2-Methyl Butyric Acid

Use in berry, fruit, brown, fermented and savory flavors

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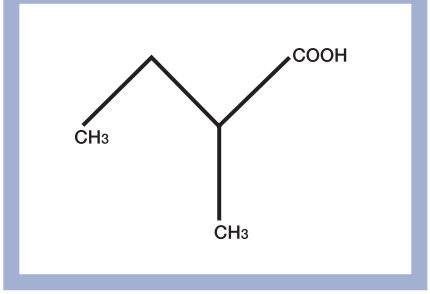
2-Methyl butyric acid (FEMA# 2695, CAS# 116-53-0) (**F-1**) is notably different in character from the closely related unbranched aliphatic fatty acid valeric acid (FEMA# 3101, CAS# 109-52-4) and also from the even more closely related isovaleric acid (FEMA# 3102, CAS# 503-74-2). It has a mild, soft, dried fruit character, whereas the related fatty acids are stronger, but much more one-dimensional and cheesy in character. 2-Methyl butyric acid is very widely distributed in nature and has an unusually wide spectrum of use in flavors.

The characters of several other 2-methyl substituted fatty acids show marked similarities. They may be less useful overall than 2-methyl butyric acid, but they can be very interesting in specific applications. 2-Methyl pentanoic acid (FEMA# 2754, CAS# 97-61-0) is also soft and reminiscent of dried fruit, and it is particularly useful in nut flavors. 2-Methyl hexanoic acid (FEMA# 3191, CAS# 4536-23-6) has a similar character and blends well with chocolate flavors. 2-Methyl heptanoic acid (FEMA# 2706, CAS# 1188-02-9) is the last member of the series to find widespread use and is particularly effective in vanilla and beef flavors.

2-Methyl butyric acid **F-1**



The dose rates given below are the levels of 2-methyl butyric acid to be used in flavors that are intended to be dosed at 0.05% in a ready-to-drink taster, beverage or bouillon. They all assume the chemical is used alone, without other members of the same family.

Berry Flavors

Cranberry: Cranberry flavors can accommodate an unusually wide variety of levels of 2-methyl butyric acid. Modest levels, around 100 ppm, have a significant effect, adding subtle depth and complexity. High levels, even up to 25,000 ppm, still blend in well, adding a notable dried fruit effect.

Strawberry: Similar comments apply to strawberry flavors, but to a slightly lesser extent. Levels around 500 ppm add depth and realism but allow the flavor to retain freshness. Very high levels in flavors, around 15,000 ppm, work well but add a dried or processed fruit character.

Lingonberry: This unusual but interesting Northern berry depends to a notable extent on the character of 2-methyl butyric acid. Five-thousand ppm in a flavor is a good starting level.

Cloudberry: Similarly, 2-methyl butyric acid is key to the character of cloudberries. In this case, 10,000 ppm is a good place to start.

Blueberry: Blueberry flavors can easily become too floral, light and aromatic, so the effect of 2-methyl butyric acid is particularly useful. Levels of 2,000–10,000 ppm in a flavor are optimal, adding depth without making the character unduly dried.

Gooseberry: In the same way, gooseberry flavors tend to overemphasize light, estery notes. Additions around 2,000 ppm are ideal, adding depth and realism without disturbing the underlying flavor.

Raspberry: Levels of 500–10,000 ppm can be used in raspberry flavors. A higher level can give a hint of processed character, but if it is well balanced with fresh notes, the effect can become pleasingly ripe.

Blackberry: Rather lower levels, up to 5,000 ppm, of 2-methyl butyric acid can be used to good effect in blackberry flavors, giving, in conjunction with high levels of musk notes, the impression of ripeness.

Blackcurrant: Only about 100 ppm of 2-methyl butyric acid is needed to create a pleasant depth in realistic blackcurrant flavors.

Other Fruit Flavors

Apricot: Modest levels of 2-methyl butyric acid can be used effectively in fresh apricot flavors, but the principal use of this chemical is to reproduce the uniquely attractive character of dried apricots at between 5,000–20,000 ppm in the flavor.

Peach: The effect in peach flavors is similar, but the best use levels are rather lower, in the range of 500–5,000 ppm. At the top end of this range the effect is in the direction of processed peach rather than dried peach.

Banana: For many people banana flavors are at their most attractive when they represent a fully ripe, but not brown, character. 2-Methyl butyric acid achieves this effect at around 2,000 ppm in flavors.

Lychee: Complexity is always welcome in lychee flavors, moving away from an overreliance on rose notes. 2-Methyl butyric acid is effective at 2,000 ppm.

Pear: Around 1,500 ppm adds attractive depth and skin character to fresh pear flavors without dulling their impact and freshness.

Rhubarb: Depth, complexity and realism are added to rhubarb flavors at levels around 1,000 ppm.

Apple: A range of 500–1,000 ppm is most effective in apple flavors, with higher levels tending to detract from the fresh effect of *trans*-2-hexenal (FEMA# 2560, CAS# 6728-26-3).

Grape: Grape flavors, especially those with a significant floral note, can benefit from additions of 200–500 ppm of 2-methyl butyric acid.

Pineapple: Five-hundred ppm also works well in pineapple flavors and at this level will not detract from the character of the fresh fruit.

Guava: Guava flavors never lack depth, and subtle levels of 2-methyl butyric acid in the region of 100 ppm are most effective.

Papaya: The same comments that apply to guava flavors are appropriate for papaya flavors, and similar levels should be used.

Mango: Similarly modest levels work well in mango flavors and add a degree of realism.

Kiwi: Kiwi flavors are light and subtle, so only modest additions of 2-methyl butyric acid, around 100 ppm, are appropriate in these flavors.

Brown Flavors

Coffee: High levels, around 20,000 ppm, work well, especially in mild roasted coffee flavors.

Brown sugar: Five-hundred ppm is an ideal level in brown sugar flavors, adding soft, attractive nuances.

Chocolate: Dark chocolate and cocoa flavors benefit from additions of 2-methyl butyric acid between 50–500 ppm.

Black tea: Five-hundred ppm also works well in black tea flavors, adding depth to the character of the flavor.

Vanilla bean: Three-hundred ppm is appropriate in vanilla bean flavors. At this level, 2-methyl butyric acid gives a subtle but attractive dried fruit, raisin character.

Fermented Flavors

Yeast: Yeast flavors can accommodate high levels of 2-methyl butyric acid, and as such, 5,000 ppm is a good starting level.

Rum: One-thousand ppm works well in rum flavors, and dark rum flavors in particular.

Beer: Similar levels work well in beer flavors, moderating the pungency of hops.

Savory Flavors

Olive: Olive flavors are made significantly more realistic by the addition of 1,000 ppm of 2-methyl butyric acid.

Roast chicken: One-thousand ppm also works well in roasted chicken flavors, especially where a note of brown flesh is required.

Lamb: Similar levels are very helpful in lamb and mutton flavors.