Tasty Tomato Flavor Compound Revealed

Any tomato that tastes terrific most likely owes some of its flavor to a natural chemical called furaneol (pronounced fur-ANN-ee-uhl), ARS scientists have discovered.

A team led by Ronald G. Buttery of the ARS Western Regional Research Center in Albany, California, is the first to find this compound in tomatoes. The scientists rate it as one of the 10 most important chemicals that make up a tomato's sweet, vine-ripened taste.

Plant breeders, says Buttery, can use the findings to make sure furaneol occurs in the new tomatoes they develop. Makers of tomato paste or other foods from processing-type tomatoes can check their products for this new flavor compound, perhaps adding it back if it is lost in processing.

A world authority on tomato flavor, Buttery admits that he "completely missed" furaneol in his previous investigations into the secrets of tomato flavor, probably because furaneol is water-soluble. "That means it can dissolve in tomato's juices," he explains, "and so is very hard to find." The compound's chemical name is 2,5-dimethyl-4-hydroxy-3(2H)-furanone.

Buttery and colleagues uncovered the flavorant by using sodium sulfate, also known as Glauber's salt, to remove all of the water from tomato samples. They pinpointed the chemical when they ran the extract through a laboratory instrument known as a gas chromatograph-mass spectrometer. Buttery also presented samples of the compound, at various concentrations, for volunteers on an aroma panel to evaluate by sniffing.

Buttery did the work with colleagues Louisa C. Ling and Gary R. Takeoka at Albany and with Gerhard E. Krammer, formerly at Albany and now with a flavor and fragrance company in Germany.—By **Marcia Wood,** ARS.

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Can you name America's No. 1 canned vegetable on a pounds-per-person basis? Answer below.

- ❑ Corn
- ❑ Tomatoes
- ❑ Pickled cucumbers
- ❑ Chili peppers

The average American consumed 75 pounds of processed tomato products (farm-weight equivalent) in 1994. Corn ranked a distant second at 10 pounds per person and chili peppers third at 5.1 pounds. Source: USDA/Economic Research Service

Bald Beets Sweet News to Sugar Industry

Losing hair can become an obsession for many people, but what if you're a sugar beet?

Scientists at the ARS Sugar Beet and Bean Research Laboratory in East Lansing, Michigan, have developed a new germplasm type of sugar beet, *Beta vulgaris* L., that has a smoother root system than standard beet varieties.

Sugar beets are a multimillion-dollar industry in the United States. They are used almost exclusively for industrial extraction and purification of sucrose found in common table sugar and many food products. Sugar beet agriculture complements the cane sugar industry by providing up to two-thirds of the nonimported sugar used by American consumers.

Conventional sugar beets are cone-shaped, with two large vertical grooves from which a mass of fibrous roots emerge. These roots help anchor the plant while it's in the ground. But they tend to hold soil—especially clay-type soils—when beets are harvested. Any soil that clings to the roots must be removed before processing and eventually returned to the farm or disposed of as waste, an expensive alternative.

Field tests with new smoothroot (no grooves) sugar beet germplasm demonstrate they can be harvested with up to 70 percent less soil clinging to them than with more conventional sugar beets.

This cuts the chances of spreading soilborne pests and diseases such as rhizomania, or crazy root, a fungus-spread viral disease in sugar beets. This disease is not currently found in all sugar beet fields or growing areas.

Work on the smoothroot germplasm was begun in the late 1970's by ARS plant geneticists J. Clair Theurer, who is now retired, and Gerald Coe at Beltsville, Maryland. Theurer released SR87, a highly smoothroot sugar beet, in 1990, but no commercial varieties are yet available, says ARS geneticist Joe Saunders.

"Some commercial seed companies are working with the smoothroot germplasm released in 1990, but the availability will await a change in the processing industry approval standards," says Saunders.

Additional smoothroot sugar beet germplasm is being developed at the East Lansing lab.—By **Dawn Lyons-Johnson,** ARS.

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