TEMPERATURE
2016, VOL. 3, NO. 1, 52–53
http://dx.doi.org/10.1080/23328940.2015.1130522

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FRONT MATTER: LETTER

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Why do people living in hot climates like their food spicy?

Comment on: Romanovsky AA. Protecting western redcedar from deer browsing—with a passing reference to TRP channels. Temperature 2015; 2:142-9; http://dx.doi.org/10.1080/23328940.2015.1047078

Dear Editor-in-Chief,

The puzzle posed in your recent editorial[1] sought reasons why people living in warm climates tend to prefer hot, spicy foods whereas those in milder regions more often embrace blander fare. Though such an association appears to be dissolving, thanks, in part, to the rapid globalization of international cuisines, the link between a nation's ambient temperature and the "spicy heat" content of its foods has historically been more than just a culinary stereotype.

A 1999 study in *BioScience*,[2] for example, found that in India, with a mean average temperature of 26.9 C, traditional meat-based dishes incorporate 31 times as many spices per recipe as in Poland, where the mean average temperature is 7.8 C. Though these two nations represented the high and low points on the global spice use spectrum at the time, the same general trend held for most countries, from Indonesia and Ethiopia (where more than just some like it hot) to Denmark and Finland (where many if not most do not).

As a medical writer for consumer magazines, I became interested in spice use while researching the potential health benefits of capsaicin, the alkaloid that gives chile peppers their bite.[3] Along with black pepper, onions, and garlic, chiles are the most common of the "heat spices" added to foods worldwide.[4] Capsaicin "tricks" temperature-sensitive pain receptors known as TRPV1s into firing, producing a "burn" virtually indistinguishable from the combustible variety.[5]

Chile heat is illusory, and our tissues aren't harmed by exposure. Still, it begs the question why so many humans, particularly those living in warm regions, have run toward, rather than away from, what is clearly an aversive stimulus? One early hypothesis for this paradox was that hot spices disguised the smell and taste of spoiled foods, making these more palatable. From an evolutionary perspective, this seems far-fetched. What adaptive benefit is there in making it easier to make yourself sick?

Another popular notion has held that capsaicin's artificial heat triggers very real perspiration, in the process turbocharging evaporative cooling and making life more comfortable for those living in hot climates. Evolutionary biologist, Paul Sherman, Ph.D., an emeritus professor at Cornell University and lead author of the *BioScience* study, finds this similarly unconvincing. Why would natural selection have left humans dependent on "finding, eating, and dealing with the potentially negative side effects of phytochemicals" to stay cool?

Many phytochemicals have beneficial impacts on human health, and researchers investigating capsaicin suggest the alkaloid may be helping us in a multitude of significant ways, from pain management[6] to tumor inhibition.[7] There is evidence, as well, that too much capsaicin may cause necrosis, ulceration, and carcinogenesis. Most of these possibilities, both on the upside and downside, remain far more promising than proven. Even if the purported benefits eventually prove to outweigh the purported harms, it still doesn't explain why humans in warm climates would be more interested in tapping them than those in colder regions.

To Sherman, a pioneer in the field of Darwinian Gastronomy, a much more elegant explanation awaits those who approach the question from the plant's perspective, not ours. Compounds like capsaicin, he argues, are

among many chemical weapons that plants have evolved to repel their enemies, from bacteria and fungi to herbivorous insects and grazing mammals.

In the eons before modern refrigeration, says Sherman, our hominid ancestors learned by trial and error to co-opt such defenses for their own benefit, tapping the pharmacopeia of antioxidant, antimicrobial, and antiviral compounds to protect themselves from germy miscreants. "Throughout recorded history," Sherman explains, "food-borne bacteria like Clostridium, Escherichia, Listeria, Salmonella and their toxins have been serious health concerns and they still are."

Chiles, onions, black pepper, and garlic are among a handful of "highly inhibitive" spice ingredients capable of killing over 75 percent of common food borne bacteria. They are also the most commonly used spices worldwide and are particularly revered in warm climates. (Until Christopher Columbus brought samples to Europe, chiles were exclusive to the New World, which makes their rise to global prominence particularly noteworthy. In only five centuries, these incredibly hardy plants have gone on to colonize every continent save Antarctica).

To investigate the possibility that spice use is less about culinary aesthetics than protection from food poisoning, Sherman and colleague Jennifer Billing combed through 93 traditional cookbooks from 36 different countries worldwide, looking for meat-based recipes (meat spoils faster than vegetables) in use for at least five generations (thus predating electrical refrigeration). They then compared spice use with the mean annual temperature of nations where the recipes are popular.

Of 4578 recipes analyzed, 93 percent called for at least one spice per dish and frequently many more. This "some like it hot" preference was, they found, far from random. "As average temperatures increased among countries," Sherman explained, "there were significant increases in both the fraction of recipes calling for at least one spice and the mean number of spices per recipe." India, with its mean temperature of 26.9 C, averaged 9.3 spices per recipe; Norway, at a refrigerator-like 2.8 C, called for 1.6 spices per recipe though up to a third of their dishes call for no spice at all. The cuisines of more temperate nations like Hungary and the US fell somewhere in the middle.

With the advent of modern refrigeration, irradiation, and other approaches to food safety, the threat of food poisoning in warm climates as well as colder ones continues to decline. Affection for spicy heat is not innate in capsaicin-loving cultures like Mexico, for instance, parents must teach their children to accept and eventually embrace five-alarm foods. There's no doubt that many "chile heads" do eventually come to love the burn. The question is whether future cultures will continue the tradition if and when such burn is no longer necessary to protect us.

"A Darwinian view of gastronomy," Sherman sums up, "helps us understand why 'some like it hot.'" If he's correct and modern food safety trends continue, it might also predict why our descendants many millennia from now may no longer feel this way.

References

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