, whose continuity in time is manifested to this day through a largely common culture, above and beyond deep political and religious differences.

Food that provides for and builds our culture – the Mediterranean Triad – is constant in the above-mentioned regions. These three basic products of Mediterranean agriculture: wheat, grapes and olives make up the territorial organization of the communities of the basin, creating defined and identifiable cultural landscapes. The use of land and water resources, the types and distribution of cultural buildings, houses, olive mills, wheat mills, warehouses...teach us the vision that people of the Mediterranean have of life. These basic products in the diet are complete –and even acquire prominence- with dairy products – sheep, goat and cow cheese are constant – as well as the consumption of milk, cream and the eastern area of the yogurt basin. The pig, considered the "king" of foods of animal origin, is also present in all countries of the region, especially in prepared products that can be consumed through the year; sausages for example. Poultry and eggs provide protein in a constant way.

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Shepherding, in addition to being a common economic activity, produces meat, hides and wool that were primordial for preparing clothes in all countries of the Mediterranean basin.

Regarding sweets, honey continues to be important in the production of pastries, being consumed directly and used for medicinal purposes. Fish –dried, salted, and/or smoked – is a part of inland diets, along with freshwater fish. Fresh seafood (fish and shellfish) center the economic and food activity of the coastal areas.

Where are the differences? How is diversity obtained? The climate, the specific characteristics of the land, the properties of the water and production techniques generate foods that differ in their organoleptic properties, but also the combinations created when making dishes, as well as the different use of spices and condiments produces very rich and differentiated gastronomies.

Cataloguing raw materials, elaborations, economical activities and commensality is a "fascinating voyage" that uncovers a subtle network of actions and thoughts with common features where differences are considered enriching.

The importance of hospitality, entertaining through food and drink and commensality – sitting down to eat together- make a difference in the customs of the area. Thus, food is a vehicle to generate networks of solidarity and social alliances.

Food and how it is prepared also depends on the time and place –social parties, different celebrations throughout life, especially weddings, and everyday life- are common features in our culture.

This inventory shows –wants to show- the similarities –types of foods used and their consumption- organized to create awareness regarding the great diversity of techniques and elaborations that offer a repertoire of practically unlimited dishes, but that maintain some clear constants – the use of olive oil as added fat – the importance of consuming pasta, bread, fruits and vegetables and legumes as the base of a daily diet. Meat, seafood and fish are quantitatively minor in the daily diet but are protagonists during festive meals. Making sweets and pastries, in the context of

festivities are examples of “domestic collaborative crafts” especially by women, who share this time of work to turn it into a time of conviviality and celebration. There are two beverages that are protagonists – water, and all the preparations where it is used, and wine, that is believed to have mythological origins, considered a drink of the gods, an element of sociability that generates an inherited and gastronomic legacy based on flavours, colours, aromas exceeding their nutritional value and the health benefits they provide.

Everyday life, meals are also organized around the life cycle –children, adults, the elderly, and their health state, adapting food and preparations for each moment and occasion.

The distance between producers and consumers disrupts the transmission of knowledge about the food‘s origin, hence the creation of an entire legislation that evidences and protects the foods of our Diet is essential. The objective is none other than to protect producers and consumers and establish a relationship between them that allows the survival of these healthy eating ways.

This inventory demonstrates how the indications of differentiated quality, Denomination of Origin, Protected geographical indications, guaranteed traditional elaborations, demonstrates the determination of institutions to recognize the idiosyncrasy of this Diet and its safeguarding.

For each country DOP, IGP and ETG foodstuffs were catalogued with priority, describing their morphological and organoleptic characteristics, production techniques, its socio-economic organization and cultural spaces necessary for their conservation and transformation, the necessary and acquired knowledge, the needed effort to achieve them and the required transformations in the landscape, common elements to all the described areas, which are expressed with all their particularities. The inventory includes traditional methods, but all technological innovations that are

not integrated into specific procedures, and the results of creativity –new elaborations, dishes and consumption proposals-.

Regarding the bonds – to the role of the community - the importance given to the historical tradition of consumption must be emphasized, which allows establishing a line of continuity between past and present that legitimizes the value of each of them, and that demonstrates a common history for the Mediterranean basin. Phoenicians, Greeks, Romans, Arabs present throughout the history of the countries generate similar features in each of them, which together with their peculiar tradition shows a diversity that allows assessing the differences while building a common framework of coexistence. The legends reinforce this mythological aspect of cultural creation, and riddles, stories, sayings, show the importance that these foods have for the life of the people.

In this Role, we have also wanted to take into account the changes that have taken place in the production and consumption of food; the phylloxera plague that devastated European vineyards in the 1870s, generating different strategies to combat it, the return of native varieties, introduction of livestock, etc. is also discussed.

This report also discusses the changes in the evaluation of foods and their preparations, the food that arise in a defined place and for specific consumption. The Neapolitan pizza for example has gone from being a local “humble” dish to being the international reference for pizza. Furthermore, the introduction of new foodstuffs, in many cases resulting from exchanges between the countries of the Mediterranean itself, is also discussed.

The labour of the producers, and the changes they have undergone are also discussed. They have gone from individuals to Cooperatives, agrarian transformation societies, transformation and production enterprises. Emphasis is made on Regulator food Councils, protagonists of the intermediation between consumers and producers, and guarantors of their quality, as well as highly active agents in the revaluation and diffusion of the products.

Travelling through this inventory opens a door to a network of culture that is shared and safeguarded in the Mediterranean.

2.5. References

1. DOOR database. Available at: http://ec.europa.eu/agriculture/quality/door/list.html?locale=es

2. E-BACCHUS database. Available at: http://ec.europa.eu/agriculture/markets/wine/e-bacchus/

3. E-SPIRIT-DRINKS database. Available at: http://ec.europa.eu/agriculture/spirits/

All the data gathered in this document may be subject to modifications and improvements at any time by the partners during the different phases of the project

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