

News

Scientists cast new light on making food nutritious

Oliver Moody Science Correspondent

Giving fruit, vegetables and other raw ingredients the botanical equivalent of sunburn can make them more nutritious, experiments have shown.

Supermarkets including Tesco are already selling chestnut mushrooms treated with “pulsed light” to enhance their levels of vitamin D2, and the cheap and rapid technique appears to have similar effects on a whole range of goods from cauliflowers to elderberries.

The flashes, each lasting for a few ten thousandths of a second, are thought to provoke a stress response that makes plants and fungi churn out beneficial

compounds to protect themselves. The method was invented to kill off unwanted microbes on the surface of food but the remarkable side-effect has increasingly come into its own over the last few years.

Scientists have used it to more than double the activity of antioxidants in tomatoes, to boost vitamin C in mango and to increase colourful anthocyanins in figs.

In the latest study, published in the journal *Innovative Food Science and Emerging Technologies*, researchers in Spain and Ireland achieved the feat in sliced carrots, using a powerful lamp to make them much better at clinging on

to several vitamin A precursors. The process involves bursts of light at wavelengths across the spectrum, from ultraviolet, through visible light, to infrared. It is sufficiently safe and straightforward that some academics say the devices could ultimately find their way into people’s kitchens.

Dilip Rai, a chemist from Teagasc, the Irish agriculture and food development authority based in Ashtown on the outskirts of Dublin, which funded the study, said the technique unleashed a kind of self-defence mechanism. “A very common example of UV light stress is skin cancer in humans, where the UV light is associated with DNA

structural damage,” he said. “A similar mechanism applies in plants. However, the plants respond by triggering the synthesis of phytochemicals to protect themselves against DNA damage.”

The downside is that in some cases the stress response can prompt unwanted effects. In one experiment with potato peel, Dr Rai and his colleagues found that the stress resulted in elevated levels of glycoalkaloids, a form of natural pesticide.

Even so, food treated with pulsed light is not likely to be dangerous, according to James Lyng, a food technologist at University College Dublin’s Institute of Food and Health. The technique

does not create any chemicals that were not already present in the plant, and in any case the toxicology profile of each new product has to be reviewed by the European Food Safety Authority.

The food industry has adopted pulsed light for preparing farmed mushrooms, which are low in vitamin D2, but has proved cooler on other applications because they are so new.

“The first study was published only in 2010, so it is not yet close to commercialisation,” Dr Rai said. “However, with the increasingly health-conscious population, the days may not be that far [off] when food producers would be interested in it.”