

WHAT'S HOT? AND, WHAT'S NOT? CHILE PEPPERS!



*L to r. Impossible to count all different peppers now available. But they do love our growing climate!
Second from right: 'Hontaka' in the GCMG's demo garden. Right: GCMG's 2012 Pepper Harvest.*

By Gene Speller
Galveston County Master Gardeners

Chile peppers -- aka chiles, chili, chilli, aji, and capsicum -- are Hot.

That's HOT as in both literally (very spicy) and figuratively (latest food craze). They are also "not hot" for those with tender palates.

Since 2000, the US hot sauce market has grown by 150% -- greater than combined total for standard condiments (ketchup, mustard, BBQ sauce, et al.). Wikipedia lists over 100 different hot sauces.

Like jalapeno flavor but the heat? Fear not. Fajita jalapenos (and others) have no heat. Likewise, even mild habanero peppers now (e.g. NuMex Suave Orange and Red).

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Left: NuMex Suave Orange and Red peppers. Center: view of (l to r)pepper seeds, membrane & apsaican gland. right, Carolina Reaper, the world's hottest pepper

What's the source of heat (pungency) in chile peppers? Capsaicin glands at the pod placenta's base (rib, white membrane) produces 20 or more capsaicinoid compounds including capsaicin - the most abundant and pungent of all capsaicinoids. They produce pain in mammals by stimulating nerve receptors (vanilloid) in affected areas. These receptors send heat and pain signals to the brain. Our auto response system then floods the nerve endings with endorphins - the body's natural pain killers.

The pungency/heat level of chile peppers is commonly stated in Scoville Heat Units (SHU), developed by Wilbur L. Scoville in 1912. SHU is based on the perceived pungency threshold after dilution of a capsaicinoid extract with sugar water. The required dilution ratio of sugar water to capsaicinoid extract is the pepper's SHU. For example, a jalapeno pepper with a dilution ratio of 1 part capsaicinoid extract to 5,000 parts sugar water would have an SHU rating of 5,000. Sweet peppers (e.g. bell peppers) have zero SHU.

High Performance Liquid Chromatography (HPLC) is the method of choice for determining chile pepper heat. For standard reference, HPLC analytical values are converted to SHU. The concentration of capsaicinoids measured by HPLC in parts per million (ppm) is converted to SHU by multiplying the ppm concentration by a factor of 16. Thus, a pure 100% concentration of capsaicin (1,000,000 ppm) equates to 16,000,000 SHU. Thus far, the current world record holder for hottest pepper is Carolina Reaper measured at 2.2 million SHU.

The capsaicinoid concentration in chile peppers is not absolute or fixed. It is highly variable and dependent upon the variety, environment, maturity, and cultural practices. It can even vary from one pod to another on the same plant.

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What's the best remedy for overexposure to hot peppers? Answer: milk. Milk contains a convenient protein called casein which has a strong affinity for capsaicin and effectively sweeps it from the nerve receptors.

Editor's note: I would have answered 'seeds' too to the hottest part of a pepper. It seems that way because, Gene explains, "The seeds pick up heat because of their proximity to the capsaicin glands. For extreme hot peppers, capsaicinoids permeate the entire pepper."