Lettuce gets a healthy suntan - Radiocápsula CPR/RCP [1]

Submitted on 18 May 2009 - 10:13pm

This article is reproduced by CienciaPR with permission from the original source.

Calificación:

Eurekalert - Salad dressing aside, a pile of spinach has more nutritional value than a wedge of iceberg lettuce. That's because darker colors in leafy vegetables are often signs of antioxidants that are thought to have a variety of health benefits. Now a team of plant physiologists has developed a way to make lettuce darker and redder—and therefore healthier—using ultraviolet light-emitting diodes (LEDs). Steven Britz of the U.S. Department of Agriculture in Beltsville, Md., and colleagues will present the research at the 2009 Conference on Lasers and Electro Optics/International Quantum Electronics Conference (CLEO/IQEC), which takes place May 31 to June 5 at the Baltimore Convention Center. The dark red tinges on a leaf of red leaf lettuce are the plant kingdom's equivalent of suntan lotion. When bombarded with ultraviolet rays from the sun, the lettuce leaf creates UV-absorbing polyphenolic compounds in its outer layer of cells. Some of these compounds are red and belong to the same family that gives color to berries and apple skin. They help block ultraviolet radiation, which can mutate plant DNA and damage the photosynthesis that allows a plant to make its food. Polyphenolic compounds,which include flavonoids like quercetin and cyanidin, are also powerful antioxidants. Diets rich in antioxidants are thought to provide a variety of health benefits to human beings, from improving brain function to slowing the wear and tear of aging. To create red leaf lettuce plants enriched with these compounds, Britz purchased low-power LEDs that shine with UVB light, a component of natural sunlight. In small quantities, this ultraviolet light allows humans to produce vitamin D, which has

been cited for its health benefits. Britz exposed the plants to levels of UVB light comparable to those that a beach goer would feel on a sunny day, approximately 10 milliwatts per square meter. After 43 hours of exposure to UVB light, the growing lettuce plants were noticeably redder than other plants that only saw white light. Though the team has yet to quantify this effect, it appears to increase as the intensity of the light increases. The effect also seems to be particularly sensitive to the wavelength used – peaking at 282 and 296 nanometers, and absent for longer wavelength UV. "We've been pleasantly surprised to see how effective the LEDs are, and are now testing how much exposure is required, and whether the light should be pulsed or continuous," says Britz. To cut transportation costs and feed the market in the wintertime, more produce is grown in greenhouses. Crops grown in the winter in northern climes receive very little UVB to begin with, and plants in greenhouses are further shielded from UVB by the glass walls. Ultraviolet LEDs could provide a way to replace and enhance this part of the electromagnetic spectrum to produce darker, more colorful lettuces. Britz also discussed the potential for using UV LEDs to preserve nutrients in vegetables that have already been harvested. Previous experiments have shown that the peel of a picked apple stays redder for a longer period of time when exposed to ultraviolet light. UVB LEDs are a promising technology for irradiating vegetables stored at low temperatures to maintain or even boost the amount of phytonutrients they contain. Contact: Colleen Morrison cmorri@osa.org [2] 202-416-1437 Optical Society of America

---

Links
[1] https://www.cienciapr.org/en/external-news/lettuce-gets-healthy-suntan-radiocapsula-cprrcp [2] mailto:cmorri@osa.org