

BOOK REVIEW

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# Book review: “Taste what you’re missing: the passionate eater’s guide to why good food tastes good” by Barb Stuckey

Charles Spence

Barb Stuckey, who describes herself as a professional food developer (though she once worked as a restaurant inspector), has just released the latest in a recent spate of books on the multisensory perception of flavor [1] (see also [2-4]). This new volume, though, is certainly targeted at a somewhat different audience from the others. It is part memoir, detailing the author’s many years working in a major North American company focused on developing novel food and beverage products, and part self-help book, offering advice on how we could all improve our ability to taste (mindful eating plays a big role here). In his book, Stevenson provided us with what is, and undoubtedly will remain to be, by far the most comprehensive academic summary of pretty much every study that has ever been published concerning how the senses interact to give rise to the emergent property that is flavor (well that is certainly how it felt on reading it) [2]. By contrast, Prescott’s much more easily-digestible contribution to the field tackled the question of why it is that we like what we like when it comes to food and drink [3]. He too dealt with the differing roles of the senses in establishing and maintaining such preferences and, equally importantly, dislikes. And then we had Shepherd’s *Neurogastronomy* [4], which focused primarily on the neuroscience of retronasal olfaction, given the widely-held belief that is where the majority of the information that contributes to what we normally think of as flavor resides.

Stuckey’s approach is much lighter than in any of these other volumes. Her book is packed with personal anecdotes and, along the way, the reader certainly learns an awful lot about her eating habits not to mention those of her husband Roger (about whom, more later). Barb, it turns out, has a thing about tomatoes. The author honestly lays out her position at the start of the book when she states that: “*But as someone who had avidly avoided*

*science classes in school, I longed to read a straightforward book written for a layperson that could teach me how to taste food without first having to teach myself science. There wasn’t one, so I decided to write this book.*” ([1], p. 7). Consistent with this objective, complex terms that might prove difficult for a lay audience to understand, such as orthonasal and retronasal olfaction, are simplified as ‘nose-smelling’ and ‘mouth-smelling’, respectively. Like the famous North American food critic, Jeffrey Steingarten, when I tested him in the lab here in Oxford some years ago, Barb strenuously objects to the label ‘supertaster’. This is the term, originally coined by Linda Bartoshuk, currently at the University of Florida, in order to describe those individuals (approximately one quarter to one third of the population) who exhibit an increased sensitivity to certain (especially bitter) tastants such as, for example, PROP (6-n-propylthiouracil) [5] as well as to oral-somatosensory textural cues [6]. Stuckey suggests that the putatively-pejorative terms ‘non-taster’ and ‘supertaster’ (which are typically used in the academic literature on the chemical senses) be replaced by the terms ‘tolerant taster’ and ‘hypertaster’, respectively. Barb and Roger are both hypertasters.

Stuckey has certainly been speaking to the right people while doing her research for the book. The text includes numerous quotes from the interviews that she conducted with many of the best-known international figures from the world of flavor research: These include Paul Breslin from Rutgers University and the Monell Chemical Senses Center talking about his work on salt perception, Barry Green from Yale talking about the major influence that touch/trigeminal stimulation has on our perception of food and drink, and, as already mentioned, Linda Bartoshuk talking about supertasters (amongst many other things). Barb also does a great job of extending just that little bit beyond what most academics are normally willing to say in print, but which may well turn out, ultimately, to be true. So, for example,

Correspondence: charles.spence@psy.ox.ac.uk  
University of Oxford, Oxford, UK

she quotes Paul Breslin in this vein as saying “*There might be around twenty qualities of taste but I am most comfortable saying that there’s five.*” ([1], p. 266). Stuckey herself goes even further. She puts forward the provocative suggestion that there may be as many as 25 different basic tastes! Yes, 25, if what one means by that term is any taste for which we have a receptor on our tongue. While most researchers who are happy with the notion of a basic taste (though note that not all are; see [7,8]) would agree with the inclusion of sweet, sour, salty, bitter, and nowadays probably also umami as basic tastes, it is interesting to realize that there are many others substances for which receptor sensitivity on the tongue has now been demonstrated. The list here includes fat, calcium, carbonation, water, metallic, and electric tastes for which there is now reasonably good evidence (for example, [9]), and others for which the evidence is currently weaker, but which have been proposed by at least some researchers (for example, kokumi, starch, mineral, pyrophosphate, lysine, polycose, hydroxide, soapy, and protein tastes).

Stuckey includes a number of case studies in her book, thus reminding me, in style at least, of Lawrence Rosenblum’s [10] popular press volume on the senses “*See what I am saying*” (Lawrence himself gets a brief mention on pp. 11–12). For example, Stuckey talks extensively about the case of Carlo Middione, an Italian chef working out of San Francisco who lost his sense of taste (or rather his sense of smell, and hence flavor) following a car accident (see Chapter 17). Barb’s book also includes some fascinating material on the preparation, and consumption, of food and drink by those who have lost one of their senses (for example, vision or hearing). Also, when she finds out that no one has done the relevant research, as when it comes to the question whether those who are deaf suffer from reduced flavor perception (see also [11]) - she goes and collects some relevant data herself.

Stuckey’s book is strongest in the numerous industry examples she provides from her work with Mattson, the largest new food product development company in North America. Many of the cases she describes seem to hinge on trying to find just the right balance of the basic tastes, not to mention the right mouth-feel, for a particular food or beverage product. Indeed, one of the major themes that came out throughout the book was the importance of food texture and the temporal dynamics of changes in mouth-feel as we eat and drink for so many of the products and brands that we buy on a regular basis. This is certainly an area of food science research that is tricky to work on in an academic research setting. It is just much easier to change the color or aroma of a foodstuff, say. However, on numerous occasions we see just how important the tactile attributes of various foods and beverages are to their success amongst consumers. Take, for example, the case of the development of low-calorie cola drinks that Stuckey

relates in Chapter 10: It turns out that while the various artificial sweeteners that have been developed in the last few decades may be several hundred times sweeter measure-for-measure than sucrose (Splenda, for example, is 600 times sweeter than sugar), their sweetness intensity profile (that is, how the perceived sweetness changes over time in the mouth) is different from what you get with sucrose. Similarly it turns out that the mouth-feel of a carbonated drink changes following the addition of sucrose (it becomes ever-so-slightly more viscous) in a way that simply does not happen if an artificial sweetener is added instead. Stuckey relates how researchers have discovered that by carefully blending different artificial sweeteners (each with a distinctive time-intensity sweetness profile) you can get a sweetness profile that does a reasonably good imitation of what you get (and what your brain expects) with sucrose, just without the calories. According to Barb, though, imitating the mouth-feel qualities of ‘the real thing’ has proved a much tougher nut to crack in artificially-sweetened cola drinks.

In *Taste what your missing*, then, one certainly gets a real sense of the kinds of problems that she and her colleagues are faced with on a daily basis in a commercial setting - everything from how to reduce the saltiness of the food served to astronauts working on the space station, through to making medicines taste a little less unpalatable, and mouthwash and bath soaps more so (antifreeze, apparently, has a very sweet taste). Many of the cases that are described in the book involve the use of one taste to mask, or unmask, another; for example, adding salt to a grapefruit or tonic water can, paradoxically, make it taste sweeter. One of the anecdotes that Stuckey relates really brings home the challenges faced by many of the big food companies who are nowadays being told that they have to lower the salt content in their products (in many of the brands we know and love). She quotes a writer from the New York Times who was taken on a visit to the Kellogg’s laboratories at Battle Creek, Michigan:

*“As a demonstration, Kellogg prepared some of its biggest sellers with most of the salt removed. The Cheez-It fell apart in surprising ways. The golden yellow hue faded. The crackers became sticky when chewed, and the mash packed onto the teeth. The taste was not merely bland but medicinal. . . They moved on to cornflakes. Without salt the cereal tasted metallic.”*  
([1], p. 183)

Many of the chapters end with a recipe and/or with an experiment for the reader to try at home, possibly on their friends, though Barb recommends experimenting on one’s partner or children (Roger, watch out). The experiments include everything from, at the end of the

introductory chapter, how to test whether you are a supertaster, through to tests and exercises designed to hone one's sense of smell. The inclusion of the recipes is something that I have not seen since Heston's [12] ground-breaking *'The Big Fat Duck Cookbook'*, though in Stuckey's case it is *'Barb's Brussels Sprouts'* (which, by the way, sound delicious) rather than the recipe for *'Nitro-poached green tea and lime mousse'* or, for those feeling a little more adventurous, *'Jelly of quail, langoustine cream, parfait of foie gras with truffle and oak toast and a side of scented moss'* that you get!

Where I thought that Stuckey was on weaker ground was when it came to the neuroscience of tasting. On p. 279, for example, in the brief section on "The expert eater brain" she confidently asserts that *"Not only do tasting experts use more areas of the brain, they can enjoy the processing better than novices."* Now while the second part of the claim may, for all I know, be true, the former statement really just does not do justice to the complexity of much of the published data that is out there. Back in 2005, the Santa Lucia group of Castriota-Scanderbeg and colleagues [13] showed for the first time that, when tasting wines, both sommeliers and non-experts show activation in both primary and secondary taste areas in the insula, the orbitofrontal cortex, and in the amygdala-hippocampal area when tasting wine in the brain scanner. The sommeliers in this particular study also exhibited an additional area of activation in the left dorsolateral prefrontal cortex (this area is involved in various high-level forms of cognitive processing). So, while the results of this Italian study provide some limited support for Stuckey's claim, there are now other data out there (see [14]; see also [http://endirect.univ-fcomte.fr/index.php?id=numero\\_234\\_13\\_1&art=2522](http://endirect.univ-fcomte.fr/index.php?id=numero_234_13_1&art=2522)) showing that wine experts sometimes use less of their brain than the non-experts when wine tasting! Thus, I would argue that the answer to the question of whether or not experts use more of their brains' valuable resources when tasting/evaluating the products about which they have expertise is by no means as clear-cut as Barb's terse proclamation would lead a naïve reader to believe. The answer here will presumably depend on the particular task that a participant has been given to perform in the scanner. As always, then, "more research is needed".

What should also be borne in mind here are the very constrained conditions in which participants find themselves in the majority of neuroimaging studies. Typically, participants are inserted, head-first, into a very noisy and narrow tube in the center of the brain scanner, with their head clamped still (to make it easier for the technicians to align the brain images that are recorded). Not only that but the wine will be drip-fed, or rather squirted, by means of one or more tubes inserted into the participant's mouth. The participant usually then has to hold the

said liquid in their mouth, without swallowing, as that can cause unwanted head movements (cf. [15]). Such a methodology is designed to minimize the input of retronasal olfaction, which, as Shepherd [4] pointed out recently in his *Neurogastronomy*, is a key component of flavor, accounting for around 80% of what we think of as flavor. Stuckey [1] puts the figure at closer to 90%. One really needs to be cautious in thinking what, exactly, can legitimately be concluded about the kind of tasting and experience that we have in our everyday lives from the results of neuroimaging studies of flavor, no matter whether we happen to be lucky enough to be a sommelier or not.

There were a number of other claims in the book that, intuitively at least, seem hard to swallow. Take, for example, the highlighted 'Sensory snack' (her words, not mine) that appears on p. 124: *"The human ear is so sensitive that people can tell the difference between hot and cold coffee simply by listening to the two being poured."* From my reading of the suggested literature at the end of the chapter (Chapter 5) it seemed hard to credit that such a claim could really be true. So I emailed Barb to find out where the claim came from. It turns out that she saw it in the New Yorker magazine but, true to form (and, as we saw earlier, in another context), Barb has tested this for herself just to make sure. Although not performed under strict laboratory conditions, she says that of the more than 500 people she has tried this on at the various speaking events she has given, 99% of them had found it easy to tell the difference between hot and cold water (poured from the same tea kettle, from the same height, into the same teacup). Unbelievable, I know, but you can try it for yourself on Barb's website at [www.tastewhatyouremissing.com](http://www.tastewhatyouremissing.com). Everyone I have tried the test on so far has got the answer right.

The explanation, at least according to the answer posted on the Naked Science Forum website, is that it is all to do with viscosity, and I quote: *"Hot water is less viscous (sticky) than cold water, so when it comes out of the tap it makes a higher-pitched splash than water at a lower temperature. You can demonstrate this for yourself at the kitchen sink. Take two mugs of the same size and fill one with hot water and the other with cold. In turn, pour the mugs into the empty sink from the same height and listen to the sound the water makes as it hits the sink bottom. The hotter liquid will sound "splasher" because it is less sticky."* (see <http://www.thenakedscientists.com/forum/index.php?topic=29172.0>).

Finally, I could not possibly end without mentioning Barb's obsession with tomatoes. In the book, we hear a lot about her *'naked tomato epiphany'* (p. 189); sometimes, I must admit the writing gets a little too fruity (yes, tomatoes are classed as a fruit, but I do not mean in that sense), especially for someone such as me who is far more accustomed to reading the dry and dusty

academic tomes brought up from the stacks down below our beloved Bodleian Library here in Oxford. Take, for example, the following: “*Eating an heirloom tomato without salt was like getting intimate with a former lover for the first time in years. I knew the curves and contours of my tomato, but I never realized just how beautiful it was naked...the ripe red flesh...*” (p. 176). Move over Nigella - This kind of prose could certainly give a whole new meaning to the term ‘gastroporn’ (defined by the Collins English dictionary as ‘the representation of food in a highly sensual manner’). Anyway, I guess it is just as well for her husband Roger that, as we learn from the dedication to the book, she loves him ‘*more than tomatoes*’. Having got that off my plate, I will let you savor the pleasures of ‘tantric eating’ that appear at the end of the book for yourselves.

While Stuckey’s book has the now-requisite recommendation from Heston Blumenthal on the back cover (see also [3]), what is striking about the remainder of the cover quotes (at least those appearing on the hard-back version of the book) is that they all come from people working in the food industry; that is, from chefs and those placed in cookery schools. Ultimately, I suspect this volume will have a much more enthusiastic reception there, and, as per the subtitle to her book, amongst ‘passionate eaters’ everywhere, than necessarily amongst those working on the more academic side of flavor perception.

#### Competing interests

The author declares that he has no competing interests.

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