

# Natural defences against disease

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Scientific studies show that dietary intake of flavonoids and related phenolics can reduce the incidence of chronic diseases, including cardiovascular disease - Europe's leading cause of death - and certain types of cancer, strokes, allergies, hepatic disease and inflammation.

Flavonoids are phytonutrients found in common [fruits and vegetables](#), such as apples, onions and tomatoes. They are historically part of the basic human diet. The reduced consumption of [fruit and vegetables](#) seen today may be contributing to the increasing incidence of [chronic diseases](#).

There is a lack of understanding of how phytonutrients work and their levels in different foods, and this has limited progress in determining their health effects. In addition, much of the research in this area is sponsored by food companies looking to promote their products, so it sometimes lacks critical evaluation.

The EU project FLORA ('Flavonoids and related phenolics for healthy Living using Orally Recommended Antioxidants') assembled an interdisciplinary team of nutritionists, [medical researchers](#) and [plant geneticists](#) to analyse systematically the health-promoting effects of plant flavonoids and related phenolics.

The four-year project looked into the beneficial health effects of these bioactive nutrients and produced European recommendations for daily intake.

The work took advantage of major advances in genetics, molecular science and genomic research, which has made it possible to produce plants that vary in the quantity and type of phenolics they accumulate.

FLORA developed three main foods using the new technology - varieties of corn, tomato and orange. These which were then used in controlled studies to assess the impact of dietary flavonoids and related bioactive nutrients in mice that model specific human diseases.

In parallel, the researchers compared blood and blond oranges with different flavonoid contents in human trials, to determine the ability of

these phytonutrients to protect against cardiovascular disease and stroke.

FLORA's investigations identified some of the mechanisms through which bioactive nutrients protect against disease at the cellular level. The researchers also evaluated the impact of post-harvest treatment and food processing on flavonoid levels, and investigated how efficiently they are taken up in the human gastrointestinal tract.

These results should promote the greater consumption of foods with higher contents of flavonoids which confer beneficial health effects, while emphasising traditional production methods and agriculture. FLORA has also published a directory of foods that are dependable sources of flavonoids on its website.

The project, led by the UK's John Innes Centre, brought together 11 partners from five EU countries and Turkey. FLORA is part of the EU's broad-based food safety initiatives. The EU provided EUR 3.3 million in funding to the project.

**More information:** FLORA leaflet  
[web.itu.edu.tr/~karaali/FLORA\\_leaflet.pdf](http://web.itu.edu.tr/~karaali/FLORA_leaflet.pdf)

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