

Superfoods, the Key to Longevity: Myth or Reality?

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Longevity has fascinated humanity since ancient times. For years, scientists, in terms of longevity, have been correlating genetics and the environment (Genotype and Phenotype).

Undoubtedly, an individual's DNA plays a role in the aging process. An individual's genotype affects a percentage quantified around 30%. But if this is true, decisive and fundamental in aging, it is equally (indeed more) the lifestyle, the so-called phenotype, which affects 70% of aging itself. Let's be clear to everyone: even in the presence of an unfavorable genotype, we are very likely to live longer by changing our lifestyle. Lifestyle means talking about physical activity and especially nutrition.

Among the research that has emerged in the last ten years, there is one that deserves particular attention, that of the blue zone [1]. It was developed by the essayist Dan Buettner with National Geographic and started by the French demographer Michel Poulain together with the Sardinian doctor Gianni Pes. They began their research in Sardinia (Italy), they circled the towns of Ogliastra and Barbagia, characterized by high percentages of longevity, in blue. Hence the term, "blue zone." Subsequently, other areas (hotspots) were identified throughout the planet that presented elements in common with the first, from the diet to lifestyle. In Europe, the hotspots are located precisely in some countries of Sardinia, in Italy, in the historical areas of Barbagia and Ogliastra, and also in the Ikaria islands, in Greece; in Japan, in the Okinawa islands; in Costa Rica on the Nicoya Peninsula; and finally, in Loma Linda, California, in the Christian community of the Seventh-day Adventists [2]. The interesting part of the research is obviously the food for thought it offers. What are the elements common to all these areas, so far apart?

For example, in the population of Okinawa, the longest-lived in the world (and also the healthiest), nutrition, for example, plays a fundamental role. Food diaries collected by American researchers in the immediate post-war period (1950) revealed that Okinawans consumed 1,785 calories per day on average, much less than the Japanese and Americans at the time (2,068 and 3,130 calories respectively). In Okinawa the main source of diet was legumes and whole grains, while in Japan and in the USA the main sources were fish, meat, and cheeses. Jumping from Okinawa to the Mediterranean Sea, in the land of Italian longevity, in Villagrande Strisali in Sardinia, a village crossed by numerous rivers and flanked by the inhospitable mountains of the Gennargentu, the testimonies of the elderly over the age of ninety (plus a few over one hundred years old), all in good health, physically and mentally active, confirm it. What they (as well as the inhabitants of the Greek island of Ikaria) have in common with the inhabitants of Okinawa is, above all, diet. Predominantly vegetarian, based on vegetables, whole grains, and legumes, their diet confirms their importance for longevity. Returning to the aforementioned study on the blue zones, the fact that two out of five hotspots (Sardinia and Ikaria) are located in the Mediterranean basin, seems to be correlated with the fact that both populations follow the Mediterranean diet, the basis of which is - and it's good to remember - whole grains, five portions a day of fruits and vegetables, legumes, and to a lesser extent cheeses, white meats, fish, and eggs.

Observation and studies on the world's centenary populations show, in essence, that longevity and incredible health are in part linked to genetic factors, but mostly due to lifestyle. And diet is an important factor in lifestyle, both for the primary and secondary prevention of

numerous chronic diseases, and for the pursuit of longevity. Above all, the presence of fruits and vegetables is essential in the diet, foods that have an important protective effect on the body thanks to the high content of polyphenols (powerful natural antioxidants) [3].

Antioxidants inhibit the harmful effect of oxygen free radicals on all cells, which prevent cell regeneration and reproduction, and accelerate the aging process even more.

The polyphenols contained in fruits and vegetables are the most powerful natural antioxidants. A review of many published clinical studies on the effect of fruit and vegetable consumption on health has shown an inverse association between dietary polyphenol intake and cardiovascular disease risk, with a reduction in cardiovascular mortality of up to 65% [4]. In simple words, polyphenols can prevent the main cardiovascular diseases responsible for aging and death.

While, on one hand, the positive vascular effect in general of diets rich in polyphenols can be demonstrated, it is equally reasonable to hypothesize, on the other, that this effect is largely determined by a relatively small number from the flavonoid family.

Conceptually, this is an important point, as the polyphenol profile present in fruit and vegetables varies greatly. If the hypothesis that the positive vascular effects of a diet rich in plant foods is due in part to a limited number of flavonoids is correct, this has important implications for dietary recommendations, and potentially for the development of new natural drugs.

Some controlled studies on the short-term effects of a dietary intervention with foods rich in polyphenols have shown that the main positive effect on reducing the risk of cardiovascular events (heart attack, stroke) is due to an evident improvement in vascular endothelial function. In particular, the acute and short-term intake of polyphenols with the diet, through a powerful direct antioxidant action as scavengers (substances capable of transforming oxygen free radicals into non-radical, free compounds reactivity and therefore toxicity), reduces the level of oxygen free radicals (oxidative stress) and therefore increases the bioavailability of nitric oxide (the most powerful endogenous natural vasodilator). All this leads to an increase in endothelium-dependent vasodilation in humans, with repair of vascular damage, improvement of blood perfusion to organs, and reduction of blood pressure [5-9].

The powerful prevention action of chronic degenerative diseases translates into a reduction in the risk of myocardial infarction, stroke, diabetes, and neoplasms, with the result not only of a longer life but, above all, of an exceptional state of physical and mental form until late age.

It is evident that the subjects who age earlier and get sick more easily are those with high oxidative stress values and low antioxidant values. Precisely in these subjects, it is vital to administer antioxidants to slow down aging and prevent diseases, especially cardiovascular diseases and neoplasms (cancer).

Here the concept of “superfoods” enters the field, that is, of those foods that, thanks to the high intrinsic content natural antioxidants (polyphenols) can contribute, if taken regularly and in the right quantity, to restore the balance between oxidative stress and antioxidant defenses, and therefore slow down aging and the onset of disease.

There are many definitions of superfoods. If you search for the term in a dictionary, there are the two definitions that appear: a nutrient-rich food considered particularly beneficial for health and well-being; or a super food rich in nutrients, vitamins, minerals, fiber, antioxidants and/or phytonutrients.

The most used (and also most correct), in my opinion, is the one that defines a superfood as “a multifunctional food that, thanks to the high content of bionutrients and biologically active molecules, has exceptional nutritional properties or that brings benefits to health and to the well-being of the body”.

Although to date there is no clear definition, the European Union has banned their use on the packaging of products, unless there are convincing research studies to support the so-called Health Claims. This is because the concept of superfoods is closely linked to the ability to have multiple physiologically active actions on the human body capable of preventing and treating diseases, and therefore improving the quality of life and giving longevity (Claims).

On one hand, some *in vitro* (laboratory) studies and some *in vivo* studies, carried out on animals, suggest that certain foods could really play a role in improving the quality of life and treating diseases. On the other hand, however, most human trials do not support this hypothesis. Many superfood studies have tested food extracts or chemical components in concentrations that are not present in foods in their natural state. Basically, for most foods with special qualities (which many call superfoods), it has not been possible to demonstrate whether (and possibly in “human” quantities) they are really able to reduce the incidence and mortality of the main diseases (heart attack, stroke, neoplasms). As Richard Feynman would say, “It doesn’t matter how beautiful your theory is, it doesn’t matter how smart you are. If it doesn’t agree with the experiment, it’s wrong”.

To return to superfoods from literature or the press, the most recent list reaches even a hundred miraculously functional foods [10,11].

If your goal is to pursue a healthy and correct diet, each food can have a supply of nutrients useful to the body. If you consistently eat a “single food” that you think is a superfood, you will probably have a bad diet. A balanced diet must contain all the nutrients necessary to maintain a good state of health for your body. Because in reality there is no food that, taken alone, is able to contain all the nutrients that our body needs. On the contrary, multiple foods, if combined, can determine the right intake of useful substances.

Many foods have particular positive physiological properties for our body. But when we talk about superfoods, that is, foods that can have healing and beneficial qualities for health, allies of prevention that reduce the incidence of diseases, I believe it is necessary to use the same methodological approach used for experimental drugs. Otherwise, there is the risk of giving false, useless, and sometimes even dangerous information for health.

Actually, there are tens of thousands of studies published in this regard.

The problem is that the vast majority of these studies do not respect all the characteristics mentioned above to validate the therapeutic and preventive efficacy of a food. To have a proven efficacy on health, a drug, as well as a “natural” substance, must have an important number of studies (on a considerable number of patients) performed in its favor; then the studies must be related to each other (metanalysis), to combine the data of multiple studies conducted on the same topic, generating a single conclusive data to answer a specific clinical question.

Going back to the nearly one hundred “aspiring” superfoods, the point isn’t good or bad. But can they all boast the title of superfood? In other words, are they really able to prevent the most important diseases and improve the quality and quantity of life?

The answer is no. Because following the logic and approach that a researcher can never abandon, superfoods, to date, exist, but can be counted on the fingers of one hand [12].

I think that the so-called “natural” and non-pharmacological interventions, to prevent diseases and improve the state of health and well-being, will become a cornerstone of future productive economic development.

Here then, the interest in “natural” aids, that is, for functional food, like superfoods, can make sense. Provided, however, that natural aids must also scientifically certified.

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