Complexities of flavour

Is flavour an intrinsic objective property, or a subjective experience that varies from person to person? **Barry Smith** sorts out the implications.

Although we're all familiar with taste, it is surprisingly complex and puzzling. What we call taste encompasses the combined sensory inputs of taste, touch and smell, as influenced by sight and sound. The tongue and associated receptors in the mouth detect only salty, sweet, sour, bitter, savoury and possibly metallic, yet we can 'taste' such flavours as mango, onion, strawberry, mint, cinnamon and vanilla. Flavours such as these are discovered by the tongue and the nose together, not by either of these organs alone.

We seldom recognize experiences of pure taste. Holding the nose closed reduces our ability to tell the difference between pieces of raw apple and raw potato because it prevents odours in the mouth from reaching the olfactory epithelium at the bridge of the nose. Similarly, people who lose their sense of smell often report that they can't taste anything, even though when tested they can detect salt, sour, bitter and sweet (there is no simple test for the savoury taste, umami).

So the quality we are interested in is not taste *per se*, but flavour. However, trying to define flavour is far from straightforward. For example, in the introduction to the multidisciplinary journal *Flavour*, the editors tell us: "We take flavour to be the experience of eating food as mediated through all the senses." The journal also "emphasizes work that investigates the flavour of real foods". At first, the editors seem to define flavour as an experience, yet those who study the physics and chemistry of flavours in food and wine are not investigating psychological experiences; rather, they are observing and measuring actual physical compounds. To these researchers, flavours reside in the food and drink we consume. What, I think, the editors intend to focus on is the multisensory experiences through which we *perceive* flavours in foods.

PSYCHOLOGISTS AND NEUROSCIENTISTS TELL US THAT FLAVOUR IS A CONCOCTION OF THE BRAIN

PROPERTY OR EXPERIENCE?

It's not hard to see why people confuse flavour (the objective property) with the subjective experience of flavour. Psychologists and neuroscientists tell us that flavour is a concoction of the brain — the result of the multisensory integration of olfactory, tactile and taste impressions, modulated by the dynamic time course of a tasting event and the location of sensory stimuli in the mouth. According to this view, the flavour of a wine, say, is a psychological construct that will vary from individual to individual as a result of different threshold sensitivities to acid, tannin, sugar, alcohol, carbon dioxide and sulphur. Lighting conditions, mood and even sounds can affect our experience of tasting, and wines can be enhanced or distorted by accompanying foods — all of which suggests that winemakers have little influence over the experience that drinkers of their wines will have.

However, advances in the science of winemaking suggest otherwise, and they are increasingly used to improve the perceptible quality of wines. Winemakers strive to find properties such as 'balance' in a wine — something that drinkers can sense even if they lack the concept of a balanced wine — and winemakers know many of the factors that affect it.

The central question, then, is this: how should we adjudicate between those who say that flavours depend on molecular compounds, and those who stress the varying perceptions of individual eaters and drinkers?

The problem is that analytical chemists struggle to connect the volatile molecules in wines with the varying perceptions of individual tasters. However, this isn't what they should be trying to do. The task is to relate the underlying chemical compounds in a wine to the relatively stable flavours they create, whereas it is the task of psychologists and neuroscientists to chart the complex relationship between flavours and flavour experiences — explaining why the latter can vary as a result of conditions internal and external to the taster. Only by recognizing flavours as intermediaries between the chemical compounds in a wine and our individual reactions to it can we hope to bridge the two.

FINDING THE FLAVOUR

The right way to view flavours is as configurations of sapid, odorous and textural properties of foods or liquids that we track using a combination of our senses. The flavour of menthol, for example, comprises a minty aroma, a slightly bitter taste, and a cool sensation in the mouth resulting from irritation of the trigeminal nerve (which also causes the hot sensation when we eat mustard or chillies). For single flavours, such as strawberry, mint and mango, which are easy to detect, there is little variation between tasters. But for more complex products, like wines, we don't always detect all their flavours. Our individual flavour experiences, like our other perceptions, are not always exact guides to reality. Tasting is hard — it requires experience, practise and knowledge to identify what one is tasting.

Studying the multisensory nature of flavour perception helps us understand how perceptions can vary across individuals, and within individuals over time, as a result of a variety of factors that affect our ability to taste. If a wine remains unchanged, we should see these variations as different ways of perceiving the same flavour, rather than claiming that there are as many flavours as there are tasters. Where the flavours of a wine evolve in the glass or the bottle, the task of an experienced taster is to assess its changing flavour profile from the series of snapshots that individual perceptions provide. Psychology and neuroscience are beginning to show us just how many factors are involved in individual perception, and with luck we will be able to work out the conditions that not only diminish, but also improve, our access to the real flavours in our food and drink. ■

Barry Smith *is director of the Institute of Philosophy at the University of London's School of Advanced Study.*
e-mail: barry.smith@sas.ac.uk