

Lettuce quality is improved by modifying its growing conditions

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Lactuca sativa

A researcher in the UPV/EHU's department of Plant Biology and Ecology has confirmed that it is possible to improve the nutraceutical quality of the lettuce by modifying its growing conditions but not at the

expense of productivity. The FisioClimaCO2 research group, to which the researcher Usue Pérez-López belongs, has applied various stress conditions to the plants and has verified the changes that take place in their composition as a result.

Today, we are seeing a rise in the demand by consumers for health-giving, nutritious products that improve physical performance, cut the risk of disease and increase lifespan. So the scientific community is redoubling its efforts to obtain foodstuffs with greater nutraceutical quality: quantity of minerals, proteins, carbohydrates, [antioxidant compounds](#), vitamins, etc.

There are various ways of improving this quality and they include genetic modification, but a recent study by the UPV/EHU has concluded that it is possible to improve [lettuce](#) quality by modifying the growing conditions but without compromising productivity.

The study sought to "conduct research to see whether a change in the growing conditions could increase nutraceutical quality in two lettuce cultivars differentiated by their pigmentation (green and red lettuces)", explained Dr Usue Pérez-López. "The change in the growing conditions consisted of subjecting the plants to short-duration stresses, since the most important thing is not to lose productivity". As many nutraceutical compounds perform defence functions in the plants, she explained that "if stress conditions are applied to them (such as watering them with salinated water, subjecting them to high light intensity or working with raised concentrations of CO₂), these defences will become intensified and, as a result, the antioxidant qualities of the plants will be boosted.

The results of the research show that the production of biomass and nutritional quality of the lettuce can be modified but the response depends on the cultivar, and the choice of best growing technique (using high light intensity or salt water alone, or accompanied by high CO₂)

depends on the characteristics of the lettuce one is seeking to modify.

This study was carried out on a laboratory level but [?]we would like to be able to test it in greenhouses[?]. From now on they will go on studying lettuce behaviour under different combinations of conditions to obtain a greater antioxidant capacity in them, and they are considering various hypotheses that they want to test out in future studies.

More information: Pérez-López U., Miranda-Apodaca J., Lacuesta M., Mena-Petite A., Muñoz-Rueda A. (2015). "Growth and nutritional quality improvement in two differently pigmented lettuce cultivars grown under elevated CO₂ and/or salinity"; *Scientia Horticulturae*. Vol. 195.

Pérez-López U., Miranda-Apodaca J., Muñoz-Rueda A., Mena-Petite A. (2015); "Interacting effects of high light and elevated CO₂ on the nutraceutical; quality of two differently pigmented *Lactuca sativa* cultivars (Blonde of Paris Batavia and Oak Leaf)". *Scientia Horticulturae*. Vol. 191.

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