

More of my ramblings on the aging issue.

GC-Mass Spec – 0 – Human Sensory Perception 1

We have heard recently about new patents for processes that folks tout to be able to produce authentic/mature-tasting whisky and rum in days or weeks instead of years.

Let's look at this with a keen nose, tongue and applying all the senses, including the common one, to the issue here.

Many groups, no matter how they mature their spirits, rely on the separation and profiling of many of the 1000's of components that make up the total product profile. And in truth there is value in this for determining some of the most flavorful (low threshold detection) compounds. Some truth! The fantastic profiles that these very expensive Gas-Chromatographic and Mass Spectroscopy instruments (and beyond) show are works of art – and science. All those peaks of compounds present. Several 10s to a few 100 of which convey the flavor of the spirit. But, they only show us so much about the potential consistency of the product, and how well one product stacks up generally in terms of chemical composition and component concentrations. Just because the profile of a two-week-aged whiskey/rum etc., looks very similar to a 30-year-old whisky or rum over select regions (the instrument is set up to handle) conveys nothing about the true overall flavor of the product. Period!

A product can be stripped down and evaluated compositionally to the nth degree and be declared as the most perfect product ever made and taste – well... awful.

Why?

Because all those nicely separated molecules on the GC and GC-MS charts, which can also be detected by the human nose at sniff ports attached to such instruments and the aroma thereby identified as raspberry, butter, coconut, cloves, etc., are not in fact really separated in real life. Some of these molecules may be shielded by forming clusters thus increasing their solubility, but at the same time reducing their volatility (propensity to leap out of the glass and be detected by a variably attuned, though most powerful instrument, about the size of a US quarter – called the olfactory bulb. And the somewhat bigger piece of flesh attached to it – known as the human brain. The system maps the stimulus of the volatile molecule and the flavor is determined by the brain – it does not reside in the molecule itself. Nor does it reside in the peak profile from the GC – the brain may recognize that the peak at point x will be raspberry accented but not know if the raspberry will be present or not in the flavor profile

when consumed. Now compound that with the simultaneous detection and interpretation of 100's of different molecular species to create the "flavor-whole" and there is some reckoning to do. In-fact we are supposed to be able to only definitively identify, with any degree of accuracy – let's call that certainty, only 3 or perhaps 4 different flavor smells out of a complex mixture according to the latest sensory research – now try a line-up of comparable "quality" high proof, highly-flavored whiskies side by side. And tell me just how different they really are.

Now some molecules act antagonistically, reducing the impact of other molecules by increasing their detection threshold for example by one means or another. Other molecules act synergistically, playing together to enhance their collective or individual impressions. Boy, or girl, is this stuff complex or what?

What the rapid maturists need to impress upon us is not fancy GC-MS profiles but to show that they have identified the most odor active contributors to estery and mature/woody-age characters and to further clarify the flavor interactions between these characters in their spirits. We need to develop knowledge of the sensory and the physicochemical interactions between aroma compounds in various spirit systems – how they all play together - and, once we unravel the resultant effects on flavor perception, then and only just then might we be able to state that the two-week whiskey is indeed as good (meaning they are near-identical in their flavor impression profiles) as that nicely long-aged whiskey laid down 10, 20 or 30 years ago. That they match well enough to say game over.

However, by then all the distillers will be redundant because the chemist will be able to step in and make an "authentic tasting product" in minutes armed with just the right set of ingredients to make rapid maturation almost instantaneous for all. I see the "nutrimatics drinks machine" from science fiction on the horizon. And the reforestation of the earth. But hopefully not for a long - long time. I hope to savor long-time matured spirits for, well - a long time.

Are all you craft distillers ready for the end?