



Trimethyl Pyrazine

This raw material's roasted character extends to virtually all "cooked" flavors.

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It would be hard to think of a single pyrazine, or any other "roasted" note for that matter, which is more useful than trimethyl pyrazine (FEMA# 3244, CAS# 14667-55-1). In general, mono-, di-, tri- and tetra-substituted pyrazines exhibit some level of family odor resemblances within each structural category. Within the tri-substituted pyrazine category, trimethyl pyrazine is by far the most widely used and probably the most cost-effective. The roasted character seems most obviously compatible with cocoa, but the use of this raw material extends to virtually all "cooked" flavors. It is often used in conjunction with other pyrazines, the precise balance varying considerably with the flavor profile.

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 ready-to-drink beverage or in a simple bouillon.

Brown Flavors

Cocoa and chocolate: This ingredient is central to the roasted note of cocoa and chocolate flavors. The ideal level of use varies a great deal, higher in dark chocolate and cocoa flavors and much lower in milk and white chocolate flavors, but 1,500 ppm is a good (high place) to start.

Coffee: In a similar way, the ideal level of use in coffee flavors is strongly determined by the level of roasted character that is desired. A level of 1,000 ppm is a reasonable starting point.

Malt and malted milk: One thousand ppm also works very well in both malt and malted milk flavors. This level is quite high, but it serves as an effective foil to the relatively high levels of methional that are often necessary to create a realistic malt profile.



Brown sugar and molasses: Lower levels, around 100 ppm, are all that is required to give a realistic "heated" profile to brown sugar flavors, although higher levels, around 500 ppm, can be used in more aggressive molasses flavors.

Black tea: Only a modest addition, in the region of 50 ppm, is needed in black tea flavors. This ingredient also works in oolong tea flavors at a similar level, but is less effective in green tea flavors.

Vanilla: Clearly, trimethyl pyrazine is at best only ever a very minor ingredient in vanilla bean flavors, but a subtle addition of 20 ppm can add noticeable additional realism.

Nut Flavors

Peanut: Trimethyl pyrazine is normally not used alone, but as part of a mixture

of roasted notes in peanut flavors; nevertheless, the ideal level of addition is fairly high, around 1,500 ppm.

Hazelnut and praline: A level of 1,500 ppm also performs very well in hazelnut and praline flavors. Unlike the peanut situation, in these flavor profiles it is often the dominant roasted note.

Walnut: The roasted note in walnut flavors is much more subdued and, in consequence, the ideal level of addition of trimethyl pyrazine is around 200 ppm.

Meat Flavors

Roast beef: The ideal level of trimethyl pyrazine in beef flavors depends very much on the profile of the flavor. Roasted and BBQ flavors can benefit from higher addition, around 100 ppm. Boiled beef flavors are better served by more modest levels, in the region of 20 ppm.

Lamb: The same comments and generally the same levels apply to lamb and mutton flavors, 100 ppm for roasted flavors or 20 ppm for stewed flavors.

Chicken: In a similar way, chicken flavors need different levels of addition depending on their profile. However, generally these are lower than in the case of beef: 100 ppm for highly roasted flavors, down to 10 ppm for boiled flavors.

Bacon: One hundred ppm of trimethyl pyrazine is also the optimum level of addition to bacon flavors.

Ham: Only a moderate level of this ingredient is helpful in ham flavors. A level of 80 ppm is a good starting point.

Hydrolyzed vegetable protein: Unsurprisingly, the ideal level in boiled beef flavors, 20 ppm, also works well in hydrolyzed vegetable protein flavors.

Seafood Flavors

Shrimp: Shrimp, scampi and lobster flavors can benefit from quite high levels of this ingredient, around 400 ppm.

Crab: Crab flavors tend to be overridden by such high levels and only need a moderate 100 ppm level of addition.

Vegetable and Cereal Flavors

Bread: Fresh bread flavors derive a significant part of their character from trimethyl pyrazine, or other similar pyrazines, and the best starting level is 1,000 ppm.

Fried onion: Depending on the level of frying or toasting desired, this pyrazine can play a major role in cooked onion flavors, starting at 500 ppm.

French fries: In a similar way, all types of cooked potato flavors will find an addition of this ingredient useful, especially french fries flavors, at around 500 ppm.

Corn: Cooked corn flavors such as corn chip can also use trimethyl pyrazine at similar levels, around 400 ppm.

Dried mushroom: Cep flavors in particular are helped by moderate additions of this chemical, in the region of 200 ppm.

Dairy Flavors

Cheese: Cheese flavors represent the main dairy application of this raw material. Levels vary dramatically depending on the type of cheese or subsequent cooking of the cheese and are typically

higher in cheeses that have either been cooked during their manufacturing process, such as cheddar or Gruyère, or have subsequently been toasted. The ideal range is from 100 ppm (which gives a subtle effect) up to 1,000 ppm (which gives a very unsubtle effect).

Butter: In a similar way, cooked butter flavors are the main area where trimethyl pyrazine proves to be helpful. The ideal level of addition is around 500 ppm.

Alcoholic Drink Flavors

Rum: Trimethyl pyrazine can play a part in many spirit flavors, but most obviously in rum flavors. Levels can vary, but 300 ppm is ideal.

Beer: In a similar way, most beer flavors might benefit from a subtle addition of this ingredient, but the main benefit is to dark beer flavors, starting at 30 ppm.

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