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Why Your Tomato Has No Flavor

By JIE JENNY ZOU



Associated Press

Tomatoes on a market table in Vienna, Austria

Researchers have found that the genetic trait breeders prize for making tomatoes—which are often picked unripe—uniformly light green and easy to identify while harvesting also contributes to making them less sweet.

The researchers at University of California, Davis; Cornell University; and institutions in Spain, analyzed 25 varieties of tomatoes, ranging from slicers, used in sandwiches, to cherry tomatoes. They published the findings in this week's issue of *Science*.

Farmers prefer completely light green tomatoes over unevenly colored ones because they allow workers to more easily identify when the fruit is ready to be picked. The trait, which is a mutation, inhibits a protein called *GLK2*, which the plant uses to produce sugar, said Ann L.T. Powell, a biochemist of plant sciences at UC Davis who co-wrote the study.

GLK2 determines the development of chloroplasts, which enable plants to convert sunlight into sugar in a process known as photosynthesis. Underdeveloped chloroplasts lead to less sugar, she said.

About 70% to 80% of fruit sugar will come from photosynthetic activity in plant leaves, which transport the sugar to the fruit. The remaining 20% to 30% comes directly from the fruit itself.

Ms. Powell said breeders may be able to use the gene to increase sweetness. She acknowledges sugar is "just one" of the factors related to flavor. Others include lycopene, which gives tomatoes their engine-red color.

David Francis, an Ohio State University associate professor who directs a tomato-breeding program, said the

study provides insight into the relatively unknown mechanisms behind photosynthesis. But he cautions that it isn't clear the study shows the gene affects sweetness.

"How can you separate variety from gene?" he said. Mr. Francis said the study compares sugar content of two different varieties of tomato. While the strains are closely related, he said other unknown genes could also have an effect on sweetness.

"Sugar is not the whole story," agreed Jack Rabin, associate director of farm programs at Rutgers New Jersey Agricultural Experiment Station. Breeders have made tomatoes firmer to facilitate shipping, he said, changing the fruit's composition by increasing interior flesh for stability and reducing the ultra-sweet gelatinous jelly, which hits taste buds first.

"Every little bit we learn will help us help consumers get the wonderful experience that they want in the tomato they're eating," said Mr. Rabin.

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