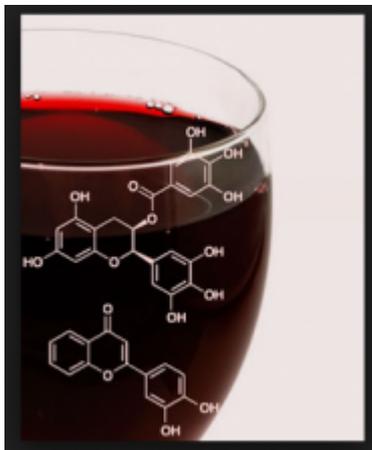


Love Chemicals? Enjoy Some Organic Wine



By *Josh Bloom* — January 22, 2016



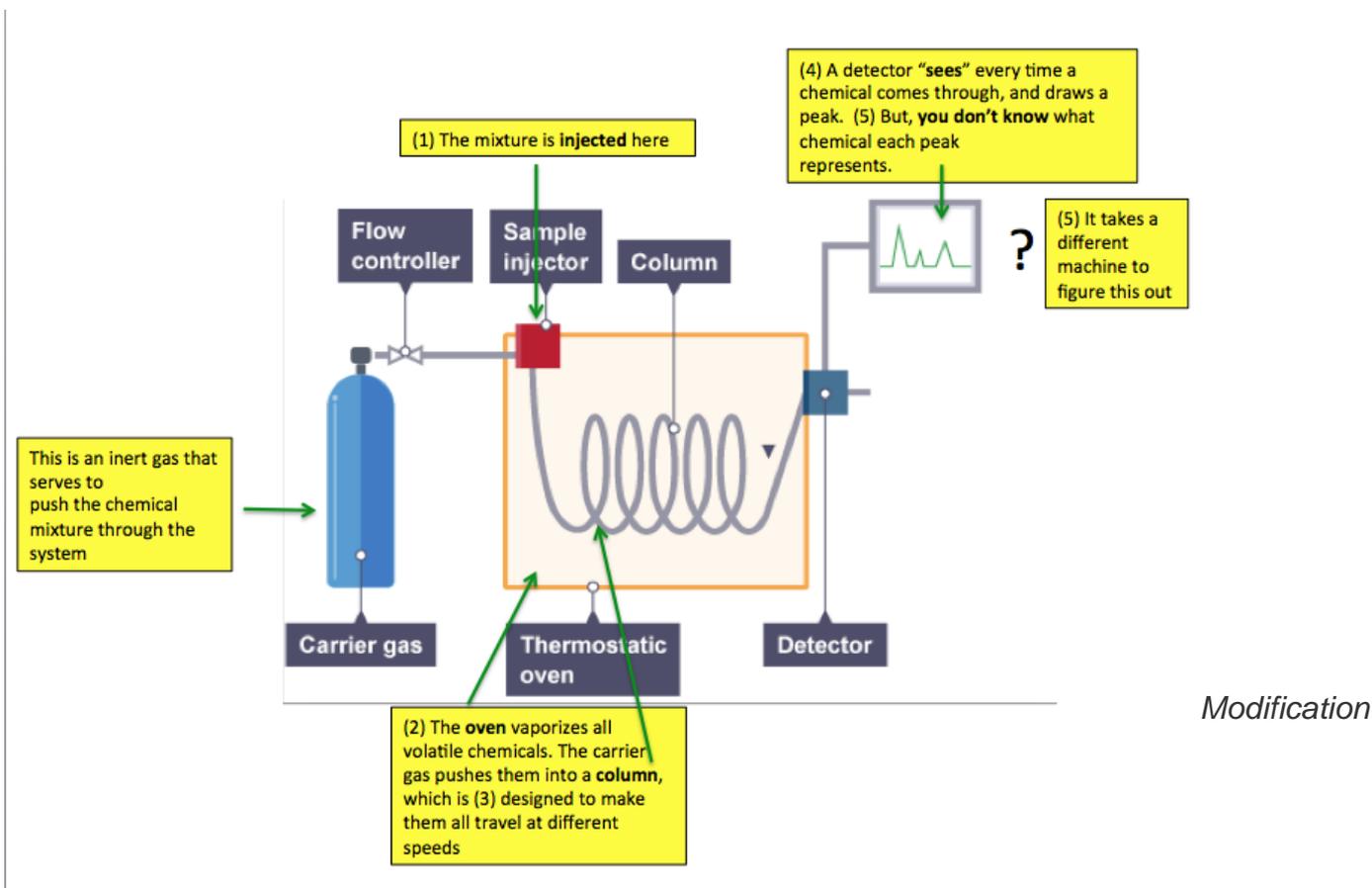
Sorry, chemophobes, but if you really hate chemicals, wine is off the

menu. That goes for organic, shade tree, non-GMO, free-range and whatever other grapes. Wine is chock full of cancer-causing chemicals. Frank Sinatra summed it up best in his smash hit "Love and Marriage": You can't have one without the other.

There are dozens of chemicals that make up the flavor and aroma of wine, and now there is cool instrumental technology that can analyze them and let growers know when is the best time to pick the grapes to make the tastiest wine. And it's just one more example that organic-types are putting their heads in a bottle if they think organic wine is any more "chemical-free" than conventional.

A study in the [Journal of Agricultural and Food Chemistry](#) ^[1] used a combination of gas chromatography (to separate all the chemicals) and ultra-sensitive mass spectrometry (to identify them) as a tool to determine picking time without guessing. Very clever stuff.

Here's how it works. First, the grapes are chemically broken down, and the chemicals that make up the flavors are extracted using solvents. It takes a whole bunch (ahem) of grapes to provide enough of these chemicals to be measured. Once this is done, the crude extract is separated into its components using gas chromatography. This is pretty interesting:



of an original image from PBS

Now for the second part. Here is the machine (Agilent 5973 mass selective detector) that tells you what each chemical component is. If you want how it works you can [read the manual](#) [2], but I recommend against this. It is 404 pages long and you will want to kill yourself by page two.



Essentially (ahem again) , the group determined that the presence of four of the chemicals was the best indicator of when it was time to pick the grapes, which is great for advancing the science of wine. Just as interesting is the 49 chemical ingredients that make up *just the odor and flavor of wine*.

If you *really* don't like chemicals, throw away the following:

1. All of your wine
2. That check you were going to send to The Environmental Working Group
3. Directions to Whole Foods

Here are the chemicals in wine, including the organic kind. Forty-nine were measured. I only put comments on a few of the really neat ones. The others are listed below. Bottoms up.

Chemical Compound	Description	Comments
2,3-Butanedione	creamy, fruity, buttery	Butter flavor in popcorn. Causes lung damage when inhaled (popcorn lung). EWG wants it banned from fragrances.
Butanal	bread, toasted	On the NJ Hazardous Substance List.
Butanoic acid	cheese	The chemical that gives vomit its odor. Also ginkgo berries.
Guaiacol	sweet, phenolic, clove	Found in wood smoke.
Benzyl alcohol	floral	Preservative. EWG calls it a neurotoxin.
p-Cresol	animal, woody	On California's Proposition 65 list as a carcinogen. Has been called an endocrine disruptor.
m-Cresol	leather, woody	On California's Proposition 65 list as a carcinogen. Has been called an endocrine disruptor.
Eugenol	spicy, clove	Clove oil. EWG calls it "quite troubling".
4-vinylguaiacol	clove, woody	Considered to be an endocrine disruptor by the Environmental Agency.
Benzoic acid	spicy	Preservative. Banned by Whole Foods Market.
Vanillin	vanilla, creamy	Principle flavor of vanilla. Banned by some states as "artificial flavor".

*EWG = Environmental Working Group

And the rest, but I think you get the point by now: 1-Hexanol, (Z)-3-Hexenol, 2-Octenal, (E)-2-Hexenol, Acetic acid, Methional, 2-Methyl-3-buten-2-ol, 3-sec-Butyl-2-methoxypyrazine, 3-Isobutyl-2-methoxypyrazine, Linalool, 2,6-Nonadienal, 2-Phenylacetaldehyde, 3-Methylbutanoic acid, $\hat{1}\pm$ -Terpineol, (E)-2,4-Decadienal, $\hat{1}^2$ -Damascenone, Hexanoic acid, 2-Phenylethanol, $\hat{1}^2$ -Ionone, p-Methylguaiacol, p-Ethylguaiacol, 4-Hydroxy-2,5-dimethyl-3 (2H)-furanone, (E)-2-Hexenoic acid, 4-Ethylphenol, 3-Ethylphenol, 2,6-Dimethoxyphenol, 4-Vinylphenol

COPYRIGHT © 1978-2016 BY THE AMERICAN COUNCIL ON SCIENCE AND HEALTH

Source URL: <https://www.acsh.org/news/2016/01/22/love-chemicals-enjoy-organic-wine>

Links

[1] <http://pubs.acs.org/doi/full/10.1021/acs.jafc.5b04774>

[2] http://www.agilent.com/cs/library/usermanuals/public/73nhw_030751.pdf