

# NOSB NATIONAL LIST FILE CHECKLIST

## PROCESSING

**MATERIAL NAME:** #28 Yeast, Brewers



**NOSB Database Form**



**References**



**MSDS (or equivalent)**



**FASP (FDA)**



**TAP Reviews from:** Joe Montecalvo, Rich  
Theuer

**NOSB/NATIONAL LIST  
COMMENT FORM  
PROCESSING**

**Material Name: #28 Yeast, Brewers**

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

**COMMENTS/QUESTIONS:**

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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 29, 1995

Name of Material: Brewers Yeast

Reviewer Name: R THEUER

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

NON-SYNTHETIC (IF NOT BIOENGINEERED)

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?

GOOD MANUFACTURING PRACTICES

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

OK

Any additional comments? (attachments welcomed)

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

Signature R Theuer

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;**

*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;**

*POSITIVE*

- (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;**

*POSITIVE*

- (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.**

*POSITIVE*

# 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 29, 1995

Name of Material: Brewers Yeast

Reviewer Name: DR. JOE MONTECALVO

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

Non Synthetic (if not improved by DNA recombinant techniques)  
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:

Any additional comments? (attachments welcomed)

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

Signature  Date 7/31/95

**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;**

*nothing in literature.*

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

*Not GREAT*

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

*As with ANY yeast product  $\rightarrow$  yeast are high in nucleic acids*

- (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 known*

- (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.**

*I believe it is compatible.*

## Identification

<b>Common Name</b>	<b>Yeast, brewers</b>	<b>Chemical Name</b>	
<b>Other Names</b>	<i>Saccharomyces</i> genus	<b>Code #: CAS</b>	
<b>Code #: CAS</b>		<b>Code #: Other</b>	
<b>N. L. Category</b>	Non-agricultural	<b>MSDS</b>	<input type="radio"/> yes <input checked="" type="radio"/> no

## Chemistry

**Family**

**Composition** Selected strains of the yeast genus *Saccharomyces*., particularly *Saccharomyces cerevisiae* (ale) and *Saccharomyces uvarum* (lager). Most industrial yeasts are polyploid which renders them more genetically stable. Brewing strains are distinct from baking strains of the same species.

**Properties** Rapid carbohydrate fermenting ability, appropriate flocculation and sedimentation characteristics, ethanol tolerance and ability to produce a highly concentrated ethanol. Yeast is a eukaryote.

**How Made** Can be "improved" by recombinant DNA techniques.

## Use/Action

**Type of Use** Processing

**Specific Use(s)** carbonation of beverages, fermentation agent.

**Action** Yeasts produce ethanol and carbon dioxide from carbohydrates.

**Combinations**

## Status

**OFPA**

**N. L. Restriction**

**EPA, FDA, etc** FDA-GRAS

**Directions**

**Safety Guidelines**

**State Differences**

**Historical status** As old as the history of man.

**International status**

## OFPA Criteria

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

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

**2119(m)3: manufacture & disposal consequences**

Beer making is the largest biotechnology industry.

**2119(m)4: effect on human health**

Yeasts are one of the oldest plants cultivated by man and has been consumed for thousands of years without known negative health effects. The effect of the resulting alcohol consumption is not so benign but is well documented elsewhere.

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

**2119(m)6: alternatives to substance**

**2119(m)7: Is it compatible?**

Industrial yeasts are used extensively in genetic manipulation research and biotechnology.

## References

See attached



## BREWERS YEAST REFERENCES

AU: Abbott,-M.S.; Pugh,-T.A.; Pringle,-A.T.

TI: Biotechnological advances in brewing.

SO: ACS-symp-ser. Washington, D.C. : American Chemical Society, 1974-. 1993. (536) p. 150-180.

CN: DNAL QD1.A45

AB: A variety of biotechnological tools have been applied to improve the ingredients of the brewing process. Using these tools agricultural materials have been developed that are free of viruses, have improved agronomic yields, or are resistant to disease. Brewer's yeasts have been constructed with novel properties such as the ability to ferment normally unfermentable carbohydrates, chill-proof beer, or degrade beta-glucans. Although there are many advantages to biotechnologically improved agricultural materials and yeast, these advantages must be weighed against regulatory, legal and consumer concerns.

AU: Boulton,-C.A.

TI: Developments in brewery fermentation.

SO: Biotechnol-genet-eng-rev. Wimborne : Intercept. 1991. v. 9 p. 127-181.

CN: DNAL TP248.3.B46

AU: Ormrod,-I.H.L.; Lalor,-E.F.; Sharpe,-F.R.

TI: The release of yeast proteolytic enzymes into beer.

SO: J-Inst-Brew. London : The Institute. Nov/Dec 1991. v. 97 (6) p. 441-443.

CN: DNAL 390.9-IN7

AU: Walker,-M.D.; Simpson,-W.J.

TI: Production of volatile sulphur compounds by ale and lager brewing strains of *Saccharomyces cerevisiae*.

SO: Lett-Appl-Microbiol. Oxford : Blackwell Scientific Publications. Jan 1993. v. 16 (1) p. 40-43.

CN: DNAL QR1.L47

AU: Nielsen,-H.; Andersen,-H.B.; Jakobsen,-M.

TI: The brewers control of yeast multiplication.

SO: Tech-Q-Mast-Brew-Assoc-Am. Madison, Wis. : The Association. 1990. v. 27 (4) p. 103-105.

CN: DNAL 390.9-M39T

AU: Hinchliffe,-E.

TI: Strain improvement of brewing yeast.

SO: Symp-Ser-Br-Mycol-Soc. Cambridge : Cambridge University Press. 1991. (18) p. 129-145.

CN: DNAL QK600.B72

AU: Dziezak,-J.D.

TI: Yeasts and yeast derivatives: definitions, characteristics, and processing.

SO: Food-Technol. Chicago, Ill. : Institute of Food Technologists. Feb 1987. v. 41 (2) p. 104-121 (not consecutive). ill., charts.

CN: DNAL 389.8-F7398

AB: Abstract: A detailed, illustrated technical review focuses on the definitive characteristics of yeasts and their commercial production. The characteristics, use, and production of each of the active yeasts (Baker's yeasts, Brewer's yeasts, and yeasts for alcohol production) and inactive yeasts (dried Brewer's yeast and primary yeasts and yeast products) are individually discussed. Yeast derivatives also are covered.(wz).

AU: Russell,-I.; Jones,-R.; Stewart,-G.

TI: The genetic modification of brewers' yeast and other industrial yeast strains.

SO: Biotechnology in food processing / edited by Susan K. Harlander and Theodore P. Labuza. Park Ridge, N.J. : Noyes Publications, c1986. p. 171-195. ill.

CN: DNAL TP248.2.B5537

CNUM=1568

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

~~YEST~~  
YEST MALT SPROUT EXTRACT

S#:	977011554	HUMAN CONSUMPTION:	0.005211	MG/KG BW/DAY/PERSON
SP#:	1568	MARKET DISAPPEARANCE:	6150.000	LBS/YR
PE:	ASP	MARKET SURVEY:	87	
S#:	1187	JECFA:		
MA#:		JECFA ADI:		MG/KG BW/DAY/PERSON
AS#:		JECFA ESTABLISHED:	940115	
		TENTIAL BEVERAGE USE LAST UPDATE:		

DENSITY: LOGP:

STRUCTURE CATEGORIES: B8

MPONENTS:

NONYMS:

EMICAL FUNCTION: D

CHNICAL EFFECT: FLAVORING AGENT OR ADJUVANT

R REG NUMBERS: 172.590

NIMUM TESTING LEVEL: 2

MMENTS:

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

UDY:	1	COMPLETENESS:	B	RANKING FACTOR:	1.737E-5
ECIES:	RAT	LEL:	300	MG/KG BW/DAY	
FECTS:	BLOOD GLUCOSE (GLU)	INCREASE			
TES:					

MMENTS:

X 4B: LOWEST EFFECT LEVEL OBSERVED IN ALL AVAILABLE DOG STUDIES

UDY:	6	COMPLETENESS:	B	RANKING FACTOR:	6.948E-7
ECIES:	DOG	LEL:	7500	MG/KG BW/DAY	
FECTS:	HEMOSIDEROSIS				
TES:	SPLEEN				
MMENTS:	EFFECT = SIDEROTIC NODULES				

CNUM=1568

## X 4C: LOWEST EFFECT LEVEL OBSERVED IN ALL AVAILABLE STUDIES

UDY: 1            COMPLETEENESS: B   RANKING FACTOR: 1.737E-5  
 ECIES: RAT  
 FECTS: BLOOD GLUCOSE (GLU) INCREASE  
 TES:  
 MMENTS: SEE BOX 4A

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

UDY: 3            COMPLETEENESS: B   LEL: 15000   MG/KG BW/DAY  
 ECIES: RAT            HNEL: 5000    MG/KG BW/DAY  
 FECTS: BLOOD GLUCOSE (GLU) INCREASE  
       MINERALIZATION  
 MMENTS: HISTOPATHOLOGY OBSERVATION(S) NOT ELSEWHERE CLASSIFIED

## X 8: HIGH CONCERN EFFECTS

FECT: HYPERPLASIA  
 TE: PANCREAS  
 ECIES: RAT  
 LSTUDY: 5            COMPLETEENESS: B   RANKING FACTOR: 1.737E-6  
 ELSTUDY: 5            HNEL: 3000        MG/KG BW/DAY  
 MMENTS: TEST COMPOUND IS MALT SPROUT EXTRACT

## FECT: REPRODUCTIVE ORGAN TOXICITY

TE: TESTIS  
 ECIES: RAT  
 LSTUDY: 5            COMPLETEENESS: B   RANKING FACTOR: 1.737E-6  
 ELSTUDY: 5            HNEL: 3000        MG/KG BW/DAY  
 MMENTS: COMPLETEENESS: B   HNEL: 300        MG/KG BW/DAY

## X 9: ORAL TOXICITY STUDIES (OTHER THAN ACUTE)

UDY: 2            COMPLETEENESS: C   SOURCE: FAP 2A2735 1:100-102  
 PE: SHORT TERM    YEAR: 1970  
 ECIES: RAT            LEL: 15000        MG/KG BW/DAY  
 RATION: 56 DAYS    HNEL:  
 FECTS: MINERALIZATION  
 TES: KIDNEY  
 MMENTS: COMPOUND FN TESTED, COMPOSITION NOT GIVEN

