Acetanisole

How this ingredient's hawthorn character helps create interesting, commercial-quality flavors

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One of the most intriguing problems I have ever faced was the challenge of working out how to compound flavors completely on a small robot compounding machine. The machine would only hold 500 raw materials, so the biggest decision was how to narrow the raw materials down to such a small number without sacrificing the ability to create interesting, commercial-quality flavors.

One of the raw materials that made the final cut was acetanisole, commonly referred to as para-methoxy acetophenone (FEMA# 2005, CAS# 100-06-1). The character of this chemical can best be described as hawthorn—something that might be expected to fit better within the floral note of a fine fragrance than within the ultimate short list of flavor raw materials. This profile is not exactly unique in flavors.

Acetophenone (FEMA# 2009, CAS# 98-86-2) is also primarily hawthorn in character and is also widely used in flavors, but the note is noticeably harsher and faintly phenolic, so acetophenone did not make the cut. 4'-Methylacetophenone (FEMA# 2677, CAS# 122-00-9) is less harsh than acetophenone and can be useful in fruit flavors. On the other hand, 2-hydroxyacetophenone (FEMA# 3548, CAS# 118-93-4) is quite phenolic and is generally more helpful in savory and brown flavors. The most recent "hawthorn" addition to the GRAS list is 4-hydroxyacetophenone (FEMA# 4330, CAS# 99-93-4). This ingredient is much softer and more floral than 2-hydroxyacetophenone and works well to soften smoke flavors.

The dose rates given throughout this article are the levels suggested for use in flavors that are intended to be dosed at 0.05% in a simple bouillon or ready-to-drink beverage.

Fruit Flavors

***Black cherry*:** Acetanisole is key to the character of black cherries. Levels can vary dramatically, ranging from around 2,000 ppm in a simple, relatively fruity flavor up to more than 15,000 ppm in a more authentic style.

***Red cherry*:** The level of use in red cherry flavors is lower, typically in the region of 1,000 ppm in flavors dominated by esters and benzaldehyde.

***Acerola cherry*:** This flavor is a little more subtle but acetanisole can still play a useful, if more modest, role at levels in the region of 500 ppm.

***Raspberry*:** A good level for this ingredient in raspberry flavors is 500 ppm, adding light floral lift and some element of raspberry skin character.

***Blackberry*:** Similar, or slightly lower, levels of this chemical work well in blackberry flavors. A 300 ppm addition is typical in flavors.

***Blueberry*:** Many blueberry flavors start out a little too perfumed, with enhanced levels of linalool in particular. Adding moderate levels, around 100 ppm, of acetanisole makes this exaggeration more acceptable and adds realism.

***Peach and apricot*:** Similar complaints can be made of peach and especially apricot flavors. A level of 100 ppm once again reduces the dominance of linalool.

***Black currant*:** The effect is really subtle in black currant flavors but, nevertheless, useful. A good starting point is 50 ppm.

***Raisin*:** Realistic raisin flavors can be quite difficult to create; just a trace addition, in the region of 20 ppm, of acetanisole adds realism.

Brown Flavors

***Vanilla*:** The level used in vanilla flavors varies dramatically. Levels as high as 5,000 ppm work well in French-style profiles, based on the character of Tahiti beans; however, much lower levels in the region of 100 ppm are more typical in Bourbon bean-style flavors.

***Caramel*:** Caramel flavors can all too easily end up overly heavy and cloying—conveying a pleasant initial impression but quickly leading to a feeling of satiety. Acetanisole offsets that character perfectly, adding a bright fragrant top note. Levels can be either relatively subtle, around 200 ppm, up to quite dominant, around 5,000 ppm, in caramel flavors.

***Coffee*:** Coffee flavors can often seem too simplistic, often too sulfury, too burnt, and sometimes both. Acetanisole adds welcome complexity and balance at around 1,000 ppm in flavors.

***Molasses*:** A level of 1,000 ppm of this component also works very well in realistic molasses flavors, offsetting the dominant notes.

***Toffee*:** Toffee flavors can suffer from the same problem of heaviness as caramel flavors, but the ideal level of this ingredient is generally lower, typically around 200 ppm.

***Brown sugar*:** Similarly low levels are also more appropriate in brown sugar flavors and they perform a similar brightening, lifting function.

***Butterscotch*:** A level of 200 ppm is also quite effective in butterscotch flavors in exactly the same way, providing lift.

***Chocolate*:** Acetophenone is an important secondary flavor component of cocoa beans, but acetanisole manages to convey this aspect of the cocoa profile much better than acetophenone. It is still only a secondary component in chocolate flavors, but it does provide a useful floral, slightly powdery nuance. It is more important in dark chocolate flavors than milk chocolate flavors, and 100 ppm is a good starting point.

Nut Flavors

***Hazelnut*:** This ingredient works exceptionally well in hazelnut flavors, adding a welcome level of naturalness and lift. Although levels can vary from 200 ppm to 2,000 ppm in hazelnut flavors, 1,000 ppm is a happy compromise.

***Pistachio*:** Similar levels, around 1,000 ppm, also work well in pistachio flavors and have the added benefit of softening the impact of the frequently overdone benzaldehyde bitter-almond component.

***Walnut*:** The effect in walnut flavors is not quite so marked and the levels are correspondingly a little lower, around 200 ppm.

***Coconut*:** This is not an ingredient to overdo in coconut flavors; it can push them to seem artificial and perfumed, but 100 ppm is a good, natural tasting level to add.

***Almond*:** Sweet almond flavors only require quite modest levels of acetanisole in the region of 20 ppm.

Savory Flavors

***Soya sauce*:** Recreating this flavor category can be tough and although this ingredient will never be a major component of soya sauce flavors, it does add realism at around 100 ppm.

***Smoke*:** The effect of acetanisole at around 20 ppm in smoke flavors is to soften the character and add authenticity.

Other Flavors

***Root beer*:** Root beer flavors are often very monochromatic and simplistic. Levels around 100 ppm can make them much more interesting and impactful.

***Cream soda*:** This category of flavors suffers from a very similar problem and, once more, 100 ppm of acetanisole is a worthwhile addition.

***Peppermint*:** Acetanisole may only be present in nature in peppermint oils at a few parts per million, but it can contribute a positive, fragrant effect to peppermint flavors at relatively enhanced levels around 20 ppm.

***Basil*:** The effect in sweet basil flavors is similar, adding a fragrant top note at levels between 10 ppm and 20 ppm.
