

NOSB NATIONAL LIST FILE CHECKLIST

PROCESSING

MATERIAL NAME: Potassium chloride

CATEGORY: Synthetic Allowed

Complete?: 3/17

✓

NOSB Database Form

✓

References

✓

MSDS (or equivalent)

✓

FASP (FDA)

✓

Date file mailed out: 1/8/95

✓

TAP Reviews from: Bob Durst

Richard Thauer

Steve Taylor

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 Potassium chloride

Type of Use: Crops; Livestock; Processing

TAP Review by:

1. Steve Taylor
2. Richard Thruer
3. Bob Ourst

Comments/Questions:

My Opinion/Vote is:

Signature _____ Date _____

Now

allowed

1.

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: Potassium Chloride

Reviewer Name: Steve Taylor

Is this substance Natural or Synthetic? Explain (if appropriate)
Synthetic (may be possible to make naturally)

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

USDA/TAP REVIEWER
COMMENT FORM

Original mailing date: 7 Jan 1995.

Name of Material: Potassium Chloride
Reviewer Name: Richard C. Theuer

NATURAL Potassium chloride (muriate of potash) is produced from brines in the United States.

COMMENTS RE SECTION 2119(m) CRITERIA:

1. Potassium and chloride are nutritionally essential elements for man and other animals.
2. Potassium salts have a bitter taste so use is self-limiting. Potassium chloride is used as a salt substitute, especially for salt-sensitive hypertensive individuals.
3. Alternatives to potassium chloride as a nutrient, dietary supplement or yeast food exist, but virtually all other potassium salts are synthetic.
4. The fact that potassium chloride is produced from brine minimizes the environmental impact of its manufacture and makes it more compatible with long-term sustainability.

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:

potassium chloride.

18 Feb 1995



USDA/TAP Reviewer Comment Form

3.

Material: Potassium chloride

Reviewer: Bob Durst

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

It is a synthetic substance. It is used as a yeast nutrient. It is also a salt substitute, where it is used to lower the sodium content.

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:

Synthetic Allowed,

Prohibited Natural, or

? This material does not belong on the National List because: This substance might be considered for exclusion from the list, as it has little (if any) effect for which there is not a suitable substitute (sea salt or sodium chloride).

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.

As mentioned above, while there are serious health concerns about excess sodium intake in the diet, and the use of KCl as a salt substitute is to reduce this, there are also numerous non-chemical ways to accomplish the same thing. Changes in diet or formulation of products with just reduced salt content (without KCl substitution).

An option might be to limit its use to only those applications where a high salt concentration is necessary to produce the product (ie. pickles, sauerkraut) where it can really show its beneficial effect of reducing sodium content.

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.

AU: Freeman,-T.-M. (Tom M.); Gregg,-O.-W. (Owen W.) CA: American Association of Cereal Chemists. Meeting (66th : 1981 : Denver, Colo.).

TI: Sodium intake-dietary concerns.

NT: "Based on presentations at the 1981 Flavor and Additives Division's symposium, "Sodium intake--dietary concerns," held October 26, 1981, at the 66th Annual Meeting of the American Association of Cereal Chemists in Denver, Colorado"--Verso t.p.

AB: Abstract: The proceedings of a 1981 symposium for food technologists, nutritionists, and health professionals concerned with the dietary intake of sodium (Na) by consumers and patients presents 9 overview articles prepared by technical authorities from academia, government, industry, and medicine. Topics include: a major review of the nutritional significance of Na (covering about half of the text); concerns of Na intake in medicine and health; an industrial perspective of the role of Na in the diet; regulatory aspects of Na and salt in processed foods; the consumer's perspective of dietary Na; national surveys of individual Na intakes; and functional and nutritional concerns regarding Na levels in cookies and crackers. A performance evaluation concerning the utility of NaCl-KCl mixtures in bread also is included. The text includes a number of data tables and illustrations and numerous literature citations.

TI: Nutrition statements adopted by the National Health and Medical Research Council at its ninety-eighth session (October 1984).

SO: J-Food-Nutr. Canberra, Australia : Australian Government Publishing Service. 1985. v. 41 (4) p. 191-194. charts.

AB: Abstract: Specific recommendations set forth by the Australian National Health and Medical Research Council covering several nutritionally related themes are discussed; viz.: the use of tables of acceptable weight-for-height based, on a body mass index of 20-25; nutrition education for school children; the replacement of NaCl by KCl in food processing; the need for further studies of food intolerance in children; and that breast-feeding should be encouraged. The importance of disseminating the Council's recommendations on breast-feeding, infant nutrition, and infant feeding practices is stressed. Other related recommendations include: the use of a warning label on soy-based infant formulas citing possible intolerance; the labelling of adult and child medications and of foods concerning colorants, additives, sugar, and other ingredients that may cause intolerance; and the use of guidelines for conclusively establishing elimination diets in food intolerance cases.(wz).

AU: Bell,-R.R.; Eldrid,-M.M.; Watson,-F.R. TI: The influence of NaCl and KCl on urinary calcium excretion in healthy young women.

SO: Nutr-Res. Elmsford, N.Y. : Pergamon Press. Jan 1992. v. 12 (1) p. 17-26. CN: DNAL QP141.A1N88

AB: The calciuric effects of NaCl and KCl were compared in 11 healthy young women consuming diets containing 600 mg calcium per day. Each subject participated in three treatment periods: (1) control diet containing 44 mmol Na and 64 mmol K, (2) control diet plus 102 mmol NaCl and (3) control diet plus 104 mmol KCl. Urine was collected during the last two days of each treatment period and analyzed for Ca, Na, K and Cl. The NaCl supplement produced calciuria similar to that reported by other researchers. However, the KCl supplement did not cause calciuria. Subjects receiving the KCl excreted 5.2 +/- 0.4 mmol Ca compared to 7.0 +/- 0.4 mmol Ca during NaCl supplementation and 5.9 +/- 0.6 mmol Ca during the control period. This suggests that the current practice of replacing some NaCl in food processing, or in salt substitutes, with KCl will decrease the amount of sodium consumed by the general population without contributing to calcium excretion. XAU: Curtin University of Technology, Perth, Australia.

Signature Robert W. Dewar

Date 3/11/95

Identification

Common Name **Potassium chloride** **Chemical Name**
Other Names muriate of potash
Code #: CAS **Code #: Other**
N. L. Category Synthetic Allowed **MSDS** yes no

Chemistry

Family
Composition KCl
Properties Colorless, elongated, prismatic, or cubical crystals, or a white, granular powder. Odorless, has a saline taste, and is stable in air. Solutions are neutral. Insoluble in alcohol.
How Made Produced from brines in the United States.

 Processing

Use/Action

Type of Use
Specific Use(s) Nutrient, dietary supplement; gelling agent; salt substitute; yeast food.
Action
Combinations

Status

OFPA
N. L. Restriction
EPA, FDA, etc FDA-GRAS
Directions
Safety Guidelines
State Differences
Historical status
International status Allowed by IFOAM.

NOSB Materials Database

6.

OFPA Criteria

2119(m)1: chemical interactions Not Applicable

2119(m)2: toxicity & persistence Not Applicable

2119(m)3: manufacture & disposal consequences

brine manufacture has little environmental impact.

2119(m)4: effect on human health

None. Potassium is an essential element but is hazardous in high doses; has caused metabolic alkalosis in infants when used as salt substitute in infant formula.

2119(m)5: agroecosystem biology Not Applicable

2119(m)6: alternatives to substance

Sodium chloride; other potassium salts. Reduce overall salt content in foods with other flavorings etc.

2119(m)7: Is it compatible?

References

See attached.

Also see references in attachment to Bob Durst's TAP review.

POTASSIUM CHLORIDE REFERENCES

AU: Reddy,-K.A.; Marth,-E.H.

TI: Reducing the sodium content of foods: A review.

SO: J-Food-Prot. Ames, Iowa : International Association of Milk, Food, and Environmental Sanitarians. Feb 1991. v. 54 (2) p. 138-150.

CN: DNAL 44.8-J824

AB: Salt (sodium chloride), a substance essential for life processes, is the second most-used food additive. It is added to foods as a flavoring or flavor enhancing agent, a preservative, or an ingredient responsible for desired functional properties in certain products. Excessive dietary sodium is believed to contribute to hypertension and development of cardiovascular disease which afflicts ca. 60 million Americans. Common salt substitutes, including potassium chloride, certain herbs, spices, organic acids, autolyzed yeast products, and hydrolyzed vegetable protein products alone or in combination, if used properly, can result in products that are consumer-acceptable.

AU: Tuncan,-E.U.; Martin,-S.E.

TI: Combined effects of salts and temperature on the thermal destruction of *Staphylococcus aureus* MF-31.

SO: J-Food-Sci-Off-Publ-Inst-Food-Technol. Chicago, Ill. : The Institute. May/June 1990. v. 55 (3) p. 833-836.

CN: DNAL 389.8-F7322

AB: The combined effects of salts (NaCl and KCl) and heat treatment temperature on the thermal destruction of *Staphylococcus aureus* MF-31 was studied by determining the relationships between the decimal reduction time (D value), temperature and each of three parameters (water activity, osmotic pressure and water binding energy) of the heating medium. The results demonstrated that the resistance of *S. aureus* MF-31 to heat destruction increased as the degree of salt-water association increased. Salts and heat treatment temperature had an interactive effect on heat resistance; however, increasing the heat treatment temperature made the difference caused by salt concentrations become insignificant.

AU: Guy,-E.J.

TI: Effect of KCl levels on functional and baking properties of sponge doughs and hedonic ratings of their breads.

SO: Cereal-Foods-World. St. Paul, Minn. : American Association of Cereal Chemists. June 1986. p. 421-425.

CN: DNAL 59.8-C333

AU: Keeton,-Jimmy-T.

TI: Effects of potassium chloride on properties of country-style hams.

SO: J-Food-Sci. Chicago, Ill. : Institute of Food Technologists. Jan/Feb 1984. v. 49 (1) p. 146-148. charts.

CN: DNAL 389.8-F7322

AB: Abstract: A study assessed acceptable levels of KCl as a substitute for NaCl in 16 hams, evaluated weight loss, color changes, and appearance of KCl-cured hams, and characterized the sensory properties of ham slices containing different KCl levels. A 1/3 replacement of NaCl by KCl produced hams having only a slight degree of bitterness, which may be useful for significantly lowering their sodium content.

AU: Maurer,-A.J.

TI: Reduced sodium usage in poultry muscle foods.

SO: Food-Technol. Chicago : Institute of Food Technologists. July 1983. v. 37 (7) p. 60-65. charts.

CN: DNAL 389.8-F7398

AB: Abstract: The sodium (Na) content of poultry products, the functions of commercially-added salt in processed meats, and mechanisms for Na reduction in processed poultry products are reviewed and discussed. The research reviewed suggests that sodium chloride (NaCl) is necessary for optimum product flavor, functionality, and safety. Potassium chloride can be substituted for up to 35-50% of the NaCl in foods, but after that amount it adversely affects food flavor.



MSDS for POTASSIUM CHLORIDE

1 - PRODUCT IDENTIFICATION

PRODUCT NAME: POTASSIUM CHLORIDE
FORMULA: KCL
CAS NO.: 7447-40-7
COMMON SYNONYMS: POTASSIUM MURIATE
PRODUCT CODES: 4920,3047,3052,3046,3040
EFFECTIVE: 05/05/86
FORMULA WT: 74.56
NIOSH/RTECS NO.: TS8050000
REVISION #01

PRECAUTIONARY LABELLING

BAKER SAF-T-DATA(TM) SYSTEM

- HEALTH - 0 NONE
- FLAMMABILITY - 0 NONE
- REACTIVITY - 0 NONE
- CONTACT - 1 SLIGHT

HAZARD RATINGS ARE 0 TO 4 (0 = NO HAZARD; 4 = EXTREME HAZARD).

LABORATORY PROTECTIVE EQUIPMENT: SAFETY GLASSES; LAB COAT

PRECAUTIONARY LABEL STATEMENTS
CAUTION

MAY CAUSE IRRITATION

DURING USE AVOID CONTACT WITH EYES, SKIN, CLOTHING. WASH THOROUGHLY AFTER HANDLING. WHEN NOT IN USE KEEP IN TIGHTLY CLOSED CONTAINER.

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

2 - HAZARDOUS COMPONENTS

COMPONENT	%	CAS NO.
NOT APPLICABLE		

3 - PHYSICAL DATA

BOILING POINT: 1437 C (2619 F) VAPOR PRESSURE(MM HG): N/A
MELTING POINT: 711 C (1312 F) VAPOR DENSITY(AIR=1): N/A
SPECIFIC GRAVITY: 1.98 (H2O=1) EVAPORATION RATE: N/A (BUTYL ACETATE=1)
SOLUBILITY(H2O): APPRECIABLE (MORE THAN 10 %) % VOLATILES BY VOLUME: 0
APPEARANCE & ODOR: WHITE CRYSTALS OR POWDER.

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 BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN POSITIVE PRESSURE MODE.

5 - HEALTH HAZARD DATA

TOXICITY: LD50 (ORAL-RAT)(MG/KG) - 3020 LD50 (ORAL-MOUSE)(MG/KG) - 383
LD50 (IPR-RAT)(MG/KG) - 660 LD50 (IV-RAT) (MG/KG) - 39

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

EFFECTS OF OVEREXPOSURE
DUST MAY IRRITATE SKIN OR EYES.
INHALATION OF DUST MAY CAUSE IRRITATION TO UPPER RESPIRATORY TRACT.
CONTACT MAY CAUSE MODERATE EYE IRRITATION.
TARGET ORGANS: NONE IDENTIFIED
MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE IDENTIFIED
ROUTES OF ENTRY: NONE INDICATED
EMERGENCY AND FIRST AID PROCEDURES
INGESTION: IF SWALLOWED AND THE PERSON IS CONSCIOUS, IMMEDIATELY GIVE
LARGE AMOUNTS OF WATER. GET MEDICAL ATTENTION.
INHALATION: IF A PERSON BREATHE IN LARGE AMOUNTS, MOVE THE EXPOSED
PERSON TO FRESH AIR. GET MEDICAL ATTENTION.
EYE CONTACT: IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15
MINUTES. GET MEDICAL ATTENTION.
SKIN CONTACT: IMMEDIATELY WASH WITH PLENTY OF SOAP AND WATER FOR AT LEAST
15 MINUTES.

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 SUITABLE PROTECTIVE CLOTHING. CAREFULLY SWEEP UP AND REMOVE.
DISPOSAL PROCEDURE
DISPOSE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL
ENVIRONMENTAL REGULATIONS.

8 - PROTECTIVE EQUIPMENT

VENTILATION: USE ADEQUATE GENERAL OR LOCAL EXHAUST VENTILATION
TO KEEP FUME OR DUST LEVELS AS LOW AS POSSIBLE.
RESPIRATORY PROTECTION: NONE REQUIRED WHERE ADEQUATE VENTILATION CONDITIONS
EXIST. IF AIRBORNE CONCENTRATION IS HIGH, USE AN APPROPRIATE RESPIRATOR
OR DUST MASK.
EYE/SKIN PROTECTION: SAFETY GLASSES WITH SIDESHIELDS, 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

POTASSIUM CHLORIDE

S#: 007447407
 SP#: 2578
 PE: NEW
 S#: 0151
 MA#:
 AS#:
 HUMAN CONSUMPTION: 3.2485 MG/KG BW/DAY/PERSON
 MARKET DISAPPEARANCE: 3833333.333 LBS/YR
 MARKET SURVEY: 87
 JECFA: NL-C
 JECFA ADI:
 JECFA ESTABLISHED: 1979
 LAST UPDATE: 920615
 DENSITY: LOGP:
 : 74.55

STRUCTURE CATEGORIES: A7

COMPONENTS:

VONYMS: CHLORURE DE POTASSIUM
POTASSIUM CHLORIDE (KCL)

EMICAL FUNCTION: G

CHNICAL EFFECT: NUTRIENT SUPPLEMENT
FLAVOR ENHANCER
FLAVORING AGENT OR ADJUVANT
MALTING OR FERMENTING AID
STABILIZER OR THICKENER
ENZYME
PROCESSING AID
PH CONTROL AGENT

REG NUMBERS: 166.110 182.5622 150.141 184.1622 150.161

VIMUM TESTING LEVEL: 3

REFERENCES: STUDIES 1-6 FROM SCOGS-102

ACUTE TOXICITY INFORMATION

LD50: 3020 MG/KG BW
 LD50: 3020 MG/KG BW
 SOURCE: ARCH INT PHARMACODYN THER 133:275-283
 YEAR: 1961
 STUDY 1 LD50 = 3020 MG/KG FOR FEMALES

AUG 94
CNUM=2578

STUDY 8 LD50 = 3100 MG/KG

SOURCE: GRM 000091 25:5089
YEAR: 1974
LD50: 2350 MG/KG BW

ADJ: 8
SPECIES: MOUSE
REMARKS:

X 9: ORAL TOXICITY STUDIES (OTHER THAN ACUTE)

3 COMPLETENESS: SOURCE: J LAB CLIN MED 75:729-741
ADJ: SHORT TERM YEAR: 1970
SPECIES: DOG LEL: > MG/KG BW/DAY
RATION: 21 DAYS HNEL: 195 MG/KG BW/DAY
EFFECTS: NO EFFECTS
REMARKS: TEST COMPOUND ADMINISTERED IN ENTERIC-COATED TABLETS
ONE DOSE LEVEL ONLY

7 COMPLETENESS: C SOURCE: J DAIRY SCI 63:82-85
ADJ: SHORT TERM YEAR: 1980
SPECIES: CATTLE LEL: > MG/KG BW/DAY
RATION: 21 DAYS HNEL: 1811 MG/KG BW/DAY
EFFECTS: NO EFFECTS
REMARKS: MALES ONLY
DECREASED FOOD INTAKE AT 1811 MG/KG-MAY BE DUE TO A PALATABILITY
PROBLEM

2 COMPLETENESS: SOURCE: IZV AKAD NAUK ARM SSR BIOL SKH
ADJ: SHORT TERM NAUKI 8:59-62
SPECIES: SHEEP YEAR: 1955
RATION: 1 DAY LEL: 2000 MG/KG BW/DAY
EFFECTS: MOTOR ACTIVITY DECREASE
URINE VOLUME INCREASE

REMARKS: 2/2 SHEEP DIED AT 4000 MG/KG
INCREASED RESPIRATION AND PULSE RATES AT 2000 AND 3000 MG/KG
EFFECTS REVERSIBLE AFTER 6 HOURS

6 COMPLETENESS: C SOURCE: AM J PHYSIOL 166:273-276
ADJ: SUBCHRONIC RODENT YEAR: 1951
SPECIES: RAT LEL: 5250 MG/KG BW/DAY
RATION: 105 DAYS HNEL:
EFFECTS: ORGAN WEIGHT DECREASE
WATER INTAKE INCREASE
CELLULAR HYPERTROPHY
HEART
ADRENAL GLAND