Synthetic Allowed

NOSB NATIONAL LIST
FILE CHECKLIST

PROCESSING

MATERIAL NAME: Calcium Hydroxide

CATEGORY: Non-agricultural **Complete?:** 3/16

✓ NOSB Database Form

✓ References

✓ MSDS (or equivalent)

✓ FASP (FDA)

✓ Date file mailed out: 1/8/95

✓ TAP Reviews from: Steve Taylor
Richard Theuer
Bob Durst

____ Supplemental Information:

MISSING INFORMATION: _____

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 Calcium Hydroxide

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

TAP Review by:

1. Steve Taylor
2. Richard Theuer
3. Bob Durst

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: JAN 7

Name of Material: Calcium Hydroxide

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?

Mined; known in agriculture as slaked lime

Any additional comments or references?

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

2.

USDA/TAP REVIEWER COMMENT FORM

Original mailing date: 7 Jan 1995.

Name of Material: Calcium Hydroxide
Reviewer Name: Richard C. Theuer

SYNTHETIC Calcium hydroxide (also known as "slaked lime" or "hydrated lime") is made as follows. Limestone is calcined (heated at very high temperature) in a kiln to obtain carbon dioxide and "quick lime" (calcium oxide). The quicklime is mixed with water to produce calcium hydroxide. The temperature for calcining far exceeds temperatures achieved in the home kitchen, which the NOSB has previously considered decisive in judging if a substance is synthetic.

COMMENTS RE SECTION 2119(m) CRITERIA:

1. Calcium hydroxide is a alkaline powder that can be dusty, so suitable protection should be employed in its use (avoidance of eye, skin and lung contact).

2. Calcium hydroxide is readily wetted with water, in which state it has minimal hazard.

3. Calcium hydroxide is used in the manufacture of other useful food ingredients, such as calcium acid phosphate, an essential component of aluminum-free baking powder, and calcium phosphates, nutrient supplements.

4. Calcium hydroxide is an available source of calcium, an essential nutrient. In this regard, limestone (calcium carbonate) and thus calcium hydroxide, an essential intermediate in the industrial utilization of limestone, have no alternatives.

5. Calcium hydroxide is compatible with sustainable agriculture. Lime kilns in the U.S. date back to the Revolutionary War period and before, so this is no new process. Oyster shells can replace limestone as the source of calcium carbonate.

The following substance should be added to the National List of Substances as an allowed synthetic ingredient in Organic Food: calcium hydroxide.

18 Feb 1995

USDA/TAP Reviewer Comment Form

Material: Calcium hydroxide

Reviewer: Bob Durst

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

Synthetic.

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

The file is accurate.

This material should be added to the National List as:

__X__ Synthetic Allowed,

_____ Prohibited Natural, or

_____ This material does not belong on the National List because:

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

Must be listed on the ingredient label.

Any additional comments or references?

As with all synthetic inorganic salts, source must be food grade. In addition each lot should be analyzed for toxic element concentrations (mercury, lead, cadmium, arsenic, thallium and antimony) and a near zero tolerance adopted.

There is come concern about any alkali treatment of food products that are high in protein (example here, cooking of corn in lime) regarding the formation of lysinoalanine. Lysinoalanine has been shown to have toxic effects in some animal species tested, but not in others. It also lowers the protein availability of the essential amino acid (lysine), which can markedly reduce the nutritional value of the food.

The above information came mostly from Food Chemistry by Owen R. Fennema. The citations in the book lead to many articles discussing this topic.

Signature _____ Date 3/11/95

NOSB Materials Database

Identification

Common Name	**Calcium Hydroxide**	Chemical Name	
Other Names	Slaked Lime, Hydrated Lime		
Code #: CAS		Code #: Other	
N. L. Category	Non-agricultural	MSDS	◉ yes ○ no

Chemistry

Family	
Composition	$Ca(OH)_2$
Properties	White powder with alkaline, slightly bitter taste. Soluble in water, glycerin and saturated solution of glucose; insoluble in alcohol.
How Made	Mined limestone is calcined (heated at very high temperature) in a kiln to obtain darbon dioxide and "quick lime". The quicklime is then mixed with water to produce calcium hydroxide.

Use/Action

Type of Use	Processing
Specific Use(s)	Miscellaneous and general purpose; buffer; neutralizing agent; firming agent. Used in making calcium acid phosphate (a component of aluminum-free baking powder) and in nutrient supplements.
Action	
Combinations	

Status

OFPA	
N. L. Restriction	
EPA, FDA, etc	FDA-GRAS
Directions	
Safety Guidelines	Use suitable protection against dust. Avoid contact with eyes, skin adn lungs.
State Differences	
Historical status	
Internationl status	Allowed by Codex and EU.

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

As with all mine operations, processors must effectively mitigate locally variable environmental impacts including runoff, erosion, and dust.

2119(m)4: effect on human health

No effects at leverls used in foods; GRAS
Calcium is beneficial to health but this source of calcium is less available than calcium from dairy products.

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

2119(m)6: alternatives to substance

Other alkaline substances. Main alternative sources of calcium are also derived from limestone.

2119(m)7: Is it compatible?

References

AU: O'Hare,-T.J.; Prasad,-A.
TI: The alleviation of sap-induced mango skin injury by calcium hydroxide.
SO: Acta-Hortic. Wageningen : International Society for Horticultural Science. Oct 1992. v. 1 (321) p. 372-381.
CN: DNAL 80-AC82

AU: Mouri,-T; Kawasaki,-Y; Hirai,-A; Miyamoto,-Y
TI: Waste disposal in orange canning factories by biological method. 4. effect of calcium hydroxide on activated sludge treatment of orange canning waste
SO: Cann-J, June 1974, 53 (6): 79-84. Eng. sum.
CN: DNAL 389.8-K13

AU: Mori,-I
TI: Calcium hydroxide treatment for waste disposal by citrus canning factories
SO: Cann-J, July 1974, 53 (7): 12-19.
CN: DNAL 389.8-K13

AU: Burianek,-J
TI: Use of macromolecular compounds of calcium hydroxide, carbon dioxide and sucrose for the clarification of [sugarbeet] juices
SO: LC-Listy-Cukrov, Nov 1974, 90 (11): 248-256. Ref. Eng. sum.
CN: DNAL 66.8-L69

1 - PRODUCT IDENTIFICATION

PRODUCT NAME: CALCIUM HYDROXIDE
FORMULA: CA(OH)2 FORMULA WT: 74.09
CAS NO.: 01305-62-0 NIOSH/RTECS NO.: EW2800000
COMMON SYNONYMS: CALCIUM HYDRATE; SLAKED LIME
PRODUCT CODES: 1372,5143,5033,1374
EFFECTIVE: 09/26/85 REVISION #01

PRECAUTIONARY LABELLING
BAKER SAF-T-DATA(TM) SYSTEM
HEALTH - 1 SLIGHT
FLAMMABILITY - 0 NONE
REACTIVITY - 1 SLIGHT
CONTACT - 2 MODERATE
HAZARD RATINGS ARE 0 TO 4 (0 = NO HAZARD; 4 = EXTREME HAZARD).
LABORATORY PROTECTIVE EQUIPMENT: SAFETY GLASSES; LAB COAT

PRECAUTIONARY LABEL STATEMENTS
WARNING
CAUSES IRRITATION
AVOID CONTACT WITH EYES, SKIN, CLOTHING.
KEEP IN TIGHTLY CLOSED CONTAINER. WASH THOROUGHLY AFTER HANDLING.

SAF-T-DATA(TM) STORAGE COLOR CODE: ORANGE (GENERAL STORAGE)

2 - HAZARDOUS COMPONENTS

COMPONENT	%	CAS NO.
CALCIUM HYDROXIDE	90-100	1305-62-0

3 - PHYSICAL DATA

BOILING POINT: N/A VAPOR PRESSURE(MM HG): N/A
MELTING POINT: 580 C (1076 F) VAPOR DENSITY(AIR=1): 2.5
SPECIFIC GRAVITY: 2.24 (H2O=1) EVAPORATION RATE: N/A (BUTYL ACETATE=1)

SOLUBILITY(H2O): NEGLIGIBLE (LESS THAN 0.1 %) % VOLATILES BY VOLUME: 0
APPEARANCE & ODOR: SOFT, ODORLESS SOLID OR CRYSTALS.

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.

5 - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE (TLV/TWA): 5 MG/M3 (PPM)
TOXICITY: LD50 (ORAL-RAT)(MG/KG) - 7340
CARCINOGENICITY: NTP: NO IARC: NO Z LIST: NO OSHA REG: NO
EFFECTS OF OVEREXPOSURE
DUST MAY IRRITATE NOSE AND THROAT.
CONTACT WITH SKIN OR EYES MAY CAUSE IRRITATION.
TARGET ORGANS: NONE IDENTIFIED
MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE IDENTIFIED
ROUTES OF ENTRY: NONE INDICATED

EMERGENCY AND FIRST AID PROCEDURES: CALL A PHYSICIAN.
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT 15 MINUTES. FLUSH SKIN WITH WATER.

6 - REACTIVITY DATA

STABILITY: STABLE HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
INCOMPATIBLES: STRONG ACIDS

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. WITH CLEAN SHOVEL, CAREFULLY PLACE MATERIAL INTO CLEAN, DRY CONTAINER AND COVER; REMOVE FROM AREA. FLUSH SPILL AREA WITH WATER.
DISPOSAL PROCEDURE
DISPOSE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL ENVIRONMENTAL REGULATIONS.

8 - PROTECTIVE EQUIPMENT

VENTILATION: USE GENERAL OR LOCAL EXHAUST VENTILATION TO MEET TLV REQUIREMENTS.
RESPIRATORY PROTECTION: RESPIRATORY PROTECTION REQUIRED IF AIRBORNE CONCENTRATION EXCEEDS TLV. AT CONCENTRATIONS ABOVE 2 PPM, A SELF-CONTAINED BREATHING APPARATUS IS ADVISED.
EYE/SKIN PROTECTION: SAFETY GLASSES WITH SIDESHIELDS, UNIFORM, RUBBER GLOVES ARE RECOMMENDED.

9 - STORAGE AND HANDLING PRECAUTIONS

SAF-T-DATA(TM) STORAGE COLOR CODE: ORANGE (GENERAL STORAGE)
SPECIAL PRECAUTIONS
KEEP CONTAINER TIGHTLY CLOSED. SUITABLE FOR ANY GENERAL CHEMICAL STORAGE 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)

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

CALCIUM HYDROXIDE

AS#:	001305620	HUMAN CONSUMPTION:	6.05932	MG/KG BW/DAY/PERSON
ASP#:	1801	MARKET DISAPPEARANCE:	7150000.000	LBS/YR
TPE:	ASP	MARKET SURVEY:	87	
AS#:	0044	JECFA:	NL	
EMA#:		JECFA ADI:		MG/KG BW/DAY/PERSON
RAS#:		JECFA ESTABLISHED:	1965	
		LAST UPDATE:	931015	
W:	74.10	DENSITY:	LOGP:	

TRUCTURE CATEGORIES: A7

OMPONENTS:

YNONYMS:
MILK OF LIME
HYDRATED LIME
SLAKED LIME
CALCIUM HYDRATE
CALCIUM HYDROXIDE (CA(OH)2)

HEMICAL FUNCTION: G

ECHNICAL EFFECT:
PH CONTROL AGENT
PROCESSING AID
FIRMING AGENT
NUTRIENT SUPPLEMENT

FR REG NUMBERS: 135.110 184.1205

INIMUM TESTING LEVEL: 3

OMMENTS: STUDY 1 FROM SCOGS-72

OX 7: ACUTE TOXICITY INFORMATION

TUDY: 1
PECIES: RAT
SOURCE: AM IND HYG ASSOC J 30:470
YEAR: 1969
LD50: 7340 MG/KG BW

OMMENTS:

TUDY: 4
SOURCE: FOOD ADDITIVES HANDBOOK (RJ LEWIS)

OCNUM=1801

PECIES: MOUSE YEAR: 1989
LD50: 7300 MG/KG BW

OMMENTS:

OX 3: GENETIC TOXICITY STUDIES

TUDY: 3A COMPLETENESS: SOURCE:
YPE: YEAR:
PECIES: LEL: MG/KG BW/DAY
URATION: HNEL:
FFECTS:
ELLS:
OMMENTS:

TUDY: 3B COMPLETENESS: SOURCE:
YPE: YEAR:
PECIES: LEL: MG/KG BW/DAY
URATION: HNEL:
FFECTS:
ELLS:
OMMENTS:

DCNUM=1793

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

CALCIUM CITRATE

AS#:	000813945	HUMAN CONSUMPTION:	0.1402	MG/KG BW/DAY/PERSON
ASP#:	1793	MARKET DISAPPEARANCE:	165500.000	LBS/YR
TYPE:	NEW	MARKET SURVEY:	87	
AS#:	0040	JECFA:	NL-C	
EMA#:		JECFA ADI:		MG/KG BW/DAY/PERSON
RAS#:		JECFA ESTABLISHED:	1979	
		LAST UPDATE:	930515	
W:	498.44	DENSITY:	LOGP:	

TRUCTURE CATEGORIES: A6 A7

OMPONENTS:

YNONYMS:
TRICALCIUM CITRATE
CITRIC ACID, CALCIUM SALT (2:3)
TRICALCIUM DICITRATE
CALCIUM CITRATE (CA3(O7C6H5)2)
1,2,3-PROPANETRICARBOXYLIC ACID, 2-HYDROXY-, CALCIUM SALT (2:3)
CALCIUM 2-HYDROXY-1,2,3-PROPANETRICARBOXYLATE (3:2)
CITRATE, CALCIUM

HEMICAL FUNCTION: G

ECHNICAL EFFECT:
NUTRIENT SUPPLEMENT
PH CONTROL AGENT
FIRMING AGENT
SEQUESTRANT

FR REG NUMBERS:

182.5195	150.141	150.161
133.173	155.200	133.179
182.6195	182.1195	133.169
182.8195	184.1195	

INIMUM TESTING LEVEL: 3

OMMENTS: NO TOX STUDIES IN SCOGS-84
NO TOX DATA

16.