Organoleptic Characteristics of Flavor Materials

Celebrating 20 years of organoleptic evaluations and welcoming a new voice

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When this article first appeared in Perfumer & Flavorist *magazine in December 1989, it included consensus evaluations of the creative staff of Food Materials Corporation, i.e. Judith Michalski, Susie Sadural, Michael Fasano and myself. A lot has changed since then. Food Materials has ceased to exist, having been purchased by Bush Boake Allen, which was later acquired by International Flavors & Fragrances. (Had I stayed at Bush Boake Allen, I would have ended back where I began, i.e. at International Flavors & Fragrances.) We are now at the 24th FEMA GRAS list. Also, the initial evaluation group has been scattered around the flavor industry—Susie Sadural is at Kraft (Glenview, Illinois), Judy is a flavor consultant (Chicago), Mike Fasano is at David Michael (Philadelphia), and I have been consulting for the last 10 years and writing this article for the last 20 years. Over the course of this column, changes in affiliations have altered the composition of this evaluation group. Today, it consists of Judy Michalski, William Jaggard (Bell Flavors), Doug Young (Symrise), Tom Gibson (Silesia), Carl Holmgren (a flavor consultant from Kalamazoo, Michigan) and, last but not least, me.*

While I never thought I would still be at this for as long as I have, it's time now for me to move on and pass on the responsibility to others. So, with the first edition of P&F *magazine in 2010, Judith Michalski will assume the authorship of this article. Judy and I have tasted together for the last 30 years and I know she will do a dynamite job.*

—Gerard Mosciano

Evaluations

On several occasions, I have outlined my own flavor training. My mentor, Louis "Lew" Strasburger, a charter member of the Society of Flavor Chemists, was a very patient and learned creative flavorist who was willing to impart his extensive flavor experience to a very impatient apprentice. The basics of the training program centered around the organoleptic evaluation of the ingredients then used in flavor creation. We evaluated ingredients on a daily basis, but never managed to achieve Lew's objective of evaluating every approved flavor ingredient at least once every two years. When the first GRAS list was released—a grandfathered listing of all the then-commonly used artificial ingredients—many of the ingredients were not available due to the absence of external ingredient suppliers who could supply food grade materials. That was why Chemical Sources was formed soon after the Society of Flavor Chemists was chartered. Today, with the issuance of new and expanded GRAS lists on a continual basis, it has become even more difficult to locate approved flavor ingredients; this has been further complicated by the increasing popularity of natural and organic ingredients. Often though I have tried, I have never been able to fill some of the voids in my flavor organoleptic database.

In an effort to fill some of the voids in my database, Mark Volpe, operations manager and Lisa Amato, technical service manager of Penta Manufacturing Co. have agreed to supply some of the needed flavor ingredients for evaluation. This article and subsequent articles will contain organoleptic evaluations of Penta supplied ingredients. I thank Penta for their support.

—Gerard Mosciano

3-Ethyl-2,6-Dimethyl Pyrazine

FEMA# 3150, CAS# 13925-07-0, Nature identical

Natural occurrence: Roasted barley, chicory root, coffee, spike lavender oil, roasted peanut, potato, rum and whiskey.

Odor: @ 1.0%. Roasted nutty, potato skin, roasted hazelnut, cashew and peanut with nuances of malt and dried leaves.

Taste: @ 5 ppm. Roasted nutty peanut, Nutella, beany coffee and mocha with nuances of brown caramel and baked potato.

Possible applications: Roasted nutty notes for hazelnut, peanut, cashew, Nutella, coffee, potato, grains, crackers and caramel.

3-Heptanone (Synonym: Ethyl Butyl Ketone)
FEMA# 2545, CAS# 106-35-4, Nature identical
Natural occurrence: Bread and coffee.
Odor: 1.0%. Impacting, ethereal ketonic, creamy, fermented, blue cheese moldy with fermented fruity banana and nutty nuances.
Taste: @ 10 ppm. Moldy blue cheese, creamy with scalded, stale, milky nuances, and fruity nuances for banana.
Possible applications: Mold ripened cheese, banana, cream, dairy nuances and yeast.

3-Hexanol
FEMA# 3351, CAS# 623-37-0, Nature identical
Natural occurrence: Clary sage oil.
Odor: @ 1.0%. Fusel, green, solventy and alcoholic, with nuances of tropical fruits, pineapple, apple and cider, and rum.
Taste: @ 20 ppm. Alcoholic, solventlike, fusel notes of rum, eggnog and whiskey, green fruity nuances of guava and apple.
Possible applications: Apple, pear, guava, banana, cider, fusel notes for whiskey and rum, cider and eggnog.

2-Iso Propyl Phenol
FEMA#3461, CAS# 88-69-7, Nature identical
Natural occurrence: Bonito and whiskey.
Odor: @ 1.0%. Solventlike, phenolic and smoky with toasted woody and burnt rubber nuances.
Taste: @ 10 ppm. Solventlike, shoe polish, woody, smoky, aged scotch and whiskeylike, with tar and burnt rubber nuances.
Possible applications: Scotch and bourbon whiskey.

1-(Methylthio)-2-Butanone
FEMA# 3207, CAS# 13678-58-5, Nature identical
Natural occurrence: Coffee.
Odor: @ 0.10%. Fresh radish, mustard, horseradish and wasabi-like with alliaceous onion, savory metallic and vegetative nuances.
Taste: @ 1.0 ppm. Sulfurous, cabbage and radish, horseradish, toasted onion and dairylike nuances.
Possible applications: Vegetative cabbage, mustard, wasabi and mustard, tropical and dairy nuances, and coffee.

2-(Methylthio)methyl-3-Phenyl-2-Propen-1-al
FEMA# 3717, CAS# 65887-08-3, Artificial
Natural occurrence: Not yet found in nature.
Odor: @ 1.0%. Vegetative sauerkraut, kimchi, cabbage, soy beans, green onion nuances.
Taste: @1.0 ppm. Vegetative sauerkraut, kimchi, cabbage, soy beans, green onion nuances.
Possible applications: Pineapple, sauerkraut, kimchi, nuances for soy and other vegetative notes.

3-Methyl-1-Cyclopentadecanone (Synonym: Muscone)
FEMA# 3434, CAS# 541-91-3, Nature identical
Natural occurrence: Natural musk.
Odor: @ 0.20%. Sweet, fragrant, perfume, musky with floral and soapy shaving creamlike nuances.
Taste: @ 1.0 ppm. Sweet, musklike, perfume, soapy with woody and bitter nuances.
Possible applications: Shaving creams and aftershaves, Sen-Sen, muscat grape, blackberry, red licorice, Japanese chewing gum nuances and dried fruits.

3-Methyl-2-Butanethiol
FEMA# 3304, CAS# 2084-18-6, Artificial
Natural occurrence: Not yet found in nature.
Odor: @ 0.10%. Sulfurous, savory burnt rubber, roasted chicken and pork meaty with nuances of roasted coffee, cultured cheeses and roasted cashew nuts.
Taste: @ 0.5 ppm. Sulfurous, savory fried meaty, fried fatty with coffee and cooked onion nuances with a slight tongue bite.
Possible applications: Savory nuances for fried and roasted meats, cooked onion, coffee, dairy cheeses and vegetative nuances.

3-Methyl-2-Butanol
FEMA# 3703, CAS# 598-75-4, Nature identical
Natural occurrence: Apple, celery, cheeses such as Swiss, Gruyere, cider, cocoa, elderberry juice, honey, grape and orange juice, plum, soybean, strawberry and wine.
Odor: @ 1.0%. Impacting, musty, alcoholic, fusel-like, with nuances of vegetables, cider, cocoa and cheese.
Taste: @ 10 ppm. Impacting, musty, alcoholic, fusel-like, with nuances of vegetables, cider, cocoa and cheese.
Possible applications: Apple lift, cheese nuances, vegetables, fusel notes for wines and whiskey, and cocoa top notes.

3-Methylbutyl-2-Methyl Propionate
FEMA# 3507, CAS# 2050-01-3, Nature identical
Natural occurrence: Banana, chamomile oil, grape, honey, hop oil and whiskey.
Odor: 1.0%. Sweet, fruity, banana and pear, slight waxy and green with red apple, Bing cherry and winey nuances.

Gerard Mosciano is joined by Judith Michalski, flavor consultant; Carl Holmgren, consulting flavor chemist; William Jaggard, Bell Flavors; and Douglas Young, principal flavorist, Symrise, in the organoleptic evaluations presented here. Natural occurrence information is from Leffingwell & Associates.

Suppliers: Suggest materials for evaluation to Judith Michalski; judithmichalskillc@gmail.com.

Suppliers of most materials found in this report can be located in Allured's *Flavor & Fragrance Materials*, published by Allured Business Media, 336 Gundersen Drive, Suite A, Carol Stream, IL 60188-2403 USA; telephone 1-630-653-2155; fax 1-630-653-2192; *www.PerfumerFlavorist.com*.

Taste: @ 10 ppm. Sweet, fruity, green, banana and ripe figlike, with pleasant berry and winey nuances.
Possible applications: Fresh green figs, red apple, pear, banana, cherry and tropical nuances.

4-Methyl-3-Penten-2-One (Synonym: Mesityloxide)

FEMA# 3368, CAS# 141-79-7, Nature identical
Natural occurrence: Cedarwood oil, coffee, osmanthus absolute.
Odor: @ 1.0%. Musty, mildew, earthy, chemical, cardboardlike with nutty, chocolate and woody nuances.
Taste: @ 3.0 ppm. Potato bin, raw and baked potato, jicama with raw vegetative, nutty and dirtlike nuances.
Possible applications: Pear, radish, various cheeses, potato, jicama, nutty and coffee nuances.

β-Naphthyl Anthranilate

FEMA# 2767, CAS# 63449-68-3, Artificial
Natural occurrence: Not yet found in nature.
Odor: @ 1.0%. Sweet, concord grape, anthranilatelike with a slight candy, syrupy, fruity, berry aftertaste and slight floral and winey nuances.
Taste: @ 10 ppm. Anthranilate, Concord grape, with slight naphthyl nuances and deep candy cherry, berry and winey nuances.
Possible applications: Concord grape, cherry, berry depth, kiddie confections and beverages.

2-Pentanol (Synonym: Sec Amyl Alcohol)

FEMA# 3316, CAS# 6032-29-7, Nature identical
Natural occurrence: Mikan peel and *Ulva rigida* oils.
Odor: @ 1.0%. Alcoholic, fusel, fermented, choking and musty with sweet white wine top notes and overripe banana and yellow apple nuances.
Taste: @ 10 ppm. Musty, fusel, alcoholic, white winelike with solventy fruity notes of ripe banana and apple, tropical nuances and melon rind.
Possible applications: Wine flavors, banana, apple, alcoholic notes, tropical and melon nuances.

3-Phenylpropyl Isobutyrate

FEMA# 2893, CAS# 103-58-2. Artificial
Natural occurrence: Not yet found in nature.
Odor: 1.0%. Sweet rich fruity, juicy fruit, honey, tropical fruity with fermented sugar, and jammy, osmanthuslike nuances.
Taste: @ 10 ppm. Sweet, rich, fruity, ripe juicy notes reminiscent of blackberry, blueberry, fig and grape, with slightly fermented misolike nuances.
Possible applications: Fig, blueberry, blackberry, grape, juicy fruit, honey and tropical nuances.

10-Undecen-1-yl Acetate (Synonym: Acetate C-11)

FEMA# 3096, CAS# 112-19-6, Artificial
Natural occurrence: Not yet found in nature.
Odor: @1.0%. Fatty, red licoricelike fruity, sharp, waxy with meaty and dairylike cheesy notes.
Taste: @ 10 ppm. Greasy fatty, waxy with grilled meaty and dairy, cheesy notes with good mouthfeel and hints of red licorice fruity nuances.
Possible applications: Fat replacers, mushroom, grilled and fatty meaty notes, dairy notes for cream, Parmesan and Romano cheeses.

Materials provided by: Penta Manufacturing Company; www.pentamfg.com

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