

Some like it hot (ever more so in the tropics): A puzzle with no solution

Reply to: Abdel-Salam OME. Preference for hot pepper: A complex interplay of personal, cultural, and pharmacological effects. *Temperature* 2016; 3:38-9; <http://dx.doi.org/10.1080/23328940.2015.1111289>;

Bosland PW. Hot stuff – do people living in hot climates like their food spicy hot or not? *Temperature* 2016; 3:40-1; <http://dx.doi.org/10.1080/23328940.2015.1130521>;

Caterina MJ. Seeking the tropical heat – a matter of microbes? *Temperature* 2016; 3:42-4; <http://dx.doi.org/10.1080/23328940.2016.1139963>;

Chahl LA. Hot genes and hot tropics. *Temperature* 2016; 3:45-6; <http://dx.doi.org/10.1080/23328940.2015.1133878>;

Gutierrez R, Simon SA. Why do people living in hot climates like their food spicy? *Temperature* 2016; 3:47-8; <http://dx.doi.org/10.1080/23328940.2015.1119616>;

Mózsik G. It remains a mystery why people living in hot climates consume spicier food. *Temperature* 2016; 3:49-50; <http://dx.doi.org/10.1080/23328940.2015.1131033>;

Thornton JS. Spicy heat love: less taste than protection from food poisoning? *Temperature* 2016; 3:51-2; <http://dx.doi.org/10.1080/23328940.2015.1130522>

Dear Editor-in-Chief,

This is my reply to the answers¹⁻⁷ submitted in response to my “puzzle” as to “Why do people living in hot climates consume more hot pepper than those living in the North?”⁸

With an estimated quarter of the World’s population eating hot pepper on a daily basis, capsaicin represents an aspect of pharmacology intimately familiar to many readers of *Temperature*.⁹ Yet, some fundamental questions remain unanswered in this field, mainly due to lack of research. Most experts agree that during evolution pepper plants developed capsaicin synthesis as a “biological weapon” to protect themselves against herbivores, but not birds who spread their seeds.⁹ Indeed, capsaicin-flavored bird seeds are commercially available to repel squirrels and other rodents from the bird-feeder.¹⁰ So why is it that the same taste which is unpalatable to rodents (and many other mammals like deer and elk) is found pleasurable by many humans including the author of this Letter? And why is it that most capsaicin-loving people seem to live in the tropics? Surprisingly, each and every author of the seven letters have agreed to discount the popular theory that capsaicin is popular under hot climates because it provides a cooling effect through “gustatory sweating” (“capsaicin-as-air conditioner”). Maybe less surprisingly, they agreed on nothing else. A slight majority of the contributors favor the “Darwinian gastronomy” concept of Sherman¹¹ that posits an antimicrobial-food preserving effect for capsaicin (“capsaicin-as-refrigerator”). Others speculate that people eat capsaicin-flavored food because it makes them feel good through releasing endorphins in the brain. Most authors also mention the possibility that eating “hot” food is a cultural phenomenon, an acquired taste. That is, people living in hot climates traditionally consume more hot pepper because this is where chili peppers grow in abundance. Personally, I find all of these theories unsatisfying. For example, a study of capsaicin effects on food-borne pathogens found that capsaicin inhibited the growth of *E. coli* only at concentrations as high as 300 $\mu\text{g/ml}$.¹² This concentration (0.03%) is close to those (0.1%) present in topical capsaicin creams used for pain relief, and is unlikely to be achieved if food preparations (of note, the German Health

Authorities consider spicy sauces with capsaicin concentrations of 0.1% or more unhealthy to eat).¹³ As to the “feel-good” effect, it begs the question why capsaicin causes endorphin run in Indians (who consume plenty of capsaicin) but not in Norwegians (who do not)? I find the cultural concept the most believable though it fails to explain why food is usually mild in Italy or Spain, countries where hot pepper was introduced centuries ago and where the climate is favorable for growing this plant. In summary, in my opinion the biological basis of the popularity of hot pepper in tropical countries remains enigmatic, and thus my puzzle remains unsolved.

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