



## **Guidance**

# **The Use of Chlorine Materials in Organic Production and Handling**

### **1. Purpose**

This guidance provides clarification regarding the use of chlorine materials in organic production and handling.

### **2. Scope**

This guidance provides information to National Organic Program (NOP) certifying agents and to certified and exempt organic operations.

### **3. Background**

The NOP is providing this guidance to clarify and ensure consistency in the use of chlorine products under the NOP regulations and in response to recommendations from the National Organic Standards Board (NOSB). The annotations limiting the use of chlorine in 7 CFR § 205.601(a)(2), § 205.603(a)(7), and § 205.605(b) of the National List of Allowed and Prohibited Substances (National List), do not align with a November 1995 NOSB recommendation on chlorine materials. This recommendation stated that chlorine materials should be allowed for use in organic crop production, organic food processing, and organic livestock production with the following annotation:

“Allowed for disinfecting and sanitizing food contact surfaces. Residual chlorine levels for wash water in direct crop or food contact and in flush water from cleaning irrigation systems that is applied to crops or fields cannot exceed the maximum residual disinfectant limit under the Safe Drinking Water Act (currently 4mg/L expressed as Cl<sub>2</sub>).”

This annotation was originally crafted to acknowledge that levels of chlorine permitted in municipal drinking water were considered acceptable for organic food production and handling. The language used in the proposed NOP rule published in March 2000 did not include the terms “in direct crop or food contact” and “in flush water ... that is applied to crops or fields.” The language used under § 205.605 (handling uses) only mentions use in disinfecting food contact surfaces, leading some handlers to question whether chlorine could be used in direct food contact. The NOP responded in the preamble of the final rule (65 FR 80548, 80616, December 21, 2000) which stated that the use of the term “residual chlorine” referred to the chlorine that was present in water when it exited the facility as effluent.

The NOSB revisited the issue through a May 2003 recommendation. The NOSB noted that “residual chlorine” is a scientific term used when measuring chlorine. Residual chlorine (also called free or available chlorine) is the chlorine that remains available in solution after the disinfection step is complete, when the initial added chlorine material has been reduced by reaction, bound to the organic matter, or evaporated. The residual chlorine is what is still available to oxidize other substances. Residual chlorine is the fraction of available chlorine in solution derived from the disinfectant source.



When calcium hypochlorite or sodium hypochlorite is used, the proper measure for residual chlorine is the sum of the concentrations of hypochlorous acid (HOCl) and hypochlorite ion (OCl<sup>-</sup>). For chlorine dioxide (ClO<sub>2</sub>), all unreacted chlorine is considered to be free chlorine. Another frequently used term is total chlorine, which is a measurement of the free plus inactive forms.

In 2003, the NOSB stated: “The Organic Foods Production Act is not designed to function as a waste water regulation. Instead, it is a regulation designed to protect organic integrity. As such, processing operations must demonstrate compliance with the chlorine annotation by monitoring the chlorine content of the water which is in direct contact with organic products, not the wash water which is discharged from the facility.” This statement represents NOP’s current thinking on this topic.

#### **4. Policy**

As per the annotations in the National List shown below, residual chlorine levels in the water shall not exceed the maximum residual disinfectant limit under the Safe Drinking Water Act (SDWA). To demonstrate compliance with the NOP regulations regarding chlorine, certified operators should monitor the chlorine level at the point where the water last contacts the organic product in direct applications. A description of the operation’s monitoring procedure should be contained in the operation’s Organic System Plan. Certifying agents should review and verify records used by certified operations to demonstrate compliance during the operation’s annual inspection.

##### **4.1 Crop operations:**

1. Residual chlorine levels in the water in direct crop contact (when used pre-harvest) or as water from cleaning irrigation systems applied to soil should not exceed the maximum residual disinfectant limit under the SDWA.
2. Chlorine products may be used up to maximum labeled rates for disinfecting and sanitizing equipment or tools. No intervening event is necessary before equipment is used in contact with organic crops.

##### **4.2 Livestock operations:**

1. Residual chlorine levels in the water in direct food or animal contact (for example, drinking water) should not exceed the maximum residual disinfectant limit under the SDWA.
2. Chlorine products may be used up to maximum labeled rates for sanitizing equipment or tools (including dairy pipelines and tanks). Label instructions should be followed regarding requirements for rinsing or not rinsing prior to the equipment’s next use.

##### **4.3 Handling operations (includes on-farm post-harvest handling):**

1. For food handling facilities and equipment, chlorine materials may be used up to maximum-labeled rates for disinfecting and sanitizing food contact surfaces. Rinsing is not required unless mandated by the label use directions.



2. Water used in direct post-harvest crop or food contact (including flume water to transport fruits or vegetables, wash water in produce lines, egg or carcass washing) is permitted to contain chlorine materials at levels approved by the Food and Drug Administration or the Environmental Protection Agency for such purpose.
  - a. Rinsing with potable water that does not exceed the maximum residual disinfectant limit for the chlorine material under the SDWA must immediately follow this permitted use.
  - b. Certified operators should monitor the chlorine level of the final rinse water, the point at which the water last contacts the organic product. The level of chlorine in the final rinse water must meet limits as set forth by the SDWA.
  - c. Water used as an ingredient in organic food handling should not exceed the maximum residual disinfectant limit for the chlorine material under the SDWA, as required by the Organic Food Production Act (7 U.S.C. 6510(a)(7)).

## 5. References

### Other Definitions

“Maximum residual disinfectant level” is a term defined by the Environmental Protection Agency (EPA) at 40 CFR §§ 141.2, 141.65 as the highest level of a disinfectant allowed in drinking water. This level is currently established by EPA at 4 mg/L for chlorine (as Cl<sub>2</sub>) and 0.8 mg/L for chlorine dioxide.

### Organic Foods Productions Act (1990 as amended)

7 U.S.C. 6510, Handling.

- (a) In General.—For a handling operation to be certified under this title, each person on such handling operation shall not, with respect to any agricultural product covered by this title...
  - (7) use in such product water that does not meet all Safe Drinking Water Act requirements.

### NOP Regulations (as amended to date)

7 CFR § 205.601 Synthetic substances allowed for use in organic crop production.

- (a) As algicide, disinfectants, and sanitizer, including irrigation system cleaning systems.
  - (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

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

- (a) As disinfectants, sanitizer, and medical treatments as applicable
  - (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.



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7 CFR § 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).

### **NOSB Recommendations**

2003, NOSB. Measuring Effluent: Clarification of Chlorine Contact with Organic Food, NOSB Processing Committee April 30, 2003.

<http://www.ams.usda.gov/AMSV1.0/getfile?dDocName=STELDEV3104548>

1995, NOSB. Final Minutes of the National Organic Standards Board Full Board Meeting Austin, Texas October 31-November 4, 1995.

<http://www.ams.usda.gov/AMSV1.0/getfile?dDocName=STELPRDC5057496>

### **Other Laws and Regulations**

Safe Drinking Water Act, 1974 as amended 1986, 1996; included in 42 U.S.C. Chapter 6A – Public Health Service, Section 300f, authorizes National Primary Drinking Water Regulations, 40 CFR Part 142. <http://water.epa.gov/lawsregs/rulesregs/sdwa/index.cfm>

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