

NOSB NATIONAL LIST FILE CHECKLIST

PROCESSING

MATERIAL NAME: #6 Enzymes: plant



NOSB Database Form



References



MSDS (or equivalent)



FASP (FDA)



TAP Reviews from: Joe Montecalvo, Rich
Theuer, Steve Taylor

**NOSB/NATIONAL LIST
COMMENT FORM
PROCESSING**

Material Name: #6 Enzymes: plant

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: August 5, 1996

Name of Material: ENZYMES: PLANT

Reviewer Name: R C Thew RECEIVED AUG 05 1996

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

NON-SYNTHETIC

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

3 SUBSTANCES: FICIN PAPAIN
BROMELAIN

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:

ADEQUATE

Any additional comments? (attachments welcomed)

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

Signature R C Thew

Date 8/5/96

USDA/TAP REVIEWER
COMMENT FORM

Mailing date: 1 Jul 1996.

Due date: 5 Aug 1996

Name of Materials: Enzymes, plant
Reviewer Name: Richard C. Theuer

NON-SYNTHETIC: Three specific enzymes - bromelain, from pineapples; papain, from papaya and ficin, from the Ficus species - are proteolytic (protein digesting) enzymes used in food processing and occasionally in human medicine (to aid protein digestion). These are natural materials in themselves. The specific carriers and stabilizers used to keep them mold-free and stable need to be reviewed separately. A preparation of a non-synthetic plant enzyme preserved with a synthetic preservative would be "synthetic."

COMMENTS RE SECTION 2119(m) CRITERIA:

1. Inhalation of enzyme preparations can cause illness and allergic symptoms in sensitive individuals. Breathing protection should be used.
2. Use of plant-derived enzymes is very consistent with sustainable agriculture.
3. When heated, enzymes are denatured and become inactive. Denatured enzymes serve as dietary protein.

The following natural substances should be allowed as ingredients in organic foods. They should not be added to the National List of natural substances prohibited for use as ingredients or processing aids in Organic Food:

Ficin

Bromelain

Papain

August 5, 1996

TAP REVIEWER COMMENT FORM for USDA/NOSB

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This file is due back to us by: August 5, 1996

Name of Material: ENZYMES: PLANT

Reviewer Name: Stwe Taylor RECEIVED AUG 05 1996

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

Non-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?

Extraction does not change the nature of the material. If it did, the enzyme activity would likely be destroyed.

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

Any additional comments? (attachments welcomed)

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

Signature Stwe Taylor Date 8/5/96

**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 except for rare allergic reactions

- (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;

None except for rare allergic reactions

- (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;

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

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

TAP REVIEWER COMMENT FORM for USDA/NOSB

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This file is due back to us by: August 5, 1996

Name of Material: ENZYMES: PLANT

Reviewer Name: JOE MONTECALVO RECEIVED AUG 05 1996

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

Synthetic (due to purification process)

If synthetic, how is the material made? (please answer here if our database form is blank) Purification of enzymes generally involves dialysis → ion exchange chromatography then freeze-drying

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?

Should only be used for major functional areas unless another organic substitute

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

Very good

Any additional comments? (attachments welcomed)

None

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

Signature Dr. Joe Montecalvo

Date 7/27/96

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;

None (max help digestion)

- (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.

OK

NOSB Materials Database

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Identification

Common Name Enzymes: plant-derived **Chemical Name**
Other Names Papain, Ficin, Bromelain
Code #: CAS **Code #: Other**
N. L. Category Non-agricultural **MSDS** yes no

Chemistry

Family
Composition Biologically active proteins which are sometimes conjugated with metals, carbohydrates and/or lipids. Whole cells, parts of cells, or cell-free extracts.
Properties Activity measured according to reaction catalyzed by individual enzymes.
How Made Derived from plant sources: Bromelain is the purified proteolytic substance derived from pineapples; Ficin is the purified proteolytic substance derived from the latex of Ficus sp.; Papain is the purified proteolytic substance derived from the papaya.
Type of Use Processing

Use/Action

Specific Use(s) Bromelain: chillproofing of beer, meat tenderizing, preparation of precooked cereals, production of protein hydrolysates; Ficin: chillproofing of beer, meat tenderizing, dough conditioner in baking; Papain: chillproofing of beer, meat tenderizing, preparation of precooked cereals; production of protein hydrolysates.
Action Enzymes as biocatalysts accelerate the rate of specific chemical reactions. Each enzyme is highly specific as to the reaction it effects.
Combinations

Status

OFPA
N. L. Restriction
EPA, FDA, etc
Directions
Safety Guidelines
Historical status
International status

