The Ripe Fruit Advantage

Why past-its-prime produce packs unique nutrients

By Rachel Meltzer , Rachel Meltzer is a Prevention magazine research editor.
http://www.prevention.com/cda/article/the-ripe-fruit-advantage/b04484b7a2f28110VgnVCM20000012281eac____/nutrition.recipes/nutrition.basics/fruits.vegetables

If those pears seem a little overripe, don't toss 'em. Fruit at or just past its peak contains disease-fighting antioxidants called nonfluorescing chlorophyll catabolites, according to a study from the University of Innsbruck in Austria. A recent Belgian study found that overripe fruit is packed with other healthful compounds, even if it doesn't look picture-perfect. To disguise bruises: Cut into chunks and blend with ice for a smoothie.

findings from the University of Innsbruck in Austria
http://www.eurekalert.org/pub_releases/2007-11/jws-rfp110607.php

---

Ripe Fruit Preferred

Chlorophyll breakdown in ripening apples and pears produces highly active antioxidants

for more information

Fall, the season of colors: Leaves turn red, yellow, and brown. The disappearance of the color green and the simultaneous appearance of these other colors are also signs of ripening fruit. A team led by Bernhard Kräutler at the University of Innsbruck (Austria) has now determined that the breakdown of chlorophyll in ripening apples and pears produces the same decomposition products as those in brightly colored leaves. As the researchers report in the journal Angewandte Chemie, these colorless decomposition products, called nonfluorescing chlorophyll catabolytes (NCC), are highly active antioxidants—making them potentially very healthy.

The beautifully colored leaves of fall are a sign of leaf senescence, the programmed cell death in plants. This process causes the disappearance of chlorophyll, which is what gives leaves their green color. For a long time, no one really knew just what happens to the chlorophyll in this process. In recent years, Kräutler and his team, working with the Zurich botanists Philippe Matile and Stefan Hörtensteiner, have been able to identify the first decomposition products: colorless, polar NCCs that contain four pyrrole rings—like chlorophyll and heme.

Now the Innsbruck researchers have examined the peels of apples and pears. Unripe fruits are green because of their chlorphyll. In ripe fruits, NCCs have replaced the chlorophyll, especially in the peel and the flesh immediately below it. These catabolytes are the same for apples and pears, and are also the same as those found in the leaves of the fruit trees. “There is clearly one biochemical pathway for chlorophyll decomposition in leaf senescence and fruit ripening,” concludes Kräutler.

When chlorophyll is released from its protein complexes in the decomposition process, it has a phototoxic effect: When irradiated with light, it absorbs energy and can transfer it to other substances. For example, it can transform oxygen into a highly reactive, destructive form. As the researchers were able to demonstrate, the NCCs have an opposite effect: They are powerful antioxidants and can thus play an important physiological role for the plant. It then became apparent that NCCs are components of the diets of humans and other higher animals, and that they could thus also play a role in their systems. Other previously identified important antioxidants in the peels of fruits include the flavonoids. Thus, the saying, “an apple a day keeps the doctor away” seems to be true, according to Kräutler.

Author: Bernhard Kräutler, Universität Innsbruck (Austria), http://pc43-c726.uibk.ac.at/oci/people/en_bernhard_kraeutler.html

Title: Colorless Tetrapyrrolic Chlorophyll Catabolites in Ripening Fruit Are Effective Antioxidants

Angewandte Chemie International Edition 2007, 46, No. 45, 8699–8702, doi: 10.1002/anie.200703587