Think tank

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Phytonutrients – What are they?

Interesting fact

A prolonged diet, rich in carotenoids may lead to a yellow to orange skin discoloration. This effect is why flamingos are pink.

Flamingos are born with grey feathers which eventually change colour due to a pink carotenoid pigment called canthaxanthin. They obtain the carotenoid from their diet of brine shrimp and blue-green algae.

In humans the discoloration eventually fades away after carotenoid intake is reduced.

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Unlike all other living organisms in the planet, plants are particularly especial. They produce a range of natural chemicals, known as phytonutrients, which helps protect them from predators, the environment and gives them their unique colour, flavour, taste and smell. Phytonutrients are found in a variety of plants, each with a different effect and benefit. These range from helping to prevent and reduce the severity of common ailments and conditions to replenishing depleting levels of certain chemicals in our bodies.

Phytonutrients can be grouped in different ways and some may belong to more than one group. Below are three examples.

Carotenoids

Carotenoids are one of the most abundant pigments in nature, second to chlorophylls. They are responsible for the bright yellows, mid oranges and deep reds of many fruit, flowers and seeds. In plants, they absorb a part of sunlight required for energy synthesis and act as a shield against excessive exposure to light. Humans are unable to synthesise their own carotenoids, yet interestingly, two carotenoids have been found in our eyes. Lutein and zeaxanthin have both been found to accumulate in the central region of our retina. Here, they are thought to prevent vision related damage. They act as powerful antioxidants and have the ability to scavenge free radicals. Other carotenoids include beta-carotene, lycopenes and neoxanthin and these can be found in leafy green vegetables, tomatoes, carrots and pumpkins.

Phytosterols (Terpenoids)

Plants employ the use of terpenoids for growth, protection and specialised functions to interact with the environment. The use of terpenoids expands across industries from pharmaceuticals, to fragrances and insecticide applications, even biofuel. Phytosterols are structurally similar to cholesterol but are metabolised differently. Many terpenoids are biologically active which have been exploited for medical purposes. Sitosterol, for example, has been recommended by physicians for over 20 years as a natural supplement for prostate health. Scientific evidence of phytosterols has also shown to lower/reduce blood cholesterol which may reduce coronary heart disease events. Other phytosterols include cineole which inhibits skin irritation and boswellic acid which has shown anti-inflammatory activity. Phytosterols can be found in almonds, avocado, macadamia nuts and the fruit of saw palmetto.

Flavonoids

Also known as bioflavonoids, this type of phytonutrient is a class of secondary plant metabolites. Flavonoids can be found in different parts of a plant, particularly in sites responsible for the colour and aroma of flowers, and in fruits to attract pollinators. They protect the plant from environmental stresses, acts as a UV filter, functions as a signalling molecule and as a detoxifying and antimicrobial agent. In humans, dietary flavonoids act as antioxidants, anti-inflammatory and anti-microbial agents and are being researched in combating neurodegenerative diseases. Flavonoids are diverse and include quercetin, hesperidin, arbutin and cyanidin to name a few. These can be found in green tea leaves, citrus fruit, berries and grape seeds.