



BACKGROUND ON PRESERVATIVES



Preservatives are used to help keep food safe for longer. Sugar, salt and vinegar are still used to preserve some foods, but most people tend to think of preservatives only as chemicals. Any processed food with a long shelf-life is likely to include preservatives, unless another way of keeping it has been used; such as freezing, canning or drying.

There are preservatives that are commonly used in fruit juices. Extensive scientific research has been - and is still - conducted to make sure that food safety is not compromised.

The main preservatives in fruit juices are: Sulphur Dioxide, Potassium Sorbate, Sodium Benzoate and Natamycin and by law, must be declared on the product label. Let us have a brief look at each of these preservatives separately:

Sulphur dioxide

Sulphur dioxide is the chemical compound with the formula SO_2 . This important gas is the main product from the combustion of sulfur compounds and is of significant environmental concern.

Sulfur dioxide is used as a preservative (E number: E220) in fruit juices, alcoholic drinks, or dried fruits due to its antimicrobial properties. The preservative is used to maintain the appearance of fruit rather than prevent rotting. This can give fruit a distinctive chemical taste.

In fruit juice, it acts as an antibiotic and antioxidant, protecting juice from spoilage organisms, bacteria, and oxidation. Sulfur dioxide is also a good reductant. In the presence of water, sulfur dioxide is able to decolorize substances that can be reduced by it, making it a useful reducing bleach for papers and delicate materials such as clothes.

Sulfur dioxide is also a very important element in winemaking, and is designated as parts per million in wine. It acts as an antibiotic and antioxidant, protecting wine from spoilage organisms, bacteria, and oxidation, and also helps to keep volatile acidity at desirable levels.

Sodium benzoate

Sodium benzoate is used as a preservative. It is not bactericidal, only bacteriostatic. It has fungi static activity. It is effective only in acidic conditions ($pH < 3.6$) making its use most prevalent in foods such as fruit juices, salad dressings, carbonated drinks, jams, etc.

It is found naturally in cranberries, prunes, greengage plums, cinnamon, ripe cloves, and apples. The International Programme on Chemical Safety found no adverse effects in humans at doses of 647-825 mg/kg of body weight per day.

Sodium benzoate is used in many soft drinks and can be identified on the label of the bottle or can as 'sodium benzoate' or E211. The taste of sodium benzoate cannot be detected by around 25 percent of the population, but for those who can taste the chemical; it tends to be perceived as sweet, salty, or sometimes bitter.

Take note: The consumption of certain mixtures of artificial food colours and the sodium benzoate preservative are associated with increases in hyperactive behaviour in children. It is important to make sure that foods with artificial colourants and sodium benzoate are kept to the absolute minimum when given to children that shows hyperactive behaviour. Rather go for fresh foodstuff.

Potassium Sorbate

Potassium sorbate is a mild preservative. Its primary use is as a food preservative (E number 202). Potassium sorbate is effective in a variety of applications including fruit juice, food, wine, and personal care.

Potassium sorbate is used to inhibit molds, and yeasts in many foods, such as cheese, wine, yogurt, dried meats, and baked goods. It can also be found in the ingredients list of many dried fruit products. In addition, herbal dietary supplement products generally contain potassium sorbate, which acts to prevent mold and microbes and to increase shelf life, and is used in such tiny quantities that there are no known adverse health effects.

Labeling of this preservative reads as "potassium sorbate" on the ingredient statement. Also, it is used in many personal care products to inhibit the development of microorganisms for shelf stability.

Also known affectionately as "wine stabilizer", potassium sorbate produces sorbic acid when added to wine. It serves two purposes. When active fermentation has ceased and the wine is racked for the final time after clearing, potassium sorbate will render any surviving yeast incapable of multiplying. Yeast living at that moment can continue fermenting any residual sugar into CO₂ and alcohol, but when they die no new yeast will be present to cause future fermentation. When a wine is sweetened before bottling, potassium sorbate is used to prevent refermentation when used in conjunction with potassium metabisulfite. It is primarily used with sweet wines, sparkling wines, and some hard ciders but may be added to table wines which exhibit difficulty in maintaining clarity after fining.

Natamycin

This preservative is used in the food industry as a preservative to inhibit fungal growth in fruit juices, on cheese and other food. It may be applied in a liquid spray or in powdered form on whole, shredded, or soft cheese, or applied on or in the wax covering of some cheeses. As a food additive, it has E number E235.

Natamycin, also known as Pimaricin, is a naturally occurring antimicrobial agent produced by the bacterium *Streptomyces natalensis*. It is a macrolide polyene antifungal drug used to treat fungal keratitis, a fungal eye infection. It is especially effective against *Aspergillus* and *Fusarium* corneal infections too.

Natamycin is used to treat fungal infections, including *Candida*, *Aspergillus*, *Cephalosporium*, *Fusarium* and *Penicillium*. It is applied as a cream, in eyedrops, or (for oral infections) in a lozenge. Natamycin shows negligible absorption into the body when administered in these ways. When taken orally, little or none is absorbed from the gastrointestinal tract, making it inappropriate for systemic infections. Natamycin and its metabolites lack acute toxicity.