

Fumaric Acid in Food

benefits



A Strong Food Acidulant with Unique Advantages

Fumaric acid is the strongest organic food acid in terms of titratable acidity and sourness per unit weight. It is more hydrophobic than other food acids and, as a result, it is a more effective antimicrobial agent and is also non-hygroscopic. Most living cells contain fumaric acid.

Fumaric acid has:

- More sourness per unit weight at low pH levels than most other acidulants

With the exception of acetic acid, which has limited applications due to its vinegar flavor, fumaric acid provides more sourness than other food acidulants at pH levels below 3.5.

- Anti-microbial effects at low pH levels

Fumaric acid has been shown to be more effective than acetic or lactic acids as an anti-microbial agent against food pathogens such as E. Coli O157:H7. Fumaric acid is also more effective in lowering pH levels since it is a stronger acid.

- Zero hygroscopicity

Fumaric acid does not absorb atmospheric moisture during storage. Dry mix products do not cake or harden during storage when fumaric acid is used as the acidulant.

Fumaric acid provides:

- Low ingredient cost

Fumaric acid is stronger than all other organic food acids; therefore, less can be used. In addition, fumaric acid is more economical than most other food acids on a cost per unit weight basis.

- Persistent sourness at pH levels below 4.5

Fumaric acid's hydrophobic nature results in persistent sourness and flavor impact. For example, it is used to create longer lasting sourness in chewing gum.

- Minimal taste impact at pH levels above 4.5

The fumarate form of fumaric acid predominates at pH levels greater than 4.5. As a result, there is minimal sourness or taste impact from fumaric acid at these pH levels. Fumaric acid is commonly used to lower the pH of bakery products such as tortillas for this reason.

- Tablet lubrication

Fumaric acid's hydrophobic nature provides improved lubrication during the manufacture of compressed tablets. This results in higher process yields, less tablet breakage, and a smoother tablet surface than when other acidulants are used.

grades

- Fumaric Acid Regular, FCC
- Fumaric Acid Powder, FCC
- Fumaric Acid Regular, NF
- Fumaric Acid Powder Special, NF

Fumaric Acid in Food



applications



Delayed Action Leavening Acid

Granular fumaric acid functions as a delayed action leavening acid in bakery doughs due to a dramatic increase in its solubility as temperature rises. With a neutralization value of 145, it is an economical replacement for other delayed action leavening acids.

Acid Sanded Confectioneries

Fumaric acid is preferred in acid sanded confectioneries because it is non-hygroscopic and, therefore, does not absorb moisture from the package headspace. This retards sucrose inversion.

Compressed Tablets

Fumaric acid is used in compressed confectionery tablets because it provides more sourness per unit weight than other granular acidulants. Also, it improves tablet lubrication and, in turn, tablet integrity.

Anti-Microbial Agent

Fumaric acid has been shown to be an effective anti-microbial agent against food pathogens such as E. Coli 0157:H7, listeria and salmonella. Anti-microbial applications include surface treatments of meat, beverages with a pH below 3.8, and in sprays or dips for fruits and vegetables.

Chewing Gum

Fumaric acid extends sourness and flavor impact in chewing gum due to its slow dissolution and hydrophobicity, which allow it to associate with gum base.

Beverages

Fumaric acid provides more sourness than other acidulants used in beverages, substantially reducing the acidulant cost. It is commonly used with other acidulants, since acidulant blends provide more sourness per unit weight than single acidulants. It is also a more effective buffer at low pH levels than other acidulants.

Gelled Desserts

Fumaric acid is an economical acidulant for gelled desserts and gelled dessert dry mixes that are dissolved in hot water, since less fumaric acid is required to provide the same level of sourness. In the case of dry mixes, a more economical package can be used, since a moisture barrier is not required as fumaric acid is non-hygroscopic.

Tortillas

Fumaric acid is the acidulant of choice in both corn and wheat flour tortillas. It lowers pH with minimal taste impact and, in the case of wheat flour tortillas, interacts with wheat gluten to improve dough machineability.