

NOSB NATIONAL LIST FILE CHECKLIST

PROCESSING

MATERIAL NAME: #24 Sorbic Acid



NOSB Database Form



References



MSDS (or equivalent)



FASP (FDA)



TAP Reviews from: Joe Montecalvo, Rich
Theuer

**NOSB/NATIONAL LIST
COMMENT FORM
PROCESSING**

Material Name: #24 Sorbic Acid

Please use this page to write down comments, questions, and your anticipated vote(s).

COMMENTS/QUESTIONS:

1. In my opinion, this material is:
 Synthetic Non-synthetic.

2. Should this material be allowed in an "organic food" (95% or higher organic ingredients)? Yes No
(IF NO, PROCEED TO QUESTION 3.)

3. Should this substance be allowed in a "food made with organic ingredients" (50% or higher organic ingredients)? Yes No

TAP REVIEWER COMMENT FORM for USDA/NOSB

Use this page or an equivalent to write down comments and summarize your evaluation regarding the data presented in the file of this potential National List material. Complete both sides of page. Attach additional sheets if you wish.

This file is due back to us by: Sept 8, 1995

Name of Material: Sorbic Acid

Reviewer Name: DR. JOE MONTECALVO

Is this substance Synthetic or non-synthetic? Explain (if appropriate)

Synthetic
If synthetic, how is the material made? (please answer here if our database form is blank)

This material should be added to the National List as:

Synthetic Allowed Prohibited Natural

or, Non-synthetic (Allowed as an ingredient in organic food)

Non-synthetic (Allowed as a processing aid for organic food)

or, this material should not be on the National List

Are there any use restrictions or limitations that should be placed on this material on the National List? none.

Please comment on the accuracy of the information in the file: Excellent Identification, Chemistry and UFE/Action - well done.

Any additional comments? (attachments welcomed) Sorbic Acid is a yeast and mold inhibitor and is fungistatic especially for cheeses. Little antibacterial action. therefore, is used for products whose spoilage mechanism is by yeast/mold/fungi.

Do you have a commercial interest in this material? Yes; No

Signature Dr. Joe Montecalvo Date 8/27/95

**Please address the 7 criteria in the Organic Foods Production Act:
(comment in those areas you feel are applicable)**

- (1) the potential of such substances for detrimental chemical interactions with other materials used in organic farming systems;**

none

- (2) the toxicity and mode of action of the substance and of its breakdown products or any contaminants, and their persistence and areas of concentration in the environment;** *none*

- (3) the probability of environmental contamination during manufacture, use, misuse or disposal of such substance;**

none.

- (4) the effect of the substance on human health;**

LD₅₀ ORALLY FOR RATS = 7.36 g / Kg body wt.

- (5) the effects of the substance on biological and chemical interactions in the agroecosystem, including the physiological effects of the substance on soil organisms (including the salt index and solubility of the soil), crops and livestock;**

none

- (6) the alternatives to using the substance in terms of practices or other available materials; and** *none*

- (7) its compatibility with a system of sustainable agriculture.**

O.K. but only for specific applications

TAP REVIEWER COMMENT FORM for USDA/NOSB

Use this page or an equivalent to write down comments and summarize your evaluation regarding the data presented in the file of this potential National List material. Complete both sides of page. Attach additional sheets if you wish.

This file is due back to us by: Sept 8, 1995

Name of Material: Sorbic Acid

Reviewer Name: RICHARD THEUER

Is this substance Synthetic or non-synthetic? Explain (if appropriate) SYNTHETIC-

If synthetic, how is the material made? (please answer here if our database form is blank)

This material should be added to the National List as:

Synthetic Allowed Prohibited Natural

or, Non-synthetic (Allowed as an ingredient in organic food)

Non-synthetic (Allowed as a processing aid for organic food)

or, this material should not be on the National List

Are there any use restrictions or limitations that should be placed on this material on the National List?

Please comment on the accuracy of the information in the file:

GOOD EXCEPT FOR METABOLIC FATE

Any additional comments? (attachments welcomed)

SOME NATURAL MATERIALS (E.G., PROPIONIC ACID) AND "SEMI-SYNTHETIC MATERIAL (CALCIUM PROPIONATE) CAN REPLACE SORBIC ACID (PROPIONIC ACID CAN BE PRODUCED BY FERMENTATION)

Do you have a commercial interest in this material? Yes; No

Signature Richard Theuer Date 8/2/95

**Please address the 7 criteria in the Organic Foods Production Act:
(comment in those areas you feel are applicable)**

- (1) **the potential of such substances for detrimental chemical interactions with other materials used in organic farming systems;**

NOT AN ISSUE

- (2) **the toxicity and mode of action of the substance and of its breakdown products or any contaminants, and their persistence and areas of concentration in the environment;**

NO DATA PRESENTED ON METABOLISM OF SORBIC ACID. IT IS "SAFE" BUT OBVIOUSLY "UNNATURAL"

- (3) **the probability of environmental contamination during manufacture, use, misuse or disposal of such substance;**

NOT AN ISSUE

- (4) **the effect of the substance on human health;**

GRAS, per FDA

- (5) **the effects of the substance on biological and chemical interactions in the agroecosystem, including the physiological effects of the substance on soil organisms (including the salt index and solubility of the soil), crops and livestock;**

NOT AN ISSUE

- (6) **the alternatives to using the substance in terms of practices or other available materials; and**

REFRIGERATION, PROPIONATES, ASCORBIC ACID

- (7) **its compatibility with a system of sustainable agriculture.**

DOES NOT FIT, IN MY OPINION

Identification

Common Name	Sorbic Acid	Chemical Name	2,4-hexadienoic acid.
Other Names	2-propenyl-acrylic acid; hexadienoic acid.		
Code #: CAS	110-44-1	Code #: Other	
N. L. Category	Synthetic Allowed	MSDS	<input type="radio"/> yes <input checked="" type="radio"/> no

Chemistry

Family

Composition C₈H₈O₂. Potassium and calcium sorbate are related salts which are often used in foods. Their reaction at low pH forms sorbic acid.

Properties Colorless, crystalline solid with a weak and characteristic odor. The *trans, trans* isomer is used and is most effective at low pH. Limited solubility in water at ordinary temperatures, but potassium salt is very soluble. Soluble in alcohol.

How Made Made by oxidating 2,4-hexadienal which in turn is produced through the trimerization of acetaldehyde. Also synthetically produced by condensation of ketene and 2-butenal in the presence of metallic catalysts to form an adduct, from which sorbic acid is recovered by acid decomposition or pyrolysis. Purification includes recrystallization and carbon adsorption.

Use/Action

Type of Use Processing

Specific Use(s) Sorbic acid and its potassium salt are collectively referred to as Sorbates. Used as preservative in cheeses, baked goods, fruit juices, sauerkraut, pickles and fresh fruits and vegetables. Also used to prolong the shelf life of prepared salads such as cole slaw and potato salad. Can be used to impregnate polyethylene wrappers for food.

Action They do not kill mold or yeast, but they do retard its growth when populations are not too high. Their activity is caused by their undissociated acid molecules which arrest the metabolism in molds through inhibiting the function of the dehydrogenase exzymes.

Combinations

Status

OFPA

N. L. Restriction

EPA, FDA, etc FDA-GRAS for both acid and salts.

Directions

Safety Guidelines

State Differences

Historical status

International status

OFPA Criteria

2119(m)1: chemical interactions **Not Applicable**

2119(m)2: toxicity & persistence **Not Applicable**

2119(m)3: manufacture & disposal consequences

Because sorbic acid is readily degraded in the environment to carbon dioxide and water, it is unlikely to be a harmful pollutant. The environmental concerns of such a manufacturing facility are typical of a chemical processing plant, in that it must conform to all environmental protection regulations.

2119(m)4: effect on human health

Skin irritant. Metabolized to carbon dioxide and water.

2119(m)5: agroecosystem biology **Not Applicable**

2119(m)6: alternatives to substance
none known.

2119(m)7: Is it compatible?

References

Food Chemicals Codex, 3rd Ed., National Academy Press, Washington D.C. 1981.

Furia, T.E. (ed.). CRC Handbook of Food Additives. 2nd ed. Cleveland: the Chemical Rubber Co., 1972.

Kirk-Othmer Encyclopedia of Chemical Technology, 3rd. Ed., 1982. John Wiley & Sons, NY.

The Merck Index. 10th ed., 1983. Merck & Co., Inc., Rahway, New Jersey:

Ag Partners of Davis, Materials Reports..., 1995. Organic Trade Association, Greenfield, MA