



What Are Superfoods and Are They Really Super?

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The term 'superfood' has become a popular buzzword in the language of food and health. However, there is no technical definition of the word and the scientific evidence for the health effects of these foods — while often positive — does not necessarily apply to real diets. A diet based on a variety of nutritious foods, including plenty of fruits and vegetables, remains the best way to ensure a balanced nutrient intake for optimal health.

The origin of the superfood

The concept of the superfood is a popular one when it comes to food and health. The media is full of reports of ultra-healthy foods, from blueberries and beetroot to cocoa and salmon. These reports claim to reflect the latest scientific evidence, and assure us that eating these foods will give our bodies the health kick they need to stave off illness and aging. But is there any truth to such reports?

The current attention on superfoods has likely been encouraged by a growing public interest in food and health, particularly in the developed world.¹ While the use of the term has been recorded as far back as the beginning of the 20th century, it has only recently become popular in mainstream language.² A simple internet search for the word, superfood, reveals close to 10 million results — predominantly from health and nutrition blogs, online newspapers and magazines, and providers of nutritional supplements.

Despite its ubiquity in the media, however, there is no official or legal definition of a superfood. The Oxford English dictionary, for example, describes a superfood as "a nutrient-rich food considered to be especially beneficial for health and well-being", while the Merriam-Webster dictionary omits any reference to health and defines it as "a super nutrient-dense food, loaded with vitamins, minerals, fibre, antioxidants, and/or phytonutrients".^{3,4} Generally speaking, superfoods refer to foods — especially fruits

and vegetables — whose nutrient content confers a health benefit above that of other foods.

What is the evidence?

In order to distinguish the truth from the hype, it is important to look carefully at the scientific evidence behind the media's superfood claims. Blueberries are one of the more popular and well-known superfoods, and have been studied frequently by scientists curious about their health properties. The berries' high concentrations of a group of antioxidant plant compounds, especially those called anthocyanins, have been reported to inhibit the growth of cancerous human colon cells, as well as kill them off.⁵ Blueberries are also rich in other antioxidants, which have been shown to prevent and reverse age-related memory decline in rats.⁶

Antioxidants are molecules which protect the cells in the body from harmful free radicals. These free radicals come from sources such as cigarette smoke and alcohol, and are also produced naturally in the body during metabolism. Too many free radicals in the body can result in oxidative stress which, in turn, causes cell damage that can lead to age-related diseases like cancer, diabetes, and heart disease.⁷

Other fruits which have received superfood status include açai berries and pomegranates. The fruit pulp of açai berries has been shown to have potent antioxidant properties, although any potential health benefits of this have yet to be confirmed in humans.^{8,9} Studies on pomegranate juice have suggested that it can lower blood pressure in the short-term, as well as reduce oxidative stress, in healthy people.^{10,11} These are both significant risk factors for heart disease.

Like pomegranate juice, beetroot has been proposed as a heart-healthy superfood. Its high levels of nitrate are claimed to be converted by the body into nitric oxide which, among other functions, has been shown to lower blood pressure and the tendency for blood clotting in humans.¹² Cocoa has similarly been claimed to cut the risk of heart disease by lowering blood pressure and increasing the elasticity of blood vessels. This is thought to be due to cocoa's high content of compounds called flavonoids.^{13,14} Finally, salmon has frequently made it onto superfood lists amid growing evidence that the omega-3 fatty acids in salmon and other oily fish may prevent heart problems in people with a high cardiovascular risk, as well as alleviate joint pain experienced by patients with rheumatoid arthritis.^{15,16,17}

Looking closer

These are just a handful of the many studies that have looked at the health properties of foods. At first glance, they appear to lend weight to the existence of certain superfoods — certainly, the nutrients in these foods have been shown to have several health-promoting properties. But a closer look reveals the difficulty in applying the results of these studies to real diets. This is because the conditions under which foods are studied in the lab are often very different to the way these foods are normally consumed by people in their everyday lives.

One major characteristic of research in this area is that very high levels of nutrients tend to be used. These are usually not realistically attainable in the context of a normal diet. On top of this, the physiological effects of many of these foods are often short-term.^{12,13} This means people would need to consume them often in order to reap their health benefits. This could be counter-productive, especially for certain foods: frequently consuming cocoa in the form of chocolate, for example, would boost intakes

not only of cocoa's health-promoting flavonoids but also of other nutrients of which we are recommended to consume less.

Perhaps an even greater consideration when looking at these studies is that many of them tend to use either animal models such as rats, or *in vitro* experiments using isolated batches of human cells. These types of studies are useful for giving scientists an idea of what the health properties and physiological mechanisms of certain food components could be, but there is no guarantee that these components will have the same effects in people when consumed in the diet. Investigating effects in humans is a complex task: our diets, genes, and lifestyles vary from person to person, making it difficult to study the impact of nutrients on health. This means that, in contrast to cell culture and animal studies, a different approach is needed when exploring effects in humans that ideally includes both intervention studies (where researchers manipulate the diet to determine the effect of a food or nutrient) and observational studies (where researchers observe the effects of natural differences in people's diets).

A final point to consider when looking at studies on the 'healthfulness' of foods is that many researchers study foods in isolation. Given that people normally consume combinations of foods, picking out a single one to study does not reflect real human consumption. What's more, there is evidence to suggest that in some cases co-consumption of foods can actually increase the body's ability to absorb nutrients. The beta-carotene in carrots and spinach, for instance, is more readily absorbed when eaten together with a source of fat such as salad dressing.¹⁸ This hints at the merits of a diet based on a variety of nutritious foods as opposed to a diet based solely on one or a handful of superfoods.

The bottom line

The idea of foods having exceptional health benefits is an attractive one, and has surely fuelled the public interest in superfoods. Indeed, the science in this area has demonstrated that certain components of foods and drinks may be particularly good for you. This is also reflected in the existence of approved health claims, for which the European Food Safety Authority has found the scientific evidence base to be sufficiently convincing.¹⁹ At the same time, it is unrealistic to expect a narrow range of 'superfoods' to significantly improve our well-being. When looking at the evidence behind superfoods, we need to be realistic about how this translates into real diets.

Labelling some foods as 'super' in the media may also give the impression that other foods in our diets are not as healthy when, in reality, these foods often provide nutrients just as valuable as those found in superfoods. Carrots, apples and onions, for example, are packed with health-promoting nutrients such as beta-carotene, fibre, and the flavonoid quercetin.²⁰ Wholegrain varieties of cereal-based starchy foods such as bread, rice and pasta are also high in dietary fibre. In adults, dietary fibre intake should be at least 25 g per day.²¹ These foods often have the added benefit of being cheap and readily available. This means we can easily consume them in large enough quantities and on a regular basis to get the most from their nutrient content. Given that most people in Europe are not eating enough fruit and vegetables to meet dietary recommendations, upping our daily intakes of a variety of fruits and vegetables will go a long way towards generally improving our well-being.²²

Conclusion

When it comes to ensuring a balanced nutrient intake for good health, we need to increase the range of nutritious foods in our diets rather than focusing solely on a handful of foods claimed to be 'super'.

Importantly, this should include a greater quantity and variety of fruits and vegetables. Many European countries provide food-based dietary guidelines to help people reach this goal.²³

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