NOSB NATIONAL LIST
FILE CHECKLIST

PROCESSING

MATERIAL NAME: **#12 Gums**

✓ **NOSB Database Form**

✓ **References**

____ **MSDS (or equivalent)**

____ **FASP (FDA)**

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

NOSB/NATIONAL LIST
COMMENT FORM
PROCESSING

Material Name: #12 Gums

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

Locust bean gum

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 8, 1995

Name of Material: Gums

Reviewer Name: R Theuer

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?

CURRENT USES LIMITED BY GOOD MANUFACTURING PRACTICES. GUMS ARE EXPENSIVE. TOO MUCH MEANS PRODUCT IS TOO THICK

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 [signature] **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;

SOME, BUT WASTE STREAM CAN BE USED AS ANIMAL FEED, MULCH, ETC.

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

OK SAFE (GRAS)

(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

VARIOUS GUM AND HYDROCOLLOIDS EXIST ~~USE~~ CHOICE IS GOVERNED BY COST, APPLICATION, ETC.

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

EXCELLENT

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 8, 1995

Name of Material: Gums

Reviewer Name: DR. JOE MONTECALVO

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

Synthetic for Guar and Locust Bean Gum and Carob – Non Synthetic for Gum Arabic

If synthetic, how is the material made? (please answer here if our database form is blank) See attached sheet for further information

This material should be added to the National List as:

✓ **Synthetic Allowed** for Guar, Locust and Carob ____ **Prohibited Natural**

or, ✓ **Non-synthetic (Allowed as an ingredient in organic food)** for Gum Arabic

____ **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: not clear - need more detailed information on extraction and purification of these gums. I will have more info available at a later date - please contact me.

Any additional comments? (attachments welcomed)

See attached sheet.

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;

No data

(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.

	Composition	Properties	Manufact.	Uses
Locust Bean Gum	From Carob Flour, Endosperm containing proteins + CHO's	Yellow-green color, odorless and tasteless	Extracted from ground kernel endosperm of tree pods Ceratonia	① Used as coffee, chocolate and cocoa substitute and extender ② Stabilizer, thickener and binder in foods and cosmetics
Guar Gum	composed of linear chains of (1→4) β-D mannopyranosyl units with α-D-galactopyranosyl attached by a (1→6) linkage. Ratio of D-galactose to D mannose is 1:2.	Soluble in cold and hot H_2O, solutions are tasteless, odorless non toxic. Heat stable	Extracted from the ground endosperm of Cyamopsis tetragonolobus by water extraction.	Used as a stabilizer and thickener for cheese, salad dressings, ice cream and soups. Has 5 to 8x the thickening power of starch
Gum Arabic	Polysaccaride composed of arabinose, galactose, rhamnose and glycuronic acid.	Soluble in water, thickener, emulsifier	Extracted from the dried gummy exudation from the stems and branches of the Acacia senegal	Emulsifier, thickener, in candy and confectionary products - in manufacturing spray dried stable flavor compounds - i.e. for packaged dry goods, puddings, deserts, cake mixes

Prep. Joe Montecalvo 8/22/95

NOSB Materials Database

Identification

Common Name	**Gums, Acacia, Guar etc.**	**Chemical Name**	
Other Names	Gum Arabic, Locust Bean Gum, Guar Gum, Carob Bean gum		
Code #: CAS	9000-30-0 (Guar); 9000-40-2 (Locust)	**Code #: Other**	
N. L. Category	Non-agricultural	**MSDS**	○ yes ◉ no

Chemistry

Family	
Composition	polysaccharides. Guar (*Cyamopsis tetragonolobus*) and locust bean (*Ceratonia siliqua*) consist of galactan and mannan units. Gum arabic is an exudate from the stem of the acacia tree.
Properties	Guar is cold water soluble so can be used in cold processes. Also stable at boiling temperatures over a wide pH range. Locust bean is not fully soluble until 180 degrees F, so it used for hot processes. Both are slightly cloudy and very viscous in solution.
How Made	Guar: seeds are dehusked and seed germs removed (sometimes the hull is loosened with 55% sulfuric acid). The endosperm portion, called splits, are swollen in water, dried, and milled by differential grinding to separate the endosperm from the germ. Locust bean gum is the same except not swollen in water. It can sometimes be pre-treated with a dilute alkali. An alternate procedure involves further purification by dispersing in boiling water, filtering, and recovering the gum by evaporation. Gum arabic is collected from the acacia tree which grows in Africa, India and the southern U.S.

Use/Action

Type of Use	Processing
Specific Use(s)	Guar and Locust bean: Used in dairy (especially ice cream), baked goods, condiments and sauces, cake mixes, puddings and fillings, beverages. Gum arabic is an emulsifier, surfactant, stabilizer, texturizer and binder used in candies, jellies, and baked goods.
Action	functions as a viscosifier, water binder, texturizer, and to improve freeze-thaw stability of the finished product. Synergistic with xanthan gum and carrageenan to improve binding properties.
Combinations	

Status

OFPA	
N. L. Restriction	
EPA, FDA, etc	FDA-GRAS
Directions	
Safety Guidelines	
State Differences	
Historical status	
Internationl status	

OFPA Criteria

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

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

2119(m)3: manufacture & disposal consequences

biodegradeable.

2119(m)4: effect on human health

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

2119(m)6: alternatives to substance

xanthan gum, carrageenan; many gums substitute for each other.

2119(m)7: Is it compatible?

References

Mar B. Nieto, Ph. D. 1995. written communication.

Boyd Foster, Arrowhead Mills, 1994. written communication.

Glicksman, M., Food Hydrocolloids. Vol. III; CRC Press, Inc., Boca Raton, FL

Furia, T.E. (ed.). CRC Handbook of Food Additives. 2nd ed. Cleveland: the Chemical Rubber Co., 1972.