Now Allowed

NOSB NATIONAL LIST
FILE CHECKLIST

PROCESSING

MATERIAL NAME: Lactic acid, fermntd gluc.

CATEGORY: Synthetic Allowed **Complete?:** 3/16

✓ NOSB Database Form

✓ References

✓ MSDS (or equivalent)

___ FASP (FDA)

✓ Date file mailed out: 2/14/95

✓ TAP Reviews from:

Richard Theuer

Steve Taylor

___ Supplemental Information:

MISSING INFORMATION: no FASP available

NOSB/NATIONAL LIST COMMENT FORM/BALLOT

Use this page to write down comments and questions regarding the data presented in the file of this National List material. Also record your planned opinion/vote to save time at the meeting on the National List.

Name of Material Lactic Acid (fermented)

Type of Use: _____ **Crops;** _____ **Livestock;** ✓ **Processing**

TAP Review by:

1. Richard Theuer
2. Steve Taylor
3. _____

Comments/Questions:

My Opinion/Vote is:

Signature _____ **Date** _____

USDA/TAP REVIEWER COMMENT FORM

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. Attach additional sheets if you wish.

This file is due back to us within 30 days of: 14 Feb

Name of Material: Lactic Acid

Reviewer Name: Steve Taylor

Is this substance Natural or Synthetic? Explain (if appropriate)

Natural

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

This material should be added to the National List as:

____ **Synthetic Allowed** ____ **Prohibited Natural**

or, ____ **This material does not belong on the National List because:**

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

Any additional comments or references?

Signature Steve Taylor **Date** 3-5-95

2.

USDA/TAP REVIEWER COMMENT FORM

Original mailing date: 14 Feb 1995.

Material: Lactic Acid 21CFR184.1061
Reviewer: Richard C. Theuer

NATURAL The natural L-isomer of lactic acid is produced by fermentation of a suitable carbohydrate substrate by lactic acid bacteria. Lactic acid can also be produced by chemical synthesis. **Synthetic** lactic acid is a mixture of D- and L-lactic acid, which may create metabolic problems in susceptible individuals. Newer commercial fermentations may use a genetically engineered microorganism. Based on previous NOSB discussions, the lactic acid produced by such a synthetic organism would be synthetic. However, the lactic acid produced by a naturally occurring microorganism and a genetically engineered one would be molecularly identical.

The remainder of this review will focus entirely on natural lactic acid.

COMMENTS RE SECTION 2119(m) CRITERIA:

1. Lactic acid has been part of the human diet for millennia.
2. Lactic acid is Generally Recognized As Safe (GRAS) [21CFR184.1061]. The prohibition against its use in infant foods is related to metabolic abnormalities caused by the 50% unnatural D-lactic acid in synthetic lactic acid.
3. Lactic acid is a multipurpose food ingredient used as an antimicrobial agent (spraying meat to eliminate Salmonella; summer sausage), a curing and pickling agent, a flavoring agent, a pH control agent, etc.

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

lactic acid
(produced by fermentation by a natural microorganism).

12 Mar 1995

NOSB Materials Database

3.

Identification

Common Name	**Lactic acid,** fermented glucose	Chemical Name	
Other Names	2-Hydroxypropanoic acid; Ethylidenelactic acid, yogurt powder		
Code #: CAS	50-21-5	Code #: Other	NIOSH # OD2800000
N. L. Category	Synthetic Allowed	MSDS	◉ yes ○ no

Chemistry

Family	
Composition	$CH_3CHOHCOOH$. Cultured whey protein concentrate, cultured skim milk and yogurt culture.
Properties	colorless to yellow liquid. Boiling point 122 C, melting point 18 C, specific gravity 1.25. Completely soluble.
How Made	Dairy solids are cultured with yogurt cultures and then dried. or spray dried. The type and amount of the microbiological flora is controlled. Can also be produced by chemical synthesis. Newer commercial fermentations may use a genetically engineered microorganism.

Use/Action

Type of Use	Processing
Specific Use(s)	frozen yogurt, yogurt beverages, bakery products, pie fillings salad dressings, baby foods. Antimicrobial agent, curing and pickling agent, flavoring agent, pH control agent.
Action	Used for acidification and flavor in bread, cakes, pies and other food products.
Combinations	

Status

OFPA	
N. L. Restriction	
EPA, FDA, etc	FDA-GRAS
Directions	
Safety Guidelines	Danger. Donot get in eyes, on skin, on clothing. Avoid breathing vapor.
State Differences	
Historical status	
Internationl status	Allowed by IFOAM, EU, and Codex.

NOSB Materials Database

OFPA Criteria

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

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

2119(m)3: manufacture & disposal consequences

no, except for the implications involved in producing the genetically engineered strain.

2119(m)4: effect on human health

no carcinogenicity. Contact with skin or eyes may cause severe irritation or burns but only in concentrated form. Very low acute toxicity.

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

2119(m)6: alternatives to substance

Buttermilk powder is more natural but not as purified; is only useful in specific situations.

2119(m)7: Is it compatible?

References

Ramesh B. Shah, Quest International, 1995, written communication.

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

AU: Eckhoff,-S.R.; Tso,-C.C.
TI: Wet milling of corn using gaseous SO2 addition before steeping and the effect of lactic acid on steeping.
SO: Cereal-Chem. St. Paul, Minn. : American Association of Cereal Chemists. May/June 1991. v. 68 (3) p. 248-251.
CN: DNAL 59.8-C33

MSDS for LACTIC ACID

1 - PRODUCT IDENTIFICATION

PRODUCT NAME: LACTIC ACID
FORMULA: CH3CHOHCOOH FORMULA WT: 90.08
CAS NO.: 50-21-5 NIOSH/RTECS NO.: OD2800000
COMMON SYNONYMS: 2-HYDROXYPROPANOIC ACID; ETHYLIDENELACTIC ACID; 1-HYDROXYETHANECARBOXYLIC ACID
PRODUCT CODES: 0194,0196
EFFECTIVE: 10/08/85 REVISION #01

PRECAUTIONARY LABELLING BAKER SAF-T-DATA(TM) SYSTEM

HEALTH - 1 SLIGHT
FLAMMABILITY - 1 SLIGHT
REACTIVITY - 1 SLIGHT
CONTACT - 3 SEVERE (CORROSIVE)
HAZARD RATINGS ARE 0 TO 4 (0 = NO HAZARD; 4 = EXTREME HAZARD).

LABORATORY PROTECTIVE EQUIPMENT
GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

PRECAUTIONARY LABEL STATEMENTS
DANGER CAUSES BURNS
DO NOT GET IN EYES, ON SKIN, ON CLOTHING.
AVOID BREATHING VAPOR. KEEP IN TIGHTLY CLOSED CONTAINER. USE WITH ADEQUATE VENTILATION. WASH THOROUGHLY AFTER HANDLING.

SAF-T-DATA(TM) STORAGE COLOR CODE: WHITE (CORROSIVE)

2 - HAZARDOUS COMPONENTS

COMPONENT	%	CAS NO.
LACTIC ACID	80-90	50-21-5
LACTIC ACID LACTATE	10-20	97-73-4

3 - PHYSICAL DATA

BOILING POINT: 122 C (252 F) VAPOR PRESSURE(MM HG): N/A

MELTING POINT: 18 C (64 F) VAPOR DENSITY(AIR=1): N/A

SPECIFIC GRAVITY: 1.25 (H2O=1) EVAPORATION RATE: N/A (BUTYL ACETATE=1)

SOLUBILITY(H2O): COMPLETE (IN ALL PROPORTIONS) % VOLATILES BY VOLUME: 0

APPEARANCE & ODOR: COLORLESS TO YELLOW LIQUID.

4 - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (CLOSED CUP N/A

FLAMMABLE LIMITS: UPPER - N/A % LOWER - N/A %

FIRE EXTINGUISHING MEDIA
USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.

SPECIAL FIRE-FIGHTING PROCEDURES
FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED (POSITIVE PRESSURE IF AVAILABLE) BREATHING APPARATUS WITH FULL FACEPIECE. MOVE EXPOSED CONTAINERS FROM FIRE AREA IF IT CAN BE DONE WITHOUT RISK. USE WATER TO KEEP FIRE-EXPOSED CONTAINERS COOL.

UNUSUAL FIRE & EXPLOSION HAZARDS
CLOSED CONTAINERS EXPOSED TO HEAT MAY EXPLODE.

5 - HEALTH HAZARD DATA

TOXICITY: LD50 (ORAL-RAT)(MG/KG) - 3730
LD50 (SCU-MOUSE)(MG/KG) - 4500

CARCINOGENICITY: NTP: NO IARC: NO Z LIST: NO OSHA REG: NO

EFFECTS OF OVEREXPOSURE
CONTACT WITH SKIN OR EYES MAY CAUSE SEVERE IRRITATION OR BURNS. INGESTION MAY CAUSE IRRITATION AND BURNING TO MOUTH AND STOMACH.

TARGET ORGANS: NONE IDENTIFIED

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE IDENTIFIED

ROUTES OF ENTRY: NONE INDICATED

EMERGENCY AND FIRST AID PROCEDURES
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES OR SKIN WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. WASH CLOTHING BEFORE RE-USE.

6 - REACTIVITY DATA

STABILITY: STABLE HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: NONE DOCUMENTED

7 - SPILL AND DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE
WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. STOP LEAK IF YOU CAN DO SO WITHOUT RISK. VENTILATE AREA. NEUTRALIZE SPILL WITH SODA ASH OR LIME. WITH CLEAN SHOVEL, CAREFULLY PLACE MATERIAL INTO CLEAN, DRY CONTAINER AND COVER; REMOVE FROM AREA. FLUSH SPILL WITH WATER.

DISPOSAL PROCEDURE
DISPOSE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL ENVIRONMENTAL REGULATIONS.

EPA HAZARDOUS WASTE NUMBER: D002 (CORROSIVE WASTE)

8 - PROTECTIVE EQUIPMENT

VENTILATION: USE ADEQUATE GENERAL OR LOCAL EXHAUST VENTILATION TO KEEP VAPOR AND MIST LEVELS AS LOW AS POSSIBLE.

RESPIRATORY PROTECTION: NONE REQUIRED WHERE ADEQUATE VENTILATION CONDITIONS EXIST. IF AIRBORNE CONCENTRATION IS HIGH, A DUST/MIST RESPIRATOR IS RECOMMENDED. IF CONCENTRATION EXCEEDS CAPACITY OF RESPIRATOR, A SELF-CONTAINED BREATHING APPARATUS IS ADVISED.

EYE/SKIN PROTECTION: SAFETY GOGGLES AND FACE SHIELD, UNIFORM, PROTECTIVE SUIT, RUBBER GLOVES ARE RECOMMENDED.

9 - STORAGE AND HANDLING PRECAUTIONS

SAF-T-DATA(TM) STORAGE COLOR CODE: WHITE (CORROSIVE)

SPECIAL PRECAUTIONS
KEEP CONTAINER TIGHTLY CLOSED. STORE IN CORROSION-PROOF AREA.

10 - TRANSPORTATION DATA AND ADDITIONAL INFORMATION

DOMESTIC (D.O.T.)
PROPER SHIPPING NAME CHEMICALS, N.O.S. (NON-REGULATED)

INTERNATIONAL (I.M.O.)
PROPER SHIPPING NAME CHEMICALS, N.O.S. (NON-REGULATED)