

NOSB NATIONAL LIST FILE CHECKLIST

PROCESSING

MATERIAL NAME: #26 Yeast, Autolysate



NOSB Database Form



References



MSDS (or equivalent)



FASP (FDA)



TAP Reviews from: Joe Montecalvo, Rich
Theuer

**NOSB/NATIONAL LIST
COMMENT FORM
PROCESSING**

Material Name: #26 Yeast, Autolysate

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 5, 1995

Name of Material: Yeast autolysate

Reviewer Name: R Thewer

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?

ALREADY LIMITED BY GMP'S, FLAVOR, COST

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 R Thewer Date 8/28/95

**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;**

NO ISSUE - BIO DEGRADABLE

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

VERY SMALL

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

POSITIVE UNLESS SENSITIVE TO MSG
(MSG IS CREATED FROM PROTEIN DURING
AUTOLYSIS)

- (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;**

O/K

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

CHEMICAL HYDROLYSATES, WHICH ARE SYNTHETIC

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

O/K

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 5, 1995

Name of Material: Yeast Autolysate

Reviewer Name: DR. JOE MONTECALVO

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

can be
Non-Synthetic or Synthetic

If synthetic, how is the material made? (please answer here if our database form is blank) - b/c the yeast cells (non-synthetic) are grown in organic medium, and only physical separation methods are involved in the process. However if media is non-organic - then the yeast autolysate should be classified as synthetic.

This material should be added to the National List as:

Synthetic Allowed Prohibited Natural
And/
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: good

Any additional comments? (attachments welcomed) - this is an example, I believe, of a food material which can be classified synthetic (non-organic growth media) and non-synthetic if grown on a organic growth media.

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

Signature Dr. Joe Montecalvo Date 8/22/95

**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;**

None

- (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.

Identification

Common Name	Yeast autolysate	Chemical Name	
Other Names	yeast extracts		
Code #: CAS		Code #: Other	
N. L. Category	Non-agricultural	MSDS	<input type="radio"/> yes <input checked="" type="radio"/> no

Chemistry

Family

Composition Autolyzed yeast extract contains amino acids, peptides, and salts resulting from the acid-catalyzed hydrolysis of polypeptide bonds in naturally occurring enzymes present in edible yeast. It also contains the water-soluble components of the yeast cell.

Properties Liquid, paste or powder, or granular form. pH of 2% solution in water is between 4.5 and 6.0.

How Made Can be made from brewer's yeast (*S. cerevisiae* or *S. uvarum*), bakers' yeast (*S. cerevisiae*), alcohol-grown yeast (*Candida utilis*) or whey-grown yeast (*K. fragilis*). See other yeast entries for processes. To prepare the autolysate, the temperature of a cell suspension is raised to 45-55°C, at which the yeast cells die but their hydrolytic enzymes remain active. At the end of autolysis, the cell-wall material can be separated from the solubilized solids by centrifugation or filtration. The extract is then evaporated to a paste or spray dried to a powder.

Use/Action

Type of Use Processing

Specific Use(s) Flavoring agent for soups, gravies, bouillon and cheese products. Used in fermentation media for the production of antibiotics, in cheese-starter culture, in production of vinegar.

Action

Combinations

Status

OFPA

N. L. Restriction

EPA, FDA, etc

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

biological manufacture

2119(m)4: effect on human health

Small concentrations of tyramine and histamine have been determined in yeast autolysates. This limits the amounts in the diet to a very small percentage of the food intake.

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

2119(m)6: alternatives to substance

2119(m)7: Is it compatible?

References

AU: Borzani,-W.; Podlech,-P.A.S.; Luna,-M.F.; Jerke,-P.R.; Stein,-M.A.C.F.

TI: Kinetics of semicontinuous microbial transformation of whey by *Lactobacillus bulgaricus* varying the initial concentration of yeast autolysate.

SO: J-biotechnol. Amsterdam : Elsevier Science Publishers,. Oct 1993. v. 31 (1) p. 61-66.

CN: DNAL QH442.J69

AU: Kollar,-R.; Sturdik,-E.; Farkas,-V.

TI: Induction and acceleration of yeast lysis by addition of fresh yeast autolysate.

SO: Biotechnol-Lett. Middlesex : Science and Technology Letters. Aug 1991. v. 13 (8) p. 543-546.

CN: DNAL QR53.B56

AB: Addition of 15% v/v of fresh yeast autolysate to the baker's yeast suspension significantly accelerated cell autolysis. The addition of classical initiators of autolysis (NaCl, ethanol) led to further 20% increase of protein yield.

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

CNUM=2927

U.S. FOOD AND DRUG ADMINISTRATION
FOOD ADDITIVE SAFETY PROFILE

YEST
~~ASP~~ AUTOLYSATE

S#:	977046755				
SP#:	2927	HUMAN CONSUMPTION:	7.1045	MG/KG BW/DAY/PERSON	
PE:	NEW	MARKET DISAPPEARANCE:	8383333.333	LBS/YR	
S#:	0365	MARKET SURVEY:	87		
MA#:		JECFA:			
AS#:		JECFA ADI:		MG/KG BW/DAY/PERSON	
		JECFA ESTABLISHED:			
		LAST UPDATE:	940215		

DENSITY: LOGP:

STRUCTURE CATEGORIES: B7

COMPONENTS:

NONYMS:
YEAST, AUTOLYZED
AUTOLYZED YEAST

EMICAL FUNCTION: F

CHEMICAL EFFECT:
FLAVOR ENHANCER
FLAVORING AGENT OR ADJUVANT
ANTICAKING AGENT OR FREE-FLOW AGENT
DRYING AGENT
HUMECTANT
MALTING OR FERMENTING AID
LEAVENING AGENT
NUTRIENT SUPPLEMENT

R REG NUMBERS:

MINIMUM TESTING LEVEL: 3

REMARKS: NO TOX DATA

DCNUM=2931

U. S. FOOD AND DRUG ADMINISTRATION
FOOD ADDITIVE SAFETY PROFILE

~~ASPS~~ YEASTS

AS#:	977030399			
ASP#:	2931	HUMAN CONSUMPTION:	35.8757	MG/KG BW/DAY/PERSON
(PE: NEW		MARKET DISAPPEARANCE:	42333333.333	LBS/YR
AS#:	0333	MARKET SURVEY:	87	
MA#:		JECFA:		
AS#:		JECFA ADI:		MG/KG BW/DAY/PERSON
		JECFA ESTABLISHED:		
		LAST UPDATE:		

DENSITY: LOGP:

STRUCTURE CATEGORIES: B7

COMPONENTS:

NONYMS: LEVURE

CHEMICAL FUNCTION: G

TECHNICAL EFFECT:

- LEAVENING AGENT
- MALTING OR FERMENTING AID
- FLAVOR ENHANCER
- FLAVORING AGENT OR ADJUVANT
- NUTRIENT SUPPLEMENT
- ANTICAKING AGENT OR FREE-FLOW AGENT
- DRYING AGENT
- HUMECTANT

PR REG NUMBERS:	160.105	160.185	160.145
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MINIMUM TESTING LEVEL: 3

COMMENTS:

ICNUM=1569

U.S. FOOD AND DRUG ADMINISTRATION
FOOD ADDITIVE SAFETY PROFILE

YEASTS
ASSTs, DRIED

HS# : 977009361 HUMAN CONSUMPTION: 5.3954 MG/KG BW/DAY/PERSON
SP# : 1569 MARKET DISAPPEARANCE: 6366666.666 LBS/YR
PE : ASP MARKET SURVEY: 87
S# : 1186 JECFA :
MA# : JECFA ADI: MG/KG BW/DAY/PERSON
AS# : JECFA ESTABLISHED: 931115
LAST UPDATE:

DENSITY: LOGP:

STRUCTURE CATEGORIES: C23 C24

COMPONENTS:

NONYMS: DRIED YEAST

CHEMICAL FUNCTION: D

FUNCTIONAL EFFECT:
LEAVENING AGENT
FLAVOR ENHANCER
FLAVORING AGENT OR ADJUVANT
NUTRIENT SUPPLEMENT
SOLVENT OR VEHICLE
MALTING OR FERMENTING AID

TOXICITY REG NUMBERS: 172.896 139.122 139.155
137.235 139.115

MINIMUM TESTING LEVEL: 3

REMARKS:

TOX 4A: LOWEST EFFECT LEVEL OBSERVED IN ALL AVAILABLE RAT OR MOUSE STUDIES

STUDY: 5A COMPLETENESS: A RANKING FACTOR: 3.596E-4>
SPECIES: RAT LEL: >15000 MG/KG BW/DAY
EFFECTS: NO EFFECTS

REMARKS: HIGHEST DOSE TESTED

OCNUM=1569

XX 4C: LOWEST EFFECT LEVEL OBSERVED IN ALL AVAILABLE STUDIES

STUDY: 5A COMPLETENESS: A RANKING FACTOR: 3.596E-4
SPECIES: RAT
EFFECTS: NO EFFECTS
NOTES:
COMMENTS: SEE BOX 4A

XX 6: HIGHEST OBSERVED NO-EFFECT LEVEL IN SPECIES OF BOX 4C

STUDY: 5A COMPLETENESS: A LEL: >NONE MG/KG BW/DAY
SPECIES: RAT HNEL: 15000 MG/KG BW/DAY
EFFECTS: NO EFFECTS
COMMENTS:

XX 9: ORAL TOXICITY STUDIES (OTHER THAN ACUTE)

STUDY: 5A COMPLETENESS: A SOURCE: FOOD COSMET TOXICOL 9:787-800
TYPE: CHRONIC RODENT
SPECIES: RAT LEL: > MG/KG BW/DAY
DURATION: 728 DAYS HNEL: 15000 MG/KG BW/DAY
EFFECTS: NO EFFECTS
NOTES:
COMMENTS: YEASTS WERE GROWN ON HYDROCARBONS

STUDY: 29 COMPLETENESS: C SOURCE: ASP 001569
TYPE: SUBCHRONIC RODENT
SPECIES: RAT LEL: > MG/KG BW/DAY
DURATION: 90 DAYS HNEL: 30000 MG/KG BW/DAY
EFFECTS: NO EFFECTS
NOTES:
COMMENTS:

STUDY: 30 COMPLETENESS: C SOURCE: ASP 001569
TYPE: SUBCHRONIC RODENT
SPECIES: RAT LEL: > MG/KG BW/DAY
DURATION: 90 DAYS HNEL: 30000 MG/KG BW/DAY
EFFECTS: NO EFFECTS
NOTES:
COMMENTS:

STUDY: 4 COMPLETENESS: A SOURCE: FOOD COSMET TOXICOL 8:499-507
TYPE: SUBCHRONIC RODENT
SPECIES: RAT LEL: > MG/KG BW/DAY
DURATION: 365 DAYS HNEL: 15000 MG/KG BW/DAY
EFFECTS: NO EFFECTS
NOTES: