

Flavor formulation

My Top Seven Dairy Materials

A chief flavorist shares her favorite raw materials for use in dairy formulations

Judith Michalski, Edlong Dairy Flavors

Flavorists all have materials they've grown fond of and use time and again in their flavor formulations. In this little article, I will share some of my preferred materials for dairy flavors and the reasons I use them. Perhaps they'll become some of your favorites too, if they're not already.



δ -Tetradecalactone (FEMA# 3590)

In and of itself, δ -tetradecalactone's oily, milky, general dairy notes are not particularly remarkable or strong. However, when used alongside the lower lactones, its beauty becomes apparent. It has a way of extending and deepening a dairy profile and provides a rich, creamy, milky background. When used at higher concentrations, δ -tetradecalactone can also exhibit a softening effect on the initial impact of a flavor. So, use it wisely. Flavors that benefit from δ -tetradecalactone's supporting role are milk, cream, fresh mozzarella and dulce de leche. Another purely inorganic reason why δ -tetradecalactone is one of my favorite materials is the way it sounds tripping off the tongue, a minor detail, but still fun to say!

***cis*-4-Heptenal (FEMA# 3289)**

On its own, *cis*-4-heptenal is powerfully green, vegetablelike and fatty—not really characteristic of any one thing. It is certainly not the first material that would come to mind for a dairy flavor if one didn't know better. However, these predominant notes belie its true creamy nature. Its effectiveness at 1–2 ppb in a finished product make it economical for use despite its relatively expensive price. The downside of its strength is that it is very easy to overdose. Take it from me, an extra drop or two of a 0.01% solution can take a flavor from lovely to lousy. When properly used, however, a little bit of *cis*-4-heptenal can impart a big, wonderfully natural-tasting creaminess and depth to cream, butter, milk and caramel flavors.

2-Heptanone (FEMA# 2544)

There's nothing subtle about this one! It screams Roquefort, which is fine if that is the goal. Although 2-heptanone is not as strong as *cis*-4-heptenal, it's easy to unintentionally overemphasize the ketonic notes because it is so highly characteristic. Flavors that bloom from the deep blueness of 2-heptanone are yogurt, sour cream, cooked milk, cheese, cheddars, as well as mold-ripened melted butter and cream.

Follow-up Questions?

Troubleshooting a formulation for a dairy product? Have more questions about one of the materials discussed here? Our dairy expert, Judith Michalski, can help. Just e-mail your questions to kfrederick@allured.com and stay tuned to the *P&Fnow* e-newsletter where your questions and others' will be answered. Sign up for the free *P&Fnow* e-newsletter by going to www.PerfumerFlavorist.com.

Further Reading

If you are interested in finding more about formulating for dairy, check out *Successful Flavors* (Allured Publishing). Judith Michalski delves into what makes dairy flavors unique. “Ruminations on Some Dairy Flavors” covers the origins of dairy flavors and explores milk, cream and butter flavors. In addition, Michalski provides detailed lists of flavor descriptors for each category. You can purchase the book today by visiting www.PerfumerFlavorist.com and clicking on Shopping.

In addition, to find more information about these and other flavor materials check out *Allured's Flavor and Fragrance Materials* and *Mosciano's Flavor Library*. You can find both at www.PerfumerFlavorist.com.

1-Octen-3-ol (FEMA# 2805)

This is another material that is neither shy nor retiring. Similar to *cis*-4-heptenal, 1-octen-3-ol is a very strong compound with an odor threshold in water of 1 ppb. Unlike *cis*-4-heptenal, it is very characteristic in its own right in that it reeks of freshly cut fungi. One of its nicknames is mushroom alcohol. Its earthy notes contribute very nicely to some of the mold-ripened cheeses, gorgonzola in particular. In a more supportive role, 1-octen-3-ol lends depth by adding to the cooked, creamy profile of milk, dulce de leche, and the earthiness in sour cream and yogurt.

Sulfurol (FEMA# 3204)

This is one of the milder sulfur flavor chemicals that exist. Sulfurol is not really a star or even a supporting actor—it's more like a member of the chorus. It's not terribly strong and is completely un-dairylike in its organoleptic qualities. While its meaty, brothy and savory descriptors are not usually ascribed to dairy flavors, it's very difficult to make a good cooked milk flavor without it. This quality of mysteriousness makes working with sulfurol an intriguing enterprise.

Methyl thiobutyrate (FEMA# 3310)

It is impossible to be indifferent to the aroma of methyl thiobutyrate. It possesses a huge, impressive stench for such a little molecule! It has been described in polite company as sweet and cheesy, but that which identifies its qualities most aptly (and bluntly) is essence of toe jam. As fascinatingly repulsive, or repulsively fascinating, as it is, methyl thiobutyrate is nonetheless invaluable for use in creating the aged flavor complex in cheddar cheese. At lower levels it imparts characteristic notes to cream cheese and interesting notes to other cultured flavors such as yogurt and buttermilk.

2-Acetyl pyrazine (FEMA# 3126)

This is another very strong compound with an odor threshold in water of 62 ppb. It is highly characteristic of one of Mother Nature's perfect foods—popcorn. This is a highly popular, and obvious, material for use in butter flavors for microwave popcorn. Unlike many of the other pyrazines that have raw, nutty, musty notes, 2-acetyl pyrazine is more toasted and lacks the aforementioned characteristics. At sub-popcorn levels it is very useful in lending balanced toasted notes to milk, caramels, toffees, browned butter and dulce de leche.

Address correspondence to Judith Michalski, Edlong Dairy Flavors, 265 Scott St., Elk Grove Village, IL 60126.

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