

The benefits of the Cretan diet

Testimony from doctors and travelers, since the end of the 18th century, mentions the good health of Greece's inhabitants in general and Crete's in particular. Those testimonies highlight the positive effect of the weather and diet on people's well being and health.

In 1948, the Greek government, willing to improve the health of its citizens using the tools of western medicine, asked the Rockefeller Foundation, which manages and finances scientific activities with the epidemiologist Leland Allbaugh, to organize a large epidemiological study of the inhabitants of Crete in order to improve their health. The purpose of the study was to discover how "developed country knowledge could best serve underdeveloped regions such as Crete"

The diet habits of every 1 for 150 households were carefully studied and recorded, using the work of numerous benevolent Red Cross workers.

This is how it was discovered that the farmer from Crete about the years 1950, whose way of life had barely changed over the last centuries had an exceptional life expectancy, despite his low level of income.

This is how started the history of the "Cretan's diet", inspired by the traditional food habits of this island, which included a rather large amount of cereals, dried vegetables, greens, fruits, herbs, olive and olive oil, oilseeds, mixed with moderates amount of meat, fish and dairy products.

Cretans and Americans diet habits were compared and here are the main differences:

- Similar amount of fat, but, in the US, most fat comes from animals (meat, dairy, butter, eggs, fried food, sweet and fat deserts) while 80% of Cretan diet fat comes from olive and olive oil.
- Most proteins in the Americans diet come from animal food, versus bread, cereals, dried vegetable for the Cretans, who eat animal proteins mostly as fish, chicken and eggs.
- Twice the amount of fruits and vegetable for the Cretans.

Sources of protein in diet, by percentages, Crete, Greece, and United States, 1948			
Food Group	Crete Fall, 1948	Greece 1948-1949	United States 1948-1949
Cereals	47	65	21
Potatoes	4	2	2
Sugar, etc.	0	0	0
Pulses and nuts	17	10	5
Vegetables and fruits	8	4	6
Meat, fish and eggs	19	11	40
Dairy products	5	8	26
Oils and fats	*	*	*
Total protein	100	100	100
Animal protein	24	19	66
Vegetable protein	76	81	34

*Less than 0.5 per cent.

Sources: Crete: Sample Survey of Crete, Form Ia, Seven-day Diet. Greece: Food Balance Sheet for Greece, 1948-1949. Ministry of Agriculture and Ministry of Coordination. Athens. United States: Food Balance Sheets, 1950 Supplement. FAO. Washington, April 1950.

The consumption of proteins per capita per day in Crete was 70.7 grams according to the seven-day diet survey, or about three-fourths that of the United States and about the same as for Greece. It's also worth mentioning the great introduction, written by Chester I. Barnard, who talks about rich countries, concern to find the most efficient way to help third world countries.

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It's important to understand, that each culture has its own set of values that one shouldn't arbitrarily destroy, just because it seems itself as superior. Additionally, the life of a population is a whole, in which every elements are linked, and a change in one aspect can have devastating effects in others, and this applies not only to economy, politics and social life but also to the spiritual well being of a country. »

Case study of seven countries

The study from the Rockefeller foundation allowed establishing the main characteristics of the Cretan diet.

In 1952, Ancel Keys, an American scientist, decided to investigate and compare diet habits in seven countries and the relative risk of heart disease. The studied countries were: the USA, Finland, Holland, Japan, Italy, Yugoslavia, and Greece (where we make a distinction between the Island of Crete and Corfu)

This study was going to follow precisely the health of thirteen thousand persons in seven countries over twenty years. The results brought a lot of valuable results, particularly in regards to mortality rate in relation to coronary disease and myocardial infarction.

For example, in Crete, the rate of death related to heart disease was of nine for one hundred thousands over a ten year period, while it was over four hundred in the USA or in Finland. In Corfu as well as in other Mediterranean countries (Italy, Yugoslavia) the death rate was lower than in the US but still much higher than in Crete. For example cancer cases in Crete were half the rate of Italy or Holland.

We had to face the evidence: thanks to their dietary habits, Cretans have an exceptional health. Those results came as a surprise at the time, as it was believed, not only that animal products were good for the health, but also that any kind of fat was bad for the heart and cholesterol levels.

As the results of Key's study seem to contradict that view, scientific studies related more particularly to Olive oil, the main source of fat used in Crete would soon reveal its qualities. Additionally, mortality rate in Crete is lower, not only in regards to heart disease but also, in general. For example cancer rates are half the ones of Italy, Holland or Finland.

One point of uncertainty remains: if Cretans seem to be in better health than their neighbors from the continent or from the Island of Corfu or even Italians or Yugoslavians who are all heavy consumers of olive oil, it is that there are other factors that are at play in their longevity. But which are those factors? Mortality heart, heart disease and all causes together.

Country	Coronary death and death for all causes (per 100,000 per year)	
	Coronary death	Death all causes
Finland	466	1390
United States	424	961
Holland	317	1134
Italy	200	1092
Yougoslavia	145	1021
Corfou (Greece)	149	847
Japan	61	1200
Crete (Greece)	9	627

Following those early studies, numerous subsequent studies confirmed the conclusions that were made earlier: observation studies were followed by intervention studies, in order to prove the hypothesis formulated from the observations of the Cretan population.

Dr Serge Renaud's study, published in 1994, proved in a brilliant way, the effect of a change in diet towards a more Cretans style. He studied 605 cases of persons from a service of cardiology in Lyon who had suffered a myocardial infarction in the preceding months, and used those patients to test two types of diets:

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The first group followed the diet recommended at the time in Western Europe and in the USA and which focus, first and foremost, was to lower the level of cholesterol, by reducing saturated fat from animal source, in favor of unsaturated fat from vegetables, but without changing other aspects of the diet.

The second diet, of “Cretan” inspiration, included more bread and cereals, fruits and vegetables, fish, less meat replaced by poultry, butter and cream replaced by olive oil and colza based margarine, and included 2 “free” meals a week including a glass or two of wine.

One year after the start of the study, it was observed a death rate 70% lower, and 76% less heart events in the “Cretan diet group”.

Four year later, it was still observed a heart related death rate 65% lower, 60% less cancers, 50% less death all cause included in the “Cretan group”, compared to the standard diet group.

However, the rate of cholesterol had been lower similarly in both groups. Even so, the blood viscosity had been raised in the “standard” group because of an increase in poly-unsaturated fats, which do help lower cholesterol, but favor cases of thrombosis, which means the creations of blood clots which attached to the cholesterol inside the arteries, is the cause of myocardial infarction.

Consequently, the positive effect of the lowering of the cholesterol level is being cancelled out by the increased tendency of the blood to create blood clots.

On the other hand, in the “Cretan group”, blood fluidity and soft vessels are favored by the presence in the diet of fat acid omega 3 from vegetable source (linolenic acid), or coming from the fish (EPA and DHA); this mechanism prevents the creation of blood clots, raise blood fluidity in the vessels and reduce blood pressure.

Among Cretans, the blood rate of linolenic acid (omega 3 from vegetable source) is 3 times higher than for the Dutch, thanks to the consumption of purslane, walnuts, almonds, as well as snails, and chicken eggs, and those chickens who feed themselves on grains of vegetable source. Among the other factors that favor Mediterranean diet, we should mention:

- Garlic and onion which lower the rate of cholesterol.
- -The phyto - estrogens, which structure is close to the estrogenic hormones, which are encountered in fruits (apples, pears, grapes, dates, peach, grapefruit, walnuts) and cereals; they raise the level of “good” cholesterol, lower the level of the “bad” one, and cause vessel’s diameter to expand.
- Anti oxidants are also present in high concentration in the Cretan diet through polyphenols, which are encountered in vegetables (fruits and vegetables and cereals), olive oil and wine tannin. Lemons, frequently used in southern countries are high in flavonoïds, a powerful anti oxidant. Selenium, another anti oxidant, is present in grains, fruit seeds, nuts, walnuts, almonds and sea food.
- Oxidants are substances that slow down the cell aging process, and their death; rich anti-oxidants diet is implied in the lower mortality rate, all cause considered, among people from the Mediterranean region as opposed to the northern countries.
- Zinc, oligo element that helps in the construction of the skin, hair and nails is found in cereals and vegetables.

Therefore, the entire environment in Crete, in 1950, was favorable to longer life expectancy, despite the low income level and maybe, thanks to it, as it forced the inhabitants of the cities to eat simply, from what the environment was providing them, freely accessible like purslane, snails, eggs and chicken fed on wild grains.

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Additionally, Cretans would observe occasional switch in their diets: 40 days before Christmas, before Easter, from the 1st to the 15th of August; during those period, meat and poultry are replaced by eggs, fish, escargots and seafood.

Unfortunately, this situation has evolved in the wrong direction due to the development of a culture of consumerism, and the adoption of more westernized food habits.

Young Cretans have left their mountain villages for cities near the sea, and their weight is now one of the highest in Europe. Obesity is becoming epidemic, particularly among children. (39% of 12 year old Cretans are overweight or obese). In forty years, consumption of red meat has raised 150% and consumption of fat by 100%. Consumption of olive oil is going down as well as the one of vegetables. French fries, unknown on the island 10 years ago are now frequently eaten. Fast foods are found throughout the island.

At the same time, heart disease problems in Finland are going down, as this country is determined to address the issue: public health authorities efforts had resulted in a drop in obesity rate, cholesterol levels, consumption of saturated fats, and blood pressure. Extremes are getting closer.

It is therefore clear, that it's not necessary to leave in Crete to change our food consumption, and our lifestyle in a direction beneficial for our health and for the health insurance system!!

Of course, we are not talking about replacing our food habits with the ones of Cretans, because of elements of emotional and cultural dimension. This is neither a realistic nor a desirable option: eating satisfaction and the feeling of being full is partly related to habits establish at an early time in life: one used to eat tuna with spices will not feel the sense of being full by eating sushi and is likely to overeat!

In addition, western city life doesn't necessarily allow easy access to a purslane salad, eggs from chicken fed on wild grains, or wild snails after the rain!

However, dietary knowledge allows those who want, to find easily accessible food items with comparable health benefits.

Finally it's important to know that no food is fully health beneficial, or fully hurtful. The secret of a healthy lifestyle is in a balanced and diversified diet.

Moreover, a specific food which could be perfectly adequate for a population with a specific gene pool (like soya in Asia) may not necessarily have the required health benefits if it's eaten in excess by a population with a different gene pool.

Sociability which also governs food habits is also important as a cause of disease related to diet: eating fast, alone, identical food groups, while sitting in front of the TV or the computer, is not advisable for health reasons as it causes weight increase and digestive diseases.

How should one eat to be in good health?

From a quantitative standpoint:

- Do not eat more than you feel you need, and for that, eat slowly and stop eating when you feel it's enough.
- Increase your physical activity in order to increase your energetic needs and preserve muscle mass which consumes energy.

Except in case of disease or a specific genetic alteration, those simple measures will guarantee a stable weight.

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From a qualitative standpoint, fat should not represent more than 30 to 35% of calories, or 1g of fat per kilo of weight. For example, for a 60 kilos woman, a daily diet could be:

- Breakfast: 10g of butter, 3g of fat in the yogurt = 13g.
- Lunch: 5g of oil in the vegetables, 10g of fat in the vegetables, 10g of fat in a grilled piece of meat, 9g of fat in a piece of cheese = 34g
- For dinner, 13g are left that can be used in one spoon of oil and a yogurt.

Those fats, unlike what we thought a few years ago, don't need to be mainly polyunsaturated fats (sun flowers), as we've seen that they favor thrombosis.

- -First cold pressed olive oil which include 71% of mono-unsaturated fat acid
- -Colza oil, which contains 64% mono-unsaturated fat acid and 10% omega 3
- -Oil from nuts, and nuts, which are not too heavy in mono-unsaturated fat acid, too heavy in polyunsaturated fat acid omega 6, but bring lots of fat acid omega 3. It can be advised to eat in small amount like almonds.

Let's remember that part of the fats needs to come from fish, in particular fishes rich in omega 3. (Salmon, sardine, haring, mackerel) approx twice a week. Proteins need to be ideally 15% of daily intake of calories, so roughly 300 calories for a diet of 2000.

To be close to the Cretans diet, a low amount of protein should come from meet and the rest from fish, snails, bread, and vegetables such as cereals, and leguminous plants (lentils, white beans, chick peas...)

Carbohydrates should be a maximum of 50% of a diet, coming from vegetables, cereals, leguminous plants, fruits and bread.

People with specific illnesses (diabetes, obesity) should sometimes reduce this amount to 45% and raise the amount of quality proteins. Others, which have renal failure must raise to 55% the amount of carbohydrates, and low the proteins.

Of course cereals and leguminous plants should be eaten with vegetables as those are complementary food groups.

- Fibers, which come from vegetables, fruits, cereals and leguminous plants.
- A diversified diet, especially if it uses seasonal fruits and vegetables, will guarantee you a proper intake of vitamins.
- Water needs to be drunk heavily, particularly during meals in to hydrate the alimentary bolus and to favor stomach transit, but also outside meals, depending on your thirst.
- A small amount of wine (at max one glass per day) can be advisable, without causing any other damages to the health. Wine contains tannins rich in polyphenols which have anti-oxidants virtues, lower bad cholesterol and will make the blood more fluid. Beer also can have some favorable effects, always in small amounts, but those effects are lost for smokers.
- Drunk heavily, alcohol has the opposite effect and will raise the incidence of heart attack and thrombosis due to "rebounded effect".

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Our conclusion:

Eating is a fundamental part of what we are. It is a biological act, which we forget too often, as we can't live without eating and, for numerous diseases changing diet can bring the cure.

It's a deeply cultural act, which result from the interaction of costumes and environment. It's sometimes a religious act.

It is a deeply intimate act, which goes all the way back to the mother breast, the first emotions of the new born, and its first pleasures. Therefore, those habits can only be changed with careful methods if one doesn't want to encounter psychological difficulties.

It is an action that unfortunately went astray in western societies, pressured by need for profit or excessively intellectualized approach.

Eating is often the result of intellectual or moral pressure, in which limitation and guilt are the forefront of the eating behavior, and motivates people to look for vitamins at the pharmacy, which they should encounter at the food market. This result in more overweight people and the food industry making money at the expense of farmers and health insurance company

A universal and public-health approach seems necessary and is beginning as studies show their need and efficiency. Unfortunately, as wealthy countries start to put in place programs for better dietary habits, poorer countries, where consumption grows, produce more and more fat people especially because those who survived centuries of starvation are those who are genetically equipped to store food and salt better. This explains they become obese and having high blood pressure, once exposed to abundance.

There is a need for further investigation and questioning around the issue of food habits on various levels ranging from philosophical, political, economical, sociological , ecological, psychological, to medical that could as my father used to say, fill "bookshelves and bookshelves"!

Remarks by Dr. Aviva Saltiel, 27 June 2009, Chania, Crete