- Nutrition / Longevity



ANALYSIS

Polyphenols: The key to a healthier, longer life or just another health food fad?

A special type of nutrient that's only found in fruit and veg could be more important to your health than vitamins and minerals

ABOVE Polyphenols such as quercetin, naringenin, rutin and chlorogenic acid can be found in tomatoes

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We all know eating fruits and vegetables is good for our health. But how much is enough, exactly? The World Health Organization (WHO) says, to help lower the risk of serious health conditions such as heart disease, stroke, type 2 diabetes and several types of cancer, we should each be eating at least 400g or 14oz a day (for context, a medium-sized apple weighs about 150g/5oz).

How close people get to this target varies around the world. But across the 38 countries in the Organisation for Economic Co-operation and Development (which includes the UK and US), only 15 per cent of people eat the recommended amount.

That's worrying because, as you'd expect, fruit and vegetables contain a smörgåsbord of nutrients that keep our brains and bodies in tip-top shape. That said, it could be that one class of nutrients, known as polyphenols, is of particular value. Hence, polyphenols is the biggest nutritional buzzword of 2025.

THE IMPORTANCE OF PHYTONUTRIENTS

When we talk about the health benefits of fruits and vegetables, we often focus on the fact that they're nutrient-dense whole foods. This means that they're packed with vitamins and minerals (essential for supporting the normal functions in our bodies) without being high in calories, fats, salt or sugar.

We could, theoretically, get all the vitamins and minerals we need without eating many, if any, fruits or vegetables. And although the same could be possibly said for eating the right combination of supplements and meal-replacement products, they aren't natural whole foods. Which is to say that they're missing one important element that gives us huge health benefits: phytonutrients. →

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→ Phytonutrients are the natural compounds found in plants that give them their colours and flavours, and help protect them from environmental stress, pests and disease. They also play a key role in promoting human health.

There are thousands of phytonutrients and they can be grouped into major classes based on their chemical structures. These include carotenoids (which give fruits and vegetables their red, orange and yellow colours) and glucosinolates (found in cruciferous vegetables such as broccoli and cabbage).

The most abundant and well-researched class of phytonutrients are polyphenols, however. More than 8,000 of these compounds have been identified in plants. Foods such as olives, plums, hazelnuts and tea all contain high levels of polyphenols.

THE BENEFITS OF POLYPHENOLS

Polyphenols are named for their chemical structure: 'poly' means many, and 'phenols' indicate they contain phenolic groups. These are ring-like structures composed of carbon, hydrogen and oxygen atoms.

It's these unique structures that play a crucial role in the biological reasons behind polyphenols' health benefits, including their antioxidant, antimicrobial and anti-inflammatory effects.

Antioxidant polyphenols protect the body from damage caused by free radicals and reactive oxygen species (ROS) – molecules produced during metabolism and stress responses. They can also form due to environmental factors such as pollution, sunlight and toxins such as cigarette smoke.

Free radicals and ROS can cause damage to your cells, proteins and DNA. They can contribute to the ageing process and the development of heart disease, cancer and neurodegenerative disorders like Alzheimer's and Parkinson's. Fortunately, polyphenols have been shown to neutralise these.

Inflammation can play a key role in healing wounds and clearing infection, but uncontrolled, chronic inflammation can increase the risk of health issues such as arthritis and cardiovascular disease. Polyphenols can also help with this by inhibiting the enzymes involved.

"Foods such as olives, plums, hazelnuts and tea all contain high levels of polyphenols"

ABOVE LEFT Polyphenols can help protect your cells from the damage caused by free radicals (the dark stream running across this illustration)

RIGHT Eating a wide variety of colourful fruit and veg will help you get a diverse range of polyphenols into your body

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Polyphenols can also protect against harmful bacteria, viruses and fungi, which can trigger inflammation and disease if allowed to go unchecked. They achieve this by interacting with cell membranes, disrupting their structure and function, and ultimately stopping their growth or destroying them altogether.

If that wasn't enough, polyphenols also interact with enzymes in the body to support digestion and metabolism. For instance, they can block enzymes that break down certain beneficial nutrients or activate those that boost detoxification.

This is all before we come to how polyphenols affect what's known as 'gene expression'.

Genes are segments of DNA that carry the instructions for building everything in the body. They serve as the blueprint for creating proteins, essential molecules that perform a wide variety of functions throughout the body, including the building and repair of muscles and bones, as well as the production of hormones and enzymes.

Each gene contains instructions for making specific proteins, but they don't always give the green light for your body to do so. Genes can be turned on or off depending on the situation – they get flipped based on what the body needs at any given moment.

Some polyphenols can influence this process, helping to increase the production of protective proteins or decreasing the production of harmful molecules.

Finally, polyphenols can also have a 'prebiotic-like' effect on the microbes in the gut. This means that they can promote the growth of beneficial bacterial families such as *Bifidobacteriaceae* and *Lactobacillaceae*, which help to protect us from infection, and reduce the number of harmful bacteria.

COLOURFUL VARIETY

The good news is that all fruits and vegetables contain polyphenols. There isn't one specific polyphenol 'superfood'. In fact, it's better to eat a variety of colourful fruits and vegetables – the different colours indicate different types of polyphenols.

Eating a variety of polyphenols is important as the different types provide different health benefits. This means several polyphenols can act with each other to enhance their effect. So, eating as diverse a range as possible will help to maximise their potential advantages for your overall health.

Extracts and supplements can be a useful way to make valuable products from the wasted parts of fruits and vegetables. However, taking polyphenols in concentrated amounts may not have the same effects and, in some cases, may act in a way that damages the body. Also, don't forget that fruits and veg come as a package, so the benefits of eating them can never be replaced with a supplement containing just one component of their health-giving goodness. **SF**

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