

PETITION FOR LISTING
ON
NATIONAL LIST OF APPROVED AND PROHIBITED
SUBSTANCES
SEC. 2118. [7 U.S.C. 6517] NATIONAL LIST

Petitioner name: Aquaculture Working Group, % George S. Lockwood, Chair
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Date of petition: April 19, 2012

Check applicable:

- § 205.609 Synthetic substances allowed for use in organic aquatic *plant* production.
 § 205.610 Nonsynthetic substances prohibited for use in organic aquatic *plant* production
 § 205.611 Synthetic substances allowed for use in organic aquatic *animal* production.
 § 205.612 Nonsynthetic substances prohibited for use in organic aquatic *animal* production.

Send to: National List Coordinator, National Organic Program,
USDA/AMS/TM/ NOP, Room 4008–So., Ag Stop 0268,
1400 Independence Ave., SW.,
Washington, DC 20250.

Summary of request:

Previous actions by NOSB and NOP allow chlorine materials in the organic production of crops and livestock under:

- § 205.601 Synthetic substances allowed for use in organic crop production.
(2) Chlorine materials— Except, That, residual chlorine levels in the water shall not exceed the maximum residual disinfectant limit under the Safe Drinking Water Act.
(i) Calcium hypochlorite.
(ii) Chlorine dioxide.
(iii) Sodium hypochlorite.

and

- § 205.603 Synthetic substances allowed for use in organic livestock production.

(7) Chlorine materials—disinfecting and sanitizing facilities and equipment. Residual chlorine levels in the water shall not exceed the maximum residual disinfectant limit under the Safe Drinking Water Act.

- (i) Calcium hypochlorite.
- (ii) Chlorine dioxide.
- (iii) Sodium hypochlorite.

and

§ 205.605 Nonagricultural (nonorganic) substances allowed as ingredients in or on processed products labeled as “organic” or “made with organic (specified ingredients or food group(s)).”

(b) Synthetics allowed:

Chlorine materials—disinfecting and sanitizing food contact surfaces, Except, That, residual chlorine levels in the water shall not exceed the maximum residual disinfectant limit under the Safe Drinking Water Act (Calcium hypochlorite; Chlorine dioxide; and Sodium hypochlorite).

This petition is a request for NOSB and NOP to allow chlorine materials in the organic production of aquatic plants in:

§ 205.609 Synthetic substances allowed for use in organic aquatic plant production.

(a) As disinfectants and sanitizers.

(x) Chlorine materials— Except, That, residual chlorine levels in the facility effluent water shall not exceed the maximum residual disinfectant limit under the Safe Drinking Water Act.

- (i) Calcium hypochlorite
- (ii) Chlorine dioxide
- (iii) Sodium hypochlorite

and.in the production of aquatic animals in

§ 205.611 Synthetic substances allowed for use in organic aquatic animal production.

(a) As disinfectants, sanitizers, cleaning compounds, and medical treatments as applicable. Medical treatments must be consistent with FDA regulations.

(x) Chlorine materials—residual chlorine levels in the facility effluent water shall not exceed the maximum residual disinfectant limit under the Safe Drinking Water Act.

- (i) Calcium hypochlorite.
- (ii) Chlorine dioxide
- (iii) Sodium hypochlorite

Chlorine materials are used in aquaculture for disinfecting hard surfaces and culture water. These materials are used in nurseries, growout operations with tanks, harvest and slaughter equipment, and in processing facilities for fish and shellfish.

The use of chlorine materials for organic production in crops, livestock and handling has been extensively reviewed and considered by NOP and NOSB since at least

1995. They have been considered suitable for organic production ever since. The NOP website:

<http://www.ams.usda.gov/AMSV1.0/ams.fetchTemplateData.do?template=TemplateJ&page=NOPNationalList>

includes the following extensive technical reviews:

Chlorine

- [Technical Evaluation Report – Crops \(2011\) \(PDF\)](#)
- [Technical Evaluation Report – Crops \(2006\) \(PDF\)](#)
- [Technical Evaluation Report – Livestock \(2006\) \(PDF\)](#)
- [Technical Evaluation Report – Handling \(2006\) \(PDF\)](#)
- [Technical Advisory Panel Report – Crops \(1995\) \(PDF\)](#)

Because of the extensive nature of these prior technical reviews, answers to most of the following questions are developed in detail in these reports and will not be repeated in this document other than in brief summary form.

Chlorine materials find widespread application in aquaculture since pathogenic microbes in aqueous environments must be eliminated or controlled for successful production. Some aquatic microbes are pathogens for aquatic plants and animals. Chlorine materials are also essential to ensure food safety for humans because human pathogens may be present in slaughtered and live fish and shellfish.

1. The substance's chemical or material common names.

Calcium hypochlorite.
Chlorine dioxide
Sodium hypochlorite

2. The manufacturer's or producer's name, address and telephone number and other contact information of the manufacturer/producer of the substance listed in the petition.

There are many sources of chlorine materials used in aquaculture. The source listed below provides chlorine materials for crops, livestock and processing under the trade name Oxide™ .

CFI Chem Fresh, Inc
<http://www.chemfresh.com>
maltomare@chemfresh.com
Contact: Michael Altomare
Phone: 209-652-5928
Fax: 818-688-8101
P.O. Box 843
Merced, CA 95341

3. The intended or current use of the substance such as use as a pesticide, animal feed additive, processing aid, nonagricultural ingredient, sanitizer or disinfectant. If the substance is an agricultural ingredient, the petition must provide a list of the types of product(s) (e.g., cereals, salad dressings) for which the substance will be used and a descrip-

tion of the substance's function in the product(s) (e.g., ingredient, flavoring agent, emulsifier, processing aid).

The following is a partial list of applications for chlorine materials for sanitizing in aquaculture:

- containers for the culture of live feed such as algae, rotifers and copepods
- tank walls and bottoms,
- facility floors, walls and ceilings,
- culture water in containers,
- piping and water distribution systems,
- growing equipment such as nets and brushes,
- personal apparel such as gloves and boots with foot dip baths,
- truck tires with dip baths, and
- harvest and slaughter equipment, including transport boxes

4. A list of the crop, livestock or handling activities for which the substance will be used. If used for crops or livestock, the substance's rate and method of application must be described. If used for handling (including processing), the substance's mode of action must be described.

A partial list of activities includes:

- nurseries,
- growout tanks, ponds and other containers,
- slaughter equipment, and
- in processing facilities.

5. The source of the substance and a detailed description of its manufacturing or processing procedures from the basic component(s) to the final product. Petitioners with concerns for confidential business information may follow the guidelines in the Instructions for Submitting CBI listed in #13.

This subject is extensively covered in the several technical evaluations and reviews cited above.

6. A summary of any available previous reviews by State or private certification programs or other organizations of the petitioned substance. If this information is not available, the petitioner should state so in the petition.

Please see Summary of request where chlorine materials are on the National List for crops, livestock, and in processed foods.

Organic Materials Review Institute

There are 17 different OMRI citations for the use of chlorine in organic production. The three copied below are for processing food, crops and livestock.

Chlorine Materials

Status: Allowed with Restrictions

Class: **Processing** Sanitizers and Cleaners

Origin: Synthetic Nonagricultural

Description:

Includes calcium hypochlorite, sodium hypochlorite, and chlorine dioxide. May only be used as disinfectants and sanitizers for food contact surfaces provided that is is not used in or on organic food or other organic processed products. Residual chlorine levels in water shall not exceed the Maximum Residual Disinfectant Limit under the Safe Drinking Water Act, currently 4 mg/L (4 ppm) expressed as chlorine.

NOP Rule: 205.605(b)

Chlorine Materials

Status: Allowed with Restrictions

Class: **Crop** Management Tools and Production Aids

Origin: Synthetic

Description:

Calcium hypochlorite, sodium hypochlorite, and chlorine dioxide. Flush water from cleaning irrigation equipment that is applied to crops or fields cannot exceed the Maximum Residual Disinfectant Limit under the Safe Drinking Water Act, currently 4 mg/L (4 ppm) expressed as chlorine. See Processing and Handling section for post harvest use.

NOP Rule: 205.601(a)(2) As algicide, disinfectants, and sanitizer, including irrigation system cleaning systems... Except, That, residual chlorine levels in the water shall not exceed the maximum residual disinfectant limit under the Safe Drinking Water Act. (i) Calcium hypochlorite. (ii) Chlorine dioxide. (iii) Sodium hypochlorite.

Chlorine Materials

Status: Allowed with Restrictions

Class: **Livestock** Management Tools and Production Aids

Origin: Synthetic

Description:

May be used for disinfecting livestock facilities and equipment. Residual chlorine levels in the water in direct contact with food products shall not exceed the maximum residual disinfectant limit under the Safe Drinking Water Act, currently 4 mg/L (4 ppm) expressed as chlorine. Includes calcium hypochlorite, chlorine dioxide and sodium hypochlorite.

NOP Rule: 205.603(a)(7) As disinfectants, sanitizer, and medical treatments as applicable... Chlorine materials—disinfecting and sanitizing facilities and equipment. Residual chlorine levels in the water shall not exceed the maximum residual disinfectant limit under the Safe Drinking Water Act. (i) Calcium hypochlorite. (ii) Chlorine dioxide. (iii) Sodium hypochlorite.

7. Information regarding EPA, FDA, and State regulatory authority registrations, including registration numbers. If this information does not exist, the petitioner should state so in the petition.

The technical reviews cited above contain extensive information about regulations for chlorine materials.

There are few international organizations with organic aquaculture standards, particularly aquatic plant standards. It appears that some await the lead of USDA in placing the 2009 recommendations of NOSB into the Final Rule.

National Standard of Canada: Organic Aquaculture Standards

Draft Date: 2010-06-23

Bleach a) Calcium hypochlorite, b) chlorine dioxide, c) sodium hypochlorite.

Not to exceed 10% solution by volume. Free chlorine levels for wash water shall not exceed the maximum limits under the applicable regulations for safe drinking water.

United Kingdom, Soil Association Organic Standards June 2011 include standards for finfish and shellfish, but apparently do not consider the use of chlorine materials.

8. The Chemical Abstract Service (CAS) number or other product numbers of the substance and labels of products that contains the petitioned substance. If the substance does not have an assigned product number, the petitioner should state so in the petition.

Calcium Hypochlorite:	7778-54-3
Sodium Hypochlorite:	7681-52-9
Chlorine Dioxide:	10049-04-4

Other Codes:

Calcium Hypochlorite: 014701 (EPA/OPP Chemical Code)
Sodium Hypochlorite: 014703 (EPA/OPP Chemical Code); NH3486300 (RTEC number)

Composition of the Substance:

Calcium hypochlorite, sodium hypochlorite, and chlorine dioxide are all synthetic materials not found in nature. Calcium hypochlorite and sodium hypochlorite are commonly known as bleach.

Calcium Hypochlorite (CaCl_2O_2)

Sodium Hypochlorite (ClNaO)

Chlorine Dioxide (ClO_2)

9. The substance's physical properties and chemical mode of action including (a) Chemical interactions with other substances, especially substances used in organic production; (b) toxicity and environmental persistence; (c) environmental impacts from its use and/ or manufacture; (d) effects on human health; and, (e) effects on soil organisms, crops, or livestock.

The technical reviews cited above contain extensive information about properties and modes of action for chlorine materials.

10. Safety information about the substance including a Material Safety Data Sheet (MSDS) and a substance report from the National Institute of Environmental Health Studies. If this information does not exist, the petitioner should state so in the petition.

Please see MSDS sheets at the following websites:

Calcium Hypochlorite <http://www.sciencelab.com/msds.php?msdsId=9927478>

Sodium Hypochlorite <http://www.sciencelab.com/msds.php?msdsId=9925000>

Chlorine Dioxide [http://www.haloxtech.com/pdf/MSDS-Chlorinedioxide\(CIO2\)-540ppm.pdf](http://www.haloxtech.com/pdf/MSDS-Chlorinedioxide(CIO2)-540ppm.pdf)

11. Research information about the substance which includes comprehensive substance research reviews and research bibliographies, including reviews and bibliographies which present contrasting positions to those presented by the petitioner in supporting the substance's inclusion on or removal from the National List. For petitions to include non-organic agricultural substances onto the National List, this information item should include research concerning why the substance should be permitted in the production or handling of an organic product, including the availability of organic alternatives. Commercial availability does not depend upon geographic location or local market conditions. If research information does not exist for the petitioned substance, the petitioner should state so in the petition.

The technical reviews cited above contain extensive information about the disinfecting properties for chlorine materials. They also provide considerable information relative to contrasting positions.

For an article *Chlorine Effective Disinfectant in Aquaculture* by Claude E. Boyd, Ph.D., please go to: <http://aquafiles.files.wordpress.com/2011/02/klorin.pdf>

12. A "Petition Justification Statement" which provides justification for any of the following actions requested in the petition:

A. Inclusion of a Synthetic on the National List, §§ 205.609 and 205.611

- Explain why the synthetic substance is necessary for the production or handling of an organic product.

Without effective water and hard surface disinfection, waterborne microbial infections can prevent the culture of healthy fish and shellfish. Processed fish and shellfish products may also contain human pathogens.

- Describe any non-synthetic substances, synthetic substances on the National List or alternative cultural methods that could be used in place of the petitioned synthetic substance.

The [Technical Evaluation Report – Crops \(2011\) \(PDF\)](#) cited above, beginning on page 12, discusses substances that could be substituted for chlorine materials. In addition to the comments contained in that report, the following comments pertain to aquaculture.

Hydrogen peroxide. This substance is allowed under 205.605(b) and 205.603(a)(13). However, it has found limited use in aquatic systems, one reason being its rapid decomposition into water and oxygen.

Ozone. This substance is included on the National List in sections 205.605 and 205.601 as a sanitizer. However, it has found limited use in aquatic systems since it can generate other substances such as bromides that are toxic to aquatic plants and animals that persist in solution.

Electrolized water. This substance has not found significant use in aquaculture, particularly since it is pH dependent, while aquatic growing systems are optimized at different pH levels.

Additional substances that could be substituted for chlorine materials in organic aquaculture production include the following: alcohols—ethanol and isopropanol; copper sulfate; peracetic acid—for use in disinfecting equipment; and soap-based algaecide/demossers. According to NOP Regulations 7 CFR 205.601(a), synthetic forms of alcohol are allowed as an algaecide, disinfectant, and sanitizer (including irrigation system cleaning systems). Copper sulfate (for restricted use as an algaecide in aquatic rice systems) is limited to one application per field during any 24-month period. Application rates are limited to those that do not increase baseline soil test values for copper over a timeframe agreed upon by the producer and accredited certifying agent. Peracetic (or peroxyacetic) acid is allowed for use in disinfecting equipment, seed, and asexually propagated planting material. None of these substances are qualified substitutes for chlorine materials.

- Describe the beneficial effects to the environment, human health, or farm ecosystem from use of the synthetic substance that support its use instead of the use of a non-synthetic substance or alternative cultural methods.

Properly used, these substances can positively effect the health of aquatic animals in aquaculture production systems as well as the health of humans who eat the fish and shellfish products. There are no practical substitute substances, nor alternative culture methods that could avoid the use of chlorine materials.

13. A “Confidential Business Information Statement” that describes the specific required information contained in the petition that is considered to be confidential business information or confidential commercial information and the basis for that determination.

This petition does not contain any confidential business information.

Conclusions

Chlorine materials are essential for the healthy production of aquatic plants and animals, and for product safety after harvest and processing. Their use is already allowed in terrestrial crops, are Generally Recognized as Safe, and provide no environmental risks. There are no natural alternatives.

This petition is a request for NOSB and NOP to allow chlorine materials in the organic production of aquatic plants in:

- § 205.609 Synthetic substances allowed for use in organic aquatic plant production.
- (a) As disinfectants and sanitizers.

(x) Chlorine materials— Except, That, residual chlorine levels in the facility effluent water shall not exceed the maximum residual disinfectant limit under the Safe Drinking Water Act.

- (i) Calcium hypochlorite
- (ii) Chlorine dioxide
- (iii) Sodium hypochlorite

and to allow chlorine materials in the organic production of aquatic animals.

§ 205.611 Synthetic substances allowed for use in organic aquatic animal production.

(a) As disinfectants, sanitizers, cleaning compounds, and medical treatments as applicable. Medical treatments must be consistent with FDA regulations.

(x) Chlorine materials—residual chlorine levels in the facility effluent water shall not exceed the maximum residual disinfectant limit under the Safe Drinking Water Act.

- (i) Calcium hypochlorite.
- (ii) Chlorine dioxide
- (iii) Sodium hypochlorite

Chlorine materials are well established in organic crop and livestock production, and handling operations and have been allowed for many years since at least 1995. They are also sanitizers widely used in aquaculture for disinfecting hard surfaces such as tank walls and floors, equipment such as nets and brushes, and personal apparel such as foot baths, and for disinfecting culture water in containers. Chlorine materials are used in nurseries, growout operations with tanks and ponds, and in processing facilities for fish and shellfish.

This petition requests allowance of chlorine materials in the organic production, harvesting and processing of aquatic plants and aquatic animals.

Aquaculture Working Group
George S. Lockwood, Chair